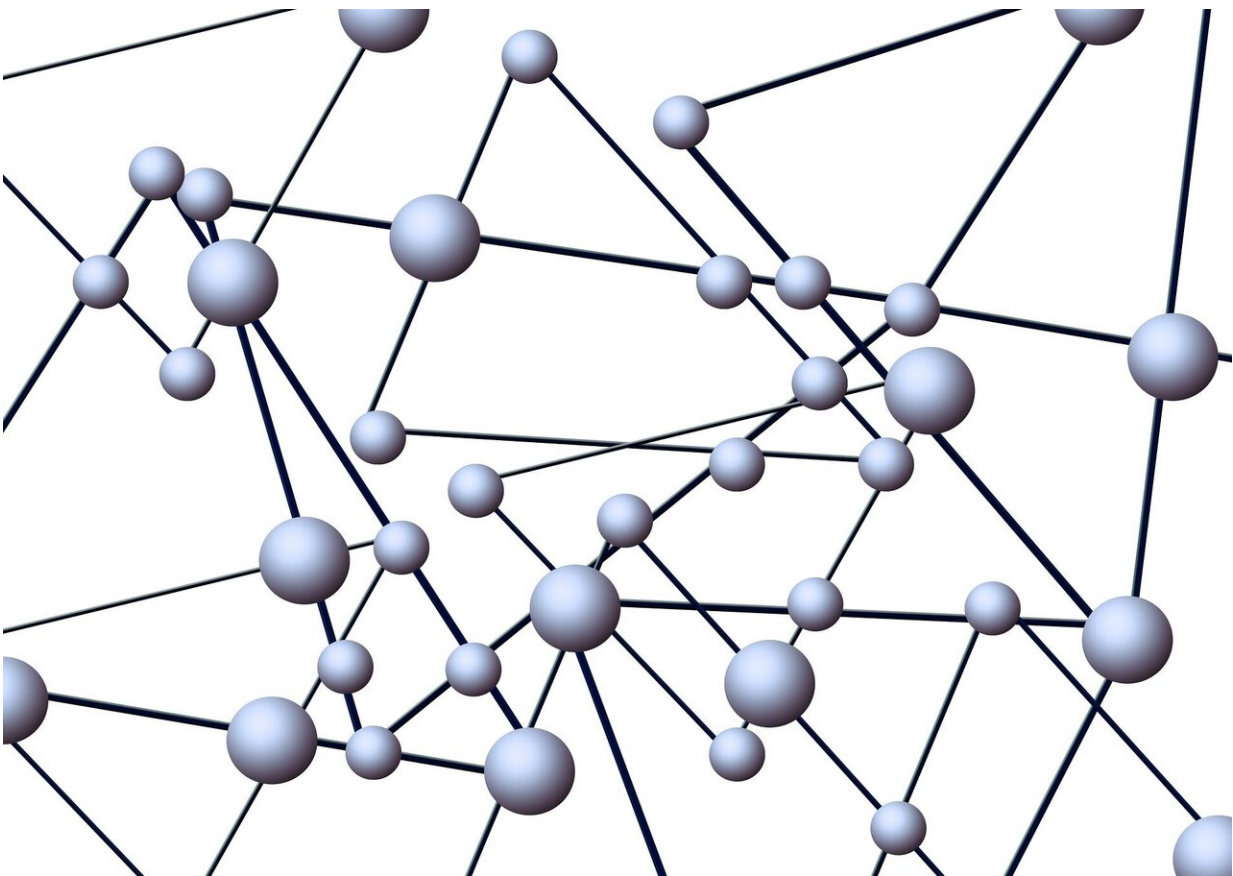# Exponential growth in COVID cases would overwhelm any state's contact tracing. Australia needs an automated system

November 17 2020, by C Raina MacIntyre

Credit: Pixabay/CC0 Public Domain

The people at highest risk of getting infected with SARS-CoV-2, the

virus that causes COVID-19, are close contacts of infected cases. So tracking these close contacts, and quarantining them so they can't infect others, is key to efficient epidemic control. Sometimes we also have to track contacts who attend venues where super-spreading occurs.

Victoria's [second wave](link) prompted the National Cabinet to order a review into [contact tracing](link), which became a flashpoint during the crisis.

The [report](link), by Australian Chief Scientist Alan Finkel and released on Friday, broadly makes the following recommendations:

- establish performance metrics on the speed of testing and contact tracing
- states and territories should pursue their own contact tracing systems, but have a national digital data exchange mechanism
- invest in technology, automation and [digital systems](link) for outbreak management
- strengthen the public health workforce, training and career tracks, as well as surge capacity for outbreaks
- go hard, go early and never fall behind
- maintain other [public health measures](link) such as social distancing, personal hygiene and early testing; and use waste-water surveillance for early warning of community transmission
- engage and communicate with communities, including those in higher risk groups and those with with diverse cultural or language needs.

We must invest in the public health workforce

The report recognizes the efforts of all jurisdictions in continually improving mechanisms for control of COVID. It also recognizes some of the challenges posed by confusing and inconsistent terminology, and also in differing testing protocols between jurisdictions.

It also reviews various digital technologies used to help with outbreak management across Australia, some of which are linked to pathology testing, and others to attendance at public venues, schools or workplaces. In Western Australia, for example, the G2G app enables facial recognition and mobile phone location data to help police to enforce quarantine.

Another strength of the report is the recognition of the public health workforce as a distinct and equally important part of the pandemic response as the clinical workforce.

Early in the pandemic, we did well to [expand ICU beds and ventilator capacity](link). However, the requirements for public health capacity during pandemics has [long been neglected](link). Victoria was [under-resourced compared to other states](link) and had fewer trained personnel for contact tracing and outbreak response, so when clusters began occurring in June, authorities were unable to stamp them out as NSW had done.

The report recommends surge capacity but no specific strategies. One strategy could involve harnessing the thousands of [Bachelors or Masters of Public Health students and graduates](link) around Australia. A course on contact tracing and surveillance within these degrees could create a large surge capacity of people with more baseline public health knowledge, compared with [other options used in Victoria](link).

Manual contact tracing can't keep up with exponential growth

However, [while Victoria was compared to NSW unfavorably](link), NSW has not yet been stressed with substantial daily community case numbers, and may also be unable to keep up without digital tracing.

This is actually the crux of the problem. If an epidemic grows too large, no city or state—no matter how well-resourced—will be able to keep up with contact tracing using manual methods such as whiteboards, phone calls or SMS.

What the report doesn't make clear is the enormous human resources requirement for contact tracing, how rapidly it increases and becomes unfeasible, and the critical importance of digital contact tracing methods which will automate the identification of contacts.

Every person with COVID will have 10 to 20 contacts to trace, which means if you have 100 cases a day, you need to trace 1,000-2,000 contacts within 24-48 hours. If you don't trace them rapidly, you will miss the window of opportunity to prevent them infecting others. If you don't trace them all, you will face a growing backlog and lose control of the epidemic.

Compounding this is the [exponential growth of epidemics](link). New cases per day can grow from 20 to 700 in a matter of weeks, as we saw in Victoria, so the task of keeping up with contact tracing becomes more and more difficult as an epidemic grows.

Even in Wuhan, the human resource capacity for contact tracing was exceeded when the outbreak reached thousands of new cases a day—equating to tens of thousands of contacts to be traced every day, and hundreds of thousands being monitored in quarantine at any one time. So authorities used [digital contact tracing to keep up](link).

Australia should expand public health workforce and implement automated contact tracing

Of the different digital tools discussed in the report, automated contact

tracing is only mentioned fleetingly, but is essential.

This could be done with QR codes and a color-coded alert system, as was used in China. With their QR code, people receive a color code—if they are green, they are free to move about; if orange or red, they must quarantine.

We've heard [many stories](#) of restaurants and entertainment venues breaching requirements for recording patron details, so that when an outbreak occurs, we have no information to enable contact tracing.

To use QR codes successfully, there has to be enforcement and substantial disincentives to noncompliance.

Australia's COVIDSafe App, in contrast, was an opt-in app that users had to download themselves, and has had low uptake and some [technical issues](#). Other automated methods that do not require people to actively opt in include harnessing location data from mobile phones, credit card use and other digital footprints. However, [many of these raise privacy issues](#), which is likely why they have been used less in Western countries than in Asia.

The bottom line is that finding all cases and tracing their contacts are the most important strategies to mitigate epidemic growth. We need to have methods to scale up vastly and rapidly with both manual and digital tracing in the event of an epidemic blowout.

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