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In Favour of a Legal Obligation to Use Contact Tracing Apps

Health Protection and Less Interference with Fundamental Rights Outweigh Data Protection Concerns

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Despite various lockdowns, the number of COVID-19 infections in the EU remains very high. In order to break the chains of infections and to end the restrictions on the free movement of people, services, and goods, the use of contact tracing apps should be made mandatory. The positive effects prevail over data protection concerns.

Key Propositions

- The wider the use of contact tracing apps, the more likely it is that the pandemic will be contained. The ongoing vaccinations do not change this. The current use of the apps is insufficient.
- Given the current circumstances, Member States should oblige their citizens to use contact tracing apps that do not collect personal data.
- It protects EU citizens and helps to get the pandemic under control. It helps to prevent further lockdowns and to quickly end limitations on fundamental rights, especially of the freedom of movement and freedom to conduct a business.
- The positive effects on health, the economy and fundamental rights far outweigh the limitation on data protection, especially since most apps used in Europe do not collect personal data.
- National apps should be compatible across the EU. This makes national restrictions on the cross-border freedom of movement unnecessary.
- Art. 15 of the e-Privacy Directive prohibits a legal obligation to use contact tracing apps – even in times of a pandemic. The EU should quickly change this ("quick-fix").

Content

1 Introduction

There is currently widespread consensus that contact tracing is one of the main tools for breaking chains of infection and therefore crucial to fighting a pandemic.[1] Yet, contact tracing is controversial as it involves the reconstruction of the whereabouts of citizens – a highly private issue in a free society.[2]

The EU Commission states that all Member States should have an app and uptake of this app should be promoted through communication at EU and national level.[3] It recommends the voluntary use of contact tracing apps.[4] This is strongly supported by the European Data Protection Board (EDPB)[5] – it notes that there should not be any negative consequences for individuals not using the app.[6]

So far, 23 EU Member States, including Germany, have introduced contact tracing apps which have been downloaded by about 50 million Europeans.[7] The contact tracing apps launched in Germany and in a number of EU Member States are "proximity tracing apps"[8].Their main purpose is proximity tracing in order to alert people who have been in contact with infected individuals so that transmission chains can be broken.[9] Proximity tracing apps measure signal strength between devices to determine the proximity between users, in order to establish whether the virus could be spread based on this proximity. If a user of the app gets infected, other users of the app, who have been in proximity to the infected user can be notified.[10] This happens when the infected user shares the information that he/she is infected with a virus in order to warn others.[11] These apps can function without transmitting any personal data.[12] Therefore, according to the EU Commission, such apps – compared to so-called "location data recording" apps – are preferable in terms of security and privacy risks as well as the principle of data minimisation.[13]

The development, maintenance and improvement of contact tracing apps takes up significant resources. The costs do vary, but can be high: For example, the development of the COVID-19 contact tracing app in Germany cost around € 20 million with operational costs between € 2.5 and € 3.5 million

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1 European Commission (2020), "Communication on additional COVID-19 response measures", p. 4; Robert Koch Institute (2020), "Leitfaden für den Öffentlichen Gesundheitsdienst zum Vorgehen bei Häufungen von COVID-19", p. 10; Robert Koch Institute (2020), "Interrupt chains of infection digitally with the Corona-Warn-App"; World Health Organization (2020), "Coronavirus disease (COVID-19) : Contact tracing" (all sources of this cep**Input** were last accessed 18 Jan. 2021).

2 Bengio, Y. et al. (2020), "The need for privacy with public digital contact tracing during the COVID-19 pandemic", in: The Lancet Digital Health, Vol. 2, Issue 7, p. e343.

3 European Commission (2020), Communication on additional COVID-19 response measures" , p. 4.

4 European Commission (2020), "Guidance on Apps supporting the fight against COVID 19 pandemic in relation to data protection", p. 5.

5 The EDPB is a body composed of representatives of the national data protection authorities, and the European Data Protection Supervisor, which contributes to the consistent application of data protection rules in the EU and promotes cooperation between the EU's national data protection authorities; see European Data Protection Board (2020) "About EDPB".

6 EDPB (2020), "Letter from EDPB to EC" p. 2.

7 European Commission (2020), "Communication on additional COVID-19 response measures", p. 4; European Commission (2021), "Mobile contact tracing apps in EU Member States"; Council of Europe (2020), "Digital solutions to fight COVID-19: 2020 data-protection report", p 27-28. 50 million is the number as of 28 October 2020.

8 In this cepInput the term "proximity tracing app" is used for these apps. There is no agreed term for these kinds of apps.

9 European Centre for Disease Prevention and Control (2020), "Mobile Applications in support of contact tracing for COVID-19 - A guidance for EU/EEA Member States", p. 9.

10 World Health Organization (2020), "Ethical Considerations to guide the use of digital proximity tracking technologies for Covid-19 Contact tracing; Interim Guidance", p. 1.

11 European Commission (2020), "Coronavirus: EU interoperability gateway for contact tracing and warning apps – Questions and answers".

12 Contact tracing apps under EU personal data protection law (cepAdhoc), p. 1.

13 European Commission (2020), "Guidance on Apps supporting the fight against COVID 19 pandemic in relation to data protection", p. 5.

per month.[14] However, all of these costs are insignificant compared with the overall burden of the pandemic on society. At the same time, the effects of a contact tracing app will be limited if usage of such an app is voluntary and too few citizens use it.[15]

Broad coverage is needed, if such apps are to play their role in controlling the spread of a virus.[16] According to a model developed by the Oxford University Big Data Institute, around 60% of the population must download an app in order to bring about a significant reduction in the spread of a virus, whereas a lower uptake will only slow it down .[17] Yet – and the experience of 2020 confirms this – an uptake of 60% or more of the population is highly unlikely on a voluntary basis.[18] This is demonstrated by the current number of downloads of national contact tracing apps: Depending on the EU Member State, downloads range between less than 10% to up to 50% of the population, with Ireland and Finland[19] at the higher end of the scale.[20] Considering the low number of downloads and further usage of such apps, the failure to introduce a mandatory contact tracing app represents a missed opportunity to contain the spread of the virus more effectively.

It may be appropriate for EU Member States to strive for a higher uptake of contact tracing technologies. The first approach would be to conduct convincing information campaigns.[21] However, during a pandemic, when time is of the essence, EU Member States should also be able to make it obligatory to use a contact tracing app. This could – and should – be limited to the duration of a pandemic. Contact tracing apps could effectively help break chains of infection thereby significantly reducing the death toll and long-term health problems of those who have been infected. They could also ease the burdens on health care systems and allow for less dramatic economic consequences and infringements of other civil rights. This is the case even when vaccination is happening, as the process of vaccinating all citizen takes time, is logistically complex and not everyone wants to be vaccinated.[22]

This cep**Input** evaluates how contact tracing apps work (Section 2) and if it is possible for an EU Member State to make it obligatory to use such apps (Section 3). It aims to foster a debate on the issue, looking at public health, economic considerations and proportionality (Sections 4 and 5). Conclusions are drawn in Section 6.

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14 Oude Egberink, J. (2020), "Duitsland lanceert Corona-tracing app".

15 Harvard Business Review (2020), "How to Get People Actually Use Contact-Tracing apps".

16 European Commission (2020), "Communication on additional COVID-19 response measures", p. 4.

17 Hinch, R. et al. (2020), "Effective Configurations of a Digital Contact Tracing app: A report to NHSX", p. 3 and p. 18; Kaya, E.K., (2020), "Safety and Privacy in the time of Covid-19: contact tracing applications ", p. 7.

18 Klar, R. et al. (2020), "The Ethics of COVID-19 tracking apps – challenges and voluntariness", In: Research ethics, Vol. 16, Issue 3-4, p. 3.

19 As of 19 November 2020, Finland had an uptake of about 50% of the population; see: Deutsche Welle (2020) "Warum Finnland die Corona-Krise gut meistert". As of 21 October 2020, Ireland had an uptake of more than 40% of the population. This number is based on 2.1 million downloads, with a population of 4,941,444 in 2019.see; Irish Government, Department of Health (2020),"Ireland is one of the first countries to link contact tracing apps with other EU Member States"; World Bank (2021) "Population, total – Ireland".

20 AP News (2020), "As Europe faces 2nd wave of virus, tracing apps lack impact"; European Commission (2020), "Coronavirus: EU interoperability gateway for contact tracing and warning apps – Questions and answers"; Ada LoveLace Institute (2020), "Digital contact tracing tracker".

21 See e.g. University of Frankfurt (2020), "Studie untersucht Einflussfaktoren auf die Bereitschaft, die Corona-Warn-App zu installieren".

22 BBC News (2020), "Europe's slow start: How many people have had the Covid vaccine?".

2 How Contact Tracing Apps Work

How contact tracing apps work varies between countries, particularly in terms of data usage and the location of data storage. As a result, the impact of the apps on privacy and data-protection also varies. Most Southeast Asian countries, for example China and South Korea, use apps which track location, whereas most apps in the EU are proximity based and do not track location.

2.1 Contact Tracing Apps in Europe

Public health authorities in the EU, including Germany[23], have developed contact tracing and warning apps in the fight against COVID-19, which take account of privacy.[24] As a result, most apps do not use any location data or track movement,[25] and individuals cannot be identified.[26] A more privacy intrusive app introduced in Norway was banned by the Norwegian Data Protection Authority (DPA) due to data protection concerns. According to the DPA, the impact on privacy was disproportionate as the app used GPS location which was then uploaded and stored in a central database.[27]

Proximity tracing apps generally work by informing users if they have been close to other app users who are confirmed to be infected with COVID-19. In technical terms, the app generates random "keys", multiple times a day, on the users' smartphones. These keys are exchanged between smartphones within a certain proximity via Bluetooth. They are stored on the smartphones for 14 days and then deleted automatically.[28] The Bluetooth Low Energy[29] key (also called a code) does not contain any information about the users or their devices.[30]

This means individuals who are tested positive for COVID-19 can share this information to warn people who have been in close proximity to them. This is done by sharing the keys – which have been generated during the last 14 days – with the backend server[31] of the national app. Based on the keys received, each app calculates the "risk score" of other users, who may then receive an alert if there is a risk of infection.[32]

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23 In Germany the Corona-Warn-App is published by the Robert Koch Institut (RKI) on behalf of the German Government; see: Robert Koch Institut (RKI) (2020), "Interrupt chains of infections digitally with the Corona-Warn-App".

24 European Commission (2020), "Coronavirus: EU interoperability gateway for contact tracing and warning apps – Questions and answers".

25 The apps in Bulgaria and Cyprus use location data; see ViruSafe and RiseUp GOVTRACER.

26 European Commission (2020), "Coronavirus: EU interoperability gateway for contact tracing and warning apps – Questions and answers".

27 digital health (2020), "Norway forced to backtrack on mass surveillance track and trace app".

28 European Commission (2020), "Coronavirus: EU interoperability gateway for contact tracing and warning apps – Questions and answers".

29 Bluetooth Low Energy is a medium range wireless technology and lightweight set of Bluetooth, to exchange information between smartphones; see Cunche, M. et al. (2020), "On using Bluetooth-Low-Energy for contact tracing", p. 1 et seq.

30 European Commission (2020), "Coronavirus: EU interoperability gateway for contact tracing and warning apps – Questions and answers".

31 The data is stored on secure backend servers, managed by national authorities. All data that is stored on a device or a server is deleted after 14 days; see EU Commission (2020), "Coronavirus: EU interoperability gateway for contact tracing and warning apps – Questions and answers", see para. 1 on "Using coronavirus tracing and warning apps"

32 European Commission (2020), "Coronavirus: EU interoperability gateway for contact tracing and warning apps – Questions and answers".

Most apps in the EU, including Germany, work on the basis of a decentralized model whereby the keys of the contacts are stored on the phone.[33] In a centralized[34] system, a central server receives the keys of the contacts collected by users confirmed to have COVID-19, and the server matches the contacts to alert users at risk. Both are viable options although the decentralized option is more compatible with the principle of data minimization and gives users more control over their information as it is kept on their phone.[35] The EU Commission's guidance[36] suggests that contact tracing apps should be deactivated once the pandemic is under control.[37] One single app, which could be used in all EU Member States, would be the preferred option. Therefore, Member States have worked on an interoperability solution for national contact tracing apps. This allows users to use their national app when travelling to other EU Member States. The Commission has set up an interoperability gateway service, which links national apps based on a decentralised model across the EU by allowing the exchange of information between the national backend servers.[38] Germany, Ireland and Italy were the first three countries which had their apps linked via this gateway in October 2020.[39]

2.1.1 Contact Tracing App in Germany

The German contact tracing app (called "Corona-Warn-App") does not track the location of a user at any point in time. The app uses Bluetooth technology to measure the distance and duration[40] of the encounter between two app users. Temporarily encrypted random identifications (IDs) are exchanged between the devices. If an app user gets a positive result from a COVID-19 test, that user can inform others on a voluntary basis. The random IDs of the person diagnosed with COVID-19 are made available to all people who are using the app. The app will then check whether the other users had contact with the user diagnosed with COVID-19. The app differentiates between different levels of risk which are calculated based on duration and distance with the infected person as well as the transmission risk[41]. This check is only performed on the individual's smartphone. If there is a risk of infection, a warning as well as recommendations for action will be displayed on the app.[42]

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[33] European Commission (2020), "Coronavirus: EU interoperability gateway for contact tracing and warning apps – Questions and answers".

[34] Bulgaria, Cyprus, France, Hungary and the Slovak Republic have a centralized system. See: Council of Europe (2020), "Digital solutions to fight COVID-19: 2020 data-protection report", p 27-28.

[35] EBDP, (2020), "Guidelines 04/2020 on the use of location data and contact tracing tools in the context of the COVID-19 outbreak", p. 9; European Commission (2020) "Guidance on Apps supporting the fight against COVID 19 pandemic in relation to data protection", p. 7.; BBC News (2020), "Corona contact tracing: World split between two types of app".

[36] The guidance is not legally binding and only applies to voluntary apps.

[37] European Commission (2020), "Guidance on Apps supporting the fight against COVID 19 pandemic in relation to data protection", p. 2.

[38] European Commission (2020), "Coronavirus: EU interoperability gateway for contact tracing and warning apps – Questions and answers", European Commission (2020); "Coronavirus: European Commission starts testing interoperability gateway service for national contact tracing and warning apps"; European Commission (2020), "Coronavirus: Member States agree on an interoperability solution for mobile tracing and warning app".

[39] European Commission (2020), "How tracing and warning Apps can help during the pandemic".

[40] Within about 2 meters and for 15 minutes or longer data will be exchanged via Bluetooth. see: Ritzer, C. et al. (2020),"Contact tracing apps in Germany: A new world for data privacy", p.1.

[41] The Robert Koch Institut (RKI) uses criteria to determine the risk of infection. The risk assessment includes the evaluation of: (1) how long ago the user met with a COVID-19-positive person, (2) how long the contact lasted, (3) how close the persons came to each other, (4) the transmission risk of the corona positive person; see Robert Koch Institut (2020), "Interrupt chains of infection digitally with the Corona-Warn-App."

[42] The German Federal Government (2020), "Corona virus warning app"; Robert Koch Institut, "Interrupt chains of infection digitally with the Corona-Warn-App".

In Germany the uptake of this app is around 30%[43] of the population.[44] Opinion polls[45] show that the app is rejected by 44% of the German population, and of those who use it, only 60% enter positive test results themselves.[46] Considering these numbers, based on the findings of the Oxford Study[47], the voluntary app is unlikely to be sufficiently effective.[48]

2.1.2 Contact Tracing App in France

France relaunched a contact tracing app called "TousAntiCovid" on 22 October 2020. It is an updated version of the "StopCovid" app.[49] This app uses Bluetooth to identify nearby users. It does not collect the location or movement of its users. If a user has been in proximity[50] to others, the app records their crypto identifiers which are stored on the phone and a central Government server. When users test positive, they are given a one-time code with their test result, which they can use to warn other users who have been close to them. The app sends the proximity history (the crypto identifiers) to a central server of the health authority. Each device with an app regularly checks with the central server to see if there are any matches with those who are infected or at risk of infection. Users at risk receive an alert which indicates if they have been close to an infected user and the measures they need to take.[51] France is one of few EU Member States[52] using a centralized system, in which data from a phone is sent to a central government server for matching.[53] About 18% of the population have downloaded the app.[54]

2.1.3 Contact Tracing App in Italy

Italy's contact tracing app "Immuni" uses Bluetooth data and does not collect any data on location or track movement. Users of the app exchange codes between their devices when they are in proximity to each other. These codes register the contact and are stored on the users' devices. The duration of the contact and the strength of the Bluetooth signal are also recorded. Users with a positive COVID-19 test can inform other users by sharing their random codes, which are then automatically checked by the other app users. If there is a risk of infection based on proximity and duration of the contact, users

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43 This is the number as of 8 January 2021, based on the total number of downloads which is 24.9 million. See Robert Koch Institut (2021), "Kennzahlen zur Corona-Warn-App" . The total population of Germany in 2019 is used which is 83,132,799; see The World Bank (2020), "Population, total – Germany".

44 Robert Koch Institut (2021), "Kennzahlen zur Corona-Warn-App" ; The World Bank (2020), "Population, total – Germany".

45 This refers to research conducted by the opinion research institute Infratest Dimap on behalf of the German Council of Economic Experts; see Welt (2020), "Mehr als die Hälfte der Deutschen verweigert Nutzung der Corona-Warn-App".

46 Welt (2020), "Mehr als die Hälfte der Deutschen verweigert Nutzung der Corona-Warn-App".

47 The Oxford Study says that the virus can be suppressed if 56% of the population uses the app and the number of cases can be reduced if fewer people use the app. See: Hinch, R. et al. (2020), "Effective Configurations of a Digital Contact Tracing app: A report to NHSX", p. 3 and p. 18.

48 Hinch, R. et al. (2020), "Effective Configurations of a Digital Contact Tracing app: A report to NHSX", p. 3 and p. 18.

49 Reuters (2020), "French Covid app needs more downloads to be effective: minister"; Healthcare IT News (2020), "France launches new contact tracing app, TousAntiCovid". The "StopCovid" app did not work well.

50 Within 2 meters for at least 15 minutes or within a distance of 1 meter for at least 5 minutes. See Gouvernement Francais (2020), "Application TousAntiCovid".

51 Ministère des Solidarités et de la Santé (2020), "TousAntiCovid: réponses à vos questions"; Gouvernement Francais (2020), "Application TousAntiCovid"; Martin, N. et al. (2020), "Contact tracing apps in France: A new world for data privacy", p. 2; Orange Pro (2020), "Comment fonctionne l'application TousAntiCovid".

52 Bulgaria, Cyprus, Hungary and the Slovak Republic also have a centralised system. See: Council of Europe (2020), "Digital solutions to fight COVID-19: 2020 data-protection report", p 27-28.

53 BBC News (2020), "Corona contact tracing: World split between two types of app"; Healthcare IT News (2020), "France launches new contact tracing app, TousAntiCovid"; BBC News (2020), "French Covid app relaunches to bumpy start"; Council of Europe (2020), "Digital solutions to fight COVID-19: 2020 data-protection report", p 27-28.

54 The World Bank (2020), Population, total – France "Population, total – France"; number of downloads provided by the "TousAntiCovid" app.

receive a notification and recommendation on what actions to take.[55] The app has been downloaded by about 19% of the population.[56]

2.2 Contact Tracing Apps in Southeast Asia

Some countries in Southeast Asia, in particular South Korea, Singapore, China and Taiwan, have been successful in using contact tracing apps and other surveillance technologies, to reduce the number of COVID-19 infections.[57] Contact tracing apps and other surveillance technologies are used together with other measures such as testing, self-isolation and social distancing.[58]

Singapore was the first country in the world to introduce a Bluetooth-based app.[59] Its "TraceTogether" app does not track locations or contacts. Any user who has been within two meters of an infected person for at least 30 minutes can be identified and receives a notification.[60] If users get infected with COVID-19, they must[61] grant the Singapore Ministry of Health access to gather their "TraceTogether" Bluetooth proximity data in order to contact people who have had close contact with them.[62] The Bluetooth data is only stored on the phone and shared with the Ministry of Health if a person is tested positive for COVID-19.[63] Once infected users release their data, the user IDs of those who have been in contact with them will be identified by the Singaporean Government.[64] Once the pandemic is over, the app will be discontinued.[65]

The "TraceTogether" token extends the protection provided by digital contact tracing tools to people who may not own or prefer not to use a mobile phone for contact tracing. It is a physical device which works like the "TraceTogether" app and exchanges Bluetooth signals with other nearby Trace Together mobile apps and "TraceTogether" tokens. People can choose between using the "TraceTogether" app

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55 Immuni (2020), "FAQ: Do you have any questions?".

56 Immuni (2021), "The numbers of immuni".

57 The Lancet Digital Health (Editorial) (2020), "Contact tracing: digital health on the front line", in: The Lancet Digital Health, Vol. 2, Issue 11, p. e561; Bradford, L. et al. (2020), "COVID-19 tracing apps: a stress test for privacy, the GDPR, and data protection regimes", in: Journal of Law and the Biosciences, Vol. 7, Issue 1, p. 1; Summers, J. et al. (2020) "Potential lessons from the Taiwan and New Zealand health responses to the COVID-19 pandemic", in: Lancet Regional Health - Western Pacific, Issue 4, p. 4.

58 The Conversation (2020), "Digital contact tracing 's mixed record abroad spells trouble for US efforts to rein in COVID-19"; Summers, J. et al. (2020), "Potential lessons from the Taiwan and New Zealand health responses to the COVID-19 pandemic", in: Lancet Regional Health - Western Pacific, Issue 4, p. 1; Tibbetts, J. H. (2020) "Researchers Continue Quest to Contain Spread of COVID-19: Digital technologies aim to accelerate contact tracing", in: BioScience, Vol. 70, Issue 8, p. 634.; Han, E. et al. (2020), "Lessons learnt from easing COVID-19 restrictions: an analysis of countries and regions in Asia Pacific and Europe", in: The Lancet Health Policy, Issue 20261, Vol. 396, p. 1527 and p. 1529 – 1531; Skoll, D. et al. (2020), "COVID-19 testing and infection surveillance: Is a combined digital contact-tracing and mass-testing feasible in the United States?", in: Cardiovascular Digital Health Journal, p. 3.

59 Kaya, E.K., (2020), "Safety and Privacy in the time of Covid-19: contact tracing applications ", p. 5.

60 Klimburg, A. et al. (2020), "Pandemic Mitigation in the Digital Age: Digital Epidemiological Measures to Combat the Coronavirus Pandemic", p. 21.

61 It is a crime in Singapore not to assist the Ministry of Health in mapping one's movements.

62 Goggin, G. (2020), "COVID-19 apps in Singapore and Australia: reimagining healthy nations with digital technology", in: Extraordinary Issue: Coronavirus, Crisis and Communication, p. 3-4; Cho, H. et al., "Contact Tracing mobile Apps for COVID-19: Privacy Considerations and Related Trade-offs", p. 2.

63 Singapore Government(2020), "TraceTogether FAQs".

64 Cho, H. et al, "Contact Tracing mobile Apps for COVID-19: Privacy Considerations and Related Trade-offs", p. 2. Cramer, S. et al. (2020), "Contact tracing apps in Singapore: A new world for data privacy", p.2.

65 Singapore Government (2020), "TraceTogether FAQs".

or the "TraceTogether" token.[66] Besides the app and the token, Singapore uses video camera footage and credit card records for the purpose of contact tracing.[67]

About 74%[68] of the population downloaded the app.[69] The app is currently mandatory for certain foreign workers.[70] The "TraceTogether" app or the "TraceTogether" token will be a mandatory requirement to enter public venues, including schools, workspace, shopping malls and restaurants from early 2021.[71]

South Korea and China use apps which are more privacy invasive compared to the app used in Singapore, as they use GPS-location data.[72] South Korea, for example, makes extensive use of GPS tracking and location-based apps. The "Corona 100m" app makes use of provider-based telecom data and alerts users if they come within 100 meters of a location visited by an infected person. The South Korean government also created a GPS-enabled app that sets off an alarm if patients in quarantine go outside.[73] South Korea's digital contact tracing has been effective also because it is combined with widespread and easily available testing, interview-based traditional tracing, and isolation of infected people and their contacts.[74] The World Health Organization regards a combination of these measures with campaigns encouraging people to avoid large gatherings as effective in reducing the spread of COVID-19.[75] In China, the Alipay "Health Code" app is mandatory for any kind of movement outside homes. The app uses a color-coded QR system for contact tracing. A green QR code is required for entering supermarkets and making use of public services and public transportation.[76] It is not known what data is being used to determine the health status on the app, but it is likely to include location data, self-reported health data and the national identity number.[77]

Taiwan discussed introducing a contact tracing app[78] but currently uses manual contact tracing via interviews with those infected with COVID-19 to determine their location and contacts over the past 14 days. A movement map is then created based on the phone data. By law, those infected are required to provide their contacts and location to medical staff.[79] The average number of contacts identified

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66 Singapore Government (2020), "Protecting more people with the TraceTogether token; today (2020), "Explainer, How the TraceTogether token works, where to collect it".

67 Ada LoveLace Institute (2020), "Exit through the App Store?'; A rapid evidence review on the technical considerations and societal implications of us-ing technology to transition from the COVID-19 crisis", p. 20.

68 This number is based on total number of users of the app, which is 4.2 million; see Singapore Government (2021), "TraceTogether safer together". Total number of population in 2019 is used, which is 5,703,569; see The World Bank (2020), "Population, total – Singapore".

69 The World Bank (2020), "Population, total – Singapore"; Singapore Government (2021) "TraceTogether safer together".

70 Singapore Government (2020), "TraceTogether FAQs".

71 The Straits Times (2020), " Coronavirus: contact tracing, Use of TraceTogether app or token mandatory by end of Dec"; Singapore Government (2020), "Moving into Phase 3 of Re-Opening on 28 December 2020".

72 Kaya, E.K., (2020), "Safety and Privacy in the time of Covid-19: contact tracing applications ",p. 5.; European Parliament (2020) "Covid-19 tracing apps: ensuring privacy and use across borders"; The Conversation (2020), "Digital contact tracing 's mixed record abroad spells trouble for US efforts to rein in COVID-19".

73 Klimburg, A. et al. (2020), "Pandemic Mitigation in the Digital Age: Digital Epidemiological Measures to Combat the Coronavirus Pandemic", p. 22.

74 Tibbetts, J. H. (2020), "Researchers Continue Quest to Contain Spread of COVID-19: Digital technologies aim to accelerate contact tracing", in: BioScience, Vol.70, Issue 8, p. 634.

75 World Health Organization (2020), "WHO Director-General's opening remarks at the media briefing on COVID-19 - 18 March 2020".

76 Klimburg, A. et al. (2020), "Pandemic Mitigation in the Digital Age: Digital Epidemiological Measures to Combat the Coronavirus Pandemic", p. 22.

77 Ada LoveLace Institute (2020), "Exit through the App Store?'; A rapid evidence review on the technical considerations and societal implications of using technology to transition from the COVID-19 crisis", p. 19.

78 Forum Privatheit (2020), "The Role of Digital Tools in Taiwan's Response to Covid-19".

79 Martin, N. (2020), "Corona-Eindämning in Taiwan: Nur digitale Tools?", p. 815.

per infected case is 17, which is significantly higher than in other countries[80].[81] Occasionally, Taiwan uses mass contact tracing via mobile phone messages using cell tower-data.[82]

3 Mandatory Contact Tracing Apps in Member States under EU law

The legality of digital contact tracing under EU law, as far as data processing and restrictions of privacy are concerned, must be assessed in reference to the General Data Protection Regulation (GDPR)[83] and the E-Privacy Directive.[84] A proximity recording app can operate without personal data, which means that the related data processing falls outside the scope of the GDPR.[85] The E-Privacy Directive applies and requires the user's prior consent in order for an app to store information on the user's smartphone or to access information already stored on it. Thus, the E-Privacy Directive represents an obstacle to the introduction of a national obligation to use a proximity tracing app in EU Member States.[86]

3.1 Restrictions of the E-Privacy Directive

The E-Privacy Directive harmonises the provisions of the Member States required to ensure an equivalent level of protection of fundamental rights and freedoms, and in particular the right to privacy with respect to the processing of personal data in the electronic communication sector.

Regarding contact tracing apps, Art. 5 E-Privacy Directive applies because such apps store information on the user's device and enable access to information already stored on it. Under the directive, this is only allowed with the consent of the user. This consent must be "freely given".[87] The fact that the user's freely given consent is required for the full functioning of such an app prevents Member States from making its use mandatory and the E-Privacy Directive does not empower them to do so based on public health considerations.[88]

At first glance, Article 15 E-Privacy Directive may provide a suitable legal basis for Member States to introduce an obligation to use a proximity tracing app: it allows them to restrict the scope of certain guarantees (e-privacy rights) granted to users of information society services – in this case, apps – under certain conditions for reasons of, inter alia, national security, defence and public security.[89] Yet, this list of reasons to restrict e-privacy rights does not include "public health", and the other reasons found in Art. 15 E-Privacy Directive do not cover the introduction of an obligation to use a proximity

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80 In France the number of identified contacts per case is 1.4. See: Nature (2020), "Why many countries failed at COVID contact tracing - but some got it right".

81 Nature (2020), "Why many countries failed at COVID contact tracing - but some got it right".

82 Martin, N. (2020), "Corona-Eindämning in Taiwan: Nur digitale Tools?", p. 815.

83 Regulation on the protection of natural persons with regard to the processing of personal data and on the free movement of such data [(EU) 2016/679].

84 Directive concerning the processing of personal data and the protection of privacy in the electronic communications sector [(EC) 2002/58].

85 In this regard see: Contact tracing apps under EU personal data protection law (cepAdhoc), p. 5 et seq. and p. 8. See also Samardzic, D. / Becker, T. (2020), "Die Grenzen des Datenschutzes – Der beschränkte Schutz durch Freiwilligkeit und Einwilligung bei Corona-Apps", in: EuZW 2020, p. 648. Yet, the GDPR also includes the possibility to derogate from data protection rights for public health reasons; Art. 9 (2) (i) and Art. 23 (1) (e) GDPR; see also Recital 54 and 112 GDPR. See to this regard also Kühling, J. / Schildbach, R. (2020), "Corona-Apps – Daten- und Grundrechtsschutz in Krisenzeiten", in: NJW 2020, p. 1548 et seq., coming inter alia to the conclusion that the broad opening clause of Art. 9 (2) (i) GDPR makes a national regulation (i.e. the introduction of a contact tracing app without consent of the user) possible in principle under certain further preconditions; see p. 1550.

86 See Contact tracing apps under EU personal data protection law (cepAdhoc) , p. 1 and p. 8.

87 Contact tracing apps under EU personal data protection law (cepAdhoc), p. 8.

88 See accordingly: Contact tracing apps under EU personal data protection law (cepAdhoc), p. 8.

89 See also Contact tracing apps under EU personal data protection law (cepAdhoc), p. 7.

tracing app because the list is exhaustive and Art. 15 E-Privacy Directive is subject to strict interpretation.[90]

3.2 Possible Amendment to the E-Privacy Directive by Way of a "Quick fix"

Article 15 E-Privacy Directive could be amended to include a new reason for limiting the said guarantees, namely to safeguard for "reasons of public interest in the area of public health, such as contact tracing of contagious diseases, in times of an epidemic or pandemic[91]". This may serve as a valid legal basis under the E-Privacy Directive for Member States to make it obligatory to use a contact tracing app to safeguard the population against infection by a virus, thus helping to prevent the spread of a contagious disease. The condition "in times of" should cover the requirement for such an obligation to be discontinued when the epidemic or pandemic is over. This can be protected e.g. by connecting it to a resolution of a national parliament.[92] Naturally, the other conditions of Art. 15 E-Privacy Directive will have to be met, inter alia, that such a limitation must constitute a necessary, appropriate and proportionate measure within a democratic society.

In view of the need for a secure legal basis and the political will to discuss necessary changes, the EU Commission, European Parliament and the Council could agree on a "quick fix"[93] of the E-Privacy Directive: Art. 15 could be amended to include a reference to public health, specifically in order to allow for contact tracing of contagious diseases in times of an epidemic or pandemic. This would enable the Member States to introduce an obligation to use a contact tracing app. Such a reference would not go beyond that which is necessary to introduce a valid legal basis while ensuring that the other conditions of the said provision still apply to safeguard e-privacy rights. Thus, a secure legal basis is possible, it can be formulated very specifically and can in principle be introduced promptly.

4 Public Health and Economic Issues as Arguments for Contact Tracing

As the legal assessment has shown, Member States may not currently impose an obligation to use a proximity tracing app. If the proposed amendment of the E-Privacy Directive is adopted, the Member States will need to evaluate whether to use the leeway to fight an epidemic or pandemic in their specific situation. Such an evaluation must consider whether a mandatory contact tracing app meets the standards of proportionality. It may be proportionate if, in an overall assessment considering all legitimate interests, the objective of the protection of public health (4.1) prevails over economic interests (4.2) and represents a proportionate measure (4.3).

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[90] According to the Court of Justice of the EU (CJEU); see altogether Contact tracing apps under EU personal data protection law (cepAdhoc), p. 7.

[91] For Member States, both situations are equally challenging: An epidemic is the occurrence in a community or region of cases of an illness, specific health-related behavior, or other health-related events clearly in excess of normal expectancy. Whereas a "pandemic" is an epidemic occurring worldwide or over a very wide area, crossing international boundaries, and usually affecting a large number of people. See Porta, M. (Ed.) (2008), A Dictionary of Epidemiology, p. 79 and p. 179.

[92] This technique is already used in connection with other aspects, e.g. § 5 (1) of the German Federal Infection Protection Act: The German Bundestag ascertains if there is "an epidemic situation of national importance".

[93] Such quick amendments are possible and have been done in the past: see for example the changes made to the Medical Devices Regulation through „Regulation (EU) 2020/561 of the European Parliament and of the Council of 23 April 2020 amending Regulation (EU) 2017/745 on medical devices, as regards the dates of application of certain of its provisions". This „Amending Regulation" was proposed by the EU Commission on 3 April 2020. The European Parliament and the Council both adopted the said regulation in April of that year so that the Amending Regulation was published in the Official Journal on 24 April 2020, which was also the moment it entered into force, see Art. 2 of the Amending Regulation.

4.1 Public Health

Epidemiological evidence suggests that proximity tracing apps can potentially reduce the harmful effects caused by other measures imposed – such as a "lockdown" over an extended period of time.[94] Combined with other measures, they have the potential to substantially reduce the number of new infections , hospitalisations, intensive care admissions and deaths.[95] The usage of a proximity tracing app could help to emerge from a "lockdown" more quickly and safely, save the lives of others and reduce personal health risks.[96] Even a moderate uptake of such an app could e.g. delay the need for a "lockdown".[97] Health problems related to mental health or caused by domestic abuse may arise as a result of other measures, in particular long periods of a "lockdown".[98] According to the World Health Organization, quarantine is expected to lead to more people suffering from loneliness, depression, harmful alcohol and drug use, and self-harm or suicidal behaviour.[99] However, as the current evidence of relatively low usage of voluntary apps shows, these reasons may not be enough to ensure that a significant portion of the population uses the app. An obligation to use it may be necessary for it to be effective in this regard.

Contact tracing apps typically require less time and resources compared to manual contact tracing. Manual contact tracing typically requires three days to identify and communicate with all the contacts of an infected person.[100] It is a slow and personnel-intensive process and those infected may often not be able to remember all the people they have been in contact with. Therefore, digital contact tracing is a much faster and more efficient way in terms of resources and accuracy.[101] Manual contact tracing can be too slow to reach those infected before they infect others, as has been the experience in the current pandemic. Proximity tracing apps should be fast enough to significantly reduce[102] the virus spread if a sufficiently large part of the population uses them. Even half a day has been shown to make a difference in the number of COVID-19 cases.[103] This is particularly true when the sheer number of infections and the corresponding lack of personnel make it difficult or impossible to track contacts manually.[104]

4.2 Economic Issues

A good government response to a pandemic is not only a public health issue but is also crucial for minimising the negative economic consequences of a crisis.[105] Empirical cross-country evidence shows

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94 Parker, M. et al. (2020),"Ethics of instantaneous contact tracing using mobile phone apps in the control of the COVID-19 pandemic", in: Journal of Medical Ethics; Vol 46, Issue 7, p. 430.

95 University of Oxford (2020), "Digital contact tracing can slow or even stop coronavirus".

96 Parker, M et al. (2020),"Ethics of instantaneous contact tracing using mobile phone apps in the control of the COVID-19 pandemic", in: Journal of Medical Ethics; Vol 46, Issue 7 p. 429.

97 University of Oxford (2020), "Digital contact tracing can slow or even stop coronavirus"

98 Ada LoveLace Institute (2020), "Exit through the App Store?'; A rapid evidence review on the technical considerations and societal implications of using technology to transition from the COVID-19 crisis", p. 3.

99 World Health Organization, Regional Office for Europe (2020), "Mental health and COVID-19".

100 Tibbetts J. H., (2020), "Researchers Continue Quest to Contain Spread of COVID-19: Digital technologies aim to accelerate contact tracing", in: BioScience, Vol. 70, Issue 8, p. 635.

101 Ada LoveLace Institute (2020), "Exit through the App Store?'; A rapid evidence review on the technical considerations and societal implications of us-ing technology to transition from the COVID-19 crisis", p. 27.

102 An Oxford Study says the virus can be suppressed if 56% of the population uses the app; see Hinch R. et al. (2020), "Effective Configurations of a Digital Contact Tracing app: A report to NHSX" p. 3 and 18.

103 Hinch, R. et al. (2020), "Effective Configurations of a Digital Contact Tracing app: A report to NHSX", p. 3 and p. 18.

104 See for example Neue Osnabrücker Zeitung (2020), "RKI: Zahl der überforderten Gesundheitsämter steigt weiter".

105 E.g. COVID-19 has triggered the most severe worldwide recession since World War II; see König, M. et al. (2020), "COVID-19 and Economic Growth: Does Government Performance Pay Off?", in: Intereconomics 55, 224–231 , p. 231.

that countries whose governments have been able to confine the pandemic more successfully have recorded less severe reductions in their GDP outcomes, as measured by the revisions of growth forecasts by international organizations such as the International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD) or the World Bank.[106]

(1) COVID-19 cases and deaths

Tab. 1 shows that China, Taiwan, South Korea, Singapore and Japan have significantly lower numbers of COVID-19 infections and COVID-19 related deaths in proportion to their population than, e.g., Germany, France, and Italy and the USA.

Tab. 1: Confirmed COVID-19 Cases and Deaths Related to COVID-19 as of 13 January

		Confirmed Covid-Cases	Confiirmed Covid-Deaths	Population (in 1000)	Cases per 1 Mill. capita	Deaths per 1 Mill. capita
World		93,105,607	1,993,910	7,673,434	12,133.50	259.85
Asia	Taiwan	842	7	23,566	35.73	0.30
	China	97,448	4,796	1,397,715	69.72	3.43
	Singapore	59,029	29	5,704	10,348.70	5.08
	South Korea	71,241	1,217	51,709	1,377.73	23.54
	Japan	310,735	4,119	126,265	2,460.97	32.62
	Qatar	146,689	246	2,832	51,796.96	86.86
Europe	Germany	2,015,235	45,207	83,133	24,241.10	543.79
	France	2,909,723	69,452	67,060	43,389.84	1,035.67
	Italy	2,336,279	80,848	60,297	38,746.19	1,340.83
United States		23,307,461	388,540	328,240	71,007.38	1,183.71

Sources: John Hopkins University & Medicine (2020) "Coronavirus Resource Center" (accessed January 14 at 9:15 pm); The World Bank (2020), "Data Population total 2019"; National Statistics Republic of China (Taiwan) (2020), "Total Population October 2020", own calculation and representation.

(2) General aspects regarding GDP growth

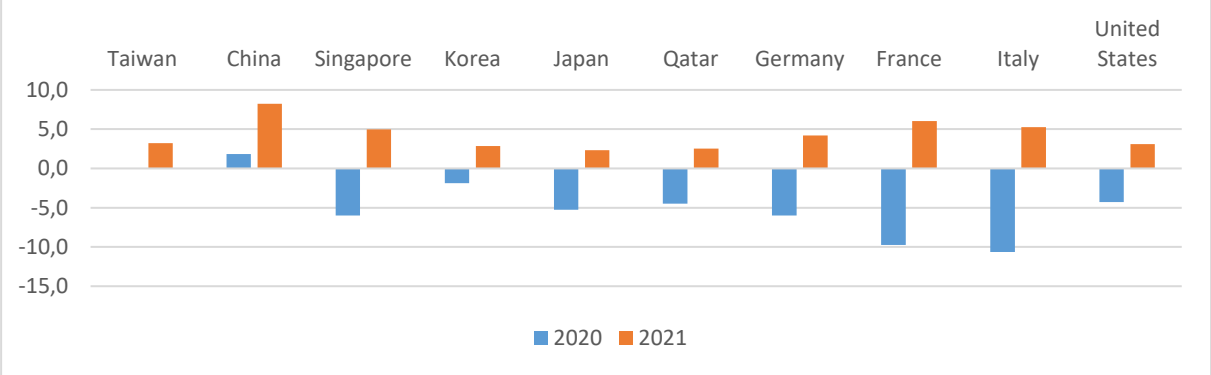
As indicated in Fig. 1, Asian countries are also showing higher economic growth. Although the pandemic had a severe negative impact on GDP growth globally in 2020, China for example might even get through the crisis without any GDP loss.[107] China is still developing and, compared to Western countries, on a catch-up growth path in terms of economic development with significantly lower GDP per capita.[108]

[106] See König, M. et al. (2020), "COVID-19 and Economic Growth: Does Government Performance Pay Off?", in: Intereconomics 55, 224–231, p. 224.

[107] IMF (2019/2020), "World Economic Outlook database October 2020 and October 2019", see Figure 1 and 2.

[108] The GDP per capita in purchasing power parities in international Dollar in 2019 was 16,709 in China compared to 56,226 in Germany and 65,253 in the United States (International Monetary Fund , "World Economic Outlook Database, October 2020").

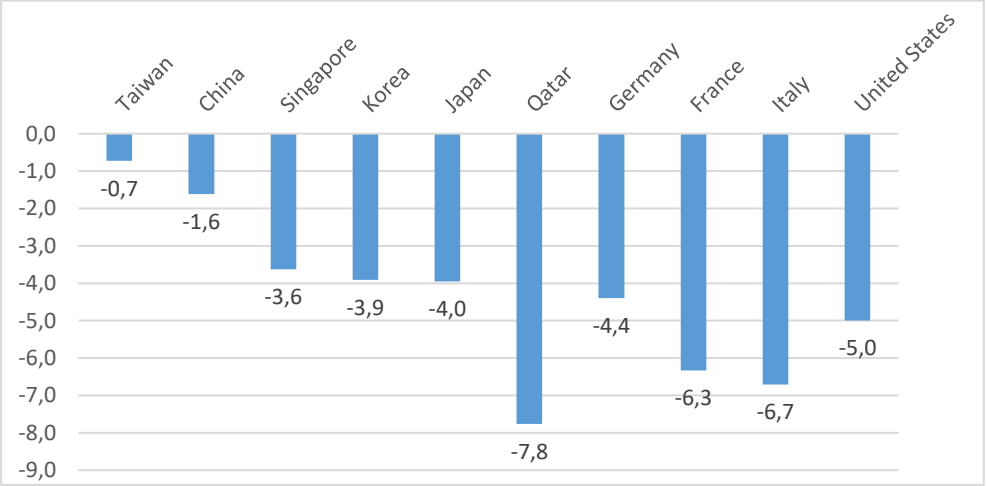
Fig. 1: Real GDP Growth in Selected Countries (in %)



Source: IMF (2020), "World Economic Outlook Database Update October 2020"

Taiwan, which is more developed, seems to be avoiding negative growth data for 2020 according to Fig. 1., and even more convincing is Japan, whose GDP was negatively impacted by tax increases at the beginning of 2020 and Typhoon Hagibis in October 2019 but now shows less GDP decline than Western countries.[109] South Korea saw a significantly smaller recession in 2020 than Western countries such as Germany, France, Italy and the United States. Most countries may compensate for the 2020 recession by coming back to a positive GDP growth path in 2021, as Fig 1 shows. To compare the overall effect of the pandemic on GDP growth in 2020 and 2021, the "corrections" to GDP forecasts between October 2019 (prior to COVID-19) and October 2020 (projections in respect of the pandemic) are shown in Fig 2.

Fig. 2: Accumulated Difference in Projected Real GDP Growth of Selected Countries October 2020 vs October 2019 in percentage points for the years 2020 + 2021



Source: IMF (2019/2020), "World Economic Outlook database October 2020 and October 2019", own calculations

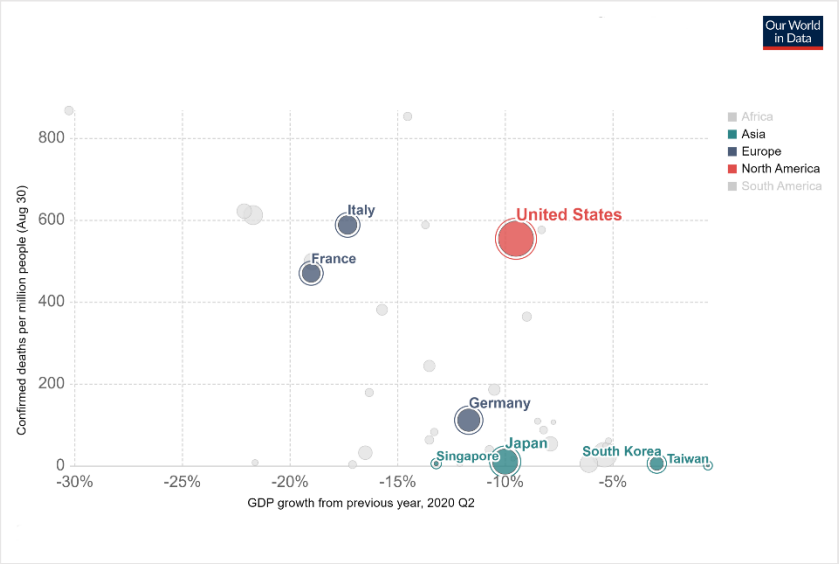
Fig. 2 indicates that in Taiwan, China, Singapore, South Korea and Japan the negative impact of COVID-19 on GDP growth projections for 2020 and 2021 are – to a varying extent – less severe than in the United States, France, Italy and Germany.

[109] The Economist (2020), "Fiscal, natural, viral. Japan's GDP shrinks dramatically after a tax rise and a typhoon. Coronavirus may compound matters".

(3) The relationship between GDP and COVID-19 cases

Taiwan, China, Singapore, South Korea and Japan show significantly lower numbers of COVID-19 cases and COVID-19 related deaths as well as a lower GDP decline. This indicates that economic growth and fighting the pandemic successfully go hand in hand.[110] This is also shown in Fig. 3. There is no evidence of a trade-off between health and the economy. On the contrary, the data indicate a positive correlation. Tab. 2 shows explicitly that countries with high fatality rates have more severe GDP losses than those with low rates. [111]

Fig. 3: COVID-19 deaths and GDP growth in Q2 2020[112]



Source: Our World in Data (2020), "Economic decline in the second quarter of 2020 vs rate of confirmed deaths due to COVID-19".

[110] König, M. et al. (2020), "COVID-19 and Economic Growth: Does Government Performance Pay Off?", in: Intereconomics 55, 224–231, p. 225, 231; Hasell, J. (2020), "Which countries have protected both health and the economy in the pandemic".

[111] Hasell, J. (2020), "Which countries have protected both health and the economy in the pandemic".

[112] Original title of the figure: "Economic decline in the second quarter of 2020 vs rate of confirmed deaths due to COVID-19. The vertical axis shows the number of COVID-10 deaths per million, as of August 30. The horizontal axis shows the percentage decline in GDP relative to the same quarter in 2019. It is adjusted for inflation." Original source: Johns Hopkins University, CSSE, Eurostat, OECD and individual national statistics agencies Note: Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19. Data for China is not shown given the earlier timing of its economic downturn. The country saw positive growth of 3.2% in Q2 preceded by a fall of 6.8% in Q1.

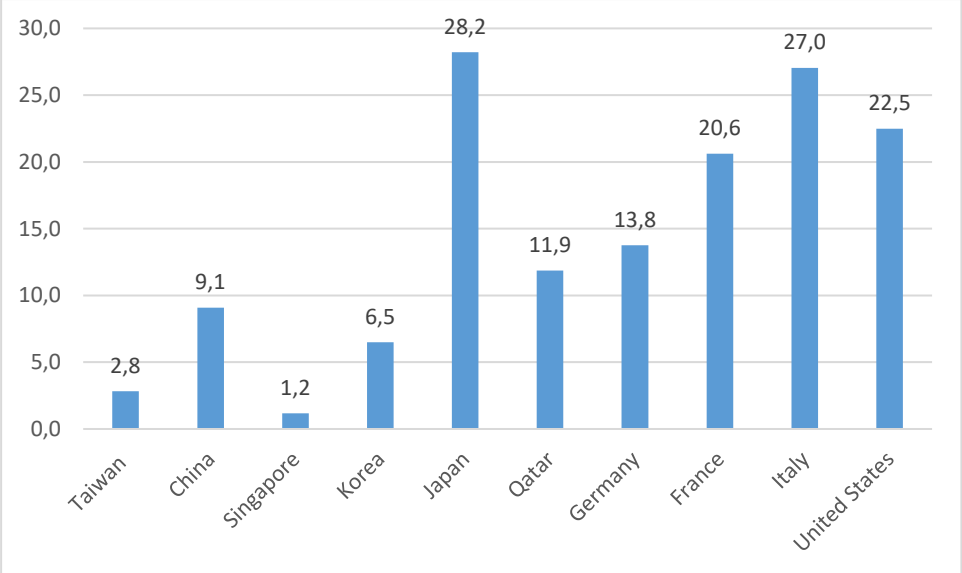
Tab.2: COVID-19 related deaths and GDP growth rate in Q2 2020

	Total confirmed deaths due to COVID-19 per million people deaths per million	GDP growth from previous year, 2020 Q2 in percent
Taiwan	0.29	-0.6
China	3.28	3.2
Singapore	4.62	-13.2
South Korea	6.32	-3.0
Japan	10.16	-10.0
Germany	111.00	-11.7
France	469.03	-19.0
Italy	588.77	-17.3
United States	553.51	-9.5

Source: Our World in Data (2020), "Economic decline in the second quarter of 2020 vs rate of confirmed deaths due to COVID-19".

The GDP data in fact underestimate the negative economic effects of the pandemic since governments have also reacted with huge financial stimulus programs for the economy. This further increases levels of government and private debt that, in most countries, were already high before the pandemic.[113] Countries with high stimulus packages cannot be regarded as particularly successful in maintaining GDP growth compared to countries that get along without such programs.[114] With the exception of Japan, stimulus packages and debt level rises are lower in Asian countries that have also been better at controlling the virus, as fig. 4 shows.

Fig 4: Rise of gross government debt to GDP ratio in percentage points 2020 to 2019



Source: IMF (2020), "World Economic Outlook database October 2020", own representation.

[113] IMF (2020), "Annual Report 2020", p. 17.

[114] IMF (2020): Fiscal Monitor: "Policies for the Recovery, October 2020, Online Annex 1.2: Smart Strategies to Contain the COVID-19 Pandemic", p. 13 (Online Annex Figure 1.2.4.: Average World Economic Outlook Database Forecast Revisions for Different Country Groups, 2020—24).

Governments will have to address the question of how to cut the additional debt.[115] This may well be possible by means of excess income and less expenditure based on sound economic dynamics, but further measures – expenditure cuts or higher taxes – may be necessary.[116]

(4) Interim Conclusions

Taiwan, China, Singapore, South Korea and Japan saw a less severe decline in their GDP in 2020 – some may completely avoid a recession – than Germany, France, Italy and the United States. At the same time, the Asian countries have had far fewer COVID-19 cases and COVID-19 related deaths than the Western countries.

As described in Section 2.2, Taiwan, China, Singapore and South Korea use contact tracing on a much broader scale than European countries. Empirical evidence suggests that country success stories in containing COVID-19 have largely stemmed from acting early, including monitoring international travel, implementing large-scale testing, and, not least, contact tracing.[117] From the beginning of the pandemic, Asian countries have been able to use past SARS experiences with a focus on broad testing strategies and contact tracing, which has led to fewer infections and fatalities, but also to fewer negative impacts on the economy.[118]

As has been shown, contact tracing can play an important role in containing the pandemic, limiting the number of infections and related deaths and reducing the negative economic impact. This is also true for democratic countries like Taiwan and South Korea.

However, using an app is not per se an economic ”wonder tool”, as shown by the data for Qatar, an authoritarian country with a mandatory app.[119] Although the authorities in Qatar offer free health care and testing to everybody, including migrant workers, and isolation centres are provided, where workers can go into quarantine and receive care, many foreign workers in Qatar have become infected as they live in crowded accommodation often with limited sanitary conditions.[120] Approximately 65% of Qatar’s current population are workers from India and Southeast Asia, who often have limited reading abilities and / or Arabic language skills making it difficult for them to understand information regarding COVID-19.[121]

Singapore also shows a comparatively high number of COVID-19 cases (see Tab. 1). However, these were high at the beginning of the pandemic, e.g. 1,426 new cases on April 20, but the number of new cases per day has come down in the meantime to relatively low levels – compared internationally –

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[115] Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2020),“Corona-Krise gemeinsam bewältigen, Resilienz und Wachstum stärken“, Jahresgutachten 20/21, p. 137 et seq.

[116] Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2020), “Corona-Krise gemeinsam bewältigen, Resilienz und Wachstum stärken“, Jahresgutachten 20/21, p. 140 et seq.

[117] IMF (2020), “Fiscal Monitor: Policies for the Recovery, October 2020, Online Annex 1.2: Smart Strategies to Contain the COVID-19 Pandemic”, p. 9.

[118] IMF (2020), “Fiscal Monitor: Policies for the Recovery, October 2020, Online Annex 1.2: Smart Strategies to Contain the COVID-19 Pandemic”, p. 9.

[119] See tab. 1 and fig. 2: Qatar has a significantly higher rate of infections in relation to its population than the named Asian countries but suffers most in terms of GDP projection decline.

[120] Amnesty International (2020),”Reality Check 2020: Countdown to the 2022 World Cup. Migrant workers‘ rights in Qatar”, p. 30.

[121] Ahmad, R. et al. (2020), ”Laboring to communicate: Use of migrant languages in COVID-19 awareness campaign in Qatar“, in: Multilingua, p. 7 et seq., 10 et seq.

since the autumn of 2020.[122] Singapore reacted to the "first wave" with lockdown measures from April to June 2020.[123] Infections then fell significantly and the country has so far been able to prevent a second wave, which is in marked contrast to European countries.

5 Proportionality of a Mandatory Proximity Tracing App

When considering whether to make it obligatory to use a proximity tracing app during a pandemic, Member States need to assess the proportionality of such a measure [Art. 15 (1) E-Privacy Directive] in light of the Charter of Fundamental Rights of the EU (hereinafter: CFR). Proportionality requires that the advantages of limiting a right are not outweighed by the disadvantages. In other words, the limitation of a right must be justified. Safeguards accompanying a measure may help to justify a measure.

On the one hand, it has been shown that at least 60% of the population need to use such an app in order for it to significantly reduce[124] the spread of a virus, although lower usage would still be effective in reducing the spread.[125] Based on current usage figures[126], in most EU Member States, this effectiveness is unlikely to be achieved on a voluntary basis. The usage of a contact tracing app could, however, be increased by making it obligatory. This would help to ensure the rapid notification of contacts – which is crucial for successful control of an infectious disease. Speedy notifications help to safeguard risk patients. Using a proximity tracing app for digital contact tracing facilitates faster tracing of the chains of infection. Overall, this would protect public health and also support the right to benefit from medical treatment [Art. 35 CFR] as it may help in substantially reducing the number of new infections, hospitalisations and intensive care admissions and thereby protect access to – i.e. the ability to receive – medical care in these facilities.[127]

On the other hand, considering that proximity tracing apps do not use location or movement data, and that it is not possible to identify an individual, the negative effects on the individual's privacy [Art. 7 CFR] and protection of personal data [Art. 8 Charter] are limited and, as such, are likely to have minimal impact even if the proximity tracing app were made mandatory during the time of a pandemic. This contrasts with tracking apps based on geolocation, which pose higher risks to privacy as they collect data on the precise locations and movements of people.[128]

So far, the current measures against COVID-19 have led to severe limitations on individual economic rights: the freedom to conduct a business [Art. 16 CFR] and the right to property [Art. 17 CFR]. Owners of businesses such as restaurants, gyms, shop owners, self-employed musicians and artists have had

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[122] COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU), accessed January 14 2021 at 9:15 am.

[123] Han, E. et al. (2020), "Lessons learnt from easing COVID-19 restrictions: an analysis of countries and regions in Asia Pacific and Europe" in: The Lancet; Vol. 396, p. 1526.

[124] An Oxford study says that the virus can be suppressed if 56% of the population uses the app and the number of cases can be reduced if fewer people use the app; Hinch, R. et al. (2020) "Effective Configurations of a Digital Contact Tracing app: A report to NHSX", p. 3 and p. 18.

[125] Hinch, R. et al. (2020) "Effective Configurations of a Digital Contact Tracing app: A report to NHSX", p. 3 and p. 18.

[126] Ada LoveLace Institute (2020), "Digital contact tracing tracker". Examples of uptake of total population are: 8.5% for Spain and 7.5% for Estonia in September 2020 and 30% for Germany as of 8 January 2021 See also: EER News (2020), "Estonia's coronavirus notification app 'HOIA' downloaded 100.000 times" and Reuters (2020), "Spain's COVID tracing app tries to balance public health with privacy". The number for Germany is based on the total number of downloads which is 24.9 million; see; Robert Koch Institut (2021), "Kennzahlen zur Corona-Warn-App" . The total population of Germany in 2019 is used which is 83,132,799; see The World Bank (2020), "Population, total – Germany".

[127] In this regard see Jarass, H., "Charta der Grundrechte der Europäischen Union", 4th edition, 2021, Art. 35, para. 7 et seq.

[128] European Parliament (2020), "Covid-19 tracing apps: ensuring privacy and use across borders".

to endure heavy losses. In this regard, governments have started extensive compensation programs but companies with high fixed costs (overhead costs) may continue to incur losses as compensation is generally calculated as a percentage of revenue and not profit.[129] Distortions among businesses and unfair competition may occur.[130] Current restrictions in Europe often go beyond economic rights however. For example, the freedom of movement [Art. 45 CFR[131]] is severely limited and in some cases restricted altogether.

From an epidemiology point of view, the limitations to the aforementioned rights may have been appropriate to contain the pandemic. However, there are measures that affect these rights to a lesser degree: e.g. an obligation to use a proximity tracing app. In this regard, the right to privacy and the right to protection of personal data are not – per se – more "substantial" than the rights derived from Art. 16 and 17 CFR and especially Art. 35 CFR.

To be able to justify such a measure, Member States need to include safeguards, for example a requirement covering the need to ensure that such an obligation is automatically discontinued when a pandemic is over. There should therefore be a public debate in all EU Member States on whether to pursue a modern technology approach to fighting COVID-19 and other pandemics in the future.

6 Conclusion

Despite various lockdowns, the number of COVID-19 infections in the EU remains very high. In order to break the chains of infections and to end the restrictions on the free movement of people, services, and goods, the use of contact tracing apps should be made mandatory. The positive effects prevail over data protection concerns. The wider the use of contact tracing apps, the more likely it is that the pandemic will be contained. The ongoing vaccinations do not change this. The current use of the apps is insufficient. Given the current circumstances, Member States should oblige their citizens to use contact tracing apps that do not collect personal data. It protects EU citizens and helps to get the pandemic under control. It helps to prevent further lockdowns and to quickly end limitations on fundamental rights, especially of the freedom of movement and freedom to conduct a business. The positive effects on health, the economy and fundamental rights far outweigh the limitation on data protection, especially since most apps used in Europe do not collect personal data. National apps should be compatible across the EU. This makes national restrictions on the cross-border freedom of movement unnecessary. Art. 15 of the e-Privacy Directive prohibits a legal obligation to use contact tracing apps – even in times of a pandemic. The EU should quickly change this ("quick-fix").

[129] See for example: Hentze, T.: Zur Ausgestaltung der Corona-Hilfen im Jahr 2021, IW-Policy Paper 27/20, p. 3, 4, 20.
[130] See for example: Hentze, T.: Zur Ausgestaltung der Corona-Hilfen im Jahr 2021, IW-Policy Paper 27/20, p. 20.
[131] What is meant is cross-border freedom of movement. Accordingly, a cross-border element is necessary, i.e. a reference to the Union. Freedom of movement within a Member State is not guaranteed by Art. 45 if the impairment has no reference the Union. However, it is protected by the fact that the guarantee of freedom of movement from the ECHR forms a general principle of Union law. In this regard see Jarass, H., "Charta der Grundrechte der Europäischen Union", 4th edition, 2021, Art. 45, para. 9.

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