

# THE GOOD, THE BAD, & THE INVASIVE

**The Impact of Vaccine Registries,  
Day Passes, & Passports**

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## Executive Summary

As more people get lifesaving COVID-19 vaccines, electronic vaccine credentials will assume an increasingly prominent role in the debate over when and how communities can safely resume in-person activities. These digital vaccination certificates take many forms: vaccine passports for international travel; domestic vaccine apps that keep a constant log of our movements around the community, determining entry to shared spaces; and traditional one-time vaccine registries. History tells us these different types of vaccine credentials should be treated very differently. International vaccine passports like the “Yellow Card” monitor health status infrequently and in spaces already subject to extensive surveillance. By contrast, domestic vaccine apps create a new layer of geolocation tracking, threatening to deepen existing social, racial, and economic inequalities. Lastly, vaccine registries maintain the pre-pandemic *status quo*, enabling schools and workplaces to track vaccine status through unobtrusive, one-time notification.

### **I. Introduction**

COVID-19 is now a vaccine-preventable disease, putting the end of the pandemic within sight. As a concept, vaccine passports are not new. The World Health Organization’s (WHO) “Yellow Card”—a paper document listing one’s vaccine history—is the most notable effort to prevent the spread of disease across borders during international travel. Similarly, many schools have required students to register vaccine status in the past, ensuring herd immunity within a community. But the use of transactional vaccine credentials (such as the Yellow Card) in a domestic context is unprecedented in modern American history.

While digital vaccine passports may help some countries prevent the introduction of novel COVID-19 strains at their respective borders, domestic use of such apps to facilitate daily tracking would have disastrous consequences. Vaccine apps would transform the harms of American medical inequity into a new form of digitally enforced segregation. Domestic vaccine apps threaten to exclude low-income, BIPOC, immigrant, and LGBTQ+ individuals underserved by our healthcare infrastructure from public life. At the same time, the technical barriers to use of a vaccine app could exclude millions of senior citizens and English language learners, despite their being vaccinated. Domestic vaccine apps also threaten to create an expansive new layer of geolocation tracking, posing a potent privacy threat to BIPOC individuals, undocumented Americans, and other over-policed communities.

### **II. A history of vaccine and immunity credentials**

France began coordinating modern, international quarantine standards in 1850 as both a public health and commercial measure.<sup>1</sup> Domestic quarantine standards were already centuries-old,<sup>2</sup> but safety often came at the price of slowing trade. The International Sanitary Conferences sought to

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<sup>1</sup> J.C. McDonald, “The History of Quarantine in Britain During the 19th Century,” *Bulletin of the History of Medicine* 25, no. 1 (February 1951): 22–44.

<sup>2</sup> McDonald, “History of Quarantine,” p. 22.

advance colonial European business interests by “reduce[ing] quarantine to an internationally agreed minimum.”<sup>3</sup>

Participating countries inched toward international quarantine standards, and eventually vaccine certificate standards, over the course of eighty-eight years.<sup>4</sup> Initial sessions in the 1850s and 1860s led to months of unproductive posturing,<sup>5</sup> with little progress beyond non-binding recommendations and an unratified draft convention.<sup>6</sup> In part, the conventions became a forum for critiquing rival powers for introducing communicable diseases from their colonial territories.<sup>7</sup>

In 1892, delegates to the seventh conference finally approved the first binding treaty, requiring some ships to quarantine after transiting the Suez Canal to Europe.<sup>8</sup> Ships certified by medical inspectors prior to entering the Canal could pass without delay, while “suspect” and “infected” ships would undergo quarantine and disinfection.<sup>9</sup> A growing list of nations adopted and expanded these protocols in later conventions, limiting detention of non-symptomatic travelers,<sup>10</sup> and expanding protocols for plague, cholera, and yellow fever.<sup>11</sup> Participants continued to adopt blatantly discriminatory measures, such as a lengthy quarantine for Muslim travelers undertaking the Hajj pilgrimage.<sup>12</sup>

“Yellow Card” vaccine credentials were introduced over the course of a decade, beginning in 1933, in response to the growth of air travel.<sup>13</sup> Formally titled the International Certificate of Vaccination or Prophylaxis, this low-tech document lists individuals’ dates of inoculation, or immunity, or vaccination for diseases of high concern. The design for the earliest recognizable Yellow Card was published by the 1944 International Sanitary Convention for Aerial Navigation.<sup>14</sup>

Yellow Cards can help mitigate the introduction of communicable diseases by travelers, but they can be deeply discriminatory, particularly for those from developing countries.<sup>15</sup> From the 1960s to early

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<sup>3</sup> McDonald, “History of Quarantine,” p. 24.

<sup>4</sup> “International Sanitary Conferences | Contagion - CURIOSity Digital Collections,” accessed May 20, 2021, <https://curiosity.lib.harvard.edu/contagion/feature/international-sanitary-conferences>.

<sup>5</sup> Valeska Huber, “Pandemics and the Politics of Difference: Rewriting the History of Internationalism through Nineteenth-Century Cholera,” *Journal of Global History* 15, no. 3 (November 2020): 394–407, p. 395. <https://doi.org/10.1017/S1740022820000236>.

<sup>6</sup> Norman Howard-Jones and World Health Organization, “The Scientific Background of the International Sanitary Conferences, 1851-1938,” 1975, <https://apps.who.int/iris/handle/10665/62873>.

<sup>7</sup> Howard-Jones, “International Sanitary Conferences,” p. 41.

<sup>8</sup> Howard-Jones, “International Sanitary Conferences,” p. 65.

<sup>9</sup> Howard-Jones, “International Sanitary Conferences,” p. 64.

<sup>10</sup> Howard-Jones, “International Sanitary Conferences,” p. 70.

<sup>11</sup> Howard-Jones, “International Sanitary Conferences,” pp. 95-96.

<sup>12</sup> Huber, “Pandemics and Politics of Difference,” p. 403.

<sup>13</sup> *International Sanitary Convention for Aerial Navigation*, art. 18, as amended on May 25, 1951, 49 Stat. 3279; Treaty Series 901, <https://www.loc.gov/law/help/us-treaties/bevans/m-ust000003-0089.pdf>.

<sup>14</sup> *International Sanitary Convention for Aerial Navigation, of 1944, Modifying the International Sanitary Convention for Aerial Navigation of April 12, 1933*, adopted on January 5, 1945, 55 Stat. 991; Treaty Series 992, <https://www.loc.gov/law/help/us-treaties/bevans/m-ust000003-0982.pdf>.

<sup>15</sup> Paul Nuki et al., “Fears of ‘Vaccine Apartheid’ as Countries Mull Immunisation Passports,” *The Telegraph*, January 18, 2021, <https://www.telegraph.co.uk/global-health/science-and-disease/fears-vaccine-apartheid-countries-mull-immunisation-passports/>.

2000s, travelers from developing countries were often barred for lack of smallpox vaccines<sup>16</sup> or because their own country's vaccine records were not honored.<sup>17</sup> While COVID-19 vaccine passports may help some wealthier countries limit the introduction of new cases and novel variants of the virus, such measures compound the humanitarian cost of those same countries' decision to stockpile large numbers of COVID-19 vaccine doses, limiting vaccine access in the global south.

### *Domestic Vaccine Registries*

In contrast to vaccine passports, which aim to exclude diseases from entering a country, domestic vaccine registries seek to boost herd immunity within a local community. While a variety of institutions have implemented vaccine registries, school-based registries are a singularly effective public health tool.<sup>18</sup> In the U.S., school registries were particularly potent at responding to the threat of measles, leading to universal adoption of K-12 student vaccine requirements by 1980.<sup>19</sup> While states vary in their precise requirements, over 95% of American students received typical childhood vaccinations, with only 2.5% citing religious or medical exemptions.<sup>20</sup> High student vaccination rates are credited with a dramatic decrease in childhood deaths due to vaccine preventable diseases—over 99% for many diseases.<sup>21</sup>

Vaccine requirements were upheld by American courts long before they were universal. In 1905, the U.S. Supreme Court ruled that vaccine mandates fell within states' lawful police powers.<sup>22</sup> 17 years later, the Court expanded the holding to encompass public school vaccine registration.<sup>23</sup> Although largely a settled question, federal and state courts have periodically reaffirmed the constitutionality of vaccine mandates and registries,<sup>24</sup> as well as the power of States to eliminate religious vaccine exemptions and other vaccine opt-out options.<sup>25</sup>

In practice, school vaccine registries pose a minor burden on students and their families, requiring vaccine documentation no more than once per year. Many doctors can easily forward proof of registration directly to schools, and officials also accept paper records from healthcare providers,

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<sup>16</sup> M. A. Strassburg, "The Global Eradication of Smallpox," *American Journal of Infection Control* 10, no. 2 (May 1982): 53–59, [https://doi.org/10.1016/0196-6553\(82\)90003-7](https://doi.org/10.1016/0196-6553(82)90003-7).

<sup>17</sup> *The History and Uses of Vaccine Passports and COVID Status Apps* (Ada Lovelace Institute), accessed May 20, 2021, <https://www.adalovelaceinstitute.org/event/history-uses-vaccine-passports-covid-status-apps/>. See also, W H Bradley, "Smallpox in England and Wales 1962," *Proceedings of the Royal Society of Medicine* 56, no. 5 (May 1963): 335–38, p. 335.

<sup>18</sup> Kevin M. Malone and Alan R. Hinman, eds., "Vaccination Mandates: The Public Health Imperative and Individual Rights," in *Law in Public Health Practice* (New York: Oxford University Press, 2003), 262–84, p. 269.

<sup>19</sup> Malone and Hinman, "Vaccination Mandates," p. 270.

<sup>20</sup> Raneë Seither, "Vaccination Coverage with Selected Vaccines and Exemption Rates Among Children in Kindergarten — United States, 2019–20 School Year," *MMWR. Morbidity and Mortality Weekly Report* 70 (2021), <https://doi.org/10.15585/mmwr.mm7003a2>.

<sup>21</sup> Malone and Hinman, "Vaccination Mandates," p. 266.

<sup>22</sup> *Jacobson v. Massachusetts*, 197 U.S. 11 (1905), <https://supreme.justia.com/cases/federal/us/197/11/>.

<sup>23</sup> *Zucht v. King*, 260 U.S. 174 (1922), <https://supreme.justia.com/cases/federal/us/260/174/>.

<sup>24</sup> *State of Arizona v. Harmon* (2017) <https://law.justia.com/cases/arizona/court-of-appeals-division-one-unpublished/2017/1-ca-cr-15-0248-prpc.html>.

<sup>25</sup> *F.F. v State of New York* (2019), <https://law.justia.com/cases/new-york/other-courts/2019/2019-ny-slip-op-29261.html>.

government officials, and other schools. Parents must prove vaccination according to their child's age, with exemptions (depending on state) for health conditions and religious beliefs.<sup>26</sup> Since vaccine

registries apply to a variety of inoculations, it appears the requirements could not be easily extended to also record COVID-19 vaccination.

### III. COVID-19 Vaccine Passports for International Travel

There are many competing proposals for cross-border vaccine passports that would modernize the analog Yellow Card standards. Leading projects include:

#### 1. WHO's "smart yellow card"

In October 2020, the WHO announced a pilot project with Estonia to create a "smart yellow card."<sup>27</sup> In March, a WHO working group released its first report on the project's status, including a framework for international interoperability,<sup>28</sup> proposing that each nation establish domestic public key infrastructure (PKI) to cryptographically sign vaccine passports.<sup>29</sup> The WHO would then manage a global directory of national public keys,<sup>30</sup> allowing border agents to confirm the authenticity of a traveler's vaccination document. The WHO aims to issue complete technical specifications by June 2021.<sup>31</sup>

#### 2. CommonPass

The Commons Project, a Geneva-based non-profit, and the World Economic Forum have partnered with airlines and other private businesses to test the CommonPass app.<sup>32</sup> The app aims to provide individuals access to their COVID-19 test results and vaccination information from a variety of private and governmental sources.<sup>33</sup> Travelers will provide a QR code upon arrival, transmitting purportedly anonymized health data to border agents. United State Customs

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<sup>26</sup> "State School Immunization Requirements and Vaccine Exemption Laws" (Centers for Disease Control and Prevention, Office for State, Tribal, Local and Territorial Support, n.d.), accessed May 20, 2021, <https://www.cdc.gov/phlp/docs/school-vaccinations.pdf>.

<sup>27</sup> John Miller and Stephanie Nebehay, "WHO Looks at Possible 'e-Vaccination Certificates' for Travel," *Reuters*, December 3, 2020, <https://www.reuters.com/article/health-coronavirus-who-passports-int-idUSKBN28D1IQ>.

<sup>27</sup> Miller and Nebehay, "WHO Looks."

<sup>28</sup> "Interim Guidance for Developing a Smart Vaccination Certificate" (World Health Organization, March 19, 2021), [https://cdn.who.int/media/docs/default-source/documents/interim-guidance-svc\\_20210319\\_final.pdf?sfvrsn=b95db77d\\_11&download=true](https://cdn.who.int/media/docs/default-source/documents/interim-guidance-svc_20210319_final.pdf?sfvrsn=b95db77d_11&download=true).

<sup>29</sup> World Health Organization, "Interim Guidance."

<sup>30</sup> World Health Organization, "Interim Guidance."

<sup>31</sup> World Health Organization, "Interim Guidance."

<sup>32</sup> Kent German, "COVID-19 Vaccine Passports Will Play a Part in Global Travel," *CNET*, May 7, 2021,

<https://www.cnet.com/health/covid-19-vaccine-passports-will-play-a-part-in-global-travel/>.

<sup>33</sup> The Commons Project and World Economic Forum, "CommonTrust Network Overview," November 16, 2020, accessed May 20, 2021,

[https://static1.squarespace.com/static/5ed685211872ca0609188980/t/5fbd699f8ee41b79ce846897/1606248871413/CommonTrust+Network+Overview+-+11.16.2020+\(3\).pdf](https://static1.squarespace.com/static/5ed685211872ca0609188980/t/5fbd699f8ee41b79ce846897/1606248871413/CommonTrust+Network+Overview+-+11.16.2020+(3).pdf).

and Border Patrol (CBP), the Centers for Disease Control and Prevention (CDC),<sup>34</sup> and the State of Hawaii have all trialed or deployed CommonPass.<sup>35</sup>

### 3. European Union's Green Certificate

The European Union (E.U.) is evaluating the introduction of QR-based “Green Certificates,” to monitor health status while travelling within the bloc.<sup>36</sup> Proponents hope the app will restore “free movement” within the Schengen Zone, which was a key pillar of the EU’s creation.<sup>37</sup> The European Parliament is seeking to expedite approval of the Green Certificate ahead of summer 2021,<sup>38</sup> replacing what some have called a “chaotic patchwork” of restrictive national COVID-19 measures.<sup>39</sup> Greece, for example, has created a digital vaccination certificate for its citizens<sup>40</sup> and will not require quarantines for summer travelers from E.U. countries who can prove vaccination.<sup>41</sup> Denmark<sup>42</sup> and Austria<sup>43</sup> have also announced plans for vaccination certificates to facilitate tourism and cross-border movement, with Austria’s chancellor saying the country doesn’t want to “wait for implementation at [the] European level.”<sup>44</sup> As this publication was finalized, the E.U. lifted travel restrictions for travelers entering into the bloc who could prove receipt a WHO-approved vaccine, but it is unclear how such vaccine status will be tracked.<sup>45</sup>

### 4. Other unilateral and bilateral initiatives

Numerous other countries and private organizations have proposed their own vaccine passport initiatives for cross-border travel. In April 2021, China announced that its COVID-19 electronic

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<sup>34</sup> Jessica Puckett, “International Air Travel Is Closer to Restarting, Thanks to This App,” *Condé Nast Traveler*, October 11, 2020, <https://www.cntraveler.com/story/common-pass-app-international-air-travel>.

<sup>35</sup> “Hawaii Safe Travels,” CommonPass, accessed May 20, 2021, <https://commonpass.org/hawaii>.

<sup>36</sup> Natasha Lomas, “Europe’s Rush for a COVID-19 ‘Digital Pass’ Stirs Concerns,” *TechCrunch* (blog), March 17, 2021, <https://social.techcrunch.com/2021/03/17/europes-rush-for-a-covid-19-digital-pass-stirs-concerns/>. See also Monika Pronczuk, “Europe’s Plan to Save Summer: A Travel Certificate,” *The New York Times*, March 17, 2021, sec. World, <https://www.nytimes.com/2021/03/17/world/europe/covid-19-travel-certificate.html> (last updated Mar. 26, 2021).

<sup>37</sup> European Commission, “COVID-19: Digital Green Certificates,” accessed May 20, 2021, [https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/safe-covid-19-vaccines-europeans/covid-19-digital-green-certificates\\_en](https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/safe-covid-19-vaccines-europeans/covid-19-digital-green-certificates_en).

<sup>38</sup> “EU Vaccine Passports: European Parliament Speeds Up Approval Procedures,” *SchengenVisaInfo.com*, March 26, 2021, <https://www.schengenvisa.info.com/news/eu-vaccine-passports-european-parliament-speeds-up-approval-procedures/>.

<sup>39</sup> Pronczuk, “Europe’s Plan.”

<sup>40</sup> “Greece Launches COVID-19 Vaccine Certificates to All Vaccinated Citizens,” *SchengenVisaInfo.com*, February 23, 2021, <https://www.schengenvisa.info.com/news/greece-launches-covid-19-vaccine-certificates-to-all-vaccinated-citizens/>.

<sup>41</sup> Michael Trout, “Unrestricted Entry to Greece for Foreign Travelers Soon a Reality,” *TourismReview*, March 29, 2021, <https://www.tourism-review.com/greece-to-launch-unrestricted-entry-to-some-travelers-news11952>.

<sup>42</sup> “Denmark Developing Digital COVID-19 ‘Vaccine Passport’,” *Reuters*, January 8, 2021, <https://www.reuters.com/business/healthcare-pharmaceuticals/denmark-developing-digital-covid-19-vaccine-passport-2021-01-08/>.

<sup>43</sup> “Austria Set to Introduce Vaccine Passport Next Month,” *PlanetSKI*, March 20, 2021, <https://planetski.eu/2021/03/20/austria-set-to-introduce-vaccine-passport-next-month/>.

<sup>44</sup> PlanetSKI, “Austria Set.”

<sup>45</sup> Matina Stevis-Gridneff and Monika Pronczuk, “The E.U. Agrees to Reopen to Vaccinated Visitors and Those from Covid-Safe Countries,” *The New York Times*, May 19, 2021, sec. World, <https://www.nytimes.com/live/2021/05/19/world/covid-vaccine-coronavirus-mask>.



(QR) health codes, already used to regulate Chinese citizens' local and regional travel,<sup>46</sup> will be available to foreign nationals with Pfizer-BioNTech, Moderna and Johnson & Johnson vaccines.<sup>47</sup> The certificate, available in paper form and electronically via WeChat, a Chinese multi-purpose app, displays a traveler's vaccination status, COVID-19, and COVID-19 antibody test results.

Israel entered bilateral agreements with Greece and Bahrain to allow travel between the countries. In February 2021, Israel and Greece agreed to allow Israeli tourists to present Israel's domestic COVID-19 vaccine app as proof of vaccination at the Greek border.<sup>48</sup> As of March, Israeli travelers with a valid Green Pass (see Section IV) and a negative COVID-19 test result can enter Greece without quarantine.<sup>49</sup> Bahrain's smartphone-based vaccine passport allows users to confirm their vaccinations status with a QR code.<sup>50</sup> Israel will also allow Bahraini vaccine passport holders to obtain an Israeli Green Pass, a domestic vaccine app used to access venues within Israel.<sup>51</sup>

## 5. Trade associations

Private trade associations have also developed vaccine passports. The International Chamber of Commerce has launched the AOKpass, a mobile tool that claims to use blockchain technology to enable travelers to "present digitally authenticated and secure medical records to border authorities."<sup>52</sup> Air France extended its pilot AOKPass program in March.<sup>53</sup> The International Air Transport Association, a global airline trade association, has created its own app that would allow passengers to upload their vaccination and testing status, and claims the app could eventually use passengers' biometric information for identification purposes.<sup>54</sup>

### *Obstacles to Digital Vaccine Passports for International Travel*

Digital vaccine passports offer potential benefits for countries with low domestic COVID-19 transmission rates, allowing them to potentially prevent the introduction of new cases and novel

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<sup>46</sup> Paul Mozur, Raymond Zhong, and Aaron Krolik, "In Coronavirus Fight, China Gives Citizens a Color Code, With Red Flags," *The New York Times*, March 2, 2020, sec. Business, <https://www.nytimes.com/2020/03/01/business/china-coronavirus-surveillance.html>.

<sup>47</sup> Eva Dou, "China to Recognize Western Shots for Its Vaccine Passports, as It Seeks to Reopen," *Washington Post*, April 20, 2021, [https://www.washingtonpost.com/world/asia-pacific/china-vaccine-passport-visas-covid/2021/04/20/8a6422d0-a14e-11eb-8a6d-f1b55f463112\\_story.html](https://www.washingtonpost.com/world/asia-pacific/china-vaccine-passport-visas-covid/2021/04/20/8a6422d0-a14e-11eb-8a6d-f1b55f463112_story.html).

<sup>48</sup> Trout, "Unrestricted Entry to Greece."

<sup>49</sup> Sarantis Michalopoulos, "Israelis Will Travel to Greece with Vaccination Certificate," [www.euractiv.com](http://www.euractiv.com), March 26, 2021, <https://www.euractiv.com/section/politics/short-news/israelis-will-travel-to-greece-with-vaccination-certificate/>.

<sup>50</sup> Daniel Estrin, "Vaccine Passports: Israel, Bahrain Reach Landmark Agreement," *NPR.Org*, April 22, 2021, <https://www.npr.org/sections/coronavirus-live-updates/2021/04/22/989891650/vaccine-passports-israel-bahrain-reach-landmark-agreement>.

<sup>51</sup> Estrin, "Israel, Bahrain."

<sup>52</sup> "ICC AOKPass," ICC - International Chamber of Commerce, accessed May 20, 2021, <https://iccwbo.org/resources-for-business/icc-aokpass/>.

<sup>53</sup> "Air France Extends Trial of ICC AOKpass Covid Test Solution," March 19, 2021, accessed May 20, 2021, [https://www.travelmole.com/news\\_feature.php?news\\_id=2046494&region=2](https://www.travelmole.com/news_feature.php?news_id=2046494&region=2).

<sup>54</sup> German, "COVID-19 Vaccine Passports."

viral strains. From a business perspective, confirming travelers' vaccine status may encourage international travel by lessening the need for quarantine upon arrival. But despite these potential benefits, vaccine passports face practical and ethical barriers to deployment.

At a practical level, the process of developing, deploying, and building trust in any vaccine passport standard is quite slow, as participants struggle to harmonize competing international objectives. These delays undermine vaccine passports' usefulness as an emergency measure, as countries wrestle with questions around encryption standards and data transmission. Just as with the development of the first analog vaccine credentials a century ago, an array of scientific and geopolitical factors will make any quick consensus hard to achieve. Even now, health officials are still studying the longevity and comparative efficacy of numerous vaccines from around the world, determining which are sufficiently effective to dispense with quarantine requirements.<sup>55</sup>

### ***Ethical Concerns Regarding COVID-19 Vaccine Passports***

The ethical barriers to vaccine passport adoption may prove even larger than the practical concerns. A new digital cordon will disproportionately affect residents of low- and middle-income countries who have been deprived of access to the COVID-19 vaccine (in part) because of actions taken by the United States and other wealthy nations. Not only were wealthy countries slow to waive intellectual property protections for several COVID-19 vaccines, but they purchased a grossly disproportionate share of the world's vaccine supply.<sup>56</sup>

In March 2021, the WHO advised against the immediate use of COVID-19 vaccine passports for exactly this reason, noting that more than 90 percent of the countries that initiated COVID-19 vaccination programs as of February 2021 were "high- or high-middle income."<sup>57</sup> Experts estimate that many poorer countries will not begin widespread vaccination until at least 2023.<sup>58</sup> In this context, COVID-19 passports will exacerbate inequality as countries in the global south seek to provide their residents with access to the vaccines that have thus far been hoarded by wealthier states.<sup>59</sup>

Lastly, it is unclear if vaccine passports would pose a meaningful privacy harm to international travelers. This is because of the extreme level of surveillance already aimed at national borders. Not only must travelers present their passports, but nearly half a billion of those travel documents are

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<sup>55</sup> German, "COVID-19 Vaccine Passports."

<sup>56</sup> Anna Rouw et al., "Global COVID-19 Vaccine Access: A Snapshot of Inequality," *KFF* (blog), March 17, 2021, <https://www.kff.org/policy-watch/global-covid-19-vaccine-access-snapshot-of-inequality/>.

<sup>57</sup> Tariro Mzezewa, "Coming Soon: The 'Vaccine Passport,'" *The New York Times*, February 4, 2021, <https://www.nytimes.com/2021/02/04/travel/coronavirus-vaccine-passports.html>.

<sup>58</sup> "More than 85 Poor Countries Will Not Have Widespread Access to Coronavirus Vaccines before 2023," *The Economist*, January 27, 2021, <https://www.eiu.com/n/85-poor-countries-will-not-have-access-to-coronavirus-vaccines/>.

<sup>59</sup> Associated Press, "WHO Advises against Mandating 'vaccine Passports' for Covid-19 to Travel," *Mint*, March 9, 2021, <https://www.livemint.com/news/world/who-advises-against-mandating-vaccine-passports-for-covid-19-to-travel-11615247731382.html>. (Quoting Dr. Michael Ryan, Executive Director of the WHO Health Emergencies Programme.)



ePassports, which include a radio frequency identification (RFID) transceiver.<sup>60</sup> That said, vaccine passports could provide immigration authorities with a new tracking tool, posing less immediately understood threats.

#### IV. The Case Against Domestic Vaccine Apps

Vaccine app proposals have proliferated in recent months, providing the false promise that the tracking technology can reopen society. While these apps vary in their capabilities and risks, none provide a credible, privacy-protective model for reliably demonstrating vaccine status.

##### 1. Israel's Green Pass

Israel was among the first countries to release a vaccine app authorizing vaccinated individuals to return to daily activities.<sup>61</sup> The Green Pass displays an individual's vaccination status and whether they have recovered from the coronavirus.<sup>62</sup> Almost all public places in Israel now require individuals to obtain a Green Pass before entering, including gyms, swimming pools, restaurants, hotels, stadiums, and other businesses.<sup>63</sup> The Green Pass uses proprietary source code, limiting third party reviews of its privacy and security.<sup>64</sup> Israeli civil rights groups challenged Green Pass requirement for workers and to attend public events,<sup>65</sup> calling on legislators to limit Green Pass mandates.<sup>66</sup>

##### 2. IBM Digital Health Pass/New York State's Excelsior Pass

IBM Watson Health and Salesforce developed Health Pass for stores and workplaces.<sup>67</sup> The software reportedly encrypts users' COVID-19 vaccine or health status with "blockchain technology," but developers provided minimal technical specifications on this functionality. New York State was the first jurisdiction to deploy Health Pass, using the branding "Excelsior pass."<sup>68</sup> While New York provided few technical details about the deployment, S.T.O.P.'s security testing showed that Excelsior pass could be easily forged through the state registration site.<sup>69</sup>

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<sup>60</sup> "E-Passports," Department of Homeland Security, July 6, 2009, <https://www.dhs.gov/e-passports>.

<sup>61</sup> Cat Ferguson and Joshua Mitnick, "Israel's 'Green Pass' Vaccine Passport Is an Early Vision of How We Leave Lockdown," *MIT Technology Review*, March 1, 2021, <https://www.technologyreview.com/2021/03/01/1020154/israels-green-pass-is-an-early-vision-of-how-we-leave-lockdown/>.

<sup>62</sup> "What Is a Green Pass?," Corona Traffic Light Model (Ramzor) Website (Israel Ministry of Health), accessed May 20, 2021, <https://corona.health.gov.il/en/directives/green-pass-info/>.

<sup>63</sup> Israel Ministry of Health, "Green Pass."

<sup>64</sup> Ferguson and Mitnick, "Israel's 'Green Pass'."

<sup>65</sup> "COVID: NGOs Petition Court to Cancel Green Pass at Yom Hashoa Events - The Jerusalem Post," *The Jerusalem Post*, April 6, 2021, <https://www.jpost.com/israel-news/covid-ngos-petition-court-to-cancel-green-pass-at-remembrance-events-664227>.

<sup>66</sup> Ilan Ben Zion, "Israel's Dilemma: Can the Unvaccinated Return to Workplaces?," *Associated Press*, April 2, 2021, <https://apnews.com/article/israel-can-unvaccinated-return-to-work-dilemma-coronavirus-7e18cdee3a66018c36a6c61d5bc8a4c1>.

<sup>67</sup> "IBM and Salesforce Join Forces to Help Deliver Verifiable Vaccine and Health Passes," *Watson Health Perspectives*, December 18, 2020, <https://www.ibm.com/blogs/watson-health/partnership-with-salesforce-verifiable-health-pass/>.

<sup>68</sup> Steve LaFleche, "New York and IBM Begin COVID-19 Digital Health Pass Pilot," *IBM News Room*, March 2, 2021, <https://newsroom.ibm.com/New-York-State-and-IBM-Digital-Health-Pass-Pilot>.

<sup>69</sup> Sam Biddle, "Cuomo's Covid-19 Vaccine Passport Leaves Users Clueless About Privacy," *The Intercept*, March 24, 2021, <https://theintercept.com/2021/03/24/andrew-cuomo-covid-ibm-blockchain/>. See also Albert Fox Cahn, "I Forged New York's

### 3. The Vaccine Credential Initiative

Microsoft, Oracle, Cigna, Mayo Clinic, and other companies have also partnered to create the Vaccine Credential Initiative (VCI), an open-source model for vaccine apps.<sup>70</sup> VCI aims to team with “hospitals, pharmacies, and clinics administering COVID-19 vaccines” to create digital immunization records for their patients.<sup>71</sup> Similar to IBM’s Digital Health Pass, app users obtain an encrypted copy of their immunization records, or a QR code printed on paper containing their vaccination credentials.<sup>72</sup>

### 4. Walmart in partnership with The Commons Project and CLEAR

Walmart, a vaccine provider, announced its plans for vaccine apps for individuals immunized at its stores. Walmart’s apps were developed by Clear, a company that “uses biometric [data] to confirm people’s identities at airports,” and CommonPass, the travel-oriented vaccine passport described above. U.S. senators Cory Booker and Jeff Merkley have questioned Clear’s data security, given the company’s collection of sensitive facial print data.<sup>73</sup> However, it is unclear what security measures are being taken to safely store Clear or CommonPass user data.

#### *Exclusion of uncertified individuals*

The BIPOC, Immigrant, and LGBTQ+ communities that were ill-served or ignored by the American healthcare system during this pandemic (and for centuries prior) may see health inequity turned into a new form of digital segregation.<sup>74</sup> The same is true for low-income Americans, who face a raft of practical challenges to getting vaccinated. If vaccine passport requirements are implemented, individuals who struggle to get the vaccine may lose their job<sup>75</sup> or find themselves barred from stores, transit, and public life.<sup>76</sup>

As of May 5<sup>th</sup>, 2021, the CDC reported that the vaccination rate for Black patients was nearly 30% lower than the national average. While only 8.8% of COVID-19 vaccines were administered to Black patients, more than 12.4% of the American population is Black.<sup>77</sup> Vaccine inequity is compounded by many Black communities’ longstanding and warranted distrust of medical institutions.<sup>78</sup>

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Digital Vaccine Passport in 11 Minutes Flat,” *The Daily Beast*, April 14, 2021, sec. politics, <https://www.thedailybeast.com/i-forged-new-yorks-digital-vaccine-passport-in-11-minutes-flat>.

<sup>70</sup> Claire Duffy, “Microsoft, Oracle and Other Tech Giants Team up Covid-19 Vaccine ‘passports’ - CNN,” CNN Business, January 17, 2021, <https://www.cnn.com/2021/01/16/tech/coronavirus-vaccine-records-microsoft-salesforce/index.html>.

<sup>71</sup> Duffy, “Microsoft.”

<sup>72</sup> “Vaccine Credential Initiative (VCI),” accessed May 20, 2021, <https://vci.org/>.

<sup>73</sup> Jim Nash, “U.S. Senators Want to Know How Secure Data from Clear Coronavirus App Is,” BiometricUpdate.com, May 28, 2020, <https://www.biometricupdate.com/202005/u-s-senators-want-to-know-how-secure-data-from-clear-coronavirus-app-is>.

<sup>74</sup> “Double Jeopardy: COVID-19 and Behavioral Health Disparities for Black and Latino Communities in the U.S.” (Substance Abuse Mental Health Services Administration (SAMHSA), 2021), <https://www.samhsa.gov/sites/default/files/covid19-behavioral-health-disparities-black-latino-communities.pdf>.

<sup>75</sup> David Child, “‘A Can of Worms’: Experts Weigh in on the Vaccine Passport Debate,” *Al Jazeera*, March 14, 2021, <https://www.aljazeera.com/news/2021/3/14/vaccine-passport-qa>.

<sup>76</sup> Child, “Can of Worms.”

<sup>77</sup> “COVID Data Tracker,” Centers for Disease Control and Prevention, March 28, 2020, <https://covid.cdc.gov/covid-data-tracker>.

<sup>78</sup> Simar Singh Bajaj and Fatima Cody Stanford, “Beyond Tuskegee — Vaccine Distrust and Everyday Racism | NEJM,” *New England Journal of Medicine* 384, no. 5 (February 4, 2021): e(12), <https://www.nejm.org/doi/full/10.1056/NEJMp2035827>.

Poverty and social vulnerability (as defined by the CDC)<sup>79</sup> are major barriers for Americans who want to get vaccinated but haven't yet received the shot.<sup>80</sup> Among this group, a quarter of those making less than \$25,000 per year have not yet been vaccinated, three times the rate for those making more than \$150,000.<sup>81</sup> Work and family duties, lack of transportation, lack of childcare, language barriers, and disability-related challenges can all block vaccination.<sup>82</sup> Now, many of the same communities that COVID-19 hit hardest face the highest barriers to vaccination, and the highest risk of being excluded from public life by vaccine apps.<sup>83</sup>

Domestic vaccine apps will also magnify the digital divide,<sup>84</sup> excluding many of the one-in-five Americans who lack a smartphone. Notably, that pool includes almost half of Americans over 65.<sup>85</sup> Vaccine apps also won't work on millions of older smartphones—not to mention individuals who refuse to download the software.<sup>86</sup> Even when vaccine apps offer paper credential options, it is unclear how meaningful the measure truly is. Many of those without an up-to-date smartphone also lack reliable access to a computer, internet connection and printer.<sup>87</sup>

Lastly, vaccine apps may disproportionately exclude immigrant communities, particularly undocumented and mixed-status families. Many immigrants will be distrustful of such apps given ICE's history of weaponizing medical data for deportation efforts.<sup>88</sup>

### ***Location Data and Security Concerns***

Domestic vaccine apps threaten to construct a new, inescapable layer of geolocation tracking, installing veritable “vaccine bouncers” at the entrances to stores, schools, and mass transit. Constantly scanning one's vaccine app creates a log of our movements throughout the day, collecting an expansive pool of data that can be weaponized by law enforcement and immigration officials.<sup>89</sup>

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<sup>79</sup> Agency for Toxic Substances and Disease Registry, “CDC SVI Documentation 2018,” September 15, 2020, [https://www.atsdr.cdc.gov/placeandhealth/svi/documentation/SVI\\_documentation\\_2018.html](https://www.atsdr.cdc.gov/placeandhealth/svi/documentation/SVI_documentation_2018.html).

<sup>80</sup> Amy Harmon and Josh Holder, “They Haven't Gotten a Covid Vaccine Yet. But They Aren't ‘Hesitant’ Either. - The New York Times,” The New York Times, May 12, 2021, <https://www.nytimes.com/2021/05/12/us/covid-vaccines-vulnerable.html>.

<sup>81</sup> Harmon and Holder, “They Haven't Gotten.”

<sup>82</sup> Harmon and Holder, “They Haven't Gotten.”

<sup>83</sup> Sharoda Dasgupta et al., “Association Between Social Vulnerability and a County's Risk for Becoming a COVID-19 Hotspot — United States, June 1–July 25, 2020,” *MMWR. Morbidity and Mortality Weekly Report* 69, no. 42 (2020): 1535–41, <https://doi.org/10.15585/mmwr.mm6942a3>. See also SAMSA, “Double Jeopardy.”

<sup>84</sup> Tamra Burns Loeb, A. J. Adkins-Jackson, and Arleen F. Brown 02.16.2021, “On Internet and Vaccine Access, Minorities Are Left Behind,” *Undark Magazine*, February 16, 2021, <https://undark.org/2021/02/16/internet-vaccine-access-minorities/>.

<sup>85</sup> “DEMOGRAPHICS OF MOBILE DEVICE OWNERSHIP AND ADOPTION IN THE UNITED STATES,” *PEW RESEARCH CENTER: INTERNET, SCIENCE & TECH* (BLOG), APRIL 7, 2021, [HTTPS://WWW.PEWRESEARCH.ORG/INTERNET/FACT-SHEET/MOBILE/](https://www.pewresearch.org/internet/fact-sheet/mobile/).

<sup>86</sup> For example, New York's Excelsior Pass requires a 2019 or later operating system on iPhones and a 2016 or later operating system on Android-based phones.

<sup>87</sup> One in four Americans do not have a broadband connection at home. “Demographics of Internet and Home Broadband Usage in the United States,” *Pew Research Center: Internet, Science & Tech* (blog), April 7, 2021, <https://www.pewresearch.org/internet/fact-sheet/internet-broadband/>.

<sup>88</sup> Akilah Johnson, “For Immigrants, IDs Prove to Be a Barrier to a Dose of Protection,” *Washington Post*, April 10, 2021, <https://www.washingtonpost.com/health/2021/04/10/covid-vaccine-immigrants-id/>.

<sup>89</sup> Matthew Guariglia, “Law Enforcement Purchasing Commercially-Available Geolocation Data Is Unconstitutional,” *Electronic Frontier Foundation*, December 3, 2020, <https://www.eff.org/deeplinks/2020/12/law-enforcement-purchasing-commercially-available-geolocation-data>.

Currently, there is no legal protection against police subpoenaing or requesting voluntary production of vaccine app data,<sup>90</sup> a tactic used with many other smartphone apps.<sup>91</sup> The difference is that users are not required to install other apps as a condition of accessing public life. Police previously used location data to target protestors and punish dissent.<sup>92</sup> And history teaches us that this power will be used to disproportionately target the same BIPOC communities that have been surveilled throughout American history.<sup>93</sup>

Even worse, it's unclear if vaccine app developers would even oppose law enforcement access to their data. CLEAR Health Pass and V-Health Passport's terms of service grant the companies broad discretion to provide data to law enforcement officials.<sup>94</sup> Additionally, Clear integrated its Health Pass functionality into the same app used in partnership with the TSA to scan travelers.<sup>95</sup>

While many vaccine app developers claim to limit their location data collection and retention, these assertions are impossible to verify for those developers that use non-open-source code. IBM relies almost entirely on vague assertions about "blockchain" to describe its privacy protections.<sup>96</sup> When Israel's Geen Pass was examined, researchers noted it was compromised by an outdated encryption library.<sup>97</sup> Additionally, apps like New York State's Excelsior Pass grant developers broad legal authority to track and retain location data.<sup>98</sup>

These concerns mirror the privacy and security fears that undermined digital contact tracing apps. Despite massive investment in app development and rollout across the United States, contact tracing apps have now largely been abandoned.<sup>99</sup> Even after Apple and Google made an unprecedented effort to develop a privacy-protective framework for contact tracing, more than 70% of Americans rejected the software, largely because of privacy concerns.<sup>100</sup> These worries are warranted. Google and Apple assured users of their contact tracing app that individuals' location data would never be shared, except in anonymized form with public health agencies.<sup>101</sup> But in February 2021, Google learned that its Android-based app generated system logs with individuals' geolocation data—logs

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<sup>90</sup> Johanna Bhuiyan, "What Happens When ICE Asks Google for Your User Information," Los Angeles Times, March 24, 2021, <https://www.latimes.com/business/technology/story/2021-03-24/federal-agencies-subpoena-google-personal-information>.

<sup>91</sup> Guariglia, "Law Enforcement Purchasing."

<sup>92</sup> Alfred Ng, "How Police Are Using Protesters' Phones against Them," CNET, June 16, 2020,

<https://www.cnet.com/news/geofence-warrants-how-police-can-use-protesters-phones-against-them/>.

<sup>93</sup> Rani Molla, "Law Enforcement Is Now Buying Cellphone Location Data from Marketers," Vox, February 7, 2020,

<https://www.vox.com/recode/2020/2/7/21127911/ice-border-cellphone-data-tracking-department-homeland-security-immigration>.

<sup>94</sup> "V-Health Passport Privacy Policy," V-Health, accessed May 20, 2021, <https://v-healthpassport.co.uk/v-health-passport-privacy-policy-for-platform/>.

<sup>95</sup> "CLEAR Privacy Policy," CLEAR, accessed May 20, 2021, [https://www.clearme.com/privacy\\_policy/](https://www.clearme.com/privacy_policy/).

<sup>96</sup> Biddle, "Cuomo's Covid-19 Vaccine Passport."

<sup>97</sup> Ferguson and Mitnick, "Israel's 'Green Pass'."

<sup>98</sup> In contrast, the Vaccine Credential Initiative uses open-source software and provides detailed technical documentation. While these technical safeguards do limit some of the forgoing concerns, they fail to address the full range of efficacy and equity objections raised above.

<sup>99</sup> Lindsey Van Ness, "For States' COVID Contact Tracing Apps, Privacy Tops Utility" (The Pew Charitable Trusts, March 19, 2021), <https://pew.org/3r1F7VN>.

<sup>100</sup> Lance Whitney, "Most Americans Say 'No' to Coronavirus Contact Tracing Apps," TechRepublic, June 16, 2020,

<https://www.techrepublic.com/index.php/article/most-americans-say-no-to-coronavirus-contact-tracing-apps/>.

<sup>101</sup> Alfred Ng, "Google Promised Its Contact Tracing App Was Completely Private—But It Wasn't," *The Markup*, April 27, 2021, <https://themarkup.org/privacy/2021/04/27/google-promised-its-contact-tracing-app-was-completely-private-but-it-wasnt>.

that were available to other apps on users' phones.<sup>102</sup> Google failed to act on this information until media attention forced its hand.<sup>103</sup> Vaccine apps will likely flounder for the same reason.

### *Coercive Adoption*

Where employers do deploy vaccine apps, low-wage workers will likely be most impacted. Service industry employees are most likely to work in venues that deploy such apps, and these employees are likely to have less financial flexibility to quit a job to requires vaccine app use as a condition of employment. Customers can easily choose to pass on a meal or a movie if they dislike installing a vaccine app as part of the price of admission, but the same is rarely true for low-wage employees who may have to choose between the app and their job.<sup>104</sup> Such coercion could compound the inequity and discrimination that has defined the divergent outcomes of some many Americans throughout the COVID-19 pandemic.

## V. CONCLUSION

Vaccine apps pose the most potent surveillance risk seen to date with the COVID-19 pandemic. While the technology may have some valuable uses in international travel, its deployment in everyday life will erode public health, polarize vaccination, and undermine the freedom of movement that is indispensable to democracy. It is not easy to push back against vaccine app developers' magical thinking. They promise a shortcut through this pandemic, a path back to normal life. But if we follow this road, we will find that the safety they offer is little more than a mirage.

That said, we must be clear to cabin these critiques of vaccine apps to novel tracking tools, not tried and true public health measures like school vaccine registries. These one-time vaccine registration measures pose far fewer of the concerns raised with domestic vaccine apps, particularly if they are rolled out at a date when a larger portion of the population has had the opportunity to easily obtain the COVID-19 vaccine.

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<sup>102</sup> Ng, "Google Promised."

<sup>103</sup> Ng, "Google Promised."

<sup>104</sup> "What to Know About New York's 'Vaccine Passport,'" *The Brian Lehrer Show* (WNYC, March 30, 2021), <https://www.wnyc.org/story/what-know-about-new-yorks-vaccine-passport/>.



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