

Pandemic, Privacy, and Public Health

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Yes We Live Together, Don't Report Us
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How can tech help with COVID?

- Contact tracing & modelling
- Quarantine enforcement
- Infectiousness risk assessment & risk passports

Case Studies: Global Tech Responses

Case Study: South Korea:

A Low-Tech Contact Tracing Built Upon Public Cooperation

- SK learned from the 2015 MERS outbreak and was prepared with timely testing & legislation that allowed the state & health officials to act quickly
- Thorough contact tracing
 - Officials permitted to use CCTV footage, credit card info, location data, etc to retrace route & identify those who came near
 - Routes are posted publicly & relevant individuals are notified by text
 - Can totally wreck businesses
- App-enforced home quarantine
 - Location-tracking: leaving home reports to officials, up to \$2500 fine

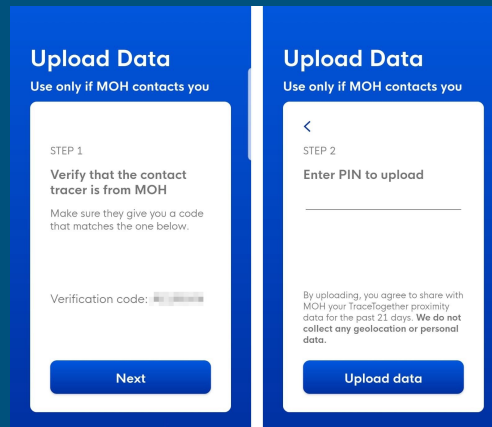
Case Study: Singapore

- Vigilant monitoring systems built after SARS

TraceTogether app (over a million downloads)

- Uses short-range bluetooth tracking similar to Google/Apple Contact Tracing, but centralized
 - iPhone users have to keep the app open so it can keep using Bluetooth
- If Bluetooth data shows that they were close to someone who has tested positive for the virus, the app will give that person the option to send their app logs to the government, which will organize a COVID-19 test.

***News is coming out about Singapore suddenly having many struggles with containing the outbreak
← lowkey ignored its migrant workers in cramped conditions oop



Messages to this chat and calls are now secured with end-to-end encryption. Gov.sg may use another company to store, read, and respond to your messages and calls. Tap for more info.

This chat is with the official business account of "Gov.sg". Tap for more info.

1 UNREAD MESSAGE

Hello, you've subscribed to [Gov.sg](#) WhatsApp 😊

We'll be sending you regular updates on the COVID-19 (Coronavirus Disease 2019) situation in Singapore, as well as other important government announcements.

If you wish to update your language selection, resubmit the form at go.gov.sg/whatsapp indicating your language preference.

Stay updated at:

- 🕒 www.moh.gov.sg (MOH website)
- 🕒 go.gov.sg/covid-19 (Gov.sg website)

9:39 PM

Case Study: China

- Alipay Health Code
 - Uses “big data” to predict contagion risk and assign a color ranking
 - Green = free movement, yellow = stay home, red = mandatory quarantine
 - >90% of the population had installed in Zhejiang (province where rolled out)
 - NYT analyzes source code and finds “**reportInfoAndLocationToPolice**,” which sends the person’s location, city name and a numerical identifier to a LE server upon install
 - Location sent each time the code is scanned
- History of function creep
 - Anti-terrorism measures at the 2008 Beijing Olympics -> establishment of extensive networks of video cameras + video analysis tools
 - “The coronavirus outbreak is proving to be one of those landmarks in the history of the spread of mass surveillance in China,” (Maya Wang, Human Rights Watch)

Case Study: Hong Kong

- Wristbands + app for incoming travellers
 - Enforces 2-week quarantine
 - Establish the perimeter of your dwelling, & beeps if you go outside it
 - Can only stop the beeping by scanning wristband QR codes of everyone in quarantine with you (social tech?)
 - Some wristbands are dumb paper, some appear to be “smart” and work without an app

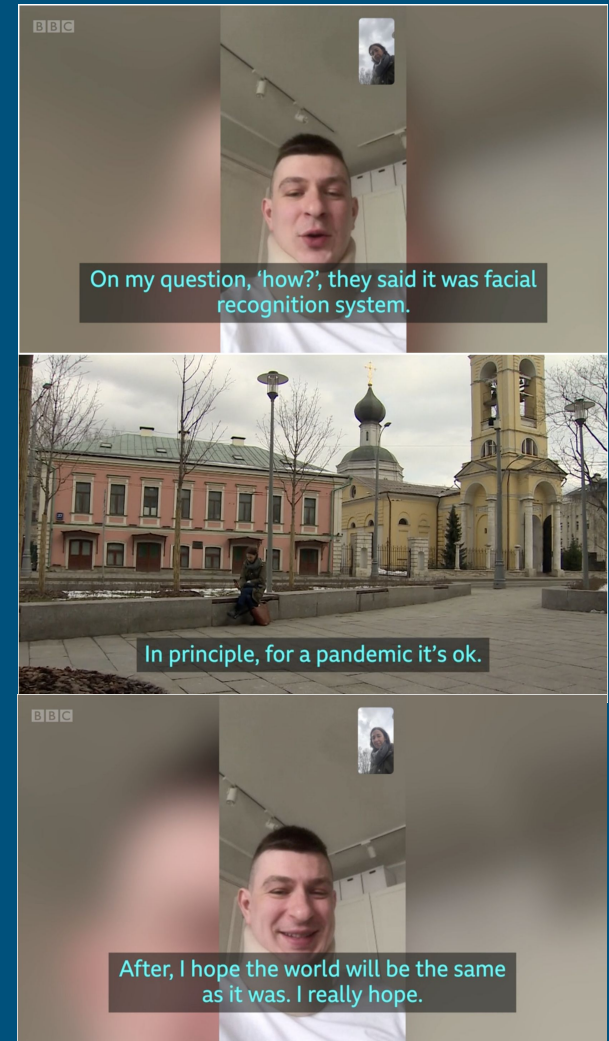


““Yes, as an American, it’s pretty unpalatable,’ Ms. Song, [medical anthropologist and professor at the U. of Hong Kong] said of the tracking system. But ultimately, she added, she saw it as ‘evidence of a functioning public health system.”



Case Study: Russia

- FindFace facial recognition software
 - Mid-2010s: users can take a picture of someone and match their face to their social media profiles on Vkontakte (VK)
 - Jan 2020: Announces partnership with government
 - Largest “live”/real-time FR system in the world?
- FindFace and COVID
 - System being used to enforce quarantine orders
 - Real time alerts to police for detected faces
 - Officials claim hundreds of people have been caught using this system
 - Also used for crowd detection
 - Developed by NtechLab



Case Study: Israel

- Shin Bet and Contact Tracing
 - Israel's internal security agency given authority to do contact tracing
 - Passed without Knesset approval at emergency session, leading to 3 lawsuits
 - Collect location data from telcos, analyze, and share info with the Ministry of Health
 - Pushback from lawmakers after revelation that would have access to conversation content as well as location data
 - Some complaints about lack of correction / appeals process for those ordered into quarantine
- Health Ministry app
 - 1.5 million downloads!
- Police enforcement of quarantine
 - Random spot checks using a combination of location data and in-person visits

Case Study: NSO Group



- Infamous spyware company
 - Provides "authorized governments with technology that helps them combat terror and crime." (Oops! Used against human rights activists and journalists in multiple countries, including Jamal Kashoggi)
- Project Fleming
 - App which allows governments to feed in telco location data and performs analyses like heat maps, filtering, and tracking individuals (using ID numbers, not identities)
- Will form basis for an app "to rate Israelis based on their potential for infecting others with the coronavirus."
 - Defense Minister Naftali Bennett tweeted that he is pushing to let countries around the world also use the "world-leading" AI system

Case Study: USA

Aggregate Geolocation Data



- CDC & state/local governments are receiving location data
- Data comes from mobile advertising industry, where users have already “opted-in” to tracking
- Names and addresses are removed

“It shows which retail establishments, parks and other public spaces are still drawing crowds that could risk accelerating the transmission of the virus ... researchers found that New Yorkers were congregating in large numbers in Brooklyn’s Prospect Park and handed that information over to local authorities.”

Google/Apple Contact Tracing (GACT)

- Bluetooth broadcasts an identifier derived from their unique **Daily Tracing Key**. Identifier changes every ~10-20 min
- Your device records all nearby identifiers and stores them for 2 weeks
- If someone tests positive, they can self-report
- Phone checks reported identifiers against stored identifiers and alerts if it finds a match

Specs:

<https://covid19-static.cdn-apple.com/applications/covid19/current/static/contact-tracing/pdf/ContactTracing-CryptographySpecification.pdf>

GACT Privacy / Security / Implementation

- Clearly built with privacy concerns in mind
- Potential for de-anonymization & attacks such as ... broadcasting numbers aggressively by driving or something
- Still dependent on widespread testing & self-reporting

GACT Privacy / Security / Implementation

- Some functionality is pushed down the stack and distributed as an OS update
- Concern: technology is available for other applications
 - *“Contact tracing is therefore no longer limited in time, or limited in use purely to trace and contain the spread of the COVID-19 virus.”*
- Concern: contact tracing is fully under the control of Apple/Google, as they control the bluetooth hardware & access -- other apps cannot access Bluetooth (on Apple's devices at least)
- Concern: **Function Creep**
 - Co-optation for other forms of surveillance, or commercial uses (advertisements)

Summary: Tech We've Seen

- Contact tracing
 - Location data
 - Cell location data
 - Bluetooth proximity data
- Quarantine enforcement
 - Cell location data
 - Facial recognition systems
 - Manual retrospective search vs automatic real-time alerts
- Risk assessment / ranking systems
 - Passports which have to be carried around

Summary: Design Considerations?

- Opt-in versus opt-out
 - Asking consumers to download an app
 - Bundling with pre-existing application / OS
 - Requiring participation to use certain amenities
 - Requiring participation upon entry into the country
- Scalability
 - Manual contact tracing + notification
 - Automatic contact tracing + notification
 - Automated detection of violations (facial recognition, location data)
- Public vs private disclosures
 - Notify potentially exposure with little detail
 - Notify potentially exposed with a lot of detail
 - Publically post information about confirmed cases

Concerns: Function Creep and Permanence

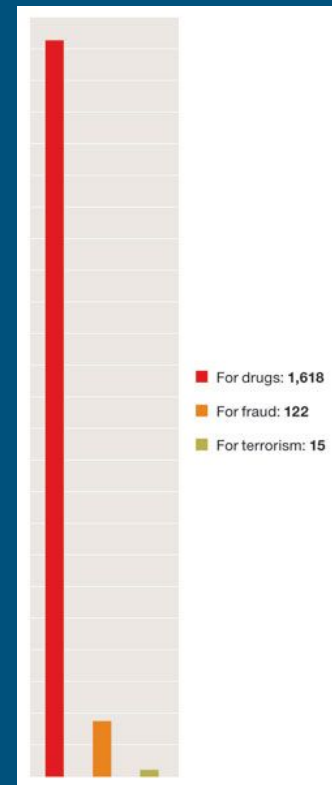
- Function creep = where a technology designed for one purpose is later used for a different purpose
- How can you prevent a contact-tracing or quarantine-enforcing system from being abused?
 - Technological measures?
 - Anonymity
 - Policy measures?
 - Expiration of authority
- Are certain systems, designs, or choices more likely to lead to abuse?

“Governments could argue they needed to keep the biometric surveillance systems in place because they fear a second wave of coronavirus, or because there is a new Ebola strain evolving in central Africa, or because...you get the idea.”

- Yuval Noah Harari

Case Study: USA Patriot Act

- USA Patriot Act passed with little debate in wake of 9/11
 - But, 5-year sunset on some provisions
- Re-authorized for over a decade
 - Recently expired, will probably be reauthorized
- Section 215 and the telephony metadata dragnet
 - Business records provision & Snowden revelations
- Example of function creep: War on Drugs
 - “Sneak and peek” warrants



Delayed-notice search warrants issued under the expanded powers of the Patriot Act, 2006–2009

Case Study: My Big Fat American Technology Company

- During 2010 Cholera outbreak, CDC used Palantir's technology to "explore text messages" between Haitians and a text platform built by an outside technology company
- Clearview A.I. is currently in discussions with state agencies about using its technology to track patients infected by the coronavirus

BIG Q's:

- What are the tradeoffs for different techniques, technologies, and designs?
- Given those, which would you put in place?
- And, what safeguards would you use to prevent abuses?

Additional Food for Thought?

THE PANDEMIC will have many losers, but it already has one clear winner: big tech. The large digital platforms, including Alphabet

WIRED

BUSINESS CULTURE GEAR IDEAS SCIENCE SECURITY TRANSPORTATION

Has the Coronavirus Killed the Techlash?

What a conspicuously socially responsible change

- Demand for online services has exploded and the infrastructure behind the internet has proved to be admirably reliable
- Fb messaging activity has increased by 50% in those countries hit hard by the virus
- Amazon is planning to hire 100,000 new staff to keep up with higher e-commerce orders.
- Startups getting crooshed

COVID Misinformation

- Misinformation related to the virus has spread on social media platforms and messaging apps
- Popular variants:
 - Incorrect health information
 - Bill Gates knew / caused the pandemic to try to vaccinate your children
 - 5G is causing the virus
- Indications that some of these may be spread by nation state actors
 - Patterns of “inauthentic activity” similar to Russian Russia's Internet Research Agency

Helpful links

- Hong Kong:
 - <https://www.nytimes.com/2020/04/08/world/asia/hong-kong-coronavirus-quarantine-wristband.html>
- Russia:
 - <https://www.forbes.com/sites/thomasbrewster/2020/01/29/findface-rolls-out-huge-facial-recognition-surveillance-in-moscow-russia/#4c2bb21d463b>
 - <https://www.bbc.com/news/av/world-europe-52157131/coronavirus-russia-uses-facial-recognition-to-tackle-covid-19>
- Singapore
 - <https://www.nytimes.com/2020/04/20/world/asia/coronavirus-singapore.html>
- Israel
 - <https://techcrunch.com/2020/03/18/israel-passes-emergency-law-to-use-mobile-data-for-covid-19-contact-tracing/>
- EU
 - <https://techcrunch.com/2020/03/27/telco-metadata-grab-is-for-modelling-covid-19-spread-not-tracking-citizens-says-ec/>
 - <https://techcrunch.com/2020/04/08/call-for-common-eu-approach-to-apps-and-data-to-fight-covid-19-and-protect-citizens-rights/>
- China
 - <https://www.nytimes.com/2020/03/01/business/china-coronavirus-surveillance.html>