Meeting of the COVID-19 Ministerial Group

Minute of Decision

Technology Options to Improve Contact Tracing, Manage Self-Isolation, and Monitor Population Movements and Disease Spread

The group of Ministers with Power to Act on COVID-19 matters [CAB-20-MIN-0130] convened on 9 April 2020 at 10.30am, and in accordance with their Power to Act:

1 **noted** that officials, as part of an All-of Government effort, continue to rapidly advance work on technological options to respond to COVID-19;

2 **agreed** that agencies should explore technological enhancements to support:

2.1 contact tracing;

2.2 monitoring disease progression and spread;

2.3 monitoring population movements;

3 **agreed** that the priority for these efforts be on contact tracing;

4 **agreed** that technology choices must be guided by the following principles:

4.1 public health efficacy;

4.2 respect for privacy;

4.3 freedom of movement;

4.4 technical feasibility;

5 **agreed** that technology choices must work within existing legal parameters and not require the use of emergency powers, and that any options outside these parameters will need to be agreed by Cabinet;

6 **directed** officials to report to the Minister for Government Digital Services and the Minister of Health as soon as possible if further resources or prioritisation of other tasks could accelerate progress on technology options for contact tracing;

7 **invited** the Minister for Government Digital Services and the Minister of Health to report back to the Ministerial Group on COVID-19 with an update on progress with implementing technology options by 20 April 2020;

8 **noted** that the Ministry of Health has developed a smartphone application that will assist with an individual's interactions with health services and the government for managing COVID-19;

9 **noted** that officials are exploring options for the addition to the Ministry of Health's smartphone application Bluetooth enabled contact tracing, reporting to the Minister for Government Digital Services and the Minister of Health jointly on progress;

10 **directed** the Ministry of Health, in consultation with the New Zealand Police, to report back to the Ministerial Group on COVID-19 with a support plan for managing the self-isolation of close contacts by 20 April 2020.

Rachel Hayward
for Secretary of the Cabinet

Distribution:
The Cabinet
Hon James Shaw

Copied to officials via email

Minister of Health

Minister of Government Digital Services

TECHNOLOGY OPTIONS TO IMPROVE CONTACT TRACING, MANAGE SELF-ISOLATION, AND MONITOR POPULATION MOVEMENTS AND DISEASE SPREAD

Proposal

1. This paper provides an overview of key technology options that are being progressed to enhance the all-of-government effort to fight COVID-19. A critical technology enhancement is a smartphone application to improve contact tracing by the Ministry of Health. This paper seeks agreement to a set of principles to guide efforts on what technology is explored and how it can be used.

Executive summary

2. Technology can help us eliminate COVID-19 from New Zealand. It can be used to enhance four key areas within the public health measures already underway:

    a. **Contact tracing** Capacity has been significantly scaled up and the process has been centralised. New modelling suggests that fighting COVID-19 requires very fast contact tracing, with as much accuracy as is possible. Different technology options can either speed up or automate much of the process. International evidence also suggests it can increase accuracy. The Ministry of Health is currently developing a smart phone application to assist the process.

    b. **Managing self-isolation** Police are currently using a location sharing system to check on people who have been overseas and are currently self-isolating. All close contacts also have to go into self-isolation for 14 days. These people receive two calls from Healthline, if they are asymptomatic. However, there is currently very little checking in to ensure that close contacts are able to comply with self-isolation. Non-compliance may be driven by a lack of support (for example the need to obtain food). The Ministry of Health, in consultation with Police, will develop a support plan for self-isolation at lower alert levels, with the focus being on supporting people to be able to self-isolate appropriately. The plan will consider the need for monitoring and enforcement, and if those needs can be assisted by the use of technology.

    c. **Monitoring disease progression and spread** Smartphone applications can be used to monitor the symptoms of those who have been diagnosed with COVID-19, close contacts and the general population. These can help to understand disease spread and identify potential new outbreaks.

    d. **Monitoring Population Movements** Anonymised data from mobile phones is currently being used by the National Crisis Management Centre (NCMC) to monitor

the effectiveness of the lock down. It draws on data being gathered and processed by Statistics New Zealand.

3. Officials' review of international developments in the use of technological enhancements have identified that there are some key principles that Ministers need to consider to guide officials work. These are:

    a. Public health efficacy - technology choices should be driven by what is most effective for public health purposes.

    b. Respect for privacy - Social license and legitimacy are critical for both pandemic control strategies and the update of technology.

    c. Freedom of movement - technology choices must improve the accuracy and speed of contact tracing or other measures and in doing so enable greater public freedom of movement.

    d. Technical feasibility - a single application tool with multiple uses is more likely to garner broad public use than multiple tools and applications, and choices should be technically feasible and able to be implemented effectively.

4. The Ministry of Health has already progressed with a smartphone application that will aid in contact tracing. This should be launched within the next two weeks. New functions or modules can be added to it over time, as they are developed.

5. Officials are focusing first on smartphone options that are effective, maintain social licence, respect users' privacy and security, comply with existing laws, and can be practically deployed soon. Agencies will continue to monitor international developments and learn from countries who are doing this well, while noting their different social and political contexts. Singapore has been a useful model in its deployment of technological enhancements and engagement is increasing with the government there to learn lessons.

6. We are also exploring enhancements to the mobile phone data we already have to make it more useful.

Contact tracing is important for public health

7. Effective testing, contact tracing and quarantine/isolation are the three key tools for management of any pandemic. Physical distancing and lock downs are also important for COVID-19.

8. The Health Act (1956) provides the mandate for Health to undertake the investigations in relation to infectious diseases including self-isolation and quarantine. Contact tracing is traditionally a people intensive process. When a person tests positive for COVID-19, they are contacted by a Public Health Unit and interviewed in depth to establish their movements in the period up to three days before they showed symptoms.

9. The interview can take up to two hours to understand everywhere they have been and who they have interacted with. All contacts are then classified as "close" or "casual". Close contacts (within two metres for more than 15 minutes) are prioritised for follow up. These close contacts need to be provided with health advice and information on the need to self-isolate for 14 days. British social data suggests that under normal circumstances, each person has about 36 close contacts but there is a wide distribution in this number (nine percent of cases will have more than 100 close traceable contacts).

10. Without any control measures, each case infects on average 2.5 people (the infection rate or R_0) and the disease spreads through the population at an exponential rate. The people most likely to be infected are those who have spent the most time with the infected person, generally others in their household. The faster both diagnosis and contact tracing is done, the lower the infection rate (R_0) will be. In countries with strong contact tracing systems (South Korea, Singapore, Taiwan) outbreaks have been brought under control without the need, as yet, for nation-wide lockdowns. These countries had a head start through their experience with SARS and MERS.

11. The effectiveness of contact tracing depends on:

    a. Speed

    b. Accuracy (human recall is fallible)

    c. Compliance by close contacts with self-isolation

The scale up of contact tracing is happening

12. The Ministry of Health is scaling up the contact tracing capacity and capability to investigate and follow up potentially 1,000 cases per day. This requires the following system changes:

    a. a shift to a model using a multidisciplinary workforce that can deliver services flexibly across New Zealand as demand rises; and

    b. development and implementation of an IT solution, which will support this model by managing and standardising workflows and information and provides a comprehensive national view.

13. These changes are currently being implemented, with the IT system having gone live the weekend of 4 April. As of Saturday 4 April, almost 5,000 (4,909) close contacts have been traced by the National Close Contact Service (NCCS) since it was stood up on March 24, with 702 contacts traced in a single day on Thursday 2 April. Originally it was making 760 calls a day - now that's more than 2,000.

14. There are also a number of process improvements being made to make the process more efficient, such as:

    a. Linking the National Health Index (which has people’s contact details) to the new contact tracing system.

    b. Automating data flows between ESR, Healthline, Ministry of Health and others.

15. Even if additional technological approaches are adopted for contact tracing, the human workforce is needed to deal with cases where people do not have mobile telephones, complex situations, and cases where manual overrides are required (for example health workers wearing appropriate PPE who treat COVID-19 patients do not need to be contact traced by an automated system).

Faster and more accurate contact tracing may be necessary to beat COVID-19

16. There is emerging scientific evidence that the particular characteristics of COVID-19 (people become infectious before their symptoms develop) mean that contact tracing has to be done within a day to be effective. The faster the contact tracing system, the more effective the epidemic control. If contact tracing can be done rapidly and accurately (without relying on human recall), then less reliance needs to be placed on other measures such as lock downs.

17. Globally, a number of technological solutions are under development or in place to either speed up traditional contact tracing or automate much of the process.

Enhancing the support for close contacts in self-isolation is also important

18. Contact tracing is only effective if close contacts go into self-isolation. Once identified, close contacts are called and asked to go into self-isolation for 14 days. They are provided with health advice and other support. Those who seem unwilling to self-isolate are referred onto the Ministry of Health Enforcement services who follow up with them and may trigger an enforcement process if necessary (this hasn't been so far).

19. As long as a close contact remains asymptomatic, they are not tested. Healthline follows up with them twice during the 14 days: halfway through and towards the end of the isolation period. Healthline will also refer people to appropriate government agencies for additional support.

20. If a close contact becomes symptomatic, they are immediately treated as a probable case and receive appropriate healthcare, and close contacts will be identified and traced. It is critical that the Ministry of Health has the lead role in considering technological enhancements in this area. Public health efficacy will be an important consideration.

21. People who have arrived from overseas are currently either self-isolating or going into quarantine. Ministers will shortly consider whether all incoming passengers should go into mandatory quarantine. Those who are currently self-isolating because of overseas travel are receiving one compliance check by Police. Police have adapted a system set up some years ago to help Search and Rescue situations to monitor self-isolation of individuals who have consented to the use of the technology. The system requests and is sent one-off information about the location of the person. In some cases the technology is not functional (for example a GPS location is not receivable within a building) and in a relatively small number of cases (around six per cent), individuals are not consenting to the use of this technology. If an individual chose to be non-compliant, it would be relatively simple to leave their phone in their place of isolation when they go out and avoid detection.

22. However, there is currently very little checking in to ensure that close contacts are able to comply with self-isolation and the numbers involved are sufficiently high that manual or repeated check-ins would require a significant level of resourcing. We have no data to suggest if compliance is high or low. This may not be such an issue during Alert Level 4 but may be more problematic if the Alert Level is reduced. At lower Alert Levels, the average number of close contacts per case is likely to be higher and the risks from any non-compliance will be greater.

23. Non-compliance may be driven by a lack of support (for example the need to obtain food). Manual monitoring of the self-isolation of close contacts may simply not be feasible with existing Police resources, particularly if the monitoring demand covers the whole country. Police are already stretched to deliver the level of monitoring and public reassurance patrolling necessary as well as delivering core policing functions.

24. The Ministry of Health, in consultation with Police, will develop a support plan for self-isolation at lower alert levels, with the focus being on supporting people to be able to self-isolate appropriately. The plan will consider the need for monitoring and enforcement, and whether those needs can be assisted by the use of technology.

25. The mathematical modelling of pandemic control suggests that the better the contact tracing system, the less need there is for extremely high levels of compliance with quarantine/self-isolation, and vice versa.

Monitoring disease progression and spread

26. It would be useful to increase our understanding of how COVID-19 progresses in individuals and monitor its spread across communities. A smartphone application could be used for a daily symptom check in for those with mild cases and close contacts. It could also be used for population wide monitoring of potential new outbreaks or clusters in a similar way to the current Flutracking system. A symptom tracking application has been widely downloaded in the UK and is providing insights into the potential prevalence of the disease there. Population-wide symptom checking could provide high-level anonymised data on potential outbreaks or clusters. The Ministry of Health will need to consider and assess any technological options in this area.

Monitoring population movements

27. Mobile network location data is very useful at an aggregate (and properly anonymised level) for monitoring population movements and understanding the effectiveness of the lockdown and physical distancing measures. It also provides useful information to inform enforcement strategies. This use does not raise any significant privacy issues and would be legal even in the absence of emergency powers.

28. Google has recently started releasing daily reporting that shows changes over time in population movements for a large number of countries including New Zealand. In New Zealand, the data goes down to regional level. It is interesting at a high level, but because of the measure it uses (a count of people at a particular location compared with a reference date) and the way it groups locations by type (for example a park, residential area, grocery store) it isn't useful for modelling or tracking compliance with self-isolation.

29. Statistics New Zealand's Data Ventures has just developed movement data for individual suburbs which shows the population movements in and out of those areas, on an hourly basis by local residents, non-residents and international visitors. The data models the entire population, even those without mobile phones. This data allows you to see the number of visitors to an area. Additionally this data can be used to classify areas of behaviour, such as what was previously home, work, holiday, shopping malls, etc. It can be used to understand behaviour during lockdown and pick up changes in physical distancing behaviour. It can also be used as an input to model population mixing and understand infection spread. The data is more granular than what Google have produced.

Social licence and legitimacy are critical for the success of any pandemic control strategy

30. Public support is critical for the success of any approach to managing COVID-19. Key concerns for the public in this area are privacy, security, autonomy, usability, and the likely benefits of any technology choice.

31. Important to retaining public support for our response is not utilising additional powers unless absolutely necessary. The technology enhancements we are keen to see officials explore are those which work within existing legal parameters and do not require the use of emergency powers. Any options that develop outside those parameters will need to seek Cabinet agreement.

32. Officials' review of international developments in the use of technological enhancements have identified that there are some key principles that Ministers need to consider to guide officials' work. These are:

    a. **Public health efficacy** - Technology choices are driven by what is most effective for public health purposes. Public health does not require any broad public sharing of personal information and so we have not assessed any options that do this. The Ministry of Health is the lead agency on determining this.

    b. **Privacy respecting -** Technology and design choices should respect privacy as far as possible, while meeting public health objectives. Key privacy considerations in this context include:
        i. whether an individual is required to provide information or do they have the option to opt in/out
        ii. what types of information someone is being asked to share
        iii. who the information is being shared with
        iv. whether the sharing is necessary and proportional to the goal
        v. what purpose the data is collected for
        vi. how long the data is kept for that purpose
        vii. how secure the data is from hacking or misuse

    Agencies will need to consider any matters of privacy using established processes and consult the Government Chief Privacy Officer and the Privacy Commissioner as appropriate.

    c. **Freedom of movement** - technology choices that improve the accuracy and speed of contact tracing will affect the level of lockdown, and thus the public freedom of movement. Technologies that improve the ability to monitor those self-isolating can reduce the need for quarantine.

    d. **Technical feasibility -** Technology choices should be technically feasible and able to be implemented effectively. The Functional Leads – the Government Chief Digital Officer, the Government Chief Information Security Officer and the Government's Chief Data Steward should all be consulted and involved as appropriate.

33. In the past week, there has been a reasonable amount of media coverage of technological options for contact tracing. Some rapid sentiment analysis of the social media discussion of this topic has been undertaken, along with a broad review of international developments in the fast moving responses being implemented in different jurisdictions. Due to the nature of this analysis, it only provides a snapshot of one

segment of New Zealand, weighted towards the digitally literate and active social media users. However, this is also the population most likely to be voluntary users of a government COVID application.

34. It seems that New Zealanders are broadly in favour of harnessing IT for contact tracing, but with a number of caveats. They want reassurance that the system will be secure and feel that the government has a bad track record on data security. Some have expressed concerns about snooping and over-reach. Mitigations would include having the system independently audited by the Privacy Commissioner. Open-sourcing and transparency are also identified mitigations. People would also like the option of deciding when and what data they disclose.

35. It will be critical that officials are keeping Ministers regularly briefed on options under development. Officials will need to report to the Minister of Government Digital Services and the Minister of Health to ensure that technological enhancements under development are consistent with the principles discussed here. Ministers may need to bring some of these ideas to the Ministerial Group on COVID-19 to ensure that what is being developed sufficiently considers public views during different phases of the response.

36. The overall approach required may also depend on which ‘scenario’ we find ourselves in. If for example our other control measures appear very effective and we are able exit Alert Level 4 after six weeks, the necessary contribution from digital contract tracing may be important but moderate, and we have more flexibility. In contrast, if after three months we were still unable to fully eliminate the virus and need to amend strategies, a more prescriptive approach to digital contract tracing may be necessary to contain the virus.

37. While these criteria steer us more towards certain technologies, officials recommend progressing technical development across a broad range of options at this time. We are still in the very early stages of pandemic management and the situation could evolve rapidly. We hope to never have to use some of these technologies. Over time, we will have a better sense of what is required and will cut off some of the technical development. Regular reporting to Ministers will enable us to monitor these developments.

Technology solutions for pandemic control

38. Many of the possible technology solutions for managing COVID-19 are best delivered through smartphone applications. If we are to get high levels of take up of these technologies, there should only be a single government app for everyone in New Zealand to manage their COVID-19 health needs. We expect this app to be launched by 17 April. New functions or modules can be added to it over time, as they are developed. We are focusing first on smartphone options that are effective, maintain social licence, respect user’s privacy and security, comply with existing laws, and can be practically deployed soon. The private sector are also developing innovative solutions that will increase overall uptake. It is important that this is supported by government, that the apps are able to co-exist and integrate over time, and that the data collected is accessible.

39. The following initiatives can all be part of the single COVID-19 app and can be added incrementally:

Initiative 1: Speeding up contact tracing (underway)

40. The Ministry of Health is currently developing the government app for people to manage their COVID-19 health. In its first iteration, it will ask individuals to share their contact details to speed up the contact tracing process. While this sounds simple, sitting behind it is a secure system to store this personal information. This will leverage 12 months of work by the Ministry of Health, in conjunction with the Department of Internal Affairs' digital identity programme and the data protection and use policy developed by the Social Wellbeing Agency. This first step will ensure a secure platform that meets all of the government's privacy and security requirements. This platform uses functional proof of concept work that has been undertaken for the National Health Information Platform programme business case work. This business case is currently with the Minister of Health. This initial development will be available through web browsers, in the first instance to enhance equitable access for those who may not use modern mobile phones. Any data usage from the app will also be zero-rated to enable access (i.e. the user doesn't have to pay for the data used).

41. As an add-on, with individual consent, the app could record the person's location through the day using the phone's location data (a mix of mobile network data, GPS if turned on, and Wi-Fi networks). This information would be stored on the phone and can be voluntarily shared with contact tracers, along with contact and calendar information, if they test positive.

Initiative 2: Adding Bluetooth interaction capability to rapidly contact trace (exploring)

42. A Bluetooth-based app can record interactions between a phone and any other phones nearby (although not the specific location). This would provide useful information on the duration of the interaction and how close the phones were.

43. The Singaporean government has just released a Bluetooth based app called TraceTogether. It is being rolled out on a voluntary basis and will capture interactions with other phones that have the app installed. The data is stored on the phone and if the user tests positive they then release the data to the government for contact tracing. Close contacts can then be automatically notified of their need to self-isolate and be tested. Each user/phone is given an anonymous identifier so the data on any person's phone only shows anonymous identifiers and not the name or contact details of any person. This ensures that if the phone is hacked, there is no breach of private information (from the tracing app). Uptake on 1 April was about 13% of the Singaporean population, a level far below what is likely necessary to have a material impact.

44. This technology appears to be the most promising for contact tracing and is being rapidly developed in a number of countries. The Singaporean government are planning to open source their technology in the next week. We have made initial contact with the Singaporean government and registered our interest.

45. Other governments and private sector groups around the world are developing similar technologies to TraceTogether. Closer to home an AUT/University of Queensland group are developing an app for the Queensland state government. Officials are monitoring these developments and remain open on the choice of the best technology path.

46. The Bluetooth capabilities can be added to the Ministry of Health app that is under development. There are still some issues with the Singaporean app that need to be worked through – it needs to run in the foreground on some phones and may interfere with Bluetooth headphones which leads to users turning it off.

47. The epidemiological value of a Bluetooth app will increase exponentially with uptake. A very high proportion of New Zealanders have smart phones. In the interests of digital inclusion, the Government could actively supply Bluetooth enabled phones to some people (which may be an option). Officials will also explore options to use Bluetooth enabled tags for those who may not or should not have a smartphone (eg children).

48. While the technical development is under way, we need to develop a greater understanding of the overall epidemiological effectiveness of different levels of app. Based on that modelling/science input we will then provide policy advice on the best mode of uptake.

49. Ideally, use of the app should be voluntary. A sustained communications/marketing campaign would be required, including from elected officials. A number of strategies can be used to achieve a high level of uptake such as emergency system notifications or SMS messages to all phones. We are also exploring the technical and legal feasibility of the app being pushed out to all smart phones. This would reduce barriers to uptake but the user would still need to open the app and register. Generally, uptake is high when user's feel that there is some benefit to them from using the up. The opportunity to return to a more normal life and restart economic activity may be a strong motivator for uptake.

50. Even if the technology is very successful, it will still need to be supported by the core human based contact tracing system.

Initiative 3: Monitoring disease progression and spread (exploring)

51. Adding symptom check-ins to an app is technically simple and straight forward. This could be done for positive and probably cases, close contacts, or the general population. The main issue is understanding the value for both the delivery of care to an individual and public health objectives. Some form of anonymisation of the data would also be required for the population-level monitoring.

Private sector approaches to contact tracing

52. The private sector are currently developing applications and solutions to manage their health and safety responsibilities for COVID-19 risks. Many of these systems will support contact tracing. Examples include systems to record the entry of people onto their premises. The Ministry of Health have standards for privacy, security and data (which are also a part of the National Health Information Platform approach), which will ensure that relevant information can be automatically shared with the Ministry for the purposes of contact tracing. Further communications with business will be needed to ensure the adoption and uptake of these standards.

53. In addition, a number of private sector companies are interested in working with the government to develop technology solutions for COVID-19. Officials have been engaging with private sector digital technology providers who have offers of help for digital tracing and other solutions. Producing a technology roadmap will enable the digital technology sector to understand what it underway, what is planned, and how they may be able to contribute.

Whatsapp

54. The government recently launched a Whatsapp channel for communications about COVID-19. Officials have been engaging with Sam Morgan on his ideas for the extension of that interface. Some of these ideas have been incorporated into ideas for symptom monitoring through the App. Whatsapp will remain as a channel for

communications and some elements (such as symptom monitoring) could be adapted to be delivered over through the Whatsapp channel in the future. The Whatsapp channel is not suitable for contact tracing.

Monitoring self-isolation of close contacts (on the horizon)

55. Once a support plan is developed for those in self-isolation, there may be some technology needed to support the monitoring of compliance. This compliance monitoring must be completely separate from any health focussed app. If it is not separated, it could destroy the social licence for all the other functions of the app.

Mobile phone network location data

56. The South Korean government is using mobile network location data augmented with payments data (use of credit/EFTPOS cards) 6(b)(i) [redacted] Within 10 minutes of a positive test result, all the close contacts of the case are messaged to inform them of the need to self-isolate and be tested. The system potentially classifies too many people as close contacts, but this is mostly occurring in the context of little lockdown. We don't believe that it would be technically possible in New Zealand to do reasonably accurate, automated contact tracing using the existing mobile phone network infrastructure. However, there are still potential uses for this information.

9(2)(f)(iv) [redacted]

60. The following table summarises the different uses and technologies referred to above.

Technology	Pandemic management tool			
	Contact tracing: Speeding up manual processes (even small improvements can greatly reduce workload)	**Contact tracing: Replacing manual processes**	**Monitoring of self-isolation and quarantine**	**Population level monitoring and intelligence**
Mobile Phone Network Location – Anonymised (coarse accuracy)				Available via Stats NZ's Data Ventures on hourly basis at suburb level. Accuracy varies between 50 -1500m depending on cell tower density.
Mobile Phone Network Location – Individual (coarse accuracy)	9(2)(f)(iv)		With the consent of a user, Police are using this technology to monitor compliance with self-isolation requirements.	
Smart Phone Location History, via an App (fine accuracy)	The Ministry of Health have an app under development, which will require the user's consent to share data.	Probably not granular enough.	Could be useful. Also requires mechanism to ensure that an individual is with their phone.	Google are using their own data in a highly anonymised way to show changes in population movement. This data does not represent the whole population.
Bluetooth data, via an App (estimated interactions, very accurate)	Could be added on to Ministry of Health app (see above), which will require the user's consent. Singapore has implemented an app using Bluetooth data called TraceTogether.	With enough uptake, can potentially replace much of the manual process.	Could be useful, but would also need to include location information.	Data would need to be shared with government to be useful, not just when needed for contact tracing. Could provide insights into effectiveness of physical distancing.

Green: underway Blue: Explore further Grey: Reassess in a few weeks

Communications

61. The Ministry of Health is preparing a communications plan will be prepared for the launch of the COVID-19 app.

62. We recommend that if Ministers do wish to discuss these issue publicly before then, they use the following messages:

    a. Contact tracing is an important tool for breaking the chain of transmission. Breaking the chain will reduce the impact of Covid-19 on our lives, our communities and our economy.

    b. The more we improve the speed and effectiveness of our contact tracing, the more effective we will be in breaking the chain of transmission.

    c. Evidence is emerging that those with Covid-19 may spread the virus to others before they develop symptoms, making speedy contact tracing more important.

    d. Contact tracing systems have already improved significantly since the government response to Covid-19 began. Further work to explore how technology can make the process easier for the public and for the health system is now underway.

    e. All options under consideration respect people's privacy and will be put through robust and appropriate testing before being used to ensure they keep data safe.

    f. Technology solutions such as apps may help transform our ability break the chain but they must go through the appropriate checks and when it comes to data privacy and security, this cannot be rushed.

    g. Other countries are already exploring, and in some cases using, solutions such as apps to revolutionise their ability to carry out contact tracing and protect their citizens and their economy's from the effects of Covid-19.

    h. New Zealand is already learning from and implementing international successes in a way that is appropriate for us.

    i. For example, anonymised data is already being used to monitor how Alert Level 4 is working.

    j. Police are already effectively and safely using a texting system that enables individuals to voluntarily check in and share their location information to help ensure people are following self-isolation rules.

    k. We will be putting out a technology roadmap for the tech sector to understand what technologies we will be using.

Next steps

63. Officials will to continue work on developing the different technology options. Efforts will be focussed on the development of the Ministry of Health app. We will further explore the privacy, security and legal requirements of the options that are being explored. We will

report back to Ministers in two weeks on progress. Any rollout will need to be carefully managed to achieve the highest possible level of take up.

64. In addition there is work progressing to explore the technological enhancements that have been introduced by the Republic of Singapore, with high-level government engagement underway.

Risks

65. Risks can be grouped into two areas: social licence/legitimacy and technology. A loss of social licence can put pandemic management at risk and this needs to be managed carefully. Ensuring that we respect the privacy and security concerns of citizens will mitigate the social licence risk. Implementing new technologies is always difficult. This type of project would normally be developed and delivered over 6 months to a year. Both the technology and design can compromise usability and hence reduce uptake and use. These risks will need to be carefully managed.

Consultation

66. Ministry of Health, Ministry of Justice, Police, MBIE, Crown Law, Statistics NZ, the Office of the Privacy Commissioner, Government Chief Digital Officer, Government Chief Security Information Officer and the Government Chief Data Steward have been consulted on this paper and their views are represented. The Department of the Prime Minister and Cabinet (PAG) was informed. In addition, advice has been sought from Dr Ayesha Verrall and Prof Philip Hill from the University of Otago. Between them they have infectious disease, public health, contact tracing and bio-ethics expertise. An external team of data and technology experts, including the Defence Technology Agency have also had input to the ideas in this paper.

Ministry of Health Comment (supported by Ministry of Justice and GCDS):

67. The Ministry of Health strongly recommends that the use of any application or other technological solution is a personal choice. The Ministry considers any move to a mandated or opt out scenario would have serious consequences in terms of public buy in and social licence once the COVID-19 response is exited from. The Ministry of Health considers that with the right messaging, a good proportion of the population would opt in and in doing so, would materially improve the speed and accuracy of contact tracing. The Ministry considers that 100% take up across the population isn't necessary.

68. Importantly, the Ministry of Health considers that data capture must be time bound, for example, data is anonymised after so many days following self-isolation and within so many days after that only information to support statistical analysis remains. All solutions need to ensure appropriate security and privacy steps are taken.

Recommendations

It is recommended that the Ministerial Group on COVID-19:

1. **Note** that officials, as part of an all-of government effort, continue to rapidly advance work on technological options to respond to COVID-19

2. **Agree** that agencies should explore technological enhancements to support:
    a. Contact tracing
    b. Monitoring disease progression and spread
    c. Monitoring population movements

3. **Agree** that the priority for these efforts will be on contact tracing

4. **Agree** that technology choices must be guided by the following principles:
    a. Public health efficacy
    b. Respect for privacy
    c. Freedom of movement
    d. Technical feasibility

5. **Agree** that technology choices must work within existing legal parameters and not require the use of emergency powers. Any options outside these parameters will need to be agreed by Cabinet.

6. **Direct** officials to report to the Minister for Government Digital Services and the Minister of Health as soon as possible if further resources or prioritisation of other tasks could accelerate progress on technology options for contact

7. **Invite** the Minister for Government Digital Services and the Minister of Health to report back to the Ministerial Group on COVID-19 with an update on progress with implementing technology options by 20 April 2020

8. **Note** that the Ministry of Health has developed a smartphone application that will assist with an individual's interactions with health services and the government for managing COVID-19

9. **Note** that officials are exploring options for the addition to the Ministry of Health smartphone application Bluetooth enabled contact tracing, reporting to the Minister for Government Digital Services and the Minister of Health jointly on progress

10. **Direct** the Ministry of Health, in consultation with the New Zealand Police, to report back to the Ministerial Group on COVID-19 with a support plan for managing the self-isolation of close contacts by 20 April 2020

Authorised for lodgement

Hon Dr David Clark

Hon Kris Faafoi