



What place should COVID-19 vaccine passports have in society?

Findings from a rapid deliberation with multidisciplinary experts to consider the risks and benefits of the potential roll-out of digital vaccine certification schemes.

Introduction

In recent weeks, vaccine passports or COVID-19 status apps – which might give some individuals greater access to travel, employment or entertainment – have attracted attention as a route to move societies out of lockdown and open up parts of the economy.

With momentum building, the Ada Lovelace Institute convened an urgent expert deliberation to consider how governments should act, chaired by Professor Sir Jonathan Montgomery. A group of 17 experts from the fields of immunology, epidemiology, sociology, international development, behavioural science, law, medical history, public health, ethics, digital identity and technical system design came together across two weeks to discuss the evidence, deliberate on use cases, explore opportunities and risks, and identify areas of consensus to support government decision makers around the world.¹

The views put forward below in these deliberation findings reflect a snapshot of our understanding of the evidence and the development of technical tools. The urgency of the issue meant – by necessity – this was a limited exercise. Nevertheless, some clear areas of concern emerged.

- **The expert group came to the view that, at present, vaccination status does not offer clear or conclusive evidence about any individual's risk to others via transmission. Without that, it cannot be a robust basis for risk-based decision making, and therefore any roll out of a digital passport is not currently justified.**
- **However, given that evidence on transmission will emerge, and other countries and companies are developing such systems, the UK Government must act urgently to address the public policy issues that arise, and create clear and specific guidelines and law around any appropriate uses, mechanisms for enforcement and methods of legal redress.**

¹ The deliberation forms part of a wider project, which also consists of an international call for evidence and a series of public events. The Ada Lovelace Institute will publish a longer report in March taking all of the evidence into consideration, and answering some of the questions raised by the expert deliberation.

- **While vaccine passports will be seen by some as a way to increase freedom, for those without a passport they would constitute a denial of liberties that others are being granted. Therefore the justifications both for the relaxation of current restrictions for some and also for their continuation for others should be clearly articulated.**
- **The Government will need to take a clear position outlining the specific purposes and use cases for which, if any, vaccine passports can be legally and legitimately used.**
- **In allowing some uses or actively facilitating digital vaccine passports, governments must address the issues and risks arising from such schemes or the creation of related digital infrastructure, and whether and how these risks could be mitigated.**

A vaccine passport as defined here consists of three things: health information (vaccine status through e.g. a certificate), verification of identity (connecting the holder to that certificate) and authorisation for the purpose of allowing or blocking actions (a pass).

Most passport models currently focus on displaying a vaccination status (rather than a more granular or 'live' assessment of risk, which might incorporate other information) so this was the primary focus of our discussions. However, many of the points below also relate to other passport models, including those based on negative COVID-19 antigen tests and tests showing antibodies after infection.

There are intuitive attractions to the idea of a vaccine passport in relation to the hope that a better balance could be found between economic activity and community safety, by allowing a more fine-grained and targeted set of restrictions than sweeping measures or national lockdowns.

There are broad social benefits that flow from loosening restrictions on social distancing and many hope that passports might help do this safely. In particular, arguments are made for:

- **Public health** – making the community safer. The effectiveness of this approach is based on the premise that only those who will not transmit the virus are able to take part in activities that would normally present a risk of transmission. But this aim is not scientifically advisable at present, as it has not been established that vaccination status reduces the risk of transmission to others (as opposed to the risk of the vaccinated person contracting COVID-19).
- **Personal liberty** – enhancing the freedoms of those who have a passport to do things that would otherwise be restricted due to COVID-19 (always noting that granting permissions for some will, in relative terms, increase the loss of liberty experienced by others). This could have a particularly profound benefit for those facing extreme harm and isolation due to the virus, for example those in care homes unable to see relatives.
- **Economic benefits** – supporting industries (and the wider economy) struggling in lockdown by enabling phased opening, for example in entertainment, leisure and hospitality.

Technology companies across the world are developing tools and standards in expectation that vaccine passports and COVID-19 status apps could become instrumental to a move from national lockdowns to a more open and mobile society.

IBM has launched [Digital Health Pass](#), integrated with Salesforce's employee management platform [Work.com](#). [CommonPass](#), supported by the World Economic Forum, and the International Air Transport Association (IATA)'s [Travel Pass](#) are both being trialled by airlines.

The Linux Foundation Public Health's [COVID-19 Credentials Initiative](#) and the [Vaccination Credential Initiative](#), which includes Microsoft and Oracle, are pushing for open interoperable standards. A marketplace of smaller, private actors has also emerged offering bespoke solutions and infrastructures.

Since the start of the pandemic, a number of countries have demonstrated interest in some form of 'immunity passport' based on natural immunity and antibodies after infection with COVID-19 (including [Germany](#) and [the UK](#), and a pilot in [Estonia](#)), but a lack of evidence about the protection acquired through natural immunity meant few schemes were used in real world scenarios.

The World Health Organisation (WHO) put out a [clear statement](#) saying there was 'not enough evidence about the effectiveness of antibody-mediated immunity to guarantee the accuracy of an "immunity passport" or "risk-free certificate"; and that 'the use of such certificates may therefore increase the risks of continued transmission'.

The approval and roll out of effective vaccines have re-energised the idea of restoring personal freedoms and societal mobility based on certification of COVID vaccination. A [number of countries](#) have made [explicit calls](#) for the development of such a tool. The WHO has shifted their stance by announcing plans to develop a [digitally enhanced International Certificate of Vaccination](#) and established the [Smart Vaccination Certificate consortium](#) with Estonia.

In the UK, the Government has yet to take a clear position on whether to introduce vaccine passports, domestically or for international travel. The Government has said there aren't current plans to introduce vaccine passports but some ministers have left the door open to digital passporting schemes when circumstances change. The Government appears to be keeping its options open by funding a number of startups piloting similar technology and reportedly instructing officials to draw up draft options for vaccine certificates for international travel.

Given its comparatively high vaccination rate – and high infection rate – the UK may be one of the first countries to have vaccinated a sizeable proportion of the country (currently a fifth of their population has received at least one dose) while remaining in national lockdown with schools closed, many workers furloughed, and international and most domestic travel banned. How the UK manages the challenge of a transition out of lockdown is therefore likely to be of international interest.

Deliberation findings

- 1. Governments must act urgently to create clear and specific guidelines and law around any uses, mechanisms for enforcement and methods of legal redress of vaccine passports.**

The evidence around transmission will develop, and that information must continue to inform future decision making. It seems likely that national requirements put in place by some countries will trigger the need for internationally accepted certification, and many systems are in development. While some experts felt any form of digital vaccine passport could not be justified due to the risks they pose (below), the expectation from the group is that some form of vaccination certification will emerge, and therefore that general prohibition is neither desirable nor achievable. Letting practice emerge via private users and private markets will heighten a number of the risks outlined below.

- 2. Digital passports should not be rolled out while so much is unknown about COVID-19, particularly the effect of different vaccines (and vaccination regimes) on transmission, the duration of protection and the generalisability of those effects.**

The primary justification for sharing personal information with a third party that would affect rights and freedoms at an individual level is that it would allow that third party to protect themselves from serious harm. In other words, the vaccine passport is premised on the assumption that my vaccine status tells you something about the risk I pose to you, not simply the risk I face from COVID-19.

At present, vaccination status does not offer clear or conclusive evidence about any individual's risk to others via transmission. Vaccination status can never offer absolutely conclusive evidence of an individual's risk to others (or their own risk), since no vaccine will be 100% effective for 100% of recipients.

- 3. Passport systems would need to be flexible if they are to address the development of mutations, such as the [E484K mutation](#), found in South African, Brazilian and now UK variants of COVID-19, which is thought likely to reduce the efficacy of vaccines.**

These variations make it unlikely that a single COVID-19 vaccination 'status' would be relevant to all countries or be of a standard and fixed duration.

These mutations make understanding of vaccination effects on individual transmission a moving target, as vaccines must be assessed against a changing background of dominant strains within the population. While booster vaccinations against variants may manage the issue of strains this will raise questions about the degree of vaccination sufficient for passports and the duration of validity of the passport will remain dynamic in response to developing scientific understanding rather than a fixed date of issue.

- 4. Governments should identify specific priority use cases for detailed consideration of whether they justify selective rights and freedoms based on vaccination status, and if so, the best mechanisms for those schemes.**

Particularly urgent use cases to consider are international travel, key frontline workers (especially in health and care, and education), and access to employment generally. Secondary use cases include access to hospitality or leisure venues. Governments should actively shape their society's choices around these use cases.

At least some of these may be satisfactorily addressed by updating existing mechanisms, rather than building a new system of passports and digital identity. For example, there are already mechanisms in place to ensure that individuals are properly protected at work. One of the most prominent examples in health settings is the [Green Book on immunisation](#), which covers requirements for vaccination in high-risk environments. Further, existing safeguarding and 'fit and proper person' requirements allow employers to require employees to demonstrate that they can be safely employed. In a non-health context this might include confirming that they have not been convicted of relevant offences through the issue of a [Disclosure and Barring Service \(DBS\) certificate](#); if deemed legally permissible, a similar service could provide one-off checks for vaccination status.

- 5. If the Government allows or actively facilitates the use of digital vaccine passports, they must address the issues and risks arising from such schemes or the creation of related digital infrastructure, and whether and how these risks could be mitigated.**

Some of these issues and risks are near-term concerns. Others are longer-term issues about how such systems might become embedded and reshape society beyond the pandemic.

Immediate risks

- 1. Undermining public health by treating a collective problem as an individual one**

Digital vaccine passports could potentially undermine other public health interventions and suggest a binary certainty (passport holders are safe; those without are risky) that does not adequately reflect a more nuanced and collective understanding of risk posed and faced during the pandemic.

It may be counterproductive or harmful to encourage risk scoring at an individual level when risk is more contextual and collective – it will be national and international herd immunity that will offer ultimate protection. Passporting might foster a false sense of security in either the passported person or others, and increase rather than decrease risky behaviours.

2. The opportunity cost of focusing on vaccine passports

There will be opportunity costs to focusing on vaccine passports rather than other interventions. There may be a comparatively narrow window where there is scientific confidence about the impact of vaccines on transmission and enough of a vaccinated population that it is worth segregating rights and freedoms. Once there is population-level herd immunity it will not make sense to differentiate and passports would be unnecessary.

Passports may be a tempting distraction. They bring political, financial and human capital costs that must be weighed against their benefits. They might crowd out more important policies to reopen society more quickly for everyone, such as by vaccine rollout and test, trace and isolate schemes, and other public health measures.

3. Exacerbating distrust by marginalised groups and increasing vaccine hesitancy

It has been argued that one of the benefits of vaccine passports is to encourage uptake of COVID-19 vaccines. In the UK, which has already seen over 90% uptake of first doses in the over 75s and elderly care home residents and where nearly 90% of unvaccinated adults say they would be vaccinated if available, it is not clear there is much additional benefit to be gained by further incentivising vaccination.

However, there is a downside risk that it could reduce trust and increase vaccine hesitancy if the scheme is seen as introducing mandatory vaccination by the back door. This may be particularly acute amongst marginalised groups who may already have greater levels of mistrust, such as Black and Asian communities, who are already seeing lower rates of vaccine uptake.

4. Exacerbating inequalities within societies

Existing distrust of the state, identity infrastructure and vaccines are also expected to put some groups at a particular disadvantage. Access to digital technology, forms of identification, tests and vaccines is already unequal, and vaccine passports may unintentionally mirror and reinforce existing inequalities without wider programmes for addressing health inequalities.

5. Increasing inequalities between nations

International cooperation will be necessary, particularly for schemes enabling international travel. But scientific concerns could quickly become geopolitical ones, with countries using recognition of (and access to) vaccines as a form of political power and influence. There is pressure on governments to acquire vaccine supplies, which in turn triggers a form of 'vaccine nationalism' – where richer countries are able to buy up supplies of vaccines where poorer ones can't.

Tying movement to vaccine certification could supercharge protectionism and entrench existing global inequalities. International friction is unhelpful when vaccination is, ultimately, a global public good. Any individual country's fate is tied to reaching international herd immunity as we are seeing with emergent new strains.

Future risks

6. Normalising health status surveillance by creating long-term infrastructure in response to a time-bounded crisis

It is likely that SARS-CoV-2 (the virus that causes COVID-19) will become endemic, like seasonal flu and other infectious disease-causing pathogens (or even better contained, like measles, or even eliminated), at which point it will no longer require the emergency and intrusive measures justified by its present transmissibility and fatality. Accepting this as a reasonable scientific expectation for the near future, raises concerns about the longevity of emergency apparatus, and that such infrastructure – once built – will not be stripped back.

Reference was made by the expert group to post-9/11 security infrastructure at airports, and the once-limited but now essentially mandatory Aadhaar identity system in India. There was pessimism about the likelihood of vaccine-passport technologies being 'switched off' once the crisis has passed. Building these roads could lead to path dependency: once an infrastructure exists, it will make certain future choices more favourable and block others. 'Once a road is built, good luck not using it,' as one participant put it. This might be a particular issue if the status of other health conditions were to be added.

The current uncertainty, ongoing social anxiety and economic cost of the pandemic makes the technical fix of a novel tool and emergency infrastructure seem attractive, but the starting point should be identifying specific problems and looking at whether and how these could be addressed through existing practices and laws.

7. Scope creep and information flows

There were particular concerns in the expert group that digital identity systems could be introduced as part of an emergency infrastructure, but used for different or expanded purposes. The wider merits of digital identity systems (for example) must be disaggregated from the immediate health context and considered in their own right.

Concerns were raised about how information might be used more broadly than was intended. Information might flow to third parties, and personal data may be repurposed. Even with the most privacy-preserving technology, the expectation is that health data will be viewed by different actors, from healthcare settings, employers, clients, police and pubs to insurance companies, who may have different levels of experience and trustworthiness in handling personal data.

Next steps

Drawing on this expert deliberation, the Ada Lovelace Institute has laid out some recommendations for the UK Government. This will necessitate engaging in wider conversations with other national governments, and we anticipate that many of these recommendations will be applicable in other national contexts.

1. Set scientific pre-conditions

To move forward, governments should have a better understanding of vaccine efficacy and transmission, durability and generalisability, and evidence that use of vaccine passports would lead to:

- a. Reduced transmission risk by vaccinated people – this is likely to involve issues of risk appetite, as the risk of transmission may be reduced but will probably not be nil
- b. Low ‘side effects’ – that passporting won’t foster a false sense of security in either the passported person or others, which might lead to an increase of risky behaviours (not following required public health measures), with a net harmful effect.

2. Identify the urgent use cases so that the benefits and risks can be assessed if these pre-conditions are met

Governments should consider a cost/benefit analysis of each specific use case. This includes assessing the likely impact on transmission risk, economic activity and social inequality if selective rights and freedoms were to be based on vaccination status.

They should evaluate the adaptation of existing mechanisms as well as a new system of passports and digital identity. Urgent domestic use cases are likely to include the deployment of frontline workers (particularly in health and care, and education) and access to employment in general.

3. Offer urgent clarification on the current legal status of the development and use of vaccine passports, in particular with regard to data protection, equality and discrimination, health and safety and employment law

Developers of vaccine passports should not be in the position of also developing the rules for where these systems should be implemented, nor are they taking responsibility for enforcing local law.

Currently, developers are operating under the assumption that governments will provide protections against unlawful or unethical use, and will enforce such restrictions. This does not reflect reality. Governments must develop clear guidelines, which will take time to do effectively.

4. Consult a wide group of experts and perspectives

As well as the experts from health, social sciences, law, ethics, technology and other disciplines involved in our deliberation, Government will need to understand the perspectives of those involved in the practical implementation of any use case, e.g. employers and industry bodies, unions, public health experts and system leaders, those working on vaccination programmes, software developers, groups working on open standards, local elected officials etc.

This understanding is a necessary condition for both policy development and effective public engagement.

5. Engage publics on any potential uses to understand impacts, build trust and legitimacy, and understand what trade-offs the public is willing to make

The issues raised by vaccine passports should be subject to proper public deliberation, engagement, co-production and evaluation that goes beyond superficial opinion polling. The deliberation should focus on issues broader than passports, such as the public health response to COVID-19 in general and how people think vaccination data should be used.

This could be done in partnership with civil society groups with relevant expertise. It will be essential to engage with those groups who are likely to face disadvantage, discrimination or unique/particular risks through the roll out of such technologies, including but not limited to:

- a. Those in insecure work or currently unemployed
- b. Those with insecure or invalid citizenship status
- c. Those unable or unwilling to have the vaccine
- d. Those who face historic or continuing over-surveillance.²

6. Work through the World Health Organisation on international travel use cases

A key use case of vaccine passports is for international travel. The UK has already played an important role in championing global vaccinations through early and significant contributions to GAVI and COVAX. It should continue to seek international agreement on international travel passports, engaging with the World Health Organisation, who are already coordinating efforts and will have greater access to scientific evidence on developments globally.

International standards will be vital for interoperability. Different countries leading different discussions outside the WHO's efforts will only heighten the difficulties of international coordination and frustrate attempts to define standards. The UK should champion the WHO as the more appropriate and legitimate venue to make decisions about international travel passports and have expert input to wrestle with the scientific evidence (particularly on risk around mutations), and take a global view.

7. Identify and mitigate risks through policy measures, technical design and governance infrastructure prior to proceeding with schemes

This will include careful consideration of the practicalities and security of any scheme and resources required – considering where responsibility and accountability for collecting, managing, securing and sharing data resides, and to what extent data minimisation is possible.

2 See current [Ada Lovelace Institute project with the Health Foundation](#) on public engagement about COVID-19 technologies and health inequalities

Consider the costs and benefits of paper-based versus digital solutions, and novel infrastructure against existing structures that might be developed through existing health and safety procedures in high-risk occupations (see Chapter 12 of the Green Book); such as a one-off consultation akin to the DBS or Electronic System for Travel Authorisation.

Explore policy measures at a domestic and global scale that could adequately counteract and mitigate the risks and issues outlined above, for example: employment benefits for those unable to work; international requirements about vaccine coverage; defining clear and limited purposes of any vaccine passport with strong legal protection for data subjects; and socio-technical design principles.

About this report

This report is an interim summary of the findings and recommendations from the Ada Lovelace Institute expert deliberation, chaired by Professor Sir Jonathan Montgomery. A fuller report of the deliberation session will be available next month.

We are indebted to the contributions of the experts who participated in this deliberation. This report highlights conclusions from that collective conversation, acknowledging that the group did not always arrive at a consensus, and the document reflects a majority view. Individual findings have not been, and should not be, attributed to any specific individual.

Members of the expert group included:

- **Jonathan Montgomery** (chair) is Professor of Health Care Law at University College London and Chair of Oxford University Hospitals NHSFT. He was previously Chair of the Nuffield Council on Bioethics and Chair of the Health Research Authority.
- **Danny Altmann** is Professor of Immunology at Imperial College London, where he heads a lab at the Hammersmith Hospital Campus. He was previously Editor-in-Chief of the British Society for Immunology's 'Immunology' journal and is an Associate Editor at 'Vaccine' and at 'Frontiers in Immunology.'
- **Dave Archard** is Emeritus Professor of Philosophy at Queen's University Belfast. He is also Chair of the Nuffield Council on Bioethics, a member of the Clinical Ethics Committee at Great Ormond Street Hospital and Honorary Vice-President of the Society for Applied Philosophy
- **Ana Beduschi** is an Associate Professor of Law at Exeter University. She currently leads the UKRI ESRC-funded project on COVID-19: Human Rights Implications of Digital Certificates for Health Status Verification.
- **Sanjoy Bhattacharya** is Professor in the History of Medicine, Director of the Centre for Global Health Histories and Director of the WHO Collaborating Centre for Global Health Histories at the University of York.
- **Sarah Chan** is a Chancellor's Fellow and Reader in Bioethics at the Usher Institute, University of Edinburgh. She is also Deputy Director of the Mason Institute for Medicine, Life Sciences and Law, Associate Director of the Centre for Biomedicine, Self and Society and a member of the Genomics England Ethics Advisory Committee.
- **Tracey Chantler** is Assistant Professor of Public Health Evaluation & Medical Anthropology at the London School of Hygiene and Tropical Medicine. She is also a member of the Immunisation Health Protection Research Unit, a collaborative research group involving Public Health England and LSHTM.
- **Robert Dingwall** is Professor of Sociology at Nottingham Trent University. He is also a Fellow of the Academy of Social Sciences and a member of the Faculty of Public Health. He sits on several government advisory committees, including NERVTAG (New and Emerging Respiratory Virus Threats Advisory Group) and the JCVI (Joint Committee on Vaccination and Immunisation) sub-committee on Covid-19.
- **Amy Fairchild** is Dean and Professor at the College of Public Health, Ohio State University. She is also Co-Director of the World Health Organization Collaborating Center for Bioethics at Columbia's Center for the History and Ethics of Public Health.
- **Matteo Galizzi** is Associate Professor of Behavioural Science at the London School of Economics. He is also Co-Director of LSE Behavioural Lab and coordinates the Behavioural Experiments in Health Network and the Data Linking Initiative in Behavioural Science.

- **Michael Parker** is Director of the Wellcome Centre for Ethics and Humanities and Director of the Ethox Centre at the University of Oxford. He is also a member of the government's Scientific Advisory Group for Emergencies, the Chair of the Genomics England Ethics Advisory Committee and a non-executive director of Genomics England.
- **Sobia Raza** is a Senior Fellow at the Health Foundation within the Data Analytics team. She is also an Associate and previous Head of Science at the PHG Foundation.
- **Peter Taylor** is Director of Research at the Institute of Development Studies. He was previously the Director of Strategic Development at the International Development Research Centre.
- **Carmela Troncoso** is Assistant Professor, Security and Privacy Engineering Lab at the École Polytechnique Fédérale de Lausanne. She was a leading researcher on DP-3T and is also a member of the Swiss National COVID-19 Science Task Force's expert group on Digital Epidemiology.
- **Edgar Whitley** is Associate Professor of Information Systems at the London School of Economics. He is co-chair of the UK Cabinet Office Privacy and Consumer Advisory Group and was the research coordinator of the LSE Identity Project on the UK's proposals to introduce biometric identity cards.
- **James Wilson** is Professor of Philosophy and Co-Director of the Health Humanities Centre at University College London. He is also an Associate editor of Public Health Ethics and Member of the National Data Guardian's Panel and Steering Group.

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About the Ada Lovelace Institute

The Ada Lovelace Institute was established by the Nuffield Foundation in early 2018, in collaboration with the Alan Turing Institute, the Royal Society, the British Academy, the Royal Statistical Society, the Wellcome Trust, Luminate, techUK and the Nuffield Council on Bioethics.

The mission of the Ada Lovelace Institute is to ensure that data and AI work for people and society. We believe that a world where data and AI work for people and society is a world in which the opportunities, benefits and privileges generated by data and AI are justly and equitably distributed and experienced.

We recognise the power asymmetries that exist in ethical and legal debates around the development of data-driven technologies, and will represent people in those conversations. We focus not on the types of technologies we want to build, but on the types of societies we want to build.

Through research, policy and practice, we aim to ensure that the transformative power of data and AI is used and harnessed in ways that maximise social wellbeing and put technology at the service of humanity.

We are funded by the Nuffield Foundation, an independent charitable trust with a mission to advance social well-being. The Foundation funds research that informs social policy, primarily in education, welfare and justice. It also provides opportunities for young people to develop skills and confidence in STEM and research. In addition to the Ada Lovelace Institute, the Foundation is also the founder and co-funder of the Nuffield Council on Bioethics and the Nuffield Family Justice Observatory.

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