



CanCOVID

COVID-19 • SCIENCE • KNOWLEDGE

CONNAISSANCES SCIENTIFIQUES - COVID-19

Issue Note

Key considerations and emerging evidence of experience across jurisdictions implementing documentation of vaccination

Contributions: Sarah Carbone, Rosa Stalteri, Rebecca Plouffe, Clémence Ongolo Zogo, Shahrzad Motaghi Pisheh, Lisa Puchalski Ritchie, Nazeem Muhajarine, Susan Law, Vivek Goel

Executive summary

As SARS-COV-2 vaccine administration accelerates in many countries, governments are considering implementing the policy of documentation of vaccination (or 'DV') to support the re-opening of the economy and the easing of restrictive public health measures. Several jurisdictions have begun to implement DV programs, with more countries expected to follow in the coming weeks and months.

Question: what is the emerging evidence and experience across jurisdictions of implementing documentation of vaccination to help manage the transition to post-pandemic activity? What are the mitigating factors for success or failure in implementation?

This rapid literature scan outlines a set of considerations and existing recommendations (scientific, technical, legal, ethical, and behavioural) for implementing DV programs that we believe are most relevant to the Canadian context. It also presents the experiences of jurisdictions that have considered and implemented these programs to date, where this information is available. Although this report is tailored to Canada more broadly, the Ontario Science Table's Science Brief provides key scientific, legal, ethical, privacy, and accessibility considerations for implementing COVID-19 vaccine certificates for provincial governments, focusing particularly on the Ontario context (1).

Implementing policies around vaccine documentation should consider, holistically, the scientific, the technical, the legal, the ethical, and the behavioral impacts. To date, evidence that DV would be an effective public health measure to prevent the spread of COVID-19, and lead to reduced morbidity and mortality, is insufficient to guide decision-making. Further, there are few countries with significant levels of fully vaccinated populations. As such, implementation may require a compelling health argument that DV is a good use of resources from a public health lens. Although there have been several use cases identified, it is clear that DV will be required by many jurisdictions for international travel with the aim to prevent the spread of COVID-19 and its variants. There are mixed views and limited evidence around domestic use of DV for participation in activities. Development of vaccine documentation across Canadian provinces and territories may cause technical challenges with respect to collection, storage, and sharing of sensitive health information.

This report has several limitations, primarily due to rapid deadlines:

- We may have missed relevant information due to rapid timelines to produce this report.
- Although we did not formally assess the quality of the evidence, the quality was generally low, and the majority of included texts were published editorials, commentaries, and media sources.
- Few considerations for implementation of vaccination documentation have been tested in practice as most global jurisdictions were found to be in the early stages of DV programs and implementation experience was limited.
- This report is largely limited to English-speaking countries as we restricted our search to English publications only.

This report synthesizes existing knowledge on documentation of vaccination and presents a set of considerations and recommendations for implementing a proof of vaccination program in Canada. The following are some key findings from this work:

1. A range of views exist regarding the documentation of vaccination, with national and international jurisdictions considering various approaches.
2. More research on existing vaccines and DV outcomes may be needed to justify the implementation of a DV program in Canada as considerable investment may be required (1).
3. Privacy, security, and interoperability are essential features of a successful DV program.
4. Introducing a DV program is a complex process as the program must comply with multiple levels of local, national, and international laws and guidelines.
5. Various accommodations may be needed to mitigate ethical concerns with DV programs for both local and international communities (1).
6. Introducing a DV program may shift social behaviours. Therefore, the government should model and plan for a range of potential responses.

7. DV programs may influence vaccine acceptance, if individuals see the activities that they can engage in if fully vaccinated (1).
8. The need for DV for domestic purposes may be time-limited and of less value once vaccination coverage levels are high and case rates low.
9. Lack of federal policy and standards for DV may result in a patchwork of different programs across the provinces and territories.
10. Global perceptions towards DV programs are rapidly evolving, and existing examples highlight the importance of strong partnerships and comprehensive planning in their implementation.

Introduction

As SARS-COV-2 vaccine administration accelerates in many countries, governments are considering policy options to support the re-opening of the economy and the easing of restrictive public health measures. One policy option under scrutiny is the documentation of vaccination, recovery, or antigen testing (referred to hereafter as 'DV program'). While specific implementation processes of DV programs vary, they generally consist of three core elements: 1) confirmation of health information (i.e., vaccination, infection or recovery status); 2) verification of identity (i.e., identifying the document holder); and 3) authorization of certain actions (i.e., establishing which actions are permitted or blocked) (2). DV programs have the potential for both domestic use (i.e., enabling the safe re-opening of businesses) and for international travel, given existing requirements for documentation to cross border and the need for control measures in the context of a global pandemic.

The introduction of DV programs is controversial and has been the subject of global debate. The utility of a DV program is partly predicated on the assumptions that vaccinated individuals are protected from severe COVID-19 infection and will not spread the virus to others. However, conclusive scientific evidence to support this is not yet available, particularly with respect to degree and duration of immunity (2–5,83). Furthermore, there is no scientific consensus on the utility of DV programs and international scholars have described many ethical challenges associated with the introduction of DV programs (6). While the World Health Organization (WHO) continues to advise against the use of DV programs for international travel (7), several jurisdictions have considered and begun to implement DV programs, with more jurisdictions expected to follow in the coming weeks and months.

The question that this rapid literature scan seeks to answer is: what is the emerging evidence and experience across jurisdictions of implementing documentation of vaccination to help manage the transition to post-pandemic activity? What are the mitigating factors for success or failure in implementation?

This rapid literature scan presents five categories of considerations (scientific, technical, legal, ethical, and behavioural) for the implementation of DV programs and multiple corresponding recommendations for the successful introduction of a DV program in Canada. Further, it summarizes emerging knowledge on the experiences of jurisdictions that have considered and implemented DV programs to date. Although this report is tailored to Canada more broadly, the Ontario Science Table's Science Brief provides key scientific, legal, ethical, privacy, and accessibility considerations for implementing COVID-19 vaccine certificates for provincial governments, focusing particularly on the Ontario context (1).

Methods

Data for this report was retrieved through academic and grey literature databases, including: LitCOVID; the WHO COVID-19 Global Literature Database; Public Health Agency of Canada; the COVID-19 Primer; COVID-END; Epistemonikos; the Agency for Healthcare Research & Quality EPC Evidence-Based Reports; the Centre for Reviews and Dissemination; TRIP; MEDLINE; and Google Scholar. Various terms were included in the search to capture a range of DV programs (e.g., 'vaccine passport', 'immunity pass', 'vaccination certificate', 'immunity license', 'immunization record'). To capture emerging evidence on the

experience of implementing DV programs, a scan of international government websites and various media sources was conducted. Texts on a range of DV types (i.e., proof of vaccination, recovery, or negative test) and intended uses (i.e., domestic, or international use) were included.

Limitations

- Relevant information may have been missed given that the search and report were completed within a rapid timeframe of two weeks.
- Although we did not formally assess the quality of the evidence, quality is generally low given that the majority of included texts were published editorials, commentaries, and media sources.
- Although many of the authors offer similar considerations for implementing DV programs, few have been tested in practice as most global jurisdictions were found to be in the early stages of DV programs and published implementation experience was limited.
- We only included texts published in English, therefore evidence in this report is largely limited to English-speaking countries.

Considerations and recommendations for implementing documentation of vaccination programs

This section of the report presents five categories of considerations relevant to the implementation of DV programs and summarizes recommendations to mitigate challenges and support the successful implementation of a DV program in Canada. Recommendations were drawn from a range of international literature on DV programs. However, some authors have developed specific lists of recommendations for the Canadian context (8). This section synthesizes existing lists by highlighting a selection of recommendations that may be relevant to the Canadian context.

It is important to note that while the available knowledge and evidence on DV programs focused largely on implementation considerations, governments also face significant risks if they do not advance a clear policy framework for DV. In Canada, a lack of clear policy and standards for DV programs may result in the proliferation of multiple different approaches across and within the provinces and territories. This could present significant logistical challenges, and potentially compromise the health and safety of the population. However, data pertaining to this type of risk was not identified through this report.

Scientific

Considerations for implementation

Although evidence on SARS-CoV-2 is rapidly emerging, ongoing concerns remain over the scientific evidence for DV programs (1). Namely, scholars have noted that insufficient evidence is available to fully understand: a) the relationship between seropositivity and immune protection, as well as the reliability of antibody tests (9–14); b) the duration of protection conferred through vaccination (3,15,16); c) the effectiveness of current vaccines for reducing and preventing transmission (2,3,5,83); and d) the extent to which vaccination is protective against currently identified and future viral variants (3,5,9,15,17). While emerging research does suggest that the current vaccinations may be effective in preventing severe COVID-19 infection and reducing transmission (15,16,18), further evidence will be necessary to scientifically justify the need for a DV program and its potential effectiveness as a policy intervention.

Recommendations for success

Given the current evidence, several scientific recommendations have been raised in the literature to help support successful DV program implementation:

1. **Include dates of vaccine administration and plans for anticipated renewal and/or expiration with all documentation of vaccination** (3,19). These can be updated as new evidence on the duration of protection provided by different vaccines becomes available.
2. **Maintain flexibility in the DV program and ensure that it is based on evidence-informed policies and subject to regular review** (2,20,21,83). The DV program will need to incorporate rapidly emerging scientific evidence on vaccination, transmission, and immunity over time, which will justify the continued use or termination of the program.
3. **Establish measures and scientific pre-conditions for vaccinations and the DV program, and use these to establish parameters and evaluate outcomes** (20). Benchmarks will be required to assess appropriate risk and transmission while the DV program is in place. Specific measures will be needed to determine the impact of the DV program over time. DV programs should be developed alongside plans for evaluation (22).
4. **Undertake evaluation of the impact of DV programs, considering comparisons of outcomes in jurisdictions with and without DV programs, and in terms of effectiveness in relation to other public health interventions, but also in light of various local or population contexts** (1,20). Consider the outcomes of the DV program in relation to other possible public health interventions. Implementing a DV program will require significant resource investments and will come with an opportunity cost.

Technical

Considerations for implementation

Many technical and practical barriers impede the development and implementation of DV programs, which involve the collection, storage, and sharing of sensitive health information. As with any new program involving personal information and identification, privacy concerns have been voiced in relation to DV programs (1,8,19,23,24). These concerns may be exacerbated if the solutions are developed in the private sector rather than by the government (8). Falsification and fraudulent uptake are also important risks associated with DV programs, as they could serve to undermine the intent and utility of the policy intervention (3,11,17,25–29). While digital documentation (rather than paper documentation) may offer a more secure platform for sharing vaccination information, robust security measures remain important for protecting the integrity of documentation and the privacy of the holder.

Ensuring international interoperability represents another significant technical challenge, as digital DV programs will need to communicate with each other in order to authenticate the documentation (2,20,30). Interoperability is particularly relevant to the Canadian context, as vaccine registries across the provinces and territories currently lack interoperability and a standardized system (5); however, the federal government is currently working with the provinces on a solution (31). Finally, depending on the type of DV program developed, practical concerns may emerge. In some jurisdictions, concerns have already been voiced among health care providers that a DV program could increase their workload (32).

Recommendations for success

To mitigate the technological barriers to DV program implementation, some recommendations have been proposed:

1. **Utilize international standards for interoperability and reliable documentation** (2,5,8,20,27,33,34). As established, jurisdictions will need to coordinate their efforts to ensure interoperability between vaccination registries and among DV programs, making internationally agreed-upon standards of paramount importance.
2. **Develop detailed training materials and protocols to accompany the DV program** (20). These materials can be used to ensure the standardization and reliability of data, while also reducing the individual time-investment required.

- 3. Incorporate privacy and security features utilizing verified technologies like blockchain and secure contracts (25,27).** These features will help to ensure that data is protected from security breaches and falsification. Blockchain technology is being utilized in many of the DV programs solutions currently in development and use internationally (33,35,36).

Legal

Considerations for implementation

The introduction of a DV program raises many legal questions which could slow or hinder implementation. DV programs will be governed by local, national, and international legal requirements, spanning a range of topics including health, human rights, equity and diversity, labour, privacy, and mobility (4,30). Implementing a DV program may require the introduction of new legislation which may take significant time to draft and be challenging to pass in government (1). Finally, additional resources and planning will be required to enforce the permitted actions under these laws (4).

Recommendations for success

Legal considerations relevant to the Canadian context were described in the literature included:

- 1. Define the purpose of the documentation and its intended use (4,8,20).** Clearly defining the program and its parameters will help to confirm when it can be used, how, and by whom.
- 2. Establish clear laws and legal guidelines for the data that can be collected through DV programs (2,4,20).** Data collected through the program should be integral to its function and securely deleted after use (28,37). Clear laws establishing the scope of the program and what is permissible under the program will help to avoid function creep and other evolving challenges.
- 3. Institute a sunset clause and clear timeline for the duration of the DV program (4,20).** Establishing important milestones and timelines will help to ensure that the program does not extend beyond its period of acceptability and utility.
- 4. Plan for how the new laws and regulations will be enforced (4).** Multiple areas and levels of enforcement may be required to support the optimal implementation of the DV program.
- 5. Assign a regulatory body to ensure program compliance with relevant laws and procedures (4,37).** Independent oversight of program developers and administrators will help to minimize risk and ensure alignment between the DV program and its intended purpose.

Ethical

Considerations for implementation

Ethical concerns related to DV programs represent a significant implementation challenge, as successful programs will need to be affordable, accessible, and equitable. In the reviewed literature, a frequent concern was the potential for DV programs to create and exacerbate inequality (1,3,6,27,32,33,38,39). In particular, while DV programs are being developed with the intent to facilitate access to domestic and international services, they do so by promoting the freedoms of the vaccinated while restricting the freedoms of others (2,15,40,83). However, while this may contribute to problematic social divides within and between societies, some scholars have noted that it may be equally problematic to continue blanket restrictions when some individuals pose no threat to others (14,17). Despite this, DV programs risk ethical complications at the local level, where certain populations who are unable or unwilling to become vaccinated may be disadvantaged (3,19,21,28), at the international level, where many low- and middle-income countries continue to await vaccine doses (3,27,41,83), and in any region where digital DV programs may not be feasible. Similarly, digital discrimination may also emerge among populations with limited technical knowledge or access to smartphones (1,2,19,28). Finally, although Canadians have a

right to access their own health information, DV programs may normalize the surveillance of health status, creating new avenues for discrimination (2,42).

Recommendations for success

Although DV programs establish a complex array of ethical challenges, some ideas have been presented to mitigate these effects:

1. **Consult with key stakeholders, including the public, to understand and address concerns with the program** (21,23). This may serve to reduce tension in the implementation of the program and support successful implementation and program sustainability.
2. **Engage trusted community members and leaders in the implementation and promotion of the program** (20,22,24). These leaders may help to foster trust in the program and help in its promotion and uptake.
3. **Ensure that all documentation and communication regarding the program is transparent and accessible** (21,22). Clear communication will be required to encourage buy-in and ensure that the population has an appropriate understanding of the program.
4. **Consider introducing different options or accommodations within the DV program to support equitable and ethical uptake** (21,43). Different types of proof (e.g., proof of vaccination, recovery, or negative infection) and documentation (e.g., paper records, digital records) will help to ensure that the program is equitable and accessible to as many people as possible. Specific accommodations may be required to avoid discrimination based on vaccination status.

Behavioural

Considerations for implementation

The behavioural responses of individuals, businesses, and jurisdictions may complicate the implementation and sustained use of DV programs. Recent polls suggest that most Canadians support the introduction of DV programs. However, support is generally higher for international travel over domestic use (44,45). Surveys in Canada and other countries have also shown that perceptions towards the developer of the DV program (e.g., private sector, government) may influence support (44,83). Perceptions towards the DV program are critical for implementation success, and some organizations and authors have cautioned that the programs may encourage vaccine hesitancy and mistrust, or reduce vaccination rates (2,22). However, this concern may be unfounded, as Israeli leaders have expressed the view that Israel's DV program incentivized vaccine uptake among the population (46,47). Further evidence is needed to fully understand the impact of DV programs on vaccine uptake among different populations – particularly with consideration for local and/or population-level cultural norms and variations.

The introduction of DV programs may also contribute to a range of negative behavioural responses. Early in the pandemic, scholars warned that DV programs may encourage individuals to seek out infection (4,11,12,14,25,28,48–50). Although this concern may be less prevalent in Canada now that vaccines are more widely available, it could persist in certain contexts. Finally, public communications on the objectives and outcomes of DV programs must be clear, otherwise individuals may engage in higher risk or less protective behaviours (e.g., hand washing, social distancing) (2,9,22). For example, one study assessed the impact of different language choices on individuals' perceived risk and behaviours and found that more individuals perceived no risk when the term 'immunity' was used to describe a DV program (51).

Recommendations for success

Some considerations have been proposed in the literature to alleviate the uncertainties of how individuals and businesses may respond to a DV program:

1. **Model and test the potential behavioural impacts of a DV program (20).** Public responses to a DV program could be diverse and challenging to predict; however, they could have serious implications for the success of the intervention. Modeling different scenarios will help to optimize success.
2. **Use evidence-informed terminology in all communications and test public understanding of the DV program (9,20).** Communications about the program will be central to uptake and implementation success. Therefore, careful consideration must be placed on communication strategies and terms.

Evidence of emerging experience

This section of the report provides an overview of several jurisdictions where DV programs have been considered or implemented, and some preliminary observations of their experiences. The current status of DV programs in Canada is also briefly reported.

International documentation of vaccination program examples

Globally, many jurisdictions have announced plans to explore DV programs as a policy option. These plans are at various stages of development and implementation. The Ada Lovelace Institute reports frequent updates on these plans through their vaccine passport policy and practice monitor (52).

To date, several jurisdictions worldwide have implemented regional or national DV programs for domestic and/or international use. Current programs are described in several jurisdictions, of which three are highlighted in Table 1 due to available evidence on their experience. Other jurisdictions have considered implementing DV programs and have been met with resistance. Notably, recent media from the United Kingdom (UK) suggests that a potential DV program has been stalled due to growing opposition and legal challenges (53,54). Similarly, although New York State in the United States has implemented a DV program, several other American states have begun to consider or issue bans against their use (55,56). As a result, it appears unlikely that the United States will adopt a national DV program (57). The experience in Canada may be similar, with receptiveness to DV programs varying across the provinces and territories. Table 2 provides a brief overview of current plans for DV programs across Canada.

Several jurisdictions have partnered with developers and other organizations to run pilot DV programs. To highlight, Estonia initiated an immunity passport pilot in 2020 and later partnered with the WHO to jointly develop a “digitally enhanced International Certificate of Vaccination” (52,58). This program is being piloted in Estonia, Hungary, and Iceland (43). The UK government also granted funding for several feasibility studies and pilot projects for digital DV programs (59,60). Further information on the outcomes of these programs was not found.

Separately, private companies and airlines have initiated the development of DV programs and are exploring partnerships with several nations. Mithani et al (2021) have recently released a scoping review which synthesizes knowledge on private sector DV programs in development (33). Of note, the International Air Transport Association (IATA) has been developing a Travel Pass Initiative, which is being trialed by over 30 global airlines (61).

Table 1. International examples and experiences implementing documentation of vaccination programs

Program Name (Jurisdictions)	Description	Evidence of experience
Green Pass (Israel)	<ul style="list-style-type: none"> Launched by the Ministry of Health in February 2021 and terminated on June 1, 2021. The application was linked to the national health ministry data. Users were given a scannable code to be displayed on their phones or on paper. The code confirmed that they had either been fully vaccinated or had recovered from a COVID-19 infection (45). The Green Pass was used domestically, to gain entry to businesses and venues, rather than to support international travel. Children under the age of 18 are included under their parents' Green Pass (62). A website and Ministry of Health hotline were developed to facilitate Pass implementation (62). In March, an option was added in the app to allow non-vaccinated persons to link a recent negative test result (43). 	<ul style="list-style-type: none"> Approximately 80% of the eligible adult population in Israel is now vaccinated and current cases are low, therefore the Green Pass initiative was retired (46). While the Green Pass was in use, concerns were raised about the falsification of passes and lack of enforcement (63). Concerns were also flagged about the equitability of the Green Pass, since the majority of Palestinians living under Israel's control continue to wait for vaccines (46,64). Overall, the Green Pass system seems to have been a success, with some leaders suggesting that the Pass encouraged vaccine uptake (46,47). However, businesses reported that enforcing the Green Pass was a burden, with some choosing to remain closed due to the Green Pass' impact on their profitability (47). The cost-benefit of the Green Pass remains an important question, as the Pass was retired early after only a few months.
Digital COVID Certificate (European Union - EU)	<ul style="list-style-type: none"> The EU's Parliament voted strongly in favour of a COVID certificate in April 2021 (65). Member states were invited to pilot the program in May 2021 (65). Member states can volunteer to use the certificate until July when it becomes formally implemented. The Certificate is available in digital or paper form and uses a QR code with a digital signature to protect against forgery and falsification. Each issuing body has a unique digital signature and the European Commission developed a gateway so that signatures can be verified across the EU (66). The Certificate confirms a person's COVID-19 status either through proof of vaccination, a negative test result within 72 hours, or proof of recovery from the virus (66). 	<ul style="list-style-type: none"> The Digital COVID Certificate went live on June 1, 2021, with seven member states connecting: Bulgaria, Czech Republic, Denmark, Germany, Greece, Croatia, and Poland. Lithuania and Spain began using the certificate shortly after. The Certificate program will require cooperation across the member states, who each reserve the right to refuse the Certificate and may adopt different conditions for access (68). The initial rollout of the Certificate was challenging as two member states weren't prepared on the launch day (69).

- The Certificate is intended to facilitate international travel and allow EU citizens to move freely in their own countries and other EU countries.
- Each member state can set its own rules, but the European Commission requests that they waive testing and quarantine requirements for Certificate holders (67).
- Some non-EU countries have also planned to participate, including Lichtenstein, Switzerland, Iceland, and Norway.

Excelsior Pass
(New York)

- Developed by IBM, the Excelsior Pass provides a digital or printable proof of vaccination or negative test result that can be used to access businesses and venues. The Pass can be found through the Wallet app (70).
- Photo ID is required along with the Pass.
- Individuals who do not wish to use the Pass can provide alternative proof of vaccination or negative test.
- Three types of passes are currently available: [1] COVID-19 vaccination Pass (available 15 days after final vaccine dose and valid for 365 days); [2] COVID-19 PCR Test Pass (valid until midnight on the third day after a test); [3] Antigen Test Pass (valid for 6 hours from the time of a test) (70).
- The Excelsior Pass was launched in New York state in March 2021.
- An estimated 1/9 eligible fully vaccinated adults in New York have downloaded the pass (71).
- Several larger venues have adopted the pass; however, most smaller businesses have not. Reports of some backlash against smaller businesses who have attempted to adopt the pass (71).
- An estimated 4% of eligible Pass holders have been unable to access the Pass due to clerical and technical issues (71,72). Some less digitally literate populations have had challenges accessing the Pass.
- Reportedly very easy to obtain a falsified Pass, the system is operating on “Trust” (71,73).

Table 2. Current status and descriptions of documentation of vaccination programs across Canada

Province or Territory	Status	Description
Alberta	Rejected	<ul style="list-style-type: none"> • Premier Jason Kenney recently stated that there would be no vaccine passports in Alberta (43).
British Columbia	Under consideration	<ul style="list-style-type: none"> • The province is exploring what a vaccine passport might look like for domestic and/or international use (74).
Manitoba	Implemented	<ul style="list-style-type: none"> • An immunization passport has been implemented, allowing fully vaccinated Manitobans to travel interprovincially without having to self-isolate for two weeks upon return (75).

		<ul style="list-style-type: none"> The cards will be available in physical and digital formats. A scannable QR code can be used to access the person's name and vaccination status.
New Brunswick	Under consideration	<ul style="list-style-type: none"> There has been discussion of a potential DV program; however, minimal details have been released (76).
Newfoundland and Labrador	-	<ul style="list-style-type: none"> No details on a possible DV program have been released.
Northwest Territories	Defer to national program	<ul style="list-style-type: none"> No plans to create a DV program for the territory; however, they will comply with national plans once implemented (77).
Nova Scotia	Under consideration	<ul style="list-style-type: none"> The province is working on a DV program to allow rotational workers to enter the province without having to quarantine (78).
Nunavut	-	<ul style="list-style-type: none"> Nunavut is accepting proof of vaccination to enter the territory without spending two weeks isolating in a designated hotel. Proof of vaccination could be a letter from a doctor or a vaccination card (79).
Ontario	Under consideration	<ul style="list-style-type: none"> Ontario is considering a DV program; however, details are not available (1,43). However, the Ontario Science Table provides key considerations for implementing COVID-19 vaccine certificates in Ontario (1).
Prince Edward Island	-	<ul style="list-style-type: none"> No details on a possible DV program have been released.
Quebec	Implemented	<ul style="list-style-type: none"> Quebec has made digital proof of vaccination available through the clicsante.ca portal (45,80). The intended use of this program is unclear (81).
Saskatchewan	-	<ul style="list-style-type: none"> No details on a possible DV program have been released.
Yukon	-	<ul style="list-style-type: none"> Fully vaccinated Yukoners can provide confirmation of their vaccination status when entering the territory from anywhere in Canada to avoid self-isolation (82).

Conclusion

This report synthesizes existing knowledge on the documentation of vaccination and presents a set of considerations and recommendations for implementing a proof of vaccination program in Canada. The following are some key findings from this work:

1. A range of views exist regarding documentation of vaccination, with national and international jurisdictions considering various approaches.
2. More research on existing vaccines and DV program outcomes may be needed to justify the implementation of a DV program in Canada as considerable investment may be required (1).
3. Privacy, security, and interoperability are essential features of a successful DV program.
4. Introducing a DV program is a complex process as the program must comply with multiple levels of local, national, and international laws and guidelines.
5. Various accommodations may be needed to mitigate ethical concerns with DV programs for both local and international communities (1).
6. Introducing a DV program may shift social behaviours. Therefore, the government should model and plan for a range of potential responses.
7. DV programs may influence vaccine acceptance, if individuals see the activities that they can engage in if fully vaccinated (1).
8. The need for DV for domestic purposes may be time-limited and of less value once vaccination coverage levels are high and case rates low.
9. Lack of federal policy and standards for DV may result in a patchwork of different programs across the provinces and territories.
10. Global perceptions towards DV programs are rapidly evolving, and existing examples highlight the importance of strong partnerships and comprehensive planning in their implementation.

References

1. Katz GM, Born KB, de Wit M, et al. COVID-19 vaccine certificates: key considerations for the Ontario context. *Science Briefs of the Ontario COVID-19 Science Advisory Table*. 2021;2(39). <https://doi.org/10.47326/ocsat.2021.02.39.1.0>
2. Ada Lovelace Institute. What place should COVID-19 vaccine passports have in society? [Internet]. Ada Lovelace Institute; 2021 Feb [cited 2021 Jun 10]. Available from: <https://www.adalovelaceinstitute.org/summary/covid-19-vaccine-passports/>
3. Gostin LO, Cohen IG, Shaw J. Digital Health Passes in the Age of COVID-19: Are “Vaccine Passports” Lawful and Ethical? *JAMA* [Internet]. 2021 May 18 [cited 2021 Jun 10];325(19):1933. Available from: <https://jamanetwork.com/journals/jama/fullarticle/2778526>
4. Greely HT. COVID-19 immunity certificates: science, ethics, policy, and law. *Journal of Law and the Biosciences* [Internet]. 2020 Jul 25 [cited 2021 Jun 10];7(1):lsaa035. Available from: <https://academic.oup.com/jlb/article/doi/10.1093/jlb/lsaa035/5848136>
5. Chief Science Advisor of Canada. Scientific considerations for using COVID-19 vaccination certificates. Ottawa: Office of the Chief Science Advisor of Canada; 2021 Mar p. 1–18.
6. Aranzales I, Chan HF, Eichenberger R, Heggemann R, Stadelmann D, Torgler B. Scientists’ opinion, attitudes, and consensus towards immunity passports [Internet]. *Health Policy*; 2021 Feb [cited 2021 Jun 10]. Available from: <http://medrxiv.org/lookup/doi/10.1101/2021.02.02.21250796>

7. Staff, the Associated Press. WHO cautions against vaccine passports for international travel. *Global News* [Internet]. 2021 Mar 9 [cited 2021 Jun 10]; Available from: <https://globalnews.ca/news/7685488/covid-vaccine-passport-who-inequity/>
8. Wilson K, Flood CM. Implementing digital passports for SARS-CoV-2 immunization in Canada. *CMAJ* [Internet]. 2021 Apr 6 [cited 2021 Jun 10];193(14):E486–8. Available from: <http://www.cmaj.ca/lookup/doi/10.1503/cmaj.210244>
9. Brownstein NC, Chen YA. Predictive values, uncertainty, and interpretation of serology tests for the novel coronavirus. *Sci Rep* [Internet]. 2021 Dec [cited 2021 Jun 10];11(1):5491. Available from: <http://www.nature.com/articles/s41598-021-84173-1>
10. Larremore DB, Bubar KM, Grad YH. Implications of Test Characteristics and Population Seroprevalence on “Immune Passport” Strategies. *Clinical Infectious Diseases* [Internet]. 2021 May 4 [cited 2021 Jun 10];72(9):e412–4. Available from: <https://academic.oup.com/cid/article/72/9/e412/5873748>
11. Kofler N, Baylis F. Ten reasons why immunity passports are a bad idea. *Nature* [Internet]. 2020 May 28 [cited 2021 Jun 10];581(7809):379–81. Available from: <http://www.nature.com/articles/d41586-020-01451-0>
12. Liew CH, Flaherty GT. Immunity passports to travel during the COVID-19 pandemic: controversies and public health risks. *Journal of Public Health* [Internet]. 2021 Apr 12 [cited 2021 Jun 10];43(1):e135–6. Available from: <https://academic.oup.com/jpubhealth/article/43/1/e135/5880641>
13. Petersen E, Lucey D, Blumberg L, Kramer LD, Al-Abri S, Lee SS, et al. COVID-19 vaccines under the International Health Regulations – We must use the WHO International Certificate of Vaccination or Prophylaxis. *International Journal of Infectious Diseases* [Internet]. 2021 Mar [cited 2021 Jun 10];104:175–7. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S1201971221000503>
14. Voo TC, Clapham H, Tam CC. Ethical Implementation of Immunity Passports During the COVID-19 Pandemic. *The Journal of Infectious Diseases* [Internet]. 2020 Aug 4 [cited 2021 Jun 10];222(5):715–8. Available from: <https://academic.oup.com/jid/article/222/5/715/5862418>
15. The Lancet Microbe. Vaccine certificates: does the end justify the means? *The Lancet Microbe* [Internet]. 2021 Apr [cited 2021 Jun 10];2(4):e130. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S2666524721000677>
16. Pavli A, Maltezou HC. COVID-19 vaccine passport for safe resumption of travel. *Journal of Travel Medicine* [Internet]. 2021 May 1 [cited 2021 Jul 23];28(4). Available from: <https://doi.org/10.1093/jtm/taab079>
17. Osama T, Razai MS, Majeed A. Covid-19 vaccine passports: access, equity, and ethics. *BMJ* [Internet]. 2021 Apr 1 [cited 2021 Jun 10];n861. Available from: <https://www.bmj.com/lookup/doi/10.1136/bmj.n861>
18. Cope K, Stremitzer A. Governments Are Constitutionally Permitted to Provide “Vaccine Passports”—Some May Also Be Constitutionally Obligated to Do So. *J Nucl Med* [Internet]. 2021 Jun 1 [cited 2021 Jun 10];62(6):771–2. Available from: <http://jnm.snmjournals.org/lookup/doi/10.2967/jnumed.121.262434>
19. Dye C, Mills MC. COVID-19 vaccination passports. *Science* [Internet]. 2021 Mar 19 [cited 2021 Jun 10];371(6535):1184–1184. Available from: <https://www.sciencemag.org/lookup/doi/10.1126/science.abi5245>

20. Ada Lovelace Institute. Checkpoints for vaccine passports [Internet]. 2021 May [cited 2021 Jun 10]. Available from: <https://www.adalovelaceinstitute.org/report/checkpoints-vaccine-passports-exec-summary/>
21. Canadian Council of Parliamentary Ombudsman. Fairness principles for public service providers regarding the use of COVID-19 vaccine certification. Canadian Council of Parliamentary Ombudsman; 2021 May.
22. Drury J, Mao G, John A, Kamal A, Rubin GJ, Stott C, et al. Behavioural responses to COVID-19 health certification: a rapid review. *MedRxiv*. 2021 Apr 9.
23. Marhold K, Fell J. Electronic vaccination certificates: avoiding a repeat of the contact-tracing ‘format wars.’ *Nat Med* [Internet]. 2021 May [cited 2021 Jun 10];27(5):738–9. Available from: <http://www.nature.com/articles/s41591-021-01286-w>
24. Tanner R, Flood CM. Vaccine Passports Done Equitably. *JAMA Health Forum* [Internet]. 2021 Apr 21 [cited 2021 Jun 10];2(4):e210972. Available from: <https://jamanetwork.com/journals/jama-health-forum/fullarticle/2779298>
25. Bansal A, Garg C, Padappayil RP. Optimizing the Implementation of COVID-19 “Immunity Certificates” Using Blockchain. *J Med Syst* [Internet]. 2020 Sep [cited 2021 Jun 10];44(9):140. Available from: <http://link.springer.com/10.1007/s10916-020-01616-4>
26. Bramstedt KA. Antibodies as Currency: COVID-19’s Golden Passport. *Bioethical Inquiry* [Internet]. 2020 Dec [cited 2021 Jun 10];17(4):687–9. Available from: <http://link.springer.com/10.1007/s11673-020-09996-5>
27. Mbunge E, Dzinamarira T, Fashoto SG, Batani J. Emerging technologies and COVID-19 digital vaccination certificates and passports. *Public Health in Practice* [Internet]. 2021 Nov [cited 2021 Jun 10];2:100136. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S2666535221000616>
28. Zhang B, Weissinger L, Himmelreich J, McMurry N, Li T, Scheinerman N, et al. Building robust and ethical vaccination verification systems [Internet]. *Open Science Framework*; 2020 Dec [cited 2021 Jun 10]. Available from: <https://osf.io/x2ucp>
29. Deguma MC, Deguma JJ. The possible threat of faking Covid-19 diagnostic tests and vaccination certifications: a call to an immediate action. *Journal of Public Health* [Internet]. 2021 Jun 7 [cited 2021 Jun 10];43(2):e340–1. Available from: <https://academic.oup.com/jpubhealth/article/43/2/e340/6155844>
30. The Royal Society. Twelve criteria for the development and use of COVID-19 vaccine passports. The Royal Society; 2021 Feb p. 1–22.
31. Akin D. A Canadian vaccine certificate faces science, privacy hurdles: officials. 2021 May 1 [cited 2021 Jun 9]; Available from: <https://globalnews.ca/news/7826318/canada-covid-vaccine-certificate-hurdles/>
32. Rimmer A. Covid-19: Certifying status for “vaccine passports” must not increase GPs’ workload, says Royal College. *BMJ* [Internet]. 2021 Apr 7 [cited 2021 Jun 4];373:n919. Available from: <https://www.bmj.com/content/373/bmj.n919>
33. Mithani SS, Bota AB, Zhu DT, Wilson K. A scoping review of global vaccine certificate solutions for COVID-19. *Research Square* [Internet]. 2021 Mar 18 [cited 2021 Jun 10]; Available from: <https://www.researchsquare.com/article/rs-334258/v2>

34. World Health Organization. Interim position paper: considerations regarding proof of COVID-19 vaccination for international travellers. WHO Newsroom [Internet]. 2021 Feb 5 [cited 2021 Jun 10]; Available from: <https://www.who.int/news-room/articles-detail/interim-position-paper-considerations-regarding-proof-of-covid-19-vaccination-for-international-travellers>
35. COVID Passport. South Korea to issue high-tech vaccine passport [Internet]. COVID Passport. 2021 [cited 2021 Jun 3]. Available from: <https://www.covidpasscertificate.com/korea-to-issue-vaccine-passport/>
36. Stupp C. WHO Plans Privacy, Security Rules for Covid-19 Vaccine Certificates. Wall Street Journal [Internet]. 2021 Jan 15 [cited 2021 Jun 4]; Available from: <https://www.wsj.com/articles/who-plans-privacy-security-rules-for-covid-19-vaccine-certificates-11610706601>
37. Office of the Privacy Commissioner of Canada. Privacy and COVID-19 vaccine passports [Internet]. Office of the Privacy Commissioner of Canada; 2021 May [cited 2021 Jun 10]. Available from: https://www.priv.gc.ca/en/opc-news/speeches/2021/s-d_20210519/
38. Baylis F, Kofler N. A public health ethic should inform policies on COVID-19 immunity passports. Lancet. 2020 Dec 7;21.
39. Hodes S, Majeed A. Using the NHS App as a covid-19 vaccine passport. BMJ [Internet]. 2021 May 11 [cited 2021 Jun 10];n1178. Available from: <https://www.bmj.com/lookup/doi/10.1136/bmj.n1178>
40. Spisak BR, McNulty EJ. Concerns regarding Covid-19 vaccine certificates. Polit life sci [Internet]. 2021 Jan 11 [cited 2021 Jun 4];1–3. Available from: https://www.cambridge.org/core/product/identifier/S0730938420000295/type/journal_article
41. Voigt K, Nahimana E, Rosenthal A. Flashing red lights: the global implications of COVID-19 vaccination passports. BMJ Glob Health [Internet]. 2021 May [cited 2021 Jun 10];6(5):e006209. Available from: <https://gh.bmj.com/lookup/doi/10.1136/bmjgh-2021-006209>
42. Lupton D. The Quantified Pandemic: Digitised Surveillance, Containment and Care in Response to the COVID-19 Crisis. SSRN Journal [Internet]. 2021 [cited 2021 Jun 10]; Available from: <https://www.ssrn.com/abstract=3806386>
43. Smith M-D. Vaccine passports could be our ticket to normalcy. But Canada isn't ready. 2021 Apr 7 [cited 2021 Jun 10]; Available from: <https://www.macleans.ca/news/canada/vaccine-passports-could-be-our-ticket-to-normalcy-but-canada-isnt-ready/>
44. Bricker D. Majority support in Canada for vaccine passports for international travel, large events. Toronto: Ipsos; 2021 Apr.
45. McMaster University, COVID-END. COVID-19 Living Evidence Profile #1. Hamilton, ON: McMaster Health Forum; 2021 May.
46. Bendix A. Israel offers a glimpse of life after herd immunity: With 80% of adults vaccinated, cases have dropped to 15 per day. Business Insider [Internet]. 2021 Jun 1 [cited 2021 Jun 11]; Available from: <https://www.businessinsider.com/israel-vaccinated-most-adults-covid-herd-immunity-2021-6>
47. Kershner I. With most adults vaccinated and case numbers low, Israel removes many restrictions. New York Times [Internet]. 2021 Jun 1 [cited 2021 Jun 11]; Available from: <https://www.nytimes.com/2021/06/01/world/middleeast/israel-covid-restrictions.html>

48. Persad G, Emanuel EJ. The Ethics of COVID-19 Immunity-Based Licenses (“Immunity Passports”). *JAMA* [Internet]. 2020 Jun 9 [cited 2021 Jun 10];323(22):2241. Available from: <https://jamanetwork.com/journals/jama/fullarticle/2765836>
49. Phelan AL. COVID-19 immunity passports and vaccination certificates: scientific, equitable, and legal challenges. *The Lancet* [Internet]. 2020 May [cited 2021 Jun 10];395(10237):1595–8. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0140673620310345>
50. Nehme M, Stringhini S, Guessous I, SEROCov-POP study team. Perceptions of immunity and vaccination certificates among the general population: a nested study within a serosurvey of anti-SARS-CoV-2 antibodies (SEROCov-POP). *Swiss Med Wkly* [Internet]. 2020 Nov 16 [cited 2021 Jun 10]; Available from: <https://doi.emh.ch/smw.2020.20398>
51. Waller J, Rubin GJ, Potts HWW, Mottershaw AL, Marteau TM. ‘Immunity Passports’ for SARS-CoV-2: an online experimental study of the impact of antibody test terminology on perceived risk and behaviour. *BMJ Open* [Internet]. 2020 Aug [cited 2021 Jun 10];10(8):e040448. Available from: <https://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2020-040448>
52. Ada Lovelace Institute. International monitor: vaccine passports and COVID status apps [Internet]. Ada Lovelace Institute. 2021 [cited 2021 Jun 10]. Available from: <https://www.adalovelaceinstitute.org/project/international-monitor-vaccine-passports-covid-status-apps/>
53. Boyers A. UK vaccine passport plans to be scrapped. *Reuters* [Internet]. 2021 May 30 [cited 2021 Jun 10]; Available from: <https://www.reuters.com/world/uk/uk-vaccine-passport-plans-be-scrapped-telegraph-2021-05-30/>
54. Brown A. Plans to use NHS app’s vaccine passport for UK gigs and events have been “scrapped.” *Express* [Internet]. 2021 Jun 3 [cited 2021 Jun 10]; Available from: <https://www.express.co.uk/life-style/science-technology/1443823/Plans-NHS-App-Vaccine-Passports-In-UK-Gig-Event-Scrapped-Report>
55. Zakrzewski C. The technology 202: European countries are starting to issue vaccine passports. The system is very different than the U.S. approach. *The Washington Post* [Internet]. 2021 Jun 2 [cited 2021 Jun 10]; Available from: <https://www.washingtonpost.com/politics/2021/06/02/technology-202-european-countries-are-starting-issue-vaccine-passports-system-is-very-different-than-us-approach/>
56. The Associated Press. Michigan House of Representatives passes pre-emptive vaccine passport ban. *CBC News* [Internet]. 2021 Jun 3 [cited 2021 Jun 10]; Available from: <https://www.cbc.ca/news/canada/windsor/michigan-covid19-vaccine-passport-ban-1.6051491>
57. Jee C. Seven EU countries just got a digital vaccine passport. *MIT Technology Review* [Internet]. 2021 Jun 2 [cited 2021 Jun 11]; Available from: <https://www.technologyreview.com/2021/06/02/1025633/seven-eu-countries-just-got-a-digital-vaccine-passport/>
58. World Health Organization. Estonia and WHO to jointly develop digital vaccine certificate to strengthen COVAX. *WHO Newsroom* [Internet]. 2020 Oct 7 [cited 2021 Jun 11]; Available from: <https://www.who.int/news-room/feature-stories/detail/estonia-and-who-to-jointly-develop-digital-vaccine-certificate-to-strengthen-covax>
59. Boland H. Government funds eight vaccine passport schemes despite no plan. *The Telegraph* [Internet]. 2021 Jan 24 [cited 2021 Jun 11]; Available from: <https://www.telegraph.co.uk/technology/2021/01/24/government-funds-eight-vaccine-passport-schemes-despite-no-plans/>

60. Cogley M. Vaccine passports to be trialled by thousands of Britons. The Telegraph [Internet]. 2021 Jan 12 [cited 2021 Jun 11]; Available from: <https://www.telegraph.co.uk/technology/2021/01/12/exclusive-vaccine-passports-trialled-thousands-britons/>
61. IATA. IATA Travel Pass [Internet]. IATA. 2021 [cited 2021 Jun 10]. Available from: <https://www.iata.org/en/programs/passenger/travel-pass/>
62. Ministry of Health. What is the Green Pass? [Internet]. Ministry of Health Corona. 2021 [cited 2021 Jun 11]. Available from: <https://corona.health.gov.il/en/directives/green-pass-info/>
63. Serhan Y. The futility of vaccine passports. The Atlantic [Internet]. 2021 Apr 7 [cited 2021 Jun 11]; Available from: <https://www.theatlantic.com/international/archive/2021/04/vaccine-passports-dont-solve-our-pandemic-problems/618521/>
64. Holmes O. Green Pass: how are COVID vaccine passports working for Israel? The Guardian [Internet]. 2021 Feb 28 [cited 2021 Jun 11]; Available from: <https://www.theguardian.com/world/2021/feb/28/green-pass-how-are-vaccine-passports-working-in-israel>
65. Peseckyte G. Seven EU countries roll out digital COVID certificate to ease travel [Internet]. www.euractiv.com. 2021 [cited 2021 Jun 4]. Available from: <https://www.euractiv.com/section/coronavirus/news/seven-eu-countries-roll-out-digital-covid-certificate-to-ease-travel/>
66. European Commission. EU Digital COVID Certificate [Internet]. European Commission. 2021 [cited 2021 Jun 11]. Available from: https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/safe-covid-19-vaccines-europeans/eu-digital-covid-certificate_en#timeline
67. Henderson C. Now that Americans can go to Europe, here's what we know about the EU's "vaccine passports" [Internet]. The Points Guy. 2021 [cited 2021 Jun 4]. Available from: <https://thepointsguy.com/news/europe-digital-covid-certificates-live/>
68. Euronews. These seven countries are now using the EU's COVID travel pass. Euronews Travel [Internet]. 2021 Jun 3 [cited 2021 Jun 11]; Available from: <https://www.euronews.com/travel/2021/06/02/eu-covid-19-digital-pass-seven-countries-begin-using-new-travel-system>
69. AFP. Meet the German team developing the EU's first vaccine passport. The Local Germany [Internet]. 2021 Jun 2 [cited 2021 Jun 4]; Available from: <https://www.thelocal.de/20210602/meet-the-german-team-developing-the-eus-first-vaccine-passport/>
70. New York State. Excelsior Pass [Internet]. New York State. 2021 [cited 2021 Jun 11]. Available from: <https://covid19vaccine.health.ny.gov/excelsior-pass>
71. Otterman S. Will the Excelsior Pass, New York's vaccine passport, catch on? 2021 Jun 1 [cited 2021 Jun 11]; Available from: <https://www.nytimes.com/2021/06/01/nyregion/excelsior-pass-vaccine.html>
72. Crist C. More than 1 million NY Excelsior vaccine passes downloaded. WebMD [Internet]. 2021 Jun 3 [cited 2021 Jun 11]; Available from: <https://www.webmd.com/vaccines/covid-19-vaccine/news/20210603/more-than-one-million-new-york-excelsior-vaccine-passes-downloaded>

73. Fowler G. We tested the first state 'vaccine passport.' Here's what worked — and didn't. The Washington Post [Internet]. 2021 Apr 9 [cited 2021 Jun 11]; Available from: <https://www.washingtonpost.com/technology/2021/04/08/vaccine-passport-new-york-excelsior-pass/>
74. Harnett CE. B.C. vaccine passport must be secure, used sparingly, says privacy commissioner. Times Colonist [Internet]. 2021 May 22 [cited 2021 Jun 11]; Available from: <https://www.timescolonist.com/news/local/b-c-vaccine-passport-must-be-secure-used-sparingly-says-privacy-commissioner-1.24321930>
75. Zimmer E. Manitoba launches vaccine passport for those fully immunized against COVID-19. Daily Hive [Internet]. 2021 Jun 9 [cited 2021 Jun 11]; Available from: <https://dailyhive.com/vancouver/manitoba-covid-19-vaccine-passport>
76. MacKinnon B-J. Privacy watchdogs urge caution on COVID-19 vaccine passports. CBC News [Internet]. 2021 May 20 [cited 2021 Jun 11]; Available from: <https://www.cbc.ca/news/canada/new-brunswick/covid-19-vaccine-passports-new-brunswick-ombud-privacy-higgs-1.6034244>
77. Government of the Northwest Territories. Questions and answers [Internet]. Government of the Northwest Territories. 2021 [cited 2021 Jun 11]. Available from: <https://www.gov.nt.ca/covid-19/en/questions-and-answers?tid=198>
78. CBC News. N.S. working on proof-of-vaccine strategy for those entering the province. CBC News [Internet]. 2021 Jun 2 [cited 2021 Jun 11]; Available from: <https://www.cbc.ca/news/canada/nova-scotia/proof-of-vaccine-nova-scotia-self-isolation-waived-entering-province-1.6050404>
79. Patar D. Nunavut to drop isolation hub rule for fully vaccinated travellers. Nunatsiaq News [Internet]. [cited 2021 Jun 11]; Available from: <https://nunatsiaq.com/stories/article/nunavut-to-drop-isolation-hub-rule-for-fully-vaccinated-travellers/>
80. Government of Quebec. Proof of COVID-19 vaccination [Internet]. Government of Quebec. 2021 [cited 2021 Jun 11]. Available from: <https://www.quebec.ca/en/health/health-issues/a-z/2019-coronavirus/progress-of-the-covid-19-vaccination/proof-covid-19-vaccination>
81. Ross S. Digital vaccination “passports” coming to Quebecers Thursday, but they have no purpose yet. CTV News [Internet]. 2021 May 11 [cited 2021 Jun 11]; Available from: <https://montreal.ctvnews.ca/digital-vaccination-passports-coming-to-quebecers-thursday-but-they-have-no-purpose-yet-1.5423521>
82. Tukker P. Yukon to drop self-isolation requirement for people who arrive fully vaccinated. CBC News [Internet]. 2021 May 5 [cited 2021 Jun 11]; Available from: <https://www.cbc.ca/news/canada/north/yukon-covid-update-may-5-1.6014188>
83. Hall MA, Studdert DM. “Vaccine Passport” Certification — Policy and Ethical Considerations. N Engl J Med [Internet]. 2021 Mar 31 [cited 2021 Jun 10];NEJMp2104289. Available from: <http://www.nejm.org/doi/10.1056/NEJMp2104289>