

*Ethical Issues of the SARS-CoV-2 Outbreak in
East-Central Europe and Beyond*

Eds. Assya Pascalev and Gergely Tari

Budapest: Trivent, 2024

© The Authors 2024

Available online at <http://trivent-publishing.eu/>



ETHICAL, LEGAL AND POLICY CHALLENGES IN COVID-19 CONTACT TRACING APPS: A EUROPEAN PERSPECTIVE

Lucija Čorić,* Anto Čartolovni**

Abstract

In an effort to combat the global pandemic caused by COVID-19, countries around the world swiftly developed contact tracing mobile applications with the aim of fastening and objectivizing manual contact tracing of people infected with SARS-CoV-2 virus. The apps encountered worldwide scepticism regarding their ethics, especially considering the privacy issue. The idea was supported by several joint documents in theory, but only a few Member States implemented it in practice, with some of them differing even from the commonly agreed technical points. This reveals a lack of solidarity and political weakness, pointing to deeper political issues within the EU.

DOI: 10.22618/TP.TST.2024.296.006

* Attorney-at-law; Čorić attorney office, Croatia.

** Assistant Professor (Digital healthcare ethics laboratory (Digit-HeaL), Catholic University of Croatia), Croatia.

This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC-BY-NC-ND 4.0) license, which permits others to copy or share the article, provided original work is properly cited and that this is not done for commercial purposes. Users may not remix, transform, or build upon the material and may not distribute the modified material (<http://creativecommons.org/licenses/by-nc/4.0/>)

ETHICAL, LEGAL AND POLICY CHALLENGES IN COVID-19 CONTACT TRACING APPS: A EUROPEAN PERSPECTIVE

Lucija Ćorić,^{*} Anto Čartolovni^{**}

Abstract

In an effort to combat the global pandemic caused by COVID-19, countries around the world swiftly developed contact tracing mobile applications with the aim of fastening and objectivizing manual contact tracing of people infected with SARS-CoV-2 virus. The apps encountered worldwide scepticism regarding their ethics, especially considering the privacy issue. The idea was supported by several joint documents in theory, but only a few Member States implemented it in practice, with some of them differing even from the commonly agreed technical points. This reveals a lack of solidarity and political weakness, pointing to deeper political issues within the EU.

I. Introductory remarks

The world faces one of the biggest health challenges in history: the global outbreak of the COVID-19 infection caused by SARS-CoV-2 virus, with already more than 4 million deaths¹ after World Health Organization's proclamation of the pandemic on 11 March 2020². The outbreak, which had severely affected healthcare systems, demands tough choices and quick decisions to be made. Governments worldwide promptly introduced epidemiological measures to prevent the spread of the virus and stop its circulation among population. Besides personal hygiene, social distancing and

^{*} Attorney-at-law; Ćorić attorney office, Croatia.

^{**} Assistant Professor (Digital healthcare ethics laboratory (Digit-HeaL), Catholic University of Croatia), Croatia.

¹ World Health Organization, "WHO Coronavirus (COVID-19) Dashboard With Vaccination Data," World Health Organization, 2021, <https://covid19.who.int/%0A>; <https://covid19.who.int/region/searo/country/bd>.

² WHO World Health Organization, "WHO Director-General's Opening Remarks at the Media Briefing on COVID-19 - 11 March 2020," WHO Director General's speeches, March 11, 2020, <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19--11-march-2020>.

self-isolation, one of the most effective measures proved to be tracing contacts of those infected with COVID-19 through an app. Its primary aim is to identify possible transmitters of the infection and their isolation, thereby slowing down the transmission of the virus and flattening the pandemic curve. Traditionally, contact tracing was done manually by epidemiologists, but ever since the Ebola outbreak in 2014-2016 in West Africa there has been an increasing shift to new solutions using digital technologies, particularly mobile technology in the form of smartphone applications³. These new apps (hereinafter referred to as: (COVID-19) contact tracing apps) might help track and trace those infected and warn others of being in contact or proximity with COVID-19 positive person. To that end, two technology giants, Apple and Google partnered in building the application programming interfaces (APIs)⁴, which were adopted by the majority of European States, whereas some States in the USA are reluctant to agree to their usage⁵. Although this high-tech solution might seem promising in suppressing the spread of SARS-CoV-2 virus⁶, appearing altruistic and benevolent in protecting our health and the health of others, it also puts forward a lot of unanswered questions and issues relating to privacy, location tracking, and health data sharing, thus inciting a considerable amount of public debate. With the pandemic surging and, in that context, a necessity to act quickly and find an adequate solution to stop the outbreak requires an inevitable trade-off between health and privacy or, to push it even further, between democracy and technocracy. In this regard, this paper aims to provide a brief overview of the various existing approaches to COVID-19 contact tracing apps and their global implementation, with a focus on the EU, and to depict the legal framework and underlying ethical issues surrounding their development and implementation.

II. State of the art

The global landscape of COVID-19 contact tracing apps presents various approaches, indicating a lack of global consensus. The apps differ in the technology they use, the information they collect, store, or share, the duration of information storage, the conditions to access the data, and the functions they perform. However, for the purpose of this paper, they can roughly be separated between those collecting vast amounts of personal data, particularly data on user's location, using GPS (Global Positioning System) and those using more privacy-friendly technologies such as Bluetooth, thus avoiding location tracing. The GPS based apps represent a vertical approach that uses the location history of the user to map their movement in order

³ Lisa O. Danquah et al., "Use of a Mobile Application for Ebola Contact Tracing and Monitoring in Northern Sierra Leone: A Proof-of-Concept Study," *BMC Infectious Diseases* 19, no. 1 (December 18, 2019): 810, <https://doi.org/10.1186/s12879-019-4354-z>.

⁴ Google and Apple, "Privacy-Preserving Contact Tracing - Apple and Google," Apple.com, 2020, <https://covid19.apple.com/contacttracing>.

⁵ Aaron Holmes and Hugh Langley, "Apple and Google's COVID-19 Contact-Tracing Tech," *Businessinsider.com*, June 10, 2020, <https://www.businessinsider.com/apple-google-coronavirus-contact-tracing-tech-states-dont-plan-using-2020-6>.

⁶ Máté Julesz, "Health equity and health data protection related to telemedicine amid the COVID-19 pandemic", *Információs Társadalom XXII*, no. 2 (2022): 27–38, <https://dx.doi.org/10.22503/inftars.XXII.2022.2.2>.

to determine whether the user has been in close contact with someone infected or, if the user has been recognized and registered as COVID-19 positive, to alert other users who crossed paths with her/him⁷. The apps based on Bluetooth technology represent a horizontal approach to detecting the proximity of two app users with the purpose of subsequent alerts, but they do not track their location history or share any other data since the app generates only anonymous codes to be exchanged between the devices or a device and a server⁸. Considering their broad usage of technology and low sensitivity to government surveillance, the first group is predictably predominant in Asian countries, such as South Korea⁹ and China, but it was also adopted by the Israeli¹⁰ government. A particularly interesting example of this approach is China's system which generates red, yellow or green QR code based on the data inserted by a user, thereby allowing or prohibiting their entrance in public transport vehicles, restaurants, airports, shops and even their own neighbourhood. Although the app is not explicitly mandatory, many places demand the customers' QR codes as the only way to enter the place¹¹. As an exemption in Asia, Singapore's TraceTogether app¹² relies on Bluetooth technology instead, and so the app does not record locations where its users have been, but only traces whom they have been close to. The data on proximity is only shared with the Singaporean Ministry of Health upon its request and user's consent. This approach, followed by most European countries, can be further subdivided according to the location where the data is stored, separating those that store data centrally on a server usually owned by the government or the Ministry of Health from those that opted for decentralized storage of data on users' smartphones. The European response to building contact tracing apps started as early as the spring of 2020 with the project called Pan-European Privacy-Preserving Proximity Tracing (PEPP-PT), "created to assist national initiatives by supplying ready-to-use, well-tested, and properly assessed mechanisms and standards, as well as support for interoperability, outreach, and operation when needed."¹³ However, on 19 April 2020 over 300 international scientists signed a Joint Statement on Contact Tracing in which they endorsed usage of Bluetooth technology instead of geolocation, but also warn against some of Bluetooth-based proposals that do not respect privacy due to the so-called

⁷ Shaoxiong Wang, Shuizi Ding, and Li Xiong, "A New System for Surveillance and Digital Contact Tracing for COVID-19: Spatiotemporal Reporting over Network and GPS," *JMIR MHealth and UHealth* 8, no. 6 (June 10, 2020): e19457–e19457, <https://doi.org/10.2196/19457>.

⁸ Johannes Abeler et al., "Covid-19 Contact Tracing and Data Protection Can Go Together", *JMIR MHealth and UHealth* 8, no. 4 (2020): e19359, <https://doi.org/10.2196/19359>.

⁹ Cuthbertson A., "Coronavirus Apps Let People Avoid High-Risk Locations in South Korea," *Independent*, March 3, 2020, <https://www.independent.co.uk/life-style/gadgets-and-tech/news/coronavirus-news-app-south-korea-latest-cases-deaths-location-a9371651.html>.

¹⁰ Joe Tidy, "Coronavirus: Israel Enables Emergency Spy Powers," *BBC News*, March 17, 2020, <https://www.bbc.com/news/technology-51930681>.

¹¹ Paul Mozur, Raymond Zhong, and Aaron Krolik, "In Coronavirus Fight, China Gives Citizens a Color Code, With Red Flags - The New York Times," *New York Times*, March 1, 2020, <https://www.nytimes.com/2020/03/01/business/china-coronavirus-surveillance.html>.

¹² Government of Singapore, "TraceTogether," accessed July 27, 2021, www.tracetgether.gov.sg/.

¹³ Media Information PEPP-PT, "Privacy Protecting Proximity Tracing to Fight Corona," April 1, 2020, <https://www.ga4gh.org/wp-content/uploads/2020-04-01-PEPP-PT-Press-Realease.pdf>.

centralized approach¹⁴. The Statement strongly praises a joint initiative launched by Google and Apple and other privacy-preserving methods developed by different initiatives worldwide, including Swiss-led Decentralized Privacy-Preserving Proximity Tracing (DP-3T), but it does not mention PEPP-PT, which was interpreted as withdrawal of European experts from PEPP-PT project, as later also explicitly confirmed by some of them¹⁵. In line with that argumentation, the European Parliament also recommended a decentralized approach, calling for coordinated action between Member States¹⁶. Nevertheless, some of the EU Member States use centralised approach and some even use GPS tracking, as shown in Table 1.

Table 1. Overview of contact tracing apps currently in use in EU Member States

| EU Member State | Name of the app | GPS or Bluetooth | Centralised (C) or decentralised (D) approach | Voluntary (V) or mandatory (M) use | Legal basis for data processing |
|-----------------|-----------------|------------------|---|------------------------------------|---------------------------------|
| Austria | Stopp Corona | Bluetooth | D (Google/Apple) | V | Consent |
| Belgium | Coronalert | Bluetooth | D (Google/Apple) | V | Consent |
| Bulgaria | Virusafe | GPS | C | V | Consent |
| Croatia | Stop COVID-19 | Bluetooth | D (Google/Apple) | V | Public interest |
| Cyprus | CovTracer | GPS | C | V | Consent |
| Czech Republic | eRouska | Bluetooth | D (Google/Apple) | V | Public interest |
| Denmark | Smittestop | Bluetooth | D (Google/Apple) | V | Public interest |
| Estonia | HOLA | Bluetooth | D (Google/Apple, DP-3T) | V | Consent |
| Finland | Koronavilkku | Bluetooth | D (Google/Apple) | V | Public interest |
| France | TousAntiCovid | Bluetooth | C | V | Public interest |

¹⁴ Sebastian Klöckner, “Contact Tracing Joint Statement,” Helmholtz Center for Information Security, April 19, 2020, <https://cisa.saarland.de/2020/04/20/joint-statement-on-contact-tracing.html>.

¹⁵ Vincent Manancourt, Laurens Cerulus, and Joanosch Delcker, “Tech Feud Complicates EU Search for Coronavirus Tracking App – POLITICO,” Politico, April 20, 2020, www.politico.eu/article/tech-feud-complicates-eu-search-for-coronavirus-tracking-app/.

¹⁶ European Parliament (EP), ‘Resolution of 17 April 2020 on EU coordinated action to combat the COVID-19 pandemic and its consequences’ (2020/2616(RSP)) P9_TA(2020)0054.

| EU Member State | Name of the app | GPS or Bluetooth | Centralised (C) or decentralised (D) approach | Voluntary (V) or mandatory (M) use | Legal basis for data processing |
|----------------------|-------------------|-------------------|---|------------------------------------|---------------------------------|
| Germany | Corona-Warn-App | Bluetooth | D (Google/Apple) | V | Consent |
| Hungary | VirusRadar | Bluetooth | C | V | Consent |
| Ireland | COVID Tracker | Bluetooth | D (Google/Apple) | V | Consent |
| Italy | Immuni | Bluetooth | D (Google/Apple) | V | Public interest |
| Latvia | Apturi Covid | Bluetooth | D (Google/Apple) | V | Public interest |
| Lithuania | Karantinas | Bluetooth | D (Google/Apple) | V | Consent |
| Malta | COVID Alert Malta | Bluetooth | D (Google/Apple) | V | Consent |
| Netherlands | CoronaMelder | Bluetooth | D (Google/Apple) | V | Public interest |
| Norway ¹⁷ | Smittestop | Bluetooth and GPS | C | V | Consent |
| Poland | ProteGO | Bluetooth | D (Google/Apple) | V | Public interest |
| Portugal | STAYAWAY COVID | Bluetooth | D (Google/Apple) | V | Public interest |
| Slovenia | #OstaniZdrav | Bluetooth | D (Google/Apple) | V | Consent |
| Spain | Radar COVID | Bluetooth | D (Google/Apple) | V | Public interest |

Table 1. reveals the predominance of a voluntary approach in contact-tracing app usage in all Member States that developed an app. Member States not included in Table 1. have either not developed an app yet (Slovakia and Greece) or do not intend to build it at all (Sweden, Luxembourg and Romania). Table 1. also shows consistent adoption of Bluetooth technology among Member States that released an app, with the exception of Bulgaria and Cyprus who opted for GPS tracking. It also seems that the use of a Bluetooth technology comes in pair with the decentralised approach and the use of Google and Apple's APIs, thus making the French and Hungarian exception a significant one. The legal basis for data processing within the app therefore remains the only major point of difference between Member States, although consent is favoured as a legal basis in most of them. However, the table serves as a strong indication that there is no common European approach to the

¹⁷ Although it is not part of the EU, Norway is relevant as part of the European Economic Area and part of the eHealth Network and therefore relevant for this overview.

development and implementation of contact tracing apps, stirring concern for the future of the EU internal market and solidarity among Member States.

III. Challenges in the development and implementation of COVID-19 contact tracing apps

Ethical, legal and policy issues related to the contact tracing apps can roughly be divided into three categories: issues relating to app's usage and effectiveness, privacy issues and questions regarding further implications of contact tracing apps.

Regarding the voluntariness of use, the EU Member States opted for a voluntary approach, thereby leaving the decision of whether they want to use an app to each individual user. This approach is not accepted just in the EU, but overwhelmingly around the world, with the exception of China, Qatar, Turkey and India¹⁸. From the libertarian perspective, this solution is welcomed, but leaves space for debating its effectiveness since the success of contact tracing apps largely depends on their broad usage. According to some studies for these apps to be effective, they should be used by at least 60% of a country's population¹⁹. One survey has earlier shown that almost 70% of population in the USA, France, Italy, the UK and Germany would definitely or probably install the app²⁰. However, although some apps were indeed downloaded many times, it seems like the download rate is nowhere close to the desired 60%²¹, even in the most tech-prone countries, such as Singapore²². That is why some authors argue that, in the context of the pandemic, not using contact tracing apps could, in fact, be unethical and irresponsible²³, especially given the fact that tracking via geolocation became so acceptable with the use of social media and other apps, such as those for carpooling and deliveries²⁴. At first sight, it seems that such an approach is far from being adopted by the EU Member States, but on 14 October 2020 Portuguese government adopted a law proposal which would, subject to the Parliament's approval, make installation of the Portuguese app obligatory in certain contexts, including armed forces, employment, education and public service²⁵. In

¹⁸ TUM Institute for Ethics in Artificial Intelligence (IEAI), "Ethics and the Use of AI-Based Tracing Tools to Manage the COVID-19 Pandemic" 17, no. June (June 2020): 1–13, https://ieai.mcts.tum.de/wp-content/uploads/2020/06/Research-Brief_ContactTracingAppsFinal-1.pdf.

¹⁹ Luca Ferretti et al. "Quantifying SARS-CoV-2 Transmission Suggests Epidemic Control with Digital Contact Tracing," *Science* 368, no. 6491 (May 8, 2020): eabb6936, <https://doi.org/10.1126/science.abb6936>.

²⁰ Abeler, "Covid-19 Contact Tracing", e19359.

²¹ Alessandro Blasimme and Effy Vayena, "What's next for COVID-19 Apps? Governance and Oversight," *Science* 370, no. 6518 (November 2020): 760–62, <https://doi.org/10.1126/science.abd9006>.

²² Michelle M. Mello and C. Jason Wang, "Ethics and Governance for Digital Disease Surveillance," *Science* 368, no. 6494 (May 2020): 951–54, <https://doi.org/10.1126/science.abb9045>.

²³ Jessica Morley et al., "Ethical Guidelines for COVID-19 Tracing Apps," *Nature* 582, no. 7810 (June 2020): 29–31, <https://doi.org/10.1038/d41586-020-01578-0>.

²⁴ Wang, "A New System for Surveillance", e19457.

²⁵ REPÚBLICA PORTUGUESA, "Comunicado Do Conselho de Ministros de 22 de Outubro de 2020," October 31, 2020, <https://www.portugal.gov.pt/pt/gc22/governo/comunicado-de-conselho-de-ministros?i=376>.

France, however, upon the government's request French supervisory authority for data protection (the CNIL) issued a preliminary opinion on the French app²⁶. The opinion stresses that the voluntary basis of the app's usage means that there cannot be negative consequences, in terms of access to healthcare, as well as to some services, such as public transport, for citizens that opt not to use the app. Another issue related to the app's usage arises from the fact that not every person possesses a smartphone and, thus, they are not able to instal and use the app either. Ironically, those are predominantly older people who are not that prone to technology²⁷ and who happen to also be the most vulnerable to the virus contagion²⁸. Taking into account the fact that almost 20% of the EU's population is of age 65 years or more, this becomes a significant factor in assessing the overall effectiveness of the app²⁹. Some authors consider it so important that they propose governmental incentives in form of specially designed and freely distributed smartphones which would be more user friendly to elderly people³⁰. From the technological perspective, using Bluetooth technology, besides all positive aspects, certainly has disadvantages too, the first one being its lack of precision in terms of proximity, enabling, for example, false positive infection alerts because two people were close to each other, but separated by a wall³¹. This technological approach also requires users to keep their Bluetooth constantly turned on, which can incite some privacy risks³² and also quickly exhaust the battery, posing another practical problem of using contact tracing apps and diminishing user satisfaction. Furthermore, the German Corona Warn App encountered some serious difficulties in its functioning³³, and currently implemented apps did not receive very high marks. For example, three apps from the largest EU countries, France, Germany and Italy, received an average mark of 3.0 with more than 150,000 reviews³⁴. This may seem like a secondary issue, but an average app user's decision on whether he

²⁶ Commission Nationale de l'Informatique et des Libertés, "Délibération N° 2020-046 Du 24 Avril 2020 Portant Avis Sur Un Projet d'application Mobile Dénommée « StopCovid »,» April 24, 2020, <https://www.cnil.fr/fr/publication-de-lavis-de-la-cnil-sur-le-projet-dapplication-mobile-stopcovid>.

²⁷ Ionut Andone et al., "How Age and Gender Affect Smartphone Usage," in *UbiComp 2016 Adjunct - Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing, UbiComp '16* (New York, NY, USA: Association for Computing Machinery, 2016), 9–12, <https://doi.org/10.1145/2968219.2971451>.

²⁸ Jérémie Cohen et al., "COVID-19-Related Mortality by Age Groups in Europe: A Meta-Analysis," *Frontiers in Medicine*, 2020, 2020.04.11.20061721, <https://doi.org/10.1101/2020.04.11.20061721>.

²⁹ Eurostat, "Statistics on Regional Typologies in the EU - Statistics Explained," June 11, 2018, https://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_regional_typologies_in_the_EU#Urban-rural_typology.

³⁰ Michele Loi, "How to Fairly Incentivise Digital Contact Tracing," *Journal of Medical Ethics*, July 9, 2020, medethics-2020-106388, <https://doi.org/10.1136/medethics-2020-106388>.

³¹ Morley, "Ethical Guidelines for COVID-19 Tracing Apps", 29–31.

³² Urs Gasser et al., "Digital Tools against COVID-19: Taxonomy, Ethical Challenges, and Navigation Aid," *The Lancet Digital Health* 2, no. 8 (August 1, 2020): e425–34, [https://doi.org/10.1016/S2589-7500\(20\)30137-0](https://doi.org/10.1016/S2589-7500(20)30137-0).

³³ Deutsche Welle, "Germany Launches 'best' Coronavirus Tracing App," Deutsche Welle, 2020, <https://www.dw.com/en/germanys-coronavirus-tracing-app-criticized-over-warning-failures/a-54305099>.

³⁴ "Data from Google Play Store Verified on 4 November 2020," accessed July 27, 2021, <https://play.google.com/store/movies>.

or she shall use an app depends also on whether the app is properly functioning and easy to use. Given that the effectiveness of the app depends on its broad usage, this issue should not be easily disregarded³⁵.

One of the main concerns that arises with the use of contact tracing apps is an issue of privacy in terms of collecting and processing personal data. Due to the famous privacy by-design principle embodied in Article 25 of the General Data Protection Regulation (hereinafter referred to as GDPR), the EU Member States were obliged to consider data protection when developing a contact tracing app³⁶. In some countries the debate on data protection within contact tracing apps has been a very heated and difficult one, with various stakeholders voicing their opinions and governments having to balance between protection of health and protection of privacy³⁷. As to the legitimacy of data processing within the app, most of the EU Member States decided to use consent as the basis for data processing, pursuant to Art 6.(1)(a) of the GDPR. This has to be differentiated from voluntary installation and use of the app, since it concerns data processing within the app, i.e. when the app is already installed. However, “consent will not be considered to be free if the data subject is unable to refuse or withdraw his or her consent without detriment” and “where there is any element of compulsion, pressure or inability to exercise free will”³⁸. These elements of compulsion and pressure are taken broadly, particularly in situations where there is an imbalance of power, which is typical for a relationship between a government and an individual. Thus, to be legitimate, the consent-based processing within contact tracing apps has to be truly free of any coercion or pressure whatsoever by a government, including, for example, stigmatization and shaming of citizens who opt not to share their data with the app. Except for consent, the GDPR offers another legal basis for processing the data within the framework of contact tracing apps, considered by the European Data Protection Board as “the most relevant legal basis for the processing”³⁹, and used by several EU Member States: the necessity for the performance of a task in the public interest set out in the Art. 6(1)(e) GDPR. Therefore, the processing of data within the app could also be mandatory once a citizen opts to use the app if it is regarded as a necessity for combating the pandemic. However, to be legitimate this legal basis must be established within the legal framework of the Union or a Member State (Art. 6(3) GDPR). Location and duration of storage of data collected through contact tracing apps also appear to be

³⁵ Kerstin N. Vokinger et al., “Digital Health and the COVID-19 Epidemic: An Assessment Framework for Apps from an Epidemiological and Legal Perspective,” *Swiss Medical Weekly* 150, no. 19–20 (May 2020): w20282, <https://doi.org/10.4414/sm.w.2020.20282>.

³⁶ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) [2016] OJ L119/1.

³⁷ IEAI, “Ethics and the Use of AI-Based Tracing”, 1-13.

³⁸ Article 29 Data Protection Working Party. Guidelines on Consent under Regulation 2016/679 (Adopted on 28 November 2017).

³⁹ European Data Protection Board, “Guidelines 04 / 2020 on the Use of Location Data and Contact Tracing Tools in the Context of the COVID-19 Outbreak,” April 21, 2020, https://edpb.europa.eu/sites/edpb/files/files/file1/edpb_guidelines_20200420_contact_tracing_covid_with_annex_en.pdf.

one of the central privacy issues. While the location is determined by choosing a centralized or decentralized model, the period of time for which the data is stored seems to be more obscure. Some apps indicate in their privacy policies that the data will be deleted once the pandemic is over⁴⁰, but it remains unclear who will proclaim that end or how it ought to be done, especially after the experience of a “fourth wave” of the pandemic in Europe bringing new lockdowns and further measures. This issue is particularly sensitive for those apps that use a centralized model and, therefore, store the data on a server, such is the case in France, Hungary, Cyprus, and Bulgaria. Lack of transparency, clear rules and open communication about the app’s features could lead to a loss of public trust and thus undermine the use and, consequently, the effectiveness of the application⁴¹.

Another question worth assessing is the issue of further use of the data and their possible misuse. Where there is technology there is also a danger of technology misuse and abuse or even dual use. In its privacy policy the Maltese app explicitly confirms that “there is a certain likelihood that, when someone is notified of a possible exposure, their recollection of social contacts over recent days may allow them to deduce the identity of the infected individual. (...) As a result of using the app, persons may thus potentially be identified”⁴². In this context, the Common EU Toolbox developed by the European Commission emphasizes a need for strong cyberattack protection, which probably goes without saying. However, the public could also be alarmed if the development of the app lacks transparency or even if its development is partially funded by Chinese investors, which was an issue with Italy’s app⁴³. The misuse could also occur should the data collected through the app be further analysed for different purposes, even by the government and even on a legitimate basis⁴⁴. According to Article 6.4. of the GDPR, different purpose for data processing must be explained before collecting the data. Thus, if the data from the contact tracing apps is to be used for different purposes, that should be emphasized at the outset. The Hungarian app, for example, notifies its users of further processing of the data by the national health authority with the purpose of taking measures necessary in the interests of public health and epidemiology⁴⁵. Considering the value of these data to future research, this approach is not surprising⁴⁶. On the other hand, Norwegian data protection authority issued temporary ban on the processing of

⁴⁰ Austrian red cross, “Datenschutzerklärung-Stopp-Corona-App – Rotes Kreuz,” accessed July 27, 2021, <https://www.roteskreuz.at/datenschutzerklaerung-stopp-corona-app>.

⁴¹ IEAI, “Ethics and the Use of AI-Based Tracing”, 1-13.

⁴² Ministry of Health, “COVID Alert Malta Privacy Policy,” accessed July 27, 2021, https://deputyprimeminister.gov.mt/en/administration-and-communication/Documents/data-protction/Covid_Alert_App_-_Privacy_Policy.pdf.

⁴³ IEAI, “Ethics and the Use of AI-Based Tracing”, 1-13.

⁴⁴ Marielle S Gross, Robert C Miller, and Assya Pascalev, “Ethical Implementation of Wearables in Pandemic Response: A Call for a Paradigm Shift,” Edmond J. Safra Center for Ethics, May 18, 2020, 1–24.

⁴⁵ VirusRadar, “VirusRadar - a Koronavírus Követésére És a COVID-19 Elleni Védekezésre,” accessed July 27, 2021, <https://virusradar.hu/privacy-policy>.

⁴⁶ Michael J. Parker et al., “Ethics of Instantaneous Contact Tracing Using Mobile Phone Apps in the Control of the COVID-19 Pandemic,” *Journal of Medical Ethics* 46, no. 7 (July 1, 2020): 427–31, <https://doi.org/10.1136/medethics-2020-106314>.

personal data collected through the contact tracing app precisely because the data was further processed for analysis and research, concluding that “the app interferes disproportionately in user privacy based on the current transmission rate in Norway, the chosen technical solution and the general support for the app”⁴⁷. This led to a temporary deactivation of the app and erasure of all the collected data.

IV. European legal framework: a failed opportunity?

Considering freedom of movement as one of the four fundamental freedoms of the EU, which was severely hampered by the coronavirus crisis, a common approach to the development of contact tracing apps should have aimed at preventing closing down the borders between the Member States and preserving freedom of movement within the EU. However, the overview from the Table 1. shows that such common approach was more a dream and less a reality.

In terms of policy making, the EU reacted promptly on announcements about the coronavirus tracking apps. With the support of the European Commission most of the Member States who opted for Bluetooth technology combined with decentralised approach agreed on certain technical points⁴⁸. Those are embodied in the Guidelines developed by the eHealth Network, a voluntary cooperative body set up by Member States and Norway⁴⁹. The Guidelines should have enabled interoperability and undisturbed functioning of the apps for users across the EU’s internal borders. Besides those Guidelines and the Resolution issued by the European Parliament, the European Commission also issued the Recommendation on a common Union toolbox for the use of technology and data for combat and exit from the COVID-19 crisis, particularly concerning mobile applications and the use of anonymized mobility data⁵⁰. The Toolbox adopts some main recommendations for a common approach to mobile tracing apps, which range from epidemiologically relevant features, through technical requirements, cybersecurity and safeguards, to necessary prerequisites for cross-border interoperability. Again, one of the main goals of the Toolbox was the adoption of a common EU approach to mobile tracing apps, which would have ensured interoperability and consistency among the apps developed by the Member States. Furthermore, the EU data protection highest authority, the European Data Protection Board (EDPB) issued Guidelines on the use of location data and contact tracing tools in the context of the COVID-19 outbreak⁵¹. The Guidelines recommend using proximity tracing instead of location

⁴⁷ NIPH, “NIPH Stops Collection of Personal Data in Smittestopp,” Norwegian Institution of Public Health, June 15, 2020, <https://www.fhi.no/en/news/2020/niph-stops-collection-of-personal-data-in-smittestopp/>.

⁴⁸ European Commission, “Coronavirus: Member States Agree on an Interoperability,” June 16, 2020, https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1043.

⁴⁹ European Union, “E-Health Network Guidelines,” EU Member States and the European Commission, June 12, 2020, https://ec.europa.eu/health/sites/health/files/ehealth/docs/ev_2019_0611_co922_en.pdf.

⁵⁰ eHealth Network, “Mobile Applications to Support Contact Tracing in the EU’s Fight against COVID-19,” Eu report. Common EU Toolbox for Member States Version 1.0 15.04.2020, April 15, 2020, https://ec.europa.eu/health/sites/health/files/ehealth/docs/covid-19_apps_en.pdf.

⁵¹ European Union, “E-Health Network Guidelines”.

data and they also clearly favour storing data on users' terminal equipment thereby opting for a decentralized approach to data storage.

Although privacy is a heavily debated topic in most of the world countries, it is fair to claim that the EU went one step further in designing a comprehensive legal framework of privacy protection embodied foremostly in the GDPR and directly enforceable in all the EU Member States. In that regard, the apps developed by the Member States dedicated serious effort to preserving privacy by the majority of them opting for the decentralized model and by choosing either consent or public interest as the legal basis for processing the data within the app. However, there are fears that accepting generous help from Apple and Google, who are already planning to integrate their technology directly into their operating systems instead of using it through an application, might have built the foundation for a new era in mass surveillance⁵². By using Apple and Google's APIs most of the Member States accepted the interference of those two giant tech companies in the realm of politics and decision making, which could have unprecedented implications for future governing⁵³, especially in the context of the inexistent common European approach to the development of the apps. Having that in mind, it seems that the centralized model could have been more apt considering the broader danger of privatization of public service⁵⁴.

Even if those fears are unfounded, it is fair to say that the EU missed its chance to use its own technology and resources which could have arguably strengthened the public trust in contact tracing apps. Furthermore, the "made in EU" apps could have ensured interoperability even if each Member State still developed its own app and this could have been a key for preserving the freedom of movement within the EU. Yet, it seems that the second wave prompted some change: according to the European Commission's data, German, Italian, Irish, Latvian, Croatian, Danish and Spanish contact tracing apps are already interoperable, in the sense that they can already "talk" to another app, i.e. exchange data with it⁵⁵. The same source claims potential interoperability that is yet to be established for all other contact tracing apps except French and Hungarian ones which did not envisage the interoperability as its feature. It remains to be seen how this interoperability is going to be implemented in practice, especially having in mind the voluntary character of the apps. Firstly, as already mentioned, the studies show a correlation between the app's effectiveness and its broad usage. It is not probable that governments would invest that much effort, money and time into app development and then leave it all to voluntary acceptance. Secondly, and being especially relevant for the cross-border

⁵² J.H. Hoepman, "Stop the Apple and Google Contact Tracing Platform. (Or Be Ready to Ditch Your Smartphone.)," April 11, 2020, <https://blog.xot.nl/2020/04/11/stop-the-apple-and-google-contact-tracing-platform-or-be-ready-to-ditch-your-smartphone/>.

⁵³ Tamar Sharon, "Blind-Sided by Privacy? Digital Contact Tracing, the Apple/Google API and Big Tech's Newfound Role as Global Health Policy Makers," *Ethics and Information Technology*, July 18, 2020, 1–13, <https://doi.org/10.1007/s10676-020-09547-x>.

⁵⁴ *Ibidem*.

⁵⁵ European Commission, "Mobile Contact Tracing Apps in EU Member States," 2020, https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/travel-during-coronavirus-pandemic/mobile-contact-tracing-apps-eu-member-states_en.

interoperability, it is possible that the Member States would in some way tie freedom of movement in and out of their territory with the contact tracing apps usage. This could undermine the concept of a voluntary approach and make use of the apps mandatory in practice. Although it is not likely that European states would follow the Indian government's approach and exercise coercion on its citizens to use the app⁵⁶, we can almost certainly expect governments advertising, recommending and strongly encouraging the usage of the app, supported by most of the media, institutions, scientific and medical community, celebrities and a wider community. In such an atmosphere not using the app could seem as an act of treason or at least as civil disobedience. That is why governments should not portray the use of contact tracing apps as an all-encompassing, quick, and easy solution for the outbreak⁵⁷. Instead, they should develop frameworks to assess, understand and present clear public benefit in using the contact tracing apps⁵⁸, as a tool that should be used together with other measures and within an elaborated infrastructure for combating the epidemic⁵⁹. Given the known risks and (yet) unknown or uncertain benefits, an adaptive governance with respect to contact tracing apps, implying social learning, reassessment of apps' effectiveness and engaging the public, seems to be reasonable and recommendable approach⁶⁰.

V. Conclusion

Mobile applications have become indispensable for our everyday life in a very short period. We use them for all kinds of purposes, and we got used to having an app as a solution for every problem there is. This is reflected in the rapid development of apps that would search and trace contacts instead of relying on epidemiologists to do it. As usual with the mobile apps, the idea is that the contact tracing apps would save us time and enable us to concentrate on more important things. However, that approach can have downfalls, mainly in terms of giving the impression that governments are doing something to combat the epidemic, but without a clear aim and evaluation of the effectiveness of such apps. After a relatively calm summer, the so-called "second wave" of the coronavirus outbreak in the autumn of 2020 brought some new developments in contact tracing apps in the EU Member States. This particularly concerns the strengthening of interoperability between the apps, which could enable their cross-border functioning within EU territory, thus maintaining freedom of movement as one of the key freedoms of the EU. However, this potential is seriously undermined by the nonexistent common approach of the Member States, testifying to a lack of cooperation and solidarity between them and consequently diminishing the effectiveness of the apps. It seems that beyond privacy, ethical and legal issues there is also a deeper political crisis emerging in this pandemic. The saying

⁵⁶ Morley, "Ethical Guidelines for COVID-19 Tracing Apps", 29–31.

⁵⁷ Federica Lucivero et al., "COVID-19 and Contact Tracing Apps: Ethical Challenges for a Social Experiment on a Global Scale," *Journal of Bioethical Inquiry* 17, no. 4 (2020): 835–39, <https://doi.org/10.1007/s11673-020-10016-9>.

⁵⁸ Gasser, "Digital Tools against COVID-19", e425–34.

⁵⁹ Parker, "Ethics of Instantaneous Contact Tracing, 427–31.

⁶⁰ Blasimme "What's next for COVID-19 Apps?", 760–62.

goes that a friend in need is a friend indeed, and there appears to be little friendship left on the Old Continent.

Acknowledgements

This work was supported by the Croatian Science Foundation (CSF), grant “(New) Ethical and Social Challenges of Digital Technologies in the Healthcare Domain”, grant number UIP-2019-04-3212. The funder had no role in the design of this study and its execution, analyses, interpretation of the data, or decision to submit results.

References

- Abeler, Johannes, Matthias Bäcker, Ulf Buermeyer, and Hannah Zillessen. “Covid-19 Contact Tracing and Data Protection Can Go Together.” *JMIR MHealth and UHealth* 8, no. 4 (2020): e19359. <https://doi.org/10.2196/19359>.
- Andone, Ionut, Konrad Blaszkiewicz, Mark Eibes, Boris Trendafilov, Alexander Markowetz, and Christian Montag. “How Age and Gender Affect Smartphone Usage.” In *UbiComp 2016 Adjunct - Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing*, 9–12. UbiComp ‘16. New York, NY, USA: Association for Computing Machinery, 2016. <https://doi.org/10.1145/2968219.2971451>.
- Austrian red cross. “Datenschutzerklärung-Stopp-Corona-App – Rotes Kreuz.” Accessed July 27, 2021. <https://www.rotekreuz.at/datenschutzerklaerung-stopp-corona-app>.
- Blasimme, Alessandro, and Effy Vayena. “What’s next for COVID-19 Apps? Governance and Oversight.” *Science* 370, no. 6518 (November 2020): 760–62. <https://doi.org/10.1126/science.abd9006>.
- Cohen, Jérémie, Daniël Korevaar, Soraya Matczak, Joséphine Brice, Martin Chalumeau, and Julie Toubiana. “COVID-19-Related Mortality by Age Groups in Europe: A Meta-Analysis.” *Frontiers in Medicine*, 2020, 2020.04.11.20061721. <https://doi.org/10.1101/2020.04.11.20061721>.
- Commission Nationale de l’Informatique et des Libertés. “Délibération N° 2020-046 Du 24 Avril 2020 Portant Avis Sur Un Projet d’application Mobile Dénommée « StopCovid »,” April 24, 2020. <https://www.cnil.fr/fr/publication-de-lavis-de-la-cnil-sur-le-projet-dapplication-mobile-stopcovid>.
- Cuthbertson A. “Coronavirus Apps Let People Avoid High-Risk Locations in South Korea.” Independent, March 3, 2020. <https://www.independent.co.uk/life-style/gadgets-and-tech/news/coronavirus-news-app-south-korea-latest-cases-deaths-location-a9371651.html>.
- Danquah, Lisa O., Nadia Hasham, Matthew MacFarlane, Fatu E. Conteh, Fatoma Momoh, Andrew A. Tedesco, Amara Jambai, David A. Ross, and Helen A. Weiss. “Use of a Mobile Application for Ebola Contact Tracing and Monitoring in Northern Sierra Leone: A Proof-of-Concept Study.” *BMC Infectious Diseases* 19, no. 1 (2019): 810. <https://doi.org/10.1186/s12879-019-4354-z>.

- “Data from Google Play Store Verified on 4 November 2020.” Accessed July 27, 2021. <https://play.google.com/store/movies>.
- Deutsche Welle. “Germany Launches ‘best’ Coronavirus Tracing App.” *Deutsche Welle*, 2020. <https://www.dw.com/en/germanys-coronavirus-tracing-app-criticized-over-warning-failures/a-54305099>.
- eHealth Network. “Mobile Applications to Support Contact Tracing in the EU’s Fight against COVID-19.” *Eu report. Common EU Toolbox for Member States Version 1.0* 15.04.2020, April 15, 2020. https://ec.europa.eu/health/sites/health/files/ehealth/docs/covid-19_apps_en.pdf.
- European Commission. “Coronavirus: Member States Agree on an Interoperability,” June 16, 2020. https://ec.europa.eu/commission/presscorner/detail/en/ip_20_10_43.
- “Mobile Contact Tracing Apps in EU Member States,” 2020. https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/travel-during-coronavirus-pandemic/mobile-contact-tracing-apps-eu-member-states_en.
- European Data Protection Board. “Guidelines 04 / 2020 on the Use of Location Data and Contact Tracing Tools in the Context of the COVID-19 Outbreak,” April 21, 2020. https://edpb.europa.eu/sites/edpb/files/files/file1/edpb_guidelines_20200420_contact_tracing_covid_with_annex_en.pdf.
- European Union. “E-Health Network Guidelines.” *EU Member States and the European Commission*, June 12, 2020. https://ec.europa.eu/health/sites/health/files/ehealth/docs/ev_20190611_co922_en.pdf.
- Eurostat. “Statistics on Regional Typologies in the EU - Statistics Explained,” June 11, 2018. https://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_regional_typologies_in_the_EU#Urban-rural_typology.
- Ferretti, Luca, Chris Wymant, Michelle Kendall, Lele Zhao, Anel Nurtay, Lucie Abeler-Dörner, Michael Parker, David Bonsall, and Christophe Fraser. “Quantifying SARS-CoV-2 Transmission Suggests Epidemic Control with Digital Contact Tracing.” *Science* 368, no. 6491 (May 8, 2020): eabb6936. <https://doi.org/10.1126/science.abb6936>.
- Gasser, Urs, Marcello Ienca, James Scheibner, Joanna Sleight, and Effy Vayena. “Digital Tools against COVID-19: Taxonomy, Ethical Challenges, and Navigation Aid.” *The Lancet Digital Health* 2, no. 8 (August 1, 2020): e425–34. [https://doi.org/10.1016/S2589-7500\(20\)30137-0](https://doi.org/10.1016/S2589-7500(20)30137-0).
- Google, and Apple. “Privacy-Preserving Contact Tracing - Apple and Google.” Apple.com, 2020. <https://covid19.apple.com/contacttracing>.
- Gouvernement of Singapour. “TraceTogether.” Accessed July 27, 2021. www.tracetogether.gov.sg/.
- Gross, Marielle S, Robert C Miller, and Assya Pascalev. “Ethical Implementation of Wearables in Pandemic Response: A Call for a Paradigm Shift.” Edmond J. Safra Center for Ethics, May 18, 2020, 1–24.
- Hoepman, J.H. “Stop the Apple and Google Contact Tracing Platform. (Or Be Ready to Ditch Your Smartphone.)” April 11, 2020. <https://blog.xot.nl/2020/04/11/stop-the-apple-and-google-contact-tracing-platform-or-be-ready-to-ditch-your-smartphone/>.

- Holmes, Aaron, and Hugh Langley. "Apple and Google's COVID-19 Contact-Tracing Tech." *Businessinsider.com*, June 10, 2020. www.businessinsider.com/apple-google-coronavirus-contact-tracing-tech-states-dont-plan-using-2020-6.
- Klößner, Sebastian. "Contact Tracing Joint Statement." Helmholtz Center for Information Security, April 19, 2020. <https://cispa.saarland/de/2020/04/20/joint-statement-on-contact-tracing.html>.
- Loi, Michele. "How to Fairly Incentivise Digital Contact Tracing." *Journal of Medical Ethics*, July 9, 2020, medethics-2020-106388. <https://doi.org/10.1136/medethics-2020-106388>.
- Lucivero, Federica, Nina Hallowell, Stephanie Johnson, Barbara Prainsack, Gabrielle Samuel, and Tamar Sharon. "COVID-19 and Contact Tracing Apps: Ethical Challenges for a Social Experiment on a Global Scale." *Journal of Bioethical Inquiry* 17, no. 4 (2020): 835–39. <https://doi.org/10.1007/s11673-020-10016-9>.
- Manancourt, Vincent, Laurens Cerulus, and Joanosch Delcker. "Tech Feud Complicates EU Search for Coronavirus Tracking App – POLITICO." *Politico*, April 20, 2020. <https://www.politico.eu/article/tech-feud-complicates-eu-search-for-coronavirus-tracking-app/>.
- Máté Julesz, "Health equity and health data protection related to telemedicine amid the COVID-19 pandemic", *Információs Társadalom XXII*, no. 2 (2022): 27–38, <https://dx.doi.org/10.22503/inftars.XXII.2022.2.2>.
- Mello, Michelle M., and C. Jason Wang. "Ethics and Governance for Digital Disease Surveillance." *Science* 368, no. 6494 (May 2020): 951–54. <https://doi.org/10.1126/science.abb9045>.
- Ministry of Health. "COVID Alert Malta Privacy Policy." Accessed July 27, 2021. https://deputyprimeminister.gov.mt/en/administration-and-communication/Documents/data-protection/Covid_Alert_App_-_Privacy_Policy.pdf.
- Morley, Jessica, Josh Cowsls, Mariarosaria Taddeo, and Luciano Floridi. "Ethical Guidelines for COVID-19 Tracing Apps." *Nature* 582, no. 7810 (June 2020): 29–31. <https://doi.org/10.1038/d41586-020-01578-0>.
- NIPH. "NIPH Stops Collection of Personal Data in Smittestopp." *Norwegian Institution of Public Health*, June 15, 2020. <https://www.fhi.no/en/news/2020/niph-stops-collection-of-personal-data-in-smittestopp/>.
- Parker, Michael J., Christophe Fraser, Lucie Abeler-Dörner, and David Bonsall. "Ethics of Instantaneous Contact Tracing Using Mobile Phone Apps in the Control of the COVID-19 Pandemic." *Journal of Medical Ethics* 46, no. 7 (July 1, 2020): 427–31. <https://doi.org/10.1136/medethics-2020-106314>.
- Paul Mozur, Raymond Zhong, and Aaron Krolik. "In Coronavirus Fight, China Gives Citizens a Color Code, With Red Flags - The New York Times." *New York Times*, March 1, 2020. <https://www.nytimes.com/2020/03/01/business/china-coronavirus-surveillance.html>.
- PEPP-PT, Media Information. "Privacy Protecting Proximity Tracing to Fight Corona," April 1, 2020. <https://www.ga4gh.org/wp-content/uploads/2020-04-01-PEPP-PT-Press-Realease.pdf>.

- República Portuguesa. “Comunicado Do Conselho de Ministros de 22 de Outubro de 2020,” October 31, 2020. <https://www.portugal.gov.pt/pt/gc22/governo/comunicado-de-conselho-de-ministros?i=376>.
- Sharon, Tamar. “Blind-Sided by Privacy? Digital Contact Tracing, the Apple/Google API and Big Tech’s Newfound Role as Global Health Policy Makers.” *Ethics and Information Technology*, July 18, 2020, 1–13. <https://doi.org/10.1007/s10676-020-09547-x>.
- Tidy, Joe. “Coronavirus: Israel Enables Emergency Spy Powers.” BBC News, March 17, 2020. <https://www.bbc.com/news/technology-51930681>.
- TUM Institute for Ethics in Artificial Intelligence (IEAI). “Ethics and the Use of AI-Based Tracing Tools to Manage the COVID-19 Pandemic” 17, no. June (June 2020): 1–13. https://ieai.mcts.tum.de/wp-content/uploads/2020/06/Research-Brief_ContactTracingAppsFinal-1.pdf.
- VirusRadar. “VirusRadar - a Koronavírus Követésére És a COVID-19 Elleni Védekezésre.” Accessed July 27, 2021. <https://virusradar.hu/privacy-policy>.
- Vokinger, Kerstin N., Vasileios Nittas, Claudia M. Witt, Sara Irina Fabrikant, and Viktor Von Wyl. “Digital Health and the COVID-19 Epidemic: An Assessment Framework for Apps from an Epidemiological and Legal Perspective.” *Swiss Medical Weekly* 150, no. 19–20 (May 2020): w20282. <https://doi.org/10.4414/smw.2020.20282>.
- Wang, Shaoxiong, Shuizi Ding, and Li Xiong. “A New System for Surveillance and Digital Contact Tracing for COVID-19: Spatiotemporal Reporting over Network and GPS.” *JMIR MHealth and UHealth* 8, no. 6 (June 10, 2020): e19457–e19457. <https://doi.org/10.2196/19457>.
- World Health Organization. “WHO Coronavirus (COVID-19) Dashboard With Vaccination Data.” World Health Organization, 2021. <https://covid19.who.int/%0Ahttps://covid19.who.int/region/searo/country/bd>.
- World Health Organization, WHO. “WHO Director-General’s Opening Remarks at the Media Briefing on COVID-19 - 11 March 2020.” WHO Director General’s speeches, March 11, 2020. <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>.