

Briefing Note on Patient-Tracing

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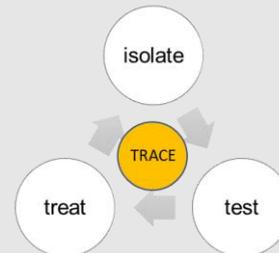
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Executive Summary

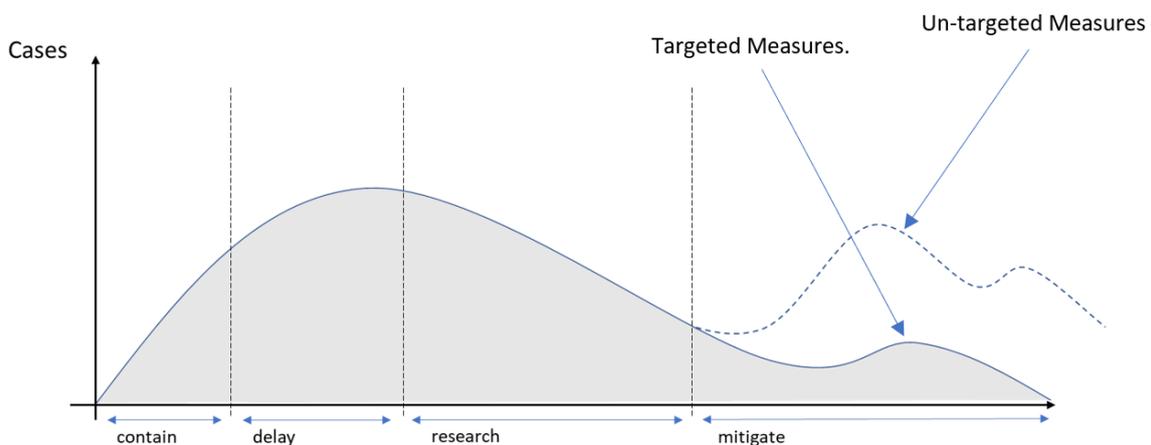
The Chief of the WHO notes that; *To suppress and control epidemics, countries must isolate, test, treat and trace.*

Patient Tracing or Contact Tracing is defined by the WHO as; *the process of identifying, assessing, and managing people who have been exposed to a disease to prevent onward transmission.*



Automated Patient Tracing is the critical component which works hand-in-hand with at-scale testing to get people back to work safely and quickly.

Traditionally patient tracing has been conducted by interviewing patients to re-trace their movements through an incubation period and is a relatively slow and resource intensive process. For example, it took 25 tracers a week to trace one early COVID-19 patient in California. Similar reports emerged in the first UK cases of 10 tracers per patient over 5 days' work. In both cases tracers worked on symptomatic patients who had already had time to transmit the disease to others.



Automated patient-tracing at scale and mass testing work together

Patient tracers reduce the risk of transmission between citizens using data. Their success depends on how quickly and accurately they can acquire data. Speed and accuracy then need to be considered when implementing appropriate measures. For example, a patient

may believe they had lunch with a friend 10 days ago but cannot be sure it was not 12. An error margin of 2 days can be factored into considerations when taking measures to prioritize contacting friends.

Why Automate Patient Tracing?

Automated Patient Tracing [APT] can dramatically improve disease control outcomes, particularly in the case of COVID-19, by expediting and scaling the process that enable targeted measures and interventions. In the case of COVID-19 large numbers of citizen are thought to be asymptomatic, so the need for at-scale tracing across transmission phases is acute.

This requires:

- Direct integration with the testing process, identifying handsets linking to patients and positive tests
- A proven graph-based approach that identifies the pathway of transmission between multiple patients and places over a significant time period
- The ability to provide and prioritize communications, so patient tracing teams can personalize contact with at-risk patients

Patient tracing is currently being implemented by governments using mobile phone apps, alongside other related but distinct services like:

- Symptoms trackers which enable citizens to consider if they have contracted COVID-19,
- Public information about a proximity to a location where diagnosed patients have been present,
- Information about accessing testing or other medical services,
- Communications from public health agencies,
- “health passports” like red green and amber QR codes used to manage citizen movements and access to services.

Those services **do not** support the WHO definition of patient tracing but may provide useful ancillary services.

The Marketing Technology Analogy

Most of the problems of automated patient tracing have already been solved in personalised digital marketing including compliance.

Most systems hold encrypted versions of name and address details in an abstract form. Similar techniques are widely deployed in payment processing and Compliance is widely achieved. In Patient Tracing the users are specialist Patient Tracers working fast on the front line of disease control. They require targeted patient contact data and identification of specific places where the disease could be transmitted. Instead of marketing

communications they use that data and communications to inhibit the spread of disease through targeted measures. The two processes are highly analogous.

Key Success Factors

Factor	Background
Does the data capture methods identify positive tested patients immediately ?	Unless patients carrying the virus are rapidly identified, the actions required to safeguard others will be delayed, enabling further transmission of the disease
What is the plan to scale the data capture methods to cover the UK population ?	Apps that scale successfully, still achieve relatively small coverage of populations. The best performer is Facebook and covers 44m people ¹ and is the UK's most popular app ² at around 66% of the population.
Will the data set have a minimum of 200 geolocation events per day – eg: a minimum of 1 every 15mins ?	This is required to get an accurate trace of patient's movements.
Can tracing teams gain real-time access to contact tracing data?	The tracing teams must have real-time access to contact tracing data otherwise time to action is lost.
Are all available data sources being utilised an integrated?	The South Koreans used App data, Telco, Bluetooth and other data sources recognising that the sum is greater than the parts. Each individually has limitations
Are the analytics proven in at-scale contact strategies?	Are we building on the best practices from contact strategies in digital marketing? For example, those deployed in airlines, retail and financial services.
Does the Tracing Technology support multi-phase tracing ?	Because very large numbers of carriers are asymptomatic it is critical to automate tracing over multiple transmission phases to protect at risk people

¹ <https://www.statista.com/statistics/1012080/uk-monthly-numbers-facebook-users/>

² <https://www.independent.co.uk/life-style/gadgets-and-tech/news/uk-phone-apps-most-popular-smartphone-facebook-instagram-netflix-a8084216.html>

Mobile App Based Tracing and Adoption Rates

Trace Together, an app launched by the Singapore Ministry of Health, was reported to have gained coverage of under 1m [17%] of citizens³ by the start of April. National Development Minister Lawrence Wong noted that 75% of the population needed to adopt the app for it to be successful.

Reuters report the similar % adoption in Israel of the state sponsored app⁴

In South Korean Contact Tracing has been highly successful for two key reasons:

- They understood it should be integrated into an at-scale testing program from the start
- They used multiple data sources that were not dependent on citizens downloading an app⁵

Chinese efforts for contact tracing harnessed large pools of data using already ubiquitous app data streams from We Chat / Tencent. These apps are already baked into daily life in Chinese society, including payments and communications.

Key Points

- Tracing must be **integrated into testing programs** to identify digital ID's of patients who test positive
- **All viable** data sources should be harnessed to iterate and refine accuracy and coverage as verified in South Korea.
- Relying on the goodwill of citizen adoption of any app is **not viable** in a pandemic situation
- Automated **Multi-phase** patient tracing is critical to get people back to work safely.

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³ <https://www.straitstimes.com/singapore/about-one-million-people-have-downloaded-the-tracetgether-app-but-more-need-to-do-so-for>

⁴ <https://www.reuters.com/article/us-health-coronavirus-israel-apps/1-5-million-israelis-using-voluntary-coronavirus-monitoring-app-idUSKBN21J5L5>

⁵ <https://www.healthsystemsglobal.org/blog/406/COVID-19-Lessons-from-South-Korea.html>