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A woman in Beijing shows a health QR code on her phone to access a shopping area, as a security guard checks her temperature.

Ten reasons why immunity passports are a bad idea

Natalie Kofler and Françoise Baylis

Restricting movement on the basis of biology threatens freedom, fairness and public health.

Imagine a world where your ability to get a job, housing or a loan depends on passing a blood test. You are confined to your home and locked out of society if you lack certain antibodies.

It has happened before. For most of the nineteenth century, immunity to yellow fever divided people in New Orleans, Louisiana, between the ‘acclimated’ who had survived

yellow fever and the ‘unacclimated’, who had not had the disease¹. Lack of immunity dictated whom people could marry, where they could work, and, for those forced into slavery, how much they were worth. Presumed immunity concentrated political and economic power in the hands of the wealthy elite, and was weaponized to justify white supremacy.

Something similar could be our dystopian future if governments introduce ‘immunity passports’ in efforts to reverse the economic catastrophe of the COVID-19 pandemic. The idea is that such certificates would be issued to those who have recovered and tested positive for antibodies to SARS-CoV-2 – the coronavirus that causes the disease. Authorities would lift restrictions on those who are presumed to have

immunity, allowing them to return to work, to socialize and to travel. This idea has so many flaws that it is hard to know where to begin.

On 24 April, the World Health Organization (WHO) cautioned against issuing immunity passports because their accuracy could not be guaranteed. It stated that: “There is currently no evidence that people who have recovered from COVID-19 and have antibodies are protected from a second infection” (see go.nature.com/3cutjqz). Nonetheless, the idea is being floated in the United States, Germany, the United Kingdom and other nations.

China has already introduced virtual health checks, contact tracing and digital QR codes to limit the movement of people. Antibody test results could easily be integrated into this

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system. And Chile, in a game of semantics, says that it intends to issue 'medical release certificates' with three months' validity to people who have recovered from the disease².

In our view, any documentation that limits individual freedoms on the basis of biology risks becoming a platform for restricting human rights, increasing discrimination and threatening – rather than protecting – public health. Here we present ten reasons why immunity passports won't, can't and shouldn't be allowed to work.

Ten points

Four huge practical problems and six ethical objections add up to one very bad idea.

COVID-19 immunity is a mystery. Recent data³ suggest that a majority of recovered patients produce some antibodies against SARS-CoV-2. But scientists don't know whether everyone produces enough antibodies to guarantee future protection, what a safe level might be or how long immunity might last. Current estimates, based on immune responses to closely related viruses such as those that cause severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), suggest that recovered individuals could be protected from re-infection for one to two years. But if SARS-CoV-2 immunity instead mimics that seen with the common cold, the protection period could be shorter.

Serological tests are unreliable. Tests to measure SARS-CoV-2 antibodies in the blood can be a valuable tool to assess the prevalence and spread of the virus. But they vary widely in quality and efficacy. This has led the WHO and former US Food and Drug Administration commissioner Scott Gottlieb to caution against their use in assessing individual health or immune status. Several available tests are sufficiently accurate, meaning they are validated to have at least 99% specificity and sensitivity. But preliminary data suggest that the vast majority aren't reliable⁴. Low specificity means the test measures antibodies other than those that are specific to SARS-CoV-2. This causes false positives, leading people to think they are immune when they aren't. Low sensitivity means that the test requires a person to have a high concentration of SARS-CoV-2 antibodies for them to be measured effectively. This causes false negatives in people who have few antibodies, leading to potentially immune individuals being incorrectly labelled as not immune.

The volume of testing needed is unfeasible. Tens to hundreds of millions of serological tests would be needed for a national immunity certification programme. For example, Germany has a population of nearly 84 million people, so would require at least 168 million serological tests to validate every resident's COVID-19

immune status at least twice. Two tests per person are the minimum, because anyone who tested negative might later become infected and would need to be retested to be immune certified. Repeat testing, on no less than an annual basis, would be necessary to ensure ongoing immunity. From June, the German government will receive 5 million serological tests a month from the Swiss firm Roche Pharmaceuticals – a leading supplier of one SARS-CoV-2 serological test that has been approved by regulators. This will allow only 6% of the German population to be tested each month.

Even if immunity passports were limited to health-care workers, the number of tests required could still be unfeasible. The United States, for example, would need more than 16 million such tests. At the time of writing, the US Centers for Disease Control and Prevention and US public-health laboratories have performed more than 12 million diagnostic tests for SARS-CoV-2 (3% of the total US population; see go.nature.com/2wemdd2). Even South Korea, a country with high testing rates, had managed to test only 1.5% of its population by 20 May (see go.nature.com/2aztfvp).

Too few survivors to boost the economy. The proportion of individuals known to have recovered from COVID-19 varies widely in different populations. Reports from hot spots in Germany and the United States suggest some locations could have recovery rates between 14% and 30%. In New York state, for example, where 3,000 people were tested at random in grocery shops and other public locations,

"A cafe can't open and serve customers without risk if only a fraction of its staff are certified as immune."

14.9% had antibodies against COVID-19 (see go.nature.com/2waaku9). But these seem to be the exception. In an April press conference, the WHO estimated that only 2–3% of the global population had recovered from the virus.

Low disease prevalence combined with limited testing capacity, not to mention highly unreliable tests, means that only a small fraction of any population would be certified as free to work. Based on current numbers of confirmed US cases, for example, only 0.43% of the population would be certified. Such percentages are inconsequential for the economy and for safety. A cafe can't open and serve customers without risk if only a fraction of its staff are certified as immune. A shop can't turn a profit if only a minuscule proportion of customers are allowed to enter.

Monitoring erodes privacy. The whole point of immunity passports is to control movement.

Thus, any strategy for immunity certification must include a system for identification and monitoring. Paper documentation could be vulnerable to forgery. Electronic documentation integrated into a smartphone app would be more resistant to fraud and more effective for contact tracing, retesting and updates of immune status.

But electronic documents present a more serious risk to privacy⁵. In some Chinese provinces, QR codes on smartphones control entrance into public places on the basis of the individual's COVID-19 health status. However, these apps report more than COVID-19 information – including people's locations, travel history, who they've come into contact with and other health information, ranging from their body temperature to whether they've recently had a cold. Taiwan is also using smartphone apps with alert systems that are directly linked to police departments. The United Kingdom, United States and many other countries are testing various app options. Yet there's no guarantee that the apps will recede when COVID-19 does. China has announced that elements of its QR-code tracking system are likely to remain in place after the pandemic ends.

Marginalized groups will face more scrutiny. With increased monitoring comes increased policing, and with it higher risks of profiling and potential harms to racial, sexual, religious or other minority groups. During the pandemic, China has been accused of racially profiling residents by forcing all African nationals to be tested for the virus. In other parts of the world, people from Asia have faced spikes in racialized prejudice.

Before this pandemic, stop-and-frisk laws in the United States already disproportionately affected people of colour. In 2019, 88% of people who were stopped and searched in New York City were African American or Latin American (go.nature.com/2jntjym). And during the pandemic, policing continues to target people from minority groups. Between mid-March and the start of May in Brooklyn, New York, 35 of the 40 people arrested for violating physical distancing laws were black⁶.

These numbers are deeply concerning, but would be even more so if monitoring and policing for COVID-19 immunity were to be used for ulterior motives. For example, 'digital incarceration' has already increased in countries such as the United States, Brazil and Iran, where individuals have been released from prison to minimize the spread of COVID-19 and then monitored using digital ankle bracelets. In the United States, where people of colour are racially segregated by neighbourhood and disproportionately incarcerated, digital incarceration could be used to monitor large segments of certain communities. The risk would be even higher if digital monitoring were to be linked to immigration status.



Health-care workers in Munich, Germany, take blood to test for antibodies to SARS-CoV-2.

Unfair access. With a shortage of testing, many will not have access. Experience so far suggests that the wealthy and powerful are more likely to obtain a test than the poor and vulnerable. In tiered health-care systems, these inequities are felt even more acutely. In early March, for example, when professional sports teams, technology executives and film celebrities were getting tested, dozens of US states were conducting fewer than 20 tests per day (see <https://covidtracking.com/data>). The very people who need to get back to work most urgently – workers who need to keep a roof over their head and food on the table – are likely to struggle to get an antibody test. Testing children before they return to school could be a low priority, as would testing retired older people and those who face physical, mental-health or cognitive challenges.

Societal stratification. Labelling people on the basis of their COVID-19 status would create a new measure by which to divide the ‘haves’ and the ‘have-nots’ – the immunoprivileged and the immunodeprived. Such labelling is particularly concerning in the absence of a free, universally available vaccine. If a vaccine becomes available, then people could choose to opt in and gain immune certification. Without one, stratification would depend on luck, money and personal circumstances. Restricting work, concerts, museums, religious services, restaurants, political polling sites and even health-care centres to COVID-19 survivors would harm and disenfranchise a majority of the population.

Social and financial inequities would be amplified. For example, employers wanting to avoid workers who are at risk of becoming unwell might privilege current employees who have had the disease, and preferentially hire those with ‘confirmed’ immunity.

Immunity passports could also fuel divisions between nations. Individuals from countries that are unable or unwilling to implement immunity passport programmes could be barred from travelling to countries that stipulate

them. Already people with HIV are subjected to restrictions on entering, living and working in countries with laws that impinge on the rights of those from sexual and gender minorities – such as Russia, Egypt and Singapore.

New forms of discrimination. Platforms for SARS-CoV-2 immune certification could easily be expanded to include other forms of personal health data, such as mental-health records and genetic-test results. The immunity passports of today could become the all-encompassing biological passports of tomorrow. These would introduce a new risk for discrimination if employers, insurance companies, law-enforcement officers and others could access private health information for their own benefit. Such concerns have been catalogued over the past few years in debates about who should have access to genetic information, as demand rises from clinicians, researchers, insurers, employers and law enforcers, for example⁷.

Threats to public health. Immunity passports could create perverse incentives. If access to certain social and economic liberties is given only to people who have recovered from COVID-19, then immunity passports could incentivize healthy, non-immune individuals to wilfully seek out infection – putting themselves and others at risk⁸. Economic hardship could amplify the incentive if an immunity passport is the only way to a pay cheque. Individuals might obtain documents illicitly, through bribery, transfer between individuals or forgery. These could create further health threats, because people claiming immunity could continue to spread the virus. Crises tend to foster nefarious trade, as happened during the Second World War when food rations in Britain caused the emergence of a robust underground exchange system.

Next steps

Strategies that focus on the individual – using conceptions of ethics rooted in libertarianism

– contradict the mission of public health⁹. They distract attention from actions that benefit all, such as funding international collaborations, practising effective public-health measures and redressing income inequity. In North America (and elsewhere), because of structural inequities, people of colour are dying from COVID-19 at much higher rates than are white people, and the virus is disproportionately affecting those who live in First Nations territories. Success depends on solidarity, a genuine appreciation that we are all in this together. An ethic premised on individual autonomy is grossly inappropriate during a public-health crisis; the overarching aim must be to promote the common good.

Instead of immunity passports, we contend that governments and businesses should invest available time, talent and money in two things.

First is the tried and true formula of pandemic damage limitation – test, trace and isolate – that has worked well from Singapore and New Zealand to Guernsey and Hanoi. Health status, personal data and location must be anonymized. Apps that empower individuals to make safe choices about their own movements should be prioritized.

Second is the development, production and global distribution of a vaccine for SARS-CoV-2. If universal, timely, free access to a vaccination becomes possible, then it could be ethically permissible to require vaccine certification for participation in certain activities. But if access to a vaccine is limited in any way, then some of the inequities we highlight could still apply, as the literature on uptake of other vaccines attests¹⁰.

Threats to freedom, fairness and public health are inherent to any platform that is designed to segregate society on the basis of biological data. All policies and practices must be guided by a commitment to social justice.

The authors

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