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## The problems with contact-tracing apps As countries look to ease restrictions and manage second waves of cases, apps are appealing but fraught with issues, reports Adam Vaughan

IN A rare display of collaboration, Apple and Google recently joined forces to help contact-tracing app technology work effectively. Such apps are attractive to countries looking to exit lockdown, but there is growing evidence it will be difficult to make them work.

Researchers at the University of Oxford released a report last week that simulated a city of 1 million people and found that 80 per cent of smartphone users in the UK would need to install a contact-tracing app in order for it to be effective in suppressing an epidemic: that is 56 per cent of the national population.

The UK's chief scientific adviser, Patrick Vallance, has indicated he thinks such apps might have a role to play in contact tracing, but that it would be a tall order to get 80 per cent of UK smartphone owners to use them. That is a tough target for the UK's NHSX, the National Health Service digital transformation unit, which is developing such an app. Surveys of 6000 potential app users in five countries suggest that nearly 74 per cent of UK smartphone users would be willing to install a contact-tracing app. The proportion who would do it in reality could be much lower, though. In Singapore, only an estimated 17 per cent of the population installed a contact-tracing app launched last month.

The principle behind contact-tracing apps is fairly simple. Once installed, they use Bluetooth low-energy technology to record when a phone has come into close proximity with anyone else using the app. If either person later reports coronavirus symptoms, the other party is notified, so they could self-isolate or seek health advice. An alert could also be sent if a medical authority certifies the other person

**Bluetooth can help track which people have been near each other**

tested positive for the virus – this would be one way to avoid users trolling the system by falsely claiming symptoms. In theory, the apps only store anonymous data temporarily, without collecting location.

Even if it were feasible to get a high number of voluntary installations, there is the big question of whether using Bluetooth to establish a contact works well, said Katina Michael at Arizona State University and Roba Abbas at the University of Wollongong, Australia, in a joint email to *New Scientist*. "How reliable is the system to gather proximity information? The range of Bluetooth is much larger than 1.5 metres for social distancing," they said.

Ross Anderson at the University of Cambridge says the range of Bluetooth can vary greatly depending on how people hold their phones, and whether they are indoors or outdoors. He also points out that the signals pass through walls, so



**TraceTogether is an app developed by the government of Singapore**

people in different rooms could be unnecessarily flagged as having had contact. The result could be a flood of false positives. The Oxford team, which is advising NHSX on its app, say the accuracy with which Bluetooth can be a useful proxy for virus transmission risk is "currently uncertain".

A further potential issue is the quality of the data. Michael and Abbas said they understand that many apps being considered would record contacts only every 5 minutes, which might mean infectious contacts are missed.

Other key issues include the level of trust between citizens

and governments, how privacy is preserved, whether apps are kept voluntary and how to also protect people who might not be able to install an app – a group that is likely to include many vulnerable older people. The American Civil Liberties Union last week laid out a list of principles, including the need for an exit strategy for such apps, to avoid such systems being maintained for "surveillance creep" after the epidemic has passed.

Nevertheless, many countries are on the verge of deploying apps. Germany is expected to release one

**"Bluetooth can vary greatly depending on how people hold their phones and where they are"**

imminently, and Australia is working on one too. One of the most high profile apps has been Singapore's TraceTogether app, built by the city state's government. But even its creators admit that it is too early to tell how effective it is. Moreover, "every country will have to develop its own app" because of different situations and requirements, says a spokesperson at Pan-European Privacy-Preserving Proximity Tracing, a European technology initiative.

Anderson says it would be better to recruit thousands of people to undertake the tracing manually. Vallance says apps should be part of a much broader contact-tracing approach, while the UK health secretary Matt Hancock said last week that such apps were a "critical" part of government efforts.

However, the apps can only work amid a broader effort of testing and tracing. "Contact-tracing apps are likely to be utilised as a means for fighting the spread of covid-19. However, they cannot be used in isolation. The apps themselves will not contain the spread," said Michael and Abbas. ■

