CERT-EU

COVID-19 monitoring technology

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TLP:WHITE

	Category	Type	Domain(s)	Sector(s)	Confidence
FOR INFORMATION	Monitoring	Privacy breach	World	Digital infrastructure, digital services	A1

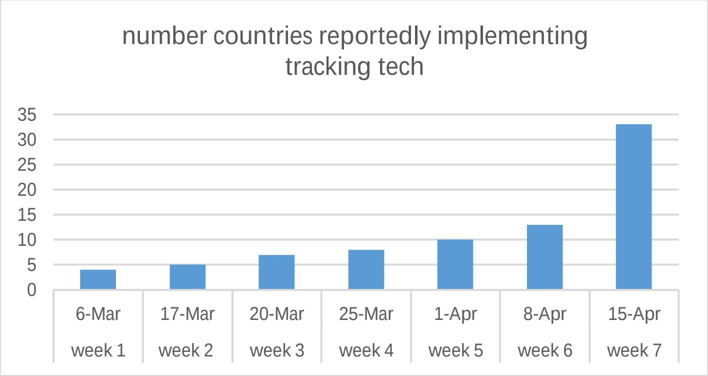
Key Points

- According to public reports, at least 33 countries have adopted monitoring technology to curb the COVID-19 pandemic as of April 15, 2020.
- The purpose of this surveillance is to track entire or specific categories of populations, analyse movements, detect, diagnose and quarantine or alert individuals at risk.
- Tracking projects have initially been started by governments, but now technology firms are proactively designing solutions.
- Efforts to safeguard privacy vary significantly among countries.

Summary

The global fight against COVID-19 is reportedly[1] resulting[2] in a massive increase in the use of existing or new surveillance technologies. Depending on the countries, there is significant variation in employed means, surveillance purposes and privacy safeguards.

Many projects have been initiated by governments and backed by domestic telecoms or technology firms (including the health technology sector). However, some of these companies, including world-class giants, national champions and start-ups, have also started to proactively design solutions[3] that could have a very wide user base.



CERT-EU has identified at least 4 main purposes of this surveillance technology, with varying degrees in terms of scope and depth.

- Track entire populations, and identify individuals breaching movement restriction directives in a country.
- Track specific categories of populations, such as individuals entering the country, tested as infected, or placed into quarantine.
- Analyse population movement. Geolocation data is handled for groups of people and theoretically anonymised. The purpose of this surveillance is to detect if confinement measures are respected in various places in a country, without attempting to identify people.
- Detect, diagnose and alert individuals at risk, chiefly those who may have been infected or are exhibiting signs of an infection.

[1] https://onezero.medium.com/the-pandemic-is-a-trojan-horse-for-surveillance-programs-around-the-world-887fa6f12ec9
[2] https://www.theguardian.com/world/2020/apr/14/growth-in-surveillance-may-be-hard-to-scale-back-after-coronavirus-pandemic-experts-say
[3] https://www.mobihealthnews.com/news/roundup-techs-role-tracking-testing-treating-covid-19

		Purpose	
		Coercion oriented	Cure oriented
Scope	Focused	Track specific categories	Detect and alert individuals at risk
	Global	Track entire populations	Analyse population movement

Countries are employing traditional, often combined and innovative surveillance means.

- **Data from telecom companies**. Used to geolocate people, typically by triangulation. A first group of countries, mostly in Europe and the US, are reportedly accessing anonymous geolocation data of groups of people (not individuals). The objective is to analyse movements in the country. A second group of countries is tracking individuals, with several variations, to track specific categories. To achieve this, telecom geolocation data are sometimes combined with other technologies (see below). The objective could be coercive (detect breaches of quarantine measures) or preventive (alert individuals assessed to have been in contact with infected people).
- **Smartphone apps**. These apps are used to track individuals, analyse how pandemic containment measures, such as physical distancing, confinement or quarantine, are respected or to detect and alert individuals at risk. The use of a specific app is sometimes mandatory, for specific population groups (e.g. people entering the country, placed in quarantine or having violated quarantine). In China and Russia, certain apps appear to be mandatory for entire populations. The Chinese app seems to be the most sophisticated, with a classification of health grades (green, yellow or red) and assorted with specific social authorisations. A growing number of countries seem, however, to promote opt-in apps, insisting on the potential benefits: inform users on the likelihood of infection, based on distancing and personal interactions logs, and symptoms. In the latter case, the app is combined with Bluetooth technology or the use of a smartwatch.
- **Surveillance devices**. Certain countries, such as Australia and Hong Kong, are using government-issued devices for those ordered into quarantine, to be installed in homes or to be worn (electronic wristbands).
- **Public cameras**. Public cameras are used to track the population in several Asian countries, including China, India, Dubai and South Korea. They are sometimes combined with facial recognition technology. In Dubai, the licence plates of vehicles spotted in use are checked to confirm if they are associated with essential workers.
- **Facial recognition**. This technology, associated with a camera or phone-based location tracking, is used to monitor those under quarantine.
- **Aerial surveillance**. In Kenya, the government is monitoring the country's border to detect illegal crossings of goods and people. In China, camera-equipped drones are used together with facial recognition.
- **Credit cards**. In South Korea, confirmed cases of COVID-19 are being tracked by a fusion of credit card purchase data, smartphone location tracking, and CCTV footage, likely backed by facial recognition algorithms.

Finally, governments in several countries are employing private companies or institutes for data collection and data analytics. This creates additional risks of personal data mishandling and privacy breaches.

- **Telecoms**. For the collection of geolocation data (see above).
- **Transportation companies.** In India, the government is taking passenger information from airlines and railway companies.
- **Digital service companies.** Google is reporting[4] that for 131 countries and regions, aggregated, anonymised Google Maps data showing how busy certain types of places are. Also on April 10, Google and Apple announced a common initiative on COVID-19 contact tracing technology[5]. The system uses Bluetooth beaconing to detect and tell users if they have been in contact with people who have declared themselves as infected.
- **Data analytics companies.** Governments in countries, such as Belgium and the UK, have contracted data analytics companies to help derive meaningful information from data collected via telecoms or other means.

[4] https://www.blog.google/technology/health/covid-19-community-mobility-reports/
[5] https://techcrunch.com/2020/04/10/apple-and-google-are-launching-a-joint-covid-19-tracing-tool/

Comments

Week after week, more countries are adopting surveillance means in order to curb the COVID-19 pandemic. Attempts to safeguard privacy are, however, varying significantly among countries. At this stage, four criteria appear to be specifically relevant:

- Grouped, anonymised surveillance vs. individualised surveillance combined with identification.
- Opt-in vs. mandatory surveillance.
- Degree of combination of several technologies (camera, facial recognition, social networks, etc.)
- Existence of personal data protection regulations, such as the GDPR in the EU, or lack thereof.

To help EU member states maintain a consistent level of personal data protection, the European Commission has released a recommendation[6] on a common Union toolbox for the use of technology and data to combat and exit from the COVID-19 crisis, in particular concerning mobile applications and the use of anonymised mobility data.

The present memo provides a synthetic overview of what is publicly known as of mid-April 2020. The landscape is however moving very fast and several factors will likely stimulate wider and more insightful surveillance in the short and mid-term:

- Social pressure, on one hand to curb the pandemic and, on the other hand, to ease confinement measures.
- Tolerance of population, at least on a temporary basis, of reduced freedom and privacy rights.
- Appetite of the tech sector to develop and sell innovative solutions.
- Appetite of certain regimes for tech-based population surveillance.

[6] https://ec.europa.eu/info/sites/info/files/recommendation_on_apps_for_contact_tracing_4.pdf

Annex – Monitoring tech

Category	Type	Description	Purpose	Countries
Telecom data	Telecom location data for individuals	- Detect if an individual leaves their house. - Use facial recognition and phone-based location tracking to monitor those under quarantine. - Enforce the country's 9 PM curfew in Ecuador. - Citizens are being location-tracked through their phones in China. - Confirmed cases of the coronavirus are being tracked in South Korea by a fusion of credit card purchase data, smartphone location tracking and CCTV footage. - Taiwan is tracking its citizens' movement by triangulating the location of their mobile phone between nearby cell towers. - Those arriving in Thailand from high-risk areas will be given a SIM card that lets the government track their movement for 14 days.	Tracking individuals	Brazil, Russia, China, Ecuador, South Korea, Taiwan, Thailand
		- In Israel, telecom providers help find people diagnosed with the coronavirus and alert those with whom the infected person might have interacted. - Through location surveillance and mass texts, the government of Pakistan is tracking confirmed cases of COVID-19 and sending alerts to people found to have potentially come in contact with those suffering the disease in the past 14 days.	Find and alert people at risk	Israel, Pakistan
	Telecom location data for groups, anonymised	- EU: 1 company in Austria, 3 companies in Belgium, 1 company in Germany, 1 company in France, 1 company in Italy, 1 company in Spain. - Companies in South Africa, in the UK, in the US.	Analyse movements in the country	Austria, Belgium, France, Germany, Italy, South Africa, Spain, UK, US
Smartphone app	Smartphone app (mandatory)	- An app called Home Quarantine requires Polish citizens who are quarantined to intermittently check in by sending a picture of themselves at home within 20 minutes or face a fine. - The app uses facial recognition to determine if it's actually the person being quarantined, and the phone's location data is used to make sure they're really at home. - In Argentina, an app is required for those who have violated quarantine and for those entering the country. The app requires users to give access to location data is to be kept installed for 14 days. - The Kingdom of Bahrain has launched a COVID-19 tracking program that relies on GPS-tracking electronic bracelets and a coronavirus contact tracing app. The system alerts a government monitoring station when an infected individual leaves isolation or if the bracelet loses its connection.	Track specific individuals	Poland, Argentina, Bahrain
	Smartphone app (mandatory)	- More than 200 Chinese cities deployed a smartphone app that grades the user's health and assigns a classification of green, yellow, or red. The app sends that data to the police and works as a hall pass for entry into certain public places. - In Russia, an app generates a unique, timed QR code that allows users to go out for three hours to get groceries, one hour to walk a dog, or 30 minutes to take out the trash.	Track populations	China, Russia
	Smartphone app (opt-in)	- A smartphone app developed by the Iranian government has scooped up millions of users' location data alongside a short questionnaire that claimed to detect the likelihood of infection. - Authorities in Poland, the Netherlands, Spain, Ireland and the UK have all either expressed an interest or started to roll out mobile phone apps to help them track and trace those infected with the virus.	Detect people at risk	Iran, Poland, Netherlands, Spain, Ireland, UK
	Smartphone app (opt-in)	- On April 10, Google and Apple announced a common initiative on COVID-19 contact tracing technology. The system uses on-board radios on mobile devices to transmit an anonymous ID over short ranges using Bluetooth beaconing. Servers relay the last 14 days of rotating IDs to other devices, which search for a match. A match is determined based on a threshold of time spent and distance maintained between two devices. If a match is found with another user that has told the system that they have tested positive, the user is notified and can take steps to be tested and self-quarantine.	Detect people at risk	

Category	Type	Description	Purpose	Countries
	Bluetooth-based app (opt-in)	- Track personal movement and contact. - Track social distancing and personal interactions. It's opt-in and offers benefits like notifying people who might have been exposed to get tested for the virus. - The Norwegian Institute of Public Health and the Norwegian tech company Simula will build a voluntary app that tracks GPS and Bluetooth data. Data to be stored for 30 days.	Analyse physical distancing	Germany, Singapore, Indonesia, Norway
	Smartwatch app	- Smartwatch app that collects health data in an attempt to determine whether people are exhibiting signs of COVID-19.	Detect people at risk	Germany
Surveillance	Surveillance devices in homes	- Those ordered into quarantine could have government surveillance devices installed in their homes.	Track specific individuals	Australia
	Wear electronic surveillance devices	- In Australia, electronic devices are required for those ordered into quarantine. - In Hong Kong, electronic wristbands are handed out at the airport.	Track specific individuals	Australia Hong Kong
Public camera	Publicly located cameras	- Run facial recognition searches. - Location data and CCTV footage are being used to track citizens. - Cameras typically used to catch speeding motorists in Dubai analyses car licence plates and determine if they are associated with essential workers who are allowed to commute. - With more than 100,000 cameras around Moscow, the Russian government is using facial recognition and phone-based location tracking to monitor those under quarantine.	Track populations	China, India, Dubai, Russia, South Korea
Facial recognition	Facial recognition searches	- Facial recognition and phone-based location tracking are used to monitor those under quarantine.	Track specific individuals	China, Russia, South Korea
Aerial surveillance	Drones	- In China, drones are being put to use in order to give directions from the government.	Track populations	China
		- The Kenyan government is instituting 24/7 aerial surveillance of the country's border to detect illegal crossings of goods or people.	Track populations	Kenya
Credit card tracking		- Confirmed cases of COVID-19 are being tracked in South Korea by a fusion of credit card purchase data, smartphone location tracking, and CCTV footage, likely analysed by facial recognition algorithms	Track specific individuals	South Korea
Ink stamps		- Stamping the hands of those arriving in airports with irremovable ink, with the stamp detailing the date until which the person must quarantine.	Track specific individuals	India
Data from companies	Unspecified companies	- Putting pressure on private companies in the country to hand over data to further contain the pandemic.	Track populations	China
Data from companies	Transportation companies	- Passenger information is obtained from airlines and railway companies.	Track populations	India
Data from companies	Google Maps	- Google is contributing a trove of movement data, which it collects from services like Google Maps' traffic function.	Analyse movement sin the country	US + 130 countries
Third party	Share data with third party	- Dalberg Data Insights company (Belgium). - Robert Koch Institute (RKI) with anonymised mass data (Germany). - Palantir (UK).		Belgium, Germany, UK