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## Digital Contact Tracing – Is It Worth the Hype?#

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## Digital Contact Tracing – Is It Worth the Hype?#

### I. Introduction

The COVID-19 pandemic and the challenges that nations faced in containing the virus brought the topic of contact tracing to the forefront of public health discussions.<sup>1</sup> As COVID-19 quickly spread around the globe, governments and public health experts began to recognize the importance of implementing a comprehensive strategy to track down and monitor infected individuals.<sup>2</sup> Due to the speed with which the coronavirus spread, countries turned to digital contact tracing and surveillance methods to supplement traditional measures.<sup>3</sup> However, due to major obstacles associated with digital contact tracing, including concerns about data privacy, many countries struggled to successfully incorporate this tool in their efforts to curb the pandemic.<sup>4</sup> Moving forward, for contact tracing programs to function properly in deterring the spread of outbreaks, governments must resolve issues related to data security, privacy, usage rates, and data collection.

This note examines the advantages and disadvantages of digital contact tracing and assesses their effectiveness in controlling the spread of diseases. Part II of this note sheds light on the background of contact tracing and how the digital form supplements the traditional process.

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<sup>1</sup> Divya Ramjee et al., Covid-19 and Digital Contact Tracing: Regulating the Future of Public Health Surveillance, 2021 Cardozo L. Rev. de novo 101, 103 (2021).

<sup>2</sup> Holly Yan, Contact tracing is key to controlling Covid-19 at the White House (and everywhere else). But these steep hurdles stand in the way, CNN Health, <https://www.cnn.com/2020/10/08/health/contact-tracing-covid-19-white-house/index.html> (Oct 8, 2020).

<sup>3</sup> Kelly Servick, COVID-19 contact tracing apps are coming to a phone near you. How will we know whether they work?, Science, <https://www.science.org/content/article/countries-around-world-are-rolling-out-contact-tracing-apps-contain-coronavirus-how> (May 21, 2020).

<sup>4</sup> Dyani Lewis, Where COVID Contact-Tracing Went Wrong, Nature, <https://www.nature.com/articles/d41586-020-03518-4> (Dec 14, 2020).

Part III discusses the various hurdles that governments have faced when implementing digital contact tracing programs. Data security and privacy issues pose the biggest hurdles due to widespread distrust among the U.S. public when it comes to government surveillance.<sup>5</sup> Another significant challenge, which stems from privacy issues, is the lack of willingness of the public to install and use contact tracing applications.<sup>6</sup> Part IV compares centralized and decentralized contact tracing systems and analyzes the benefits and challenges of both approaches using international examples. Moreover, Part V addresses the issue of interstate operability and federal data protection law. The purpose of this note is to assess the pros and cons of using digital contact tracing and to propose that utilizing contact tracing technology is not worth the effort in fighting future outbreaks like the COVID-19 pandemic due to major resistance from the general public.

## II. Background

### A. A Brief Overview of Contact Tracing

Contact tracing is a long-standing public health invention that has been used to control the transmission of various diseases, including the bubonic plague, Human Immunodeficiency Virus (HIV), and yellow fever.<sup>7</sup> It is an important tool that involves identifying, listing, and surveilling individuals who have come into close contact with infected persons.<sup>8</sup> The primary goals of contact tracing are to promptly diagnose and treat new cases and to control disease outbreaks.<sup>9</sup> When

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<sup>5</sup> *Id.*

<sup>6</sup> *Id.*

<sup>7</sup> Taylor Farrow, Contact Tracing: Where We Were, Where We Are, Where We Are Going. the Influence "Privacy by Design" Has Had on Contact Tracing Apps and the Lasting Impression It Will Have Well After the Pandemic Is over, 19 Rutgers J.L. & Pub. Pol'y 121, 127 (2021).

<sup>8</sup> Krista C. Swanson et al., Contact Tracing Performance During the Ebola Epidemic in Liberia, 2014-2015, National Library of Medicine, PLoS neglected tropical diseases vol. 12,9 e0006762 1, 2 (2018).

<sup>9</sup> *Id.*

implemented properly, contact tracing can curb the spread of a targeted virus by breaking the chains of transmission through swift identification, medical treatments, and quarantine support.<sup>10</sup>

Although various governments and tech companies around the world have now digitized the process, contact tracing has traditionally been done manually by public health departments and healthcare professionals.<sup>11</sup> When done manually, contact tracing entails detecting locations where a recently infected individual visited and the people they may have encountered.<sup>12</sup> Contact tracing consists of three important steps, each of which can require a significant investment of time and resources.<sup>13</sup> The first step involves trained public healthcare workers to correctly identify and track down an infected individual, also known as a “case,” so that he or she can be interviewed.<sup>14</sup> This initial step is not as straightforward as it may seem, as identifying cases can become difficult when a disease is not easily detectable from the beginning.<sup>15</sup> For instance, with the coronavirus, many people were asymptomatic and days would pass before the infected individual got tested; and even once they did get tested, more days would pass by before they received their test results due to the

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<sup>10</sup> World Health Organization, Coronavirus disease (COVID-19): Contact Tracing, WHO, <https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-covid-19-contact-tracing#:~:text=What%20is%20contact%20tracing%3F,with%20the%20COVID%2D19%20virus> (Last visited May 1, 2020).

<sup>11</sup> Nancy E. Kass et al., The Ethics of Contact Tracing Programs and Their Implications for Women, 5 *Duke J. Gender L. & Pol'y* 89, 90-91 (1998).

<sup>12</sup> Brian Ray, Just Plain Dumb?: How Digital Contact Tracing Apps Could've Worked Better (and Why They Never Got the Chance), 51 *Seton Hall L. Rev.* 1467, 1474 (2021).

<sup>13</sup> Jennifer Oliva, Public Health Surveillance in the Context of Covid-19, 18 *Ind. Health L. Rev.* 107, 108 (2021).

<sup>14</sup> *Id.*

<sup>15</sup> Jennifer Steinhauer et al., Contact Tracing Is Failing in Many States. Here's Why, *New York Times*, <https://www.nytimes.com/2020/07/31/health/covid-contact-tracing-tests.html> (Oct 5, 2020).

long turn-around time of diagnostic tests.<sup>16</sup> These lags can have a considerable impact on the capacity and accuracy of contact tracing efforts.<sup>17</sup>

The second step involves interviewing the case to identify their contacts, which refers to the list of people with whom the case has come into contact and are, thus, at risk of exposure to the disease.<sup>18</sup> Getting infected individuals to participate in these interviews can be tough because the process involves asking in-depth questions that may be perceived as intrusive.<sup>19</sup> For instance, during a phone interview, a contact tracer may ask about every person the interviewee encountered within the past two weeks, an interviewee's sexual partners, or even where the interviewee woke up on the day of the call.<sup>20</sup> Thus, it is critical for contact tracers to be trained to establish trust with case interviewees.<sup>21</sup> For the third and last step, contact tracers must notify the case's contacts and inform them of the potential exposure to the infection, encourage them to get tested, and ask that they take steps to reduce exposure (i.e., quarantining or isolating themselves).<sup>22</sup>

Long before the term contact tracing became popularized by the recent COVID-19 pandemic, contact tracing was used to control various outbreaks, especially sexually transmitted diseases like acquired immunodeficiency syndrome (AIDS).<sup>23</sup> During the HIV/AIDS epidemic in the 1980s, states responded to public fear by passing statutes that permitted or mandated notification of sexual and needle-sharing partners of potential exposure to HIV when infected

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<sup>16</sup> *Id.*

<sup>17</sup> *Id.*

<sup>18</sup> Oliva, 18 Ind. Health L. Rev. at 108-09.

<sup>19</sup> *Id.*

<sup>20</sup> *Id.* at 109.

<sup>21</sup> *Id.*

<sup>22</sup> *Id.*

<sup>23</sup> Kass et al., 5 Duke J. Gender L. & Pol'y at 89.

individuals refused to inform their partners on their own.<sup>24</sup> For example, New York Public Health Law requires the following:

Every municipal health commissioner or the department's district health officer, upon determination that such reported case or, any other known case of HIV infection merits contact tracing in order to protect the public health, shall personally or through their qualified representatives notify the known contacts of the protected individual.<sup>25</sup>

In California, physicians that have confirmed positive HIV test results of a patient under their care are permitted to disclose to persons who are reasonably believed to be the patient's spouse, sexual partner, needle-sharing partner, or local public health authorities that the patient tested positive for HIV.<sup>26</sup> Maryland, on the other hand, allows physicians to notify an individual's HIV positive status to his or her sexual and needle-sharing partners or to local health officers only when the individual refuses to do so on his or her own.<sup>27</sup> Such statutes, in turn, permit state health agencies to use contact tracing to reach out to infected individuals and try to obtain from them a list of their sexual and needle-sharing partners.<sup>28</sup> This has caused major concerns among LGBTQ rights organizations and civil rights groups due to the discrimination and stigmatization

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<sup>24</sup> Leah H. Wissow, Public Health vs. Privacy: Rebalancing the Government Interest in Involuntary Partner-Notification Following Advancements in HIV Treatment, 21 Am. U. J. Gender Soc. Pol'y & L. 481, 482–83 (2012) (citing Benjamin F. Neidl, The Lesser of Two Evils: New York's HIV/AIDS Partner Notification Law and Why the Right of Privacy Must Yield to Public Health, 73 St. John's L. Rev. 1191, 1198 (1999)).

<sup>25</sup> N.Y. PUB. HEALTH LAW § 2133(1).

<sup>26</sup> CAL HEALTH & SAF CODE § 121015(a) (explaining that physicians are not permitted to “disclose any identifying information about the individual believed to be infected, except as required in §121022 or with the written consent of the individual”).

<sup>27</sup> MD. HEALTH-GENERAL CODE ANN. § 18-337(b).

<sup>28</sup> Neidl, 73 St. John's L. Rev. at 1211-12.

associated with AIDS.<sup>29</sup> Mainstream media, especially at the time of the epidemic, emphasized the links between AIDS and recreational drug use and homosexuality, causing widespread hatred and anxiety toward the disease.<sup>30</sup> Discrimination against persons with HIV comes in numerous forms and includes adverse employment decisions, barriers to public accommodations, denial of medical services, and harassment.<sup>31</sup> Thus, this fear of discrimination deters many infected individuals from taking part in contact tracing programs and, at times, even getting necessary medical treatment.<sup>32</sup> Without the proper legal protections in place, contact tracing will likely fail in controlling diseases like AIDS.<sup>33</sup> For it to be effective, it is crucial that contact tracing be implemented in a way that builds and maintains trust—meaning privacy and anonymity are protected.<sup>34</sup>

## **B. Digital Contact Tracing**

The vast scale of the COVID-19 pandemic and society's dependence on internet connectivity have led to the emergence of digital surveillance as a crucial way to support traditional contact tracing efforts.<sup>35</sup> Digital contact tracing uses mobile devices to gather data about the device users' locations or the people they encounter.<sup>36</sup> Governments and tech companies have developed contact tracing applications that use either Bluetooth or Global Positioning System (GPS)

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<sup>29</sup> Rose Saxe, Contact Tracing and COVID-19: Lessons from HIV, ACLU, <https://www.aclu.org/news/hiv/contact-tracing-and-covid-19-lessons-from-hiv> (May 15, 2020).

<sup>30</sup> Neidl, 73 St. John's L. Rev. at 1229-30.

<sup>31</sup> Lawrence O. Gostin et al., Piercing the Veil of Secrecy in HIV/AIDS and Other Sexually Transmitted Diseases: Theories of Privacy and Disclosure in Partner Notification, 5 Duke J. Gender L. & Pol'y 9, 59 (1998).

<sup>32</sup> *Id.*

<sup>33</sup> *Id.*

<sup>34</sup> Saxe, *supra* note 29.

<sup>35</sup> Ramjee et al., 2021 Cardozo L. Rev. de novo at 103.

<sup>36</sup> Farrow, 19 Rutgers J.L. & Pub. Pol'y at 136.

technology to alert individuals that they have been exposed to someone who is or is likely to be infected with COVID-19.<sup>37</sup> Most Bluetooth-based apps provide “exposure notifications” using an application programming interface (API) developed by Apple and Google, and they track the people a device user encounters.<sup>38</sup> A key advantage of such apps is that they offer more privacy protections since they only gather data about the users’ contacts and not about their locations.<sup>39</sup> On the other hand, GPS-based apps provide “contact tracing” by monitoring users’ whereabouts and the times they were at those locations; the apps then use that data to match up with other device users that were at those same locations during those times.<sup>40</sup> While GPS-based apps collect more information compared to Bluetooth-based apps, a key benefit is that GPS location data can be used to identify possible outbreaks and hotspots.<sup>41</sup>

Whether an app uses Bluetooth or GPS technology, if two or more people using the app spend more than a specific length of time (e.g., 15 minutes, as recommended by the CDC) within a certain minimum distance—commonly six feet—of each other, their devices create and collect anonymous records of the contacts.<sup>42</sup> If a user gets infected and reports it, the app alerts those with whom the infected individual came into extended contact.<sup>43</sup> The notification does not include the user’s name or other personal information.<sup>44</sup>

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<sup>37</sup> *Id.*

<sup>38</sup> Thorin Klosowski, [COVID Contact Tracing Apps Are Far From Perfect](https://www.nytimes.com/wirecutter/blog/covid-contact-tracing-apps/), New York Times, <https://www.nytimes.com/wirecutter/blog/covid-contact-tracing-apps/> (Nov 2, 2020).

<sup>39</sup> Umberto Bacchi, [Digital handshake: Can contact tracing deliver on its promise in coronavirus battle?](https://www.reuters.com/article/us-health-coronavirus-tech-trfn/digital-handshake-can-contact-tracing-deliver-on-its-promise-in-coronavirus-battle-idUSKBN22H254), Reuters, <https://www.reuters.com/article/us-health-coronavirus-tech-trfn/digital-handshake-can-contact-tracing-deliver-on-its-promise-in-coronavirus-battle-idUSKBN22H254> (May 5, 2020).

<sup>40</sup> Farrow, 19 Rutgers J.L. & Pub. Pol’y at 136.

<sup>41</sup> *Id.*

<sup>42</sup> Klosowski, *supra* note 38.

<sup>43</sup> *Id.*

<sup>44</sup> *Id.*



While both technologies are designed to achieve this common goal, the way they do it is different.<sup>45</sup> If a device is using a Bluetooth app relying on the Google-Apple exposure notification API, it sends out a “chirp” along with a rotating, random identification (ID) number.<sup>46</sup> When two or more users are near each other for 10 to 15 minutes, their devices capture the others’ “chirps” and records them as a contact.<sup>47</sup> Once a user reports a positive COVID-19 test result, all contacts within a specified time frame are alerted.<sup>48</sup> In contrast, a GPS-based contact tracing app records users’ location data and notifies them when and where they encountered an infected individual, whose identity remains anonymous.<sup>49</sup>

Compared to relying solely on traditional contact tracing, digital surveillance tools make the process a lot less labor intensive because the apps are the ones doing the work of collecting personal information and monitoring an individual’s contacts.<sup>50</sup> Moreover, digital surveillance, at least in theory, makes contact tracing more reliable since the process is not solely based on people’s memories.<sup>51</sup> However, digital contact tracing is still vulnerable to major drawbacks, such as data privacy and low adoption rates;<sup>52</sup> and there are limited published empirical data demonstrating the effectiveness of either the Bluetooth or GPS technology.<sup>53</sup>

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<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> *Id.*

<sup>48</sup> *Id.*

<sup>49</sup> *Id.*

<sup>50</sup> Farrow, 19 Rutgers J.L. & Pub. Pol’y at 137.

<sup>51</sup> *Id.*

<sup>52</sup> Lewis, *supra* note 4.

<sup>53</sup> Centers for Disease Control and Prevention, [Digital Contact Tracing Tools](https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/digital-contact-tracing-tools.html), CDC, <https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/digital-contact-tracing-tools.html>.

### III. Barriers to the Adoption of Digital Contact Tracing

While digital contact tracing is a useful public health tool, it is not without limitations.<sup>54</sup> The effectiveness of any given contact tracing program relies heavily on public participation and cooperation, and the digitization of this public health strategy has amplified people's concerns about data security and public trust.<sup>55</sup> In fact, the public tends to perceive contact tracing programs as acts of government surveillance.<sup>56</sup> Thus, overcoming the barriers to implementing digital contact tracing requires providing not only assurances that an individual's health and medical information will be protected from misuse but also clarity about the government's goals and outcomes in using the public's personal data.<sup>57</sup>

#### A. Data Security and Privacy Issues

One of the major barriers contact tracing is the widespread public distrust of governments and public health authorities, and this distrust is largely based on concerns about data security and privacy.<sup>58</sup> The American public generally fears the normalization of emergency and surveillance powers of the government, and there is a strong belief that such powers will linger even after the emergency ends.<sup>59</sup> For instance, following the September 11 attacks, Congress enacted the Patriot Act and has since amended the statutes to give the U.S. government ways to

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<sup>54</sup> Ramjee et al., 2021 *Cardozo L. Rev.* de novo at 103.

<sup>55</sup> Lewis, *supra* note 4.

<sup>56</sup> Allan M. Brandt, The History of Contact Tracing and the Future of Public Health, *American Journal of Public Health* 112(8), 1097, 1097-98 (2022).

<sup>57</sup> Ramjee et al., 2021 *Cardozo L. Rev.* de novo at 119; Brandt, *American Journal of Public Health* 112(8)1097.

<sup>58</sup> Lewis, *supra* note 4.

<sup>59</sup> Sharon Bassan, A Proportionality-Based Framework for Government Regulation of Digital Tracing Apps in Times of Emergency, 126 *Dick. L. Rev.* 361, 371 (2022).

continue collecting and processing citizen data in the name of preventing terrorism.<sup>60</sup> The public’s deeply-rooted distrust of government authorities, a history of large-scale data breaches, and numerous privacy scandals in the tech sector have made it difficult for the public to have faith in the government or big tech companies, especially when it comes to sharing data related to their health and location.<sup>61</sup>

*Calvary Chapel San Jose v. Cody* demonstrates some key concerns that people have with contact tracing and how their information may be misused.<sup>62</sup> In *Calvary Chapel*, religious plaintiffs brought a First Amendment claim against Santa Clara County officials, arguing that the County’s stay-at-home order (“County Order”) violated their free exercise of religion.<sup>63</sup> In particular, the County Order required the plaintiffs to record “names and contact information” of all attendees of religious services and use that information to “assist the County Public Health Department in any case investigation and contact tracing.”<sup>64</sup> This raises various concerns because such personal information can be used to track someone’s location data, health information, as well as religious beliefs.

Similarly, *Parker v. Wolf* involved Pennsylvania’s contact tracing program, implemented during the COVID-19 pandemic.<sup>65</sup> Once trained public health staff received information about a positive test result, they conducted interviews with the infected individual (i.e., case) to make a

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<sup>60</sup> *Id.*

<sup>61</sup> Lewis, *supra* note 4; Jessica Rich, How our outdated privacy laws doomed contact-tracing apps, <https://www.brookings.edu/blog/techtank/2021/01/28/how-our-outdated-privacy-laws-doomed-contact-tracing-apps/> (Jan 28, 2021).

<sup>62</sup> *Calvary Chapel San Jose v. Cody*, No. 20-CV-03794-BLF, 2020 WL 6508565, at \*1 (N.D. Cal. Nov. 5, 2020).

<sup>63</sup> *Id.* at \*2.

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

<sup>65</sup> *Parker v. Wolf*, 506 F. Supp 3d at 274.

list of people with whom the case came into contact.<sup>66</sup> The interview consisted of the staff asking about personal information, including one's address, phone number, and email, which would then be shared with contact tracers.<sup>67</sup> Then, the Department of Health (DOH), with the consent of the case, enrolled the case's close contacts in a symptom tracker tool called Sara Alert system.<sup>68</sup> Sara Alert and the state's disease surveillance system were used in conjunction to allow contact tracers to "track, monitor, isolate and test symptomatic contacts."<sup>69</sup> The plaintiff in *Parker* alleged that he received "incessant messages" from the alert system requiring him to perform daily self-reports and objected to the DOH surveilling his family and viewing their medical records.<sup>70</sup> Although both *Calvary* and *Parker* were ultimately dismissed for lack of standing, they illustrate the frustrations many people have with contact tracing programs.

According to a study commissioned by the security software vendor Avira, 71% of Americans responded that they would not use COVID-19 contact tracing apps and, for many, the main reason was privacy concerns.<sup>71</sup> In fact, over 40% of the respondents indicated that they did not trust any organization to safeguard their personal data.<sup>72</sup> Moreover, location data alone contains a massive amount of personal information and can potentially be used to disclose intimate details about a person, such as his or her social, sexual, religious, and political

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<sup>66</sup> *Id.*

<sup>67</sup> *Id.*

<sup>68</sup> *Id.*

<sup>69</sup> *Id.*

<sup>70</sup> *Id.* at 278.

<sup>71</sup> Kat Jercich, [Survey Says majority of Americans won't use COVID-19 contact-tracing apps](https://www.healthcareitnews.com/news/survey-says-majority-americans-wont-use-covid-19-contact-tracing-apps), Healthcare IT News, <https://www.healthcareitnews.com/news/survey-says-majority-americans-wont-use-covid-19-contact-tracing-apps> (June 16, 2020).

<sup>72</sup> *Id.*

associations.<sup>73</sup> For example, people’s location information can reveal whether they were visiting a psychologist, where they are working, or what shops they are frequenting.<sup>74</sup> Even if the data is gathered without any direct link to a person’s name or phone number, it is possible to use the raw data to identify individuals without their consent.<sup>75</sup> This makes it all the more concerning for the general public, since there is a high risk of misuse and stigmatization.<sup>76</sup>

### **B. Low Adoption and Usage Rates**

A natural consequence of the privacy concerns associated with contact tracing systems is the low adoption and usage rates.<sup>77</sup> According to a research model developed at Oxford University, at least 56%—ideally, at least 60%— of the total population must be tracked to effectively contain a virus.<sup>78</sup> To incentivize as many people as possible to participate, governments must persuade citizens that the system they are using is safe and beneficial for the overall public.<sup>79</sup> However, it is difficult to reach this threshold if participation is voluntary.<sup>80</sup> For instance, both Switzerland’s SwissCovid app and Singapore’s TraceTogether app only achieved

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<sup>73</sup> Jay Stanley et al., The Limits of Location Tracking in an Epidemic, ACLU, [https://www.aclu.org/sites/default/files/field\\_document/limits\\_of\\_location\\_tracking\\_in\\_an\\_epidemic.pdf](https://www.aclu.org/sites/default/files/field_document/limits_of_location_tracking_in_an_epidemic.pdf) (Apr 8, 2020).

<sup>74</sup> Jennifer Valentino-DeVries et al., Your Apps Know Where You Were Last Night, and They’re Not Keeping It Secret, <https://www.nytimes.com/interactive/2018/12/10/business/location-data-privacy-apps.html> (Dec 10, 2018).

<sup>75</sup> *Id.*

<sup>76</sup> Stanley et al., *supra* note 71.

<sup>77</sup> Ramjee et al., 2021 *Cardozo L. Rev.* de novo at 119-20.

<sup>78</sup> Elad D. Gil, Digital Contact Tracing Has Failed: Can It Be Fixed with Better Legal Design?, 25 *Va. J.L. & Tech.* 1, 10–11 (2021); Emily Seto, et al., Adoption of COVID-19 Contact Tracing Apps: A Balance Between Privacy and Effectiveness, *Journal of medical Internet research* vol. 23(3) e25726, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7935397/> (Mar 4, 2021).

<sup>79</sup> Gil, 25 *Va. J.L. & Tech.* 1 at 10-11.

<sup>80</sup> *Id.*

a country-wide adoption rate of 20% in the early stages of the pandemic.<sup>81</sup> Meanwhile, the penetration rates in the U.S. were even lower.<sup>82</sup> In Colorado, Connecticut, and Maryland, only about 20% of the population in each state were reported to be using each respective state's official contact tracing app.<sup>83</sup> The rate was even lower in Washington, with usage rate reaching a mere 13%; and several other states failing to achieve even 10%.<sup>84</sup>

One possible way to address the privacy and usage issues is to incorporate blockchain technology to strengthen the protection of private data that is shared through digital contact tracing.<sup>85</sup> A blockchain-based contact tracing system would act as a decentralized system that uses smart contracts to operate.<sup>86</sup> Blockchain technology relies on a network that is completely distributed and keeps the identities of the users anonymous.<sup>87</sup> Moreover, a blockchain-based network can expand accessibility and traceability worldwide, making it possible for users from various geographical locations to connect without infringing on privacy.<sup>88</sup> Using blockchain technology in contact tracing programs is currently a proposed solution, and some scholars have

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<sup>81</sup> Melyssa Eigen, et al, Country Spotlight: Switzerland's SwissCovid App, Berkman Klein Center for Internet & Society at Harvard University, <https://cyber.harvard.edu/story/2020-07/country-spotlight-switzerlands-swisscovid-app> (Jul 10, 2020); Michael L. Cederblom, Welcome to the Digital Age: Reinventing Contact Tracing and the Public Health Service Act for A Modern Pandemic Response, 31 *Annals Health L. & Life Sci.* 101, 126 (2022).

<sup>82</sup> Jennifer Valentino-DeVries, Coronavirus Apps Show Promise but Prove a Tough Sell, N.Y. TIMES, <https://www.nytimes.com/2020/12/07/technology/coronavirus-exposure-alert-apps.html> (Dec. 7, 2020)).

<sup>83</sup> *Id.*

<sup>84</sup> *Id.*

<sup>85</sup> Haya R. Hasan et al., COVID-19 Contact Tracing Using Blockchain, National Library of Medicine (Apr 21, 2021).

<sup>86</sup> *Id.*

<sup>87</sup> Sheikh Mohammad Idrees et al., Blockchain-based Digital Contact Tracing Apps for COVID-19 Pandemic Management: Issues, Challenges, Solutions, and Future Directions, *JMIR Med Inform* 2021;9(2):e25245, <https://medinform.jmir.org/2021/2/e25245/> (Feb 2021).

<sup>88</sup> *Id.*

pointed out that lack of scalability could pose an issue.<sup>89</sup> In the context of blockchain networks, the term scalability refers to the capacity of the network to handle growing volumes of transactions and nodes.<sup>90</sup> To handle immense loads of transactions and data, a blockchain contact tracing platform would need to find a way to expand its scale to manage high volumes of data.<sup>91</sup> Another potential challenge may be interoperability between different blockchain platforms.<sup>92</sup> The concept of blockchain interoperability refers to the notion of facilitating communication and interaction between different blockchain networks.<sup>93</sup> While research is currently being done in this area, it remains to be seen how blockchain technology can be applied to contact tracing.

#### IV. Centralized vs. Decentralized Contact Tracing

Another major concern with contact tracing is the significant tradeoff between privacy and efficacy when it comes to the architecture of contact tracing systems.<sup>94</sup> In addressing privacy concerns, governments may choose between a centralized and a decentralized contact tracing programs.<sup>95</sup> Centralized systems record data on a centralized server and, thus, hinge heavily on public trust of government authorities to safeguard sensitive personal information.<sup>96</sup> Having a

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<sup>89</sup> Nida Bari et al., Efficient Contact Tracing for pandemics using blockchain, ScienceDirect, Informatics in Medicine Unlocked 2021 Vol. 26, 1, 5 (2021).

<sup>90</sup> WIPRO, Improving Performance & Scalability of Blockchain Networks, WIPRO, <https://www.wipro.com/blogs/hitarshi-buch/improving-performance-and-scalability-of-blockchain-networks/#:~:text=Scalability%20of%20blockchain%20networks%20is,of%20nodes%20in%20the%20network.> (Nov 2019).

<sup>91</sup> Bari et al., ScienceDirect, Informatics in Medicine Unlocked 2021 at 5.

<sup>92</sup> Bari et al., ScienceDirect, Informatics in Medicine Unlocked 2021 at 5.

<sup>93</sup> Steven Ehrlich, Blockchain Interoperability: The Tab Switching of Web 3.0, Forbes, <https://www.forbes.com/sites/digital-assets/article/blockchain-interoperability-the-tab-switching-of-web-30/?sh=5ae908e16cf1> (Mar 10, 2023).

<sup>94</sup> Ramjee et al., 2021 Cardozo L. Rev. de novo at 130.

<sup>95</sup> *Id.*

<sup>96</sup> Oliva, 18 Ind. Health L. Rev. at 114.

central server can be more efficient, but also leaves the database more vulnerable to hackers.<sup>97</sup> In contrast, decentralized systems are more privacy-focused but rely on self-reporting by users, which can increase chances of false negatives, false positives, and accidental reports.<sup>98</sup> More importantly, the biggest limitation of such decentralized systems is that users may simply choose not to report.<sup>99</sup> These limitations to efficacy can, in turn, lead people to lose faith in the contact tracing programs.<sup>100</sup>

### A. Centralized Contact Tracing

As the name suggests, a centralized contact tracing system records all user data to a central server.<sup>101</sup> A centralized approach to contact tracing allows a national authority to gather and utilize information about patients and their contacts for disease control purposes.<sup>102</sup> For instance, a centralized contact tracing app on a smartphone shares the user's anonymous ID to a central database, and the information is then used to trace contacts and notify users that have come into close contact with each other.<sup>103</sup> Centralized systems use anonymized data and places significant amount of trust in the main server—that is, trust that people's personal information will not be

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<sup>97</sup> Bari et al., ScienceDirect, Informatics in Medicine Unlocked 2021 at 10.

<sup>98</sup> Ramjee et al., 2021 Cardozo L. Rev. de novo at 116; 130.

<sup>99</sup> *Id.* at 130.

<sup>100</sup> *Id.*

<sup>101</sup> Farrow, 19 Rutgers J.L. & Pub. Pol'y at 152.

<sup>102</sup> Justin Fendos, PART I: COVID-19 Contact Tracing: Why South Korea's Success is Hard to Replicate, Georgetown Journal of International Affairs, <https://gjia.georgetown.edu/2020/10/12/parti-covid-19-contact-tracing-why-south-koreas-success-is-hard-to-replicate/> (Oct 12, 2020).

<sup>103</sup> Muhammad Shahroz et al., COVID-19 digital contact tracing applications and techniques: A review post initial deployments, Transportation Engineering Vol. 5 (2021): 100072, 1, 2 (Sep 5, 2021).



misused.<sup>104</sup> A major advantage of centralized systems are more economically efficient compared to decentralized ones, because of the use of a central database.<sup>105</sup> However, such servers are more prone to risks such as manipulation and corruption.<sup>106</sup> Furthermore, because centralized systems involve extensive data retention, it requires a significant amount of public trust before it can be adopted and implemented.<sup>107</sup>

### **i. Centralized Contact Tracing in South Korea**

South Korea is an example of a country that implemented a centralized contact tracing program that used citizen location data.<sup>108</sup> During the 2015 Middle East Respiratory Syndrome (MERS) outbreak in the country, the South Korean legislature overhauled the Infectious Disease Control and Prevention Act (IDCPA).<sup>109</sup> The amended provisions to the IDCPA allowed for cooperation between central and local governments and authorized local governments to implement control measures to combat the outbreak.<sup>110</sup> According to Article 76-2(1) of the IDCPA, the Health Minister and the Director of the Korean Centers for Disease Control and Prevention (KCDC) have the authority to compel medical facilities, companies, and individuals to provide information regarding patients as well as potential patients.<sup>111</sup> Moreover, under article 76-2(2) of the Act, the Health Minister can get private data from both confirmed and potential infected

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<sup>104</sup> Joseph Duball, Centralized vs. decentralized: EU's contact tracing privacy conundrum, IAPP, <https://iapp.org/news/a/centralized-vs-decentralized-eus-contact-tracing-privacy-conundrum/> (Apr 28, 2020).

<sup>105</sup> Bari et al., ScienceDirect, Informatics in Medicine Unlocked 2021 at 5.

<sup>106</sup> *Id.* at 10.

<sup>107</sup> Duball, Centralized vs. decentralized: EU's contact tracing privacy conundrum.

<sup>108</sup> Keren Landman, What We Can Learn From South Korea's Coronavirus Response, ELEMENTAL <https://elemental.medium.com/what-we-can-learn-from-south-koreas-coronavirus-response-97a4db5c9fef> (June 1, 2020).

<sup>109</sup> Cederblom, 31 Annals Health L. & Life Sci. at 119.

<sup>110</sup> *Id.*

<sup>111</sup> *Id.* (citing IDCPA, article 76-2(1)).

individuals without a warrant.<sup>112</sup> The amended Act also permits public health officials to close various types of facilities and obtain surveillance camera footage and cellphone records to track down infected individuals.<sup>113</sup> In essence, the South Korean government can gain access to various types of personal data, including cellular geolocation data and even credit card histories, during a public health emergency.<sup>114</sup> The government is simply required to notify the individual and destroy the data afterwards.<sup>115</sup>

These amended provisions of the IDCPA made it possible for South Korea to utilize a centralized digital contact program during the COVID-19 pandemic.<sup>116</sup> The statute required public health officials to comply with mandatory disclosure requirements when disclosing certain types of data, which included information on movement paths of infected individuals.<sup>117</sup> South Korea's success with its contact tracing program can be attributed to the immediacy with which it implemented it.<sup>118</sup> Another key aspect of the system was that the government was limited in the way its location data was used to support contact tracing efforts.<sup>119</sup>

The South Korean government implemented rapid testing, rigorous advertising on mitigation practices, and real-time cellphone alerts about exposure risk.<sup>120</sup> This prioritization of testing and optimizing supply to test high-risk individuals allowed the government to quickly

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<sup>112</sup> *Id.* at 119.

<sup>113</sup> Derek Thompson, *What's Behind South Korea's COVID-19 Exceptionalism?*, ATLANTIC, <https://www.theatlantic.com/ideas/archive/2020/05/whats-south-koreas-secret/611215/> (May 6, 2020).

<sup>114</sup> Cederblom, 31 *Annals Health L. & Life Sci.* at 120.

<sup>115</sup> *Id.* at 119-20.

<sup>116</sup> *Id.* at 107.

<sup>117</sup> *Id.* at 121.

<sup>118</sup> Justin Fendos, PART I: COVID-19 Contact Tracing: Why South Korea's Success is Hard to Replicate, *Georgetown Journal of International Affairs* (noting that the program was implemented immediately following the outbreak in Daegu).

<sup>119</sup> Cederblom, 31 *Annals Health L. & Life Sci.* at 107.

<sup>120</sup> Fendos, *supra* note 113.

identify infected individuals.<sup>121</sup> Once infected individuals were identified, the KCDC was authorized under the IDCPA to collect a surveillance camera footage, geolocation data from phones, and other electronic data that could help them in tracking down the infected individual's movements and contacts.<sup>122</sup> To allow citizens to take precautions against potential exposure to the virus, the government publicized information on infected individuals' movements and sent emergency text messages to residents in high-risk areas.<sup>123</sup> In some cases, a city or district may send notifications to people in the nearby area about a person's positive test results even before they are officially diagnosed.<sup>124</sup> Such notifications contain information such as the infected individual's age and gender.<sup>125</sup> Because the amended IDCPA allows the government to gain access to surveillance camera footage and people's credit-card transactions when necessary, some notifications included a detail record of the infected individual's movements down to the times and names of places they visited.<sup>126</sup> Some districts even went as far as to reveal which rooms of a building an infected individual visited and whether they wore a mask.<sup>127</sup>

It is important to note that the South Korean government was not met with the intense level of resistance from the public that was seen here in the United States.<sup>128</sup> Although the public did raise concerns regarding privacy, a social consensus was established for the most part that public cooperation was necessary during a public health crisis.<sup>129</sup>

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<sup>121</sup> *Id.*

<sup>122</sup> Cederblom, 31 *Annals Health L. & Life Sci.* at 122.

<sup>123</sup> *Id.* at 123.

<sup>124</sup> Mark Zastrow, South Korea is reporting intimate details of COVID-19 cases: has it helped?, *Nature*, <https://www.nature.com/articles/d41586-020-00740-y> (Mar 18, 2020).

<sup>125</sup> *Id.*

<sup>126</sup> *Id.*

<sup>127</sup> *Id.*

<sup>128</sup> World Health Organization, Republic of Korea: Success against COVID-19 Based on Innovation and Public Trust, World Health Organization (Dec 2, 2020).

<sup>129</sup> Cederblom, 31 *Annals Health L. & Life Sci.* at 121.

## ii. Hardships of Implementing a Centralized Contact Tracing System in the U.S.

While a mandatory, centralized approach to contact tracing could be effective in combating outbreaks like COVID-19 early on, such a system would not be welcomed in the U.S. due to the amount of privacy concerns that it poses. For one thing, such a method runs up against people's reasonable expectation of privacy under the Fourth Amendment established under the *Katz* decision.<sup>130</sup> Although courts have not yet ruled on it, a centralized contact tracing system would likely implicate *Carpenter v. United States*, which held that Fourth Amendment protections apply to historical cell-site location information (CSLI) since individuals maintain a legitimate expectation of privacy in the record of their physical movements captured through CSLI.<sup>131</sup>

However, it is important to consider that performing contact tracing in the midst of a pandemic should be analyzed under the Fourth Amendment's special needs doctrine.<sup>132</sup> For instance, contact tracing is likely to be considered a "community caretaking" activity constituting an "exigent circumstance" that makes obtaining a warrant impractical.<sup>133</sup> However, there is the added wrinkle that contact tracing, especially with diseases like COVID-19, can entail monitoring a large portion of the public and gathering information on even asymptomatic individuals.<sup>134</sup> Because exigent circumstances are very narrowly defined under the Fourth Amendment, it will be interesting to see if public health emergencies could be categorized as such to allow collection of

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<sup>130</sup> *Katz v. United States*, 389 U.S. 347, 359 (1967); Patrick McKnight, Could Contact Tracing Technology Violate the Fourth Amendment?, American Bar Association, [https://www.americanbar.org/groups/business\\_law/publications/committee\\_newsletters/cyberspace/2020/202006/contact-tracing/](https://www.americanbar.org/groups/business_law/publications/committee_newsletters/cyberspace/2020/202006/contact-tracing/) (June 11, 2020).

<sup>131</sup> *Carpenter v. United States*, 201 L. Ed. 2d 507, 138 S. Ct. 2206, 2223 (2018).

<sup>132</sup> Alan Z. Rozenshtein, Disease Surveillance and the Fourth Amendment, Lawfare, <https://www.lawfareblog.com/disease-surveillance-and-fourth-amendment> (Apr 7, 2020).

<sup>133</sup> *Id.*

<sup>134</sup> *Id.*

individuals' personal data for digital contact tracing purposes.<sup>135</sup> However, it is likely to be met with intense resistance from the public due to the highly intrusive nature of centralized methods.<sup>136</sup>

### **B. Decentralized Contact Tracing**

A decentralized version of contact tracing also uses Bluetooth technology but works differently in that it gives users more control over their personal information.<sup>137</sup> With a decentralized approach, user information is kept on their devices through a mobile application and matches are made with other users who may have contracted the virus; because it uses Bluetooth technology, users have to be in close proximity for matches to be made.<sup>138</sup> For example, when individuals A and B come into contact with each other, their devices exchange a key code.<sup>139</sup> When one of them becomes infected, they must update their status in the app so that contacts can be matched and alerts can be sent.<sup>140</sup> With decentralized contact tracing, there is a public database that gathers information and broadcasts unique user identifiers, meaning no personally identifiable information is stored.<sup>141</sup> Unlike centralized contact tracing that keep data on a central server, this sort of decentralized approach has been favored by countries that prioritize privacy concerns.<sup>142</sup>

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<sup>135</sup> Cederblom, 31 *Annals Health L. & Life Sci.* at 136.

<sup>136</sup> *Id.*

<sup>137</sup> Cristina Criddle et al., Coronavirus contact-tracing: world split between two types of app, BBC, <https://www.bbc.com/news/technology-52355028> (May 7, 2020).

<sup>138</sup> *Id.*

<sup>139</sup> *Id.*

<sup>140</sup> *Id.*

<sup>141</sup> Oliva, 18 *Ind. Health L. Rev.* at 114.

<sup>142</sup> Criddle, *supra* note 131.

A majority of contact tracing apps built by state governments in the U.S. were supported by the Bluetooth-based technology created by the Google-Apple joint venture.<sup>143</sup> This Bluetooth-based exposure notification protocol works on both iOS and Android operating systems and restricts users from collecting location data.<sup>144</sup> By enabling the exchange of randomly generated identification numbers with nearby devices, this system detects whether a user of the app came into contact with any infected individuals.<sup>145</sup> The apps are programmed to alert users if someone they had been exposed to later inputs a positive COVID-19 test result, thereby encouraging them to get tested or take other appropriate measures (e.g., getting tested, quarantining, etc.).<sup>146</sup>

### **i. International Examples of Decentralized Contact Tracing**

In May 2020, Switzerland became the first country to adopt the decentralized Google-App exposure notification app.<sup>147</sup> The app, called SwissCovid, is voluntary and stores data on a user's cell phone for 21 days; the app uses the data to notify close encounters with infected individuals.<sup>148</sup> Instead of relying on GPS, SwissCovid runs on Bluetooth Low Energy and, thus, does not track user location.<sup>149</sup> When phones within a distance of 1.5 meters detect each other for 15 minutes or longer, the devices exchange encrypted IDs through the app and record the encounter.<sup>150</sup> When

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<sup>143</sup> Alejandro de la Garza, Contact Tracing Apps were Big Tech's Best Idea for Fighting COVID-19. Why Haven't They Helped?, Time, <https://time.com/5905772/covid-19-contact-tracing-apps/> (Nov 10, 2020).

<sup>144</sup> Leo Kelion, Coronavirus: First Google/Apple-based Contact-Tracing App Launched, BBC, <https://www.bbc.com/news/technology-52807635> (May 26, 2020).

<sup>145</sup> Garza, *supra* note 137.

<sup>146</sup> *Id.*

<sup>147</sup> Kelion, *supra* note 138.

<sup>148</sup> Reuters Staff, Swiss parliament paves way for coronavirus tracing app rollout this month, Reuters, <https://www.reuters.com/article/us-health-coronavirus-swiss-apps/swiss-parliament-paves-way-for-coronavirus-tracing-app-rollout-this-month-idUSKBN23F2E9> (June 8, 2020).

<sup>149</sup> Melyssa Eigen, et al, Country Spotlight: Switzerland's SwissCovid App, Berkman Klein Center for Internet & Society at Harvard University, <https://cyber.harvard.edu/story/2020-07/country-spotlight-switzerlands-swisscovid-app> (Jul 10, 2020).

<sup>150</sup> *Id.*

users test positive for COVID, authorities will issue them a 12-digit “Covidcode” that users can opt to enter into the app.<sup>151</sup> If the user chooses to input the code in the app, a federal government server validates the code and later automatically notifies all encrypted IDs that the user came into contact with while they were infected.<sup>152</sup> Recipients of the notification are informed only about the timeframe of the exposure and not about the identities of the infected individuals.<sup>153</sup> According to initial polls conducted in May 2020, about 70% of Swiss residents indicated support for the SwissCovid app, mainly due to the voluntariness of the app.<sup>154</sup> However, according to June 2020 reports, only about 20% of the Swiss population had downloaded the app; such a figure is likely to be too low for the app to be effective.<sup>155</sup>

Germany and Ireland soon followed by also launching decentralized contact tracing apps, and the source codes for both countries’ apps are open for anyone to inspect.<sup>156</sup> Ireland and Germany had relatively high adoption rates—Ireland with the world’s highest rate at 37% and Germany with over 20%.<sup>157</sup> Because the system is Bluetooth-based and user information is not stored in a central database, governments are unable to use statistical analysis to re-identify individuals’ contacts or characteristics.<sup>158</sup>

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<sup>151</sup> *Id.*

<sup>152</sup> *Id.*

<sup>153</sup> *Id.*

<sup>154</sup> Swiss Info, Poll: 70% of residents back ‘SwissCovid’ tracing app, Swifinfo.ch, [https://www.swissinfo.ch/eng/politics/covid-19\\_poll--70--of-residents-back--swisscovid--tracing-app/45783230](https://www.swissinfo.ch/eng/politics/covid-19_poll--70--of-residents-back--swisscovid--tracing-app/45783230) (May 25, 2020).

<sup>155</sup> Eigen, *supra* note 143.

<sup>156</sup> Oliva, 18 Ind. Health L. Rev. at 117.

<sup>157</sup> Charlotte Jee, Is a Successful Contact Tracing App Possible? These Countries Think So., MIT Technology Review, <https://www.technologyreview.com/2020/08/10/1006174/covid-contract-tracing-app-germany-ireland-success/> (Aug 10, 2020).

<sup>158</sup> Robert Cattanaach et al., Contact Tracing: Strategies and Issues for Balancing Public Health Demands and Privacy Concerns, Antitrust, Fall 2020, at 18, 20.

## ii. Drawbacks of a Decentralized Contact Tracing System

Decentralized approaches to contact tracing also have major drawbacks.<sup>159</sup> While decentralized approaches aim to maximize privacy, this creates a major limitation in terms of efficacy of tracing.<sup>160</sup> Since it is a voluntary system, one of the biggest hurdles is that widespread adoption is critical for decentralized apps to be effective in combating outbreaks.<sup>161</sup> As mentioned earlier, Oxford University studies suggest that at least 56%—ideally, at least 60%—of the total population must be tracked to effectively contain a virus.<sup>162</sup>

Decentralized contact tracing apps are vulnerable to reports of false positive test results (i.e., reports of exposure when there were none) because users may be notified as having come into contact with each other even in instances of very low possibility of transmission.<sup>163</sup> For example, people standing with a thin wall between them could still be flagged as having been close to each other if the wall is porous enough for a Bluetooth signal to penetrate through it.<sup>164</sup> The system may also not take into account the various precautions people take, including wearing masks or other protective equipment.<sup>165</sup> Because these apps are not completely foolproof, false negatives are also an issue—meaning apps may fail to flag someone as a potential infected person even when they have been exposed to the virus.<sup>166</sup>

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<sup>159</sup> Ashkan Soltani, et al., Contact-tracing apps are not a solution to the COVID-19 crisis, Brookings, <https://www.brookings.edu/techstream/inaccurate-and-insecure-why-contact-tracing-apps-could-be-a-disaster/> (Apr 27, 2020).

<sup>160</sup> Cattanach, Contact Tracing: Strategies and Issues for Balancing Public Health Demands and Privacy Concerns, Antitrust, Fall 2020, at 18, 20.

<sup>161</sup> Cederblom, 31 *Annals Health L. & Life Sci.* at 126.

<sup>162</sup> Gil, 25 *Va. J.L. & Tech.* at 10–11; Emily Seto, et al., Adoption of COVID-19 Contact Tracing Apps: A Balance Between Privacy and Effectiveness, *Journal of medical Internet research* vol. 23,3 e25726, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7935397/> (Mar 4, 2021).

<sup>163</sup> Soltani, *supra* note 153.

<sup>164</sup> *Id.*

<sup>165</sup> *Id.*

<sup>166</sup> *Id.*



More importantly, while decentralized systems do help to resolve some privacy issues by incorporating strong encryption and security safeguards, privacy continues to pose a concern because re-identifying data is still a possibility.<sup>167</sup> For example, because a user's health status is associated with a unique identifier, it is possible to connect the dots to correlate an infected individual with their photos using stationary cameras that are connected to a Bluetooth device in public areas.<sup>168</sup>

## V. Interstate Operability and Federal Data Protection Law

Another problem experts point out is the lack of a national contact tracing system in the United States and whether having separate state contact tracing apps is even useful.<sup>169</sup> To have a more comprehensive system, interstate operability is crucial; this refers to whether apps can be cross-compatible across states.<sup>170</sup> The U.S. government may be able to achieve this through its power to regulate interstate commerce.<sup>171</sup> This would be important in determining whether creating a national network is even feasible.<sup>172</sup> Moreover, there is a need for a baseline federal data privacy law to safeguard sensitive personal information acquired through contact tracing apps.<sup>173</sup> In Europe, the European Data Protection Board (EDPB) encouraged member states to adopt “a common European approach in response to the current [COVID-19] crisis, or at least

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<sup>167</sup> Oliva, 18 Ind. Health L. Rev. at 117.

<sup>168</sup> Andy Greenberg, Does Covid-19 contact tracing pose a privacy risk? Your questions, answered, Wired, <https://www.wired.com/story/apple-google-contact-tracing-strengths-weaknesses/> (Apr 17, 2020).

<sup>169</sup> Farrow, 19 Rutgers J.L. & Pub. Pol'y at 132.

<sup>170</sup> *Id.*

<sup>171</sup> Ramjee, 2021 Cardozo L. Rev. de novo at 110.

<sup>172</sup> *Id.*

<sup>173</sup> Farrow, 19 Rutgers J.L. & Pub. Pol'y at 123.

put in place an interoperable framework” to “promote the effective application of data protection principles, a common level of data minimization and a common data retention period.”<sup>174</sup>

Following in the EDPB’s footsteps, the United States should aim to achieve interstate operability by adopting a more comprehensive set of data protection laws similar to the European Union’s General Data Protection Regulation (GDPR). Under the GDPR’s “rights-based” approach, people own their personal information and have the legal right to control it.<sup>175</sup> Under the GDPR, health information, such as COVID-19 diagnosis, falls under a special category or personal data that receive extra protections.<sup>176</sup> Specifically, the GDPR defines “data concerning health” as “personal data related to the physical or mental health of a natural person . . . , which information about his or her health status.”<sup>177</sup>

Currently, in the U.S., the following states have or are preparing to enforce new GDPR-inspired statutes in 2023: California, Colorado, Connecticut, Utah, and Virginia.<sup>178</sup> Such a shift could encourage interstate operability because contact tracing apps would fall under the governance of a more comprehensive, GDPR-like statute.<sup>179</sup> Such a statute would require states processing personal data to have a “lawful basis” and create heightened thresholds for states wanting to process individuals’ personal health information.<sup>180</sup>

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<sup>174</sup> EDPB, Statement on the data protection impact of the interoperability of contact tracing apps, June 16, 2020.

<sup>175</sup> Frederic D. Bellamy, U.S. Data Privacy Laws to Enter New Era in 2023, Reuters, <https://www.reuters.com/legal/legalindustry/us-data-privacy-laws-enter-new-era-2023-2023-01-12/> (Jan 12, 2023).

<sup>176</sup> Laura Bradford et al., COVID-19 Contact Tracing Apps: a stress test for privacy, the GDPR, and data protection regimes, *Journal of Law and the Biosciences*, Vol. 7(1), January-June 2020, lsaa034, 1, 6 (May 28, 2020).

<sup>177</sup> GDPR ART. 4.

<sup>178</sup> Bellamy, *supra* note 168.

<sup>179</sup> Bradford et al., *Journal of Law and the Biosciences*, Vol. 7(1) at 11.

<sup>180</sup> *Id.*

## **VI. Conclusion**

Although only about one-third of states in the U.S. made contact tracing apps available during the COVID-19 pandemic, contact tracing remains a time-tested tool used to tackle public health crises. However, for it to be effective, the type of contact tracing methods that the U.S. government uses moving forward will need to significantly change to address the mounting concerns about safeguarding people's personal information.

Since privacy and security issues are a major concern, the U.S. government will likely face much less resistance from the public by adopting a decentralized contact tracing option. However, for viruses like COVID-19 that spread quickly through casual exposure, a decentralized contact tracing app may not prove useful, as they rely heavily on voluntary cooperation on the part of the general public. Because privacy continues to be one of the major hurdles preventing the American public from trusting contact tracing apps, the U.S. government should consider ways to earn the public's trust and to ensure better protection of user information. Creative solutions, such as blockchain-based contact tracing apps, could be the answer. Ultimately, without establishing strong faith in the government, existing contact tracing programs are likely not worth the hype in controlling pandemics.