Chair in Digital Government

Effects of Covid-19 on digital public services.

Professor Miriam Lips and Dr Elizabeth Eppel

School of Government, Victoria University of Wellington

29 March 2021

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Acknowledgements

In preparation of this Final Paper an online Roundtable Discussion was held on Thursday 20 August, 2020. Eighteen senior officials participated from 12 central government and the non-profit sector organisations (excluding the research team and University). In addition, a follow-up interview was held in March 2021 with senior officials from the Ministry of Health.

The authors would like to thank the round table participants and the interview participants from the Ministry of Health for sharing their experiences and insights.

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Introduction

This paper provides an overview of the implications of the Covid-19 pandemic for digital public services in New Zealand.

A roundtable discussion under Chatham House Rules with senior leaders in government and the non-profit sector held in August 2020 focused on the lessons learned from the government's response to the Covid-19 pandemic and what a post-covid-19 New Zealand public service needs to look like. Also, a follow-up discussion was held with officials from the Ministry of Health (MoH) as one of the lead agencies in the government's response.

The paper provides a summary of the arrival of Covid-19 in New Zealand and digital public service developments during the lockdown (Alert level 4). This is followed by an overview of the policy context within which digital public services in New Zealand operate. Based on research undertaken by the research team of the Chair in Digital Government, some evidence of how well digital government is performing is presented together with opportunities and threats associated with the Covid-19 pandemic. These lead into a set of learnings that could guide public debate.

Background - Covid-19 arrives in New Zealand: a digital public service response

2019 had presented New Zealand with two extraordinary tragedies which in different ways challenged its people and its politicians yet again to deal with the exceptional: the March killings of 51 people and injury of 49 others in two Christchurch mosques while participating in Friday prayers; and then the 21 deaths and injuries of 46 visitors through forces of nature when Whakaari erupted in December. Responses to these events built on the knowledge and capabilities of the public sector acquired through the Canterbury earthquakes in 2010-11 and Kaikoura in 2016.

Most New Zealanders would have been hoping 2020 would be a less eventful and tragic year. Yet in the New Year, another set of novel events began unfolding. The threat to New Zealand arising from what has become known as the Covid-19 corona virus was on the radar of the Officials Committee for Domestic and Security Co-ordination (OCDESC) by the end of January 2020 (McLachlan, 2020). Many commentators now seem to agree that the Covid-19 pandemic presents

challenges of unprecedented magnitude and scope for how New Zealanders live and work, and how government governs.

The fast evolving international scale of what on 30 January was declared by the World Health Organization (WHO) 'a public health emergency of international concern over the global outbreak of novel coronavirus' had already caused New Zealand, with Australia, to limit travel from China and begin planning for worse to come. Covid-19 cases began to show in quickly growing numbers around the world. OCDESC put whole-of-government response planning into place, resurrecting as a starting point the pandemic planning done nearly two decades earlier for SARS, but in the end not used when that threat dissipated. International research suggests that a disaster plan cannot guarantee emergency response success, but provides a preliminary blueprint for co-ordination of agencies and resources to cope with mismanagement, chaos, and confusion arising from high impact, low frequency events (Crichton & Ramsay, 2009; Hu, Knox & Kapucu, 2014). So there was an untested starting point about who might need to be involved in action but limited detail that took account of the newly unfolding circumstances, the uncertainty that might entail, and significantly, what was not yet known about the behaviour of the virus itself. The rest was about working it out while putting the planning into effect.

Research also strongly suggests that conditions of high uncertainty require effective inter-organisational communication and collaboration (see for example Weick, 1995; Weick & Sutcliffe, 2007; Kahneman, 2011) to help make more holistic sense of what are inherently poorly understood and evolving new circumstances where there is little in the way of prior experience and standard operating procedures. In this regard New Zealand's collaborative leadership process under ODESC, with different agencies contributing the best of their sector knowledge and expertise to cope with the scale of the wide reaching social and economic effects anticipated was advantageous: Ministry of Health (MoH) and their public health focus and connections domestically and internationally with other health agencies and WHO; Ministry of Business, Innovation and Employment (MBIE) with the knowledge of businesses, trade and national infrastructure to support the essential functioning and logistics of New Zealand's economy; Civil Defence, and Police (McLachlan, 2020). When the first New Zealand Covid-19 case was diagnosed on 28 February 2020, collaborative planning had been underway for a month and included information sharing and co-ordination with Australia. A glimpse of this collaborative, all of government approach was first seen more publicly when the interagency officials group appeared at the press conference following Prime Minister (PM) Jacinda Ardern's announcement to New Zealand on 21 March 2020 that *"we are experiencing an unprecedented event – a global pandemic that in New Zealand, we have moved to fight by going hard, and going early".* A State of National Emergency was issued on 25 March 2020 and the country entered Covid-

19 Alert Level 4 lockdown. This state of emergency brought a special privacy code of practice into force, similar to the one after the Christchurch earthquakes, making it much easier for government agencies to share information. Also, from then onwards during Alert Level 4, the PM and the Director-General of Health Dr Ashley Bloomfield, signalling the important part a public health response was to play, became the faces of the New Zealand response to Covid-19, holding daily press conferences on television which were also live-streamed. On 13 May 2020, new legislation, the Covid-19 Public Health Response Act, administered by MoH, came into force to support the New Zealand response to Covid-19.

At the end of February 2020, the Digital Public Service (DPS) branch of the Department of Internal Affairs (DIA) was told by the Minister for Government Digital Services, Kris Faafoi, that Covid-19 was the 'only airplane on the runway': all Business As Usual (BAU) for the branch needed to be stopped and all efforts needed to go into Covid response. DPS joined the Operations Command Centre led by former Police Commissioner Mike Bush and led a digital infrastructure workstream as part of the all-of-government response. This workstream involved four areas of contribution during Alert Level 4 lockdown:

1. To support government agencies as they moved to remote working;
2. To act as a broker between government agencies and the vendor community in relation to getting Information & Communication Technology (ICT) equipment to the places where it was needed most;
3. To provide support for the government's communication efforts through providing digital channels; and
4. To lead prototyping for a potential COVID card and provide technology and assurance advice and support for MoH's contact tracing app.

An important part of the Covid-19 response was a public health response, and consequently the development of some key digital systems and applications to support this response, including the NZ COVID Tracer app, were led by MoH. The Ministry were guided by the Digital Health Strategic Framework (MoH, 2019), which allowed MoH to use approaches and development methods for digital solutions. MoH commented that, compared to those used three years before the arrival of the pandemic, they were in a position to be more agile and deploy parts of their digital infrastructure in new ways to meet the Covid response needs. Having new cloud-based platforms with multiple capabilities and working with agile teams for instance gave MoH the opportunity to adapt policy settings in the digital solutions very quickly. This new way of developing digital solutions

led to discussions with the New Zealand Treasury who have agreed that this work be funded on the basis of continuous improvement, rather than a traditional project business case submission procedure and a multi-year waterfall approach towards system development in which the products only emerge for use at the end of the project.

As envisaged by the New Zealand government, during the 'go early, go hard' Alert Levels 4, 3 and 2 response periods, people, businesses and government agencies were suddenly much more reliant on digital public services. Where possible, people packed up their digital technology from work and took their work home. However, government agencies were noted to be at different levels of digital maturity regarding remote working. Home internet connectivity for government staff was another issue: a DIA support team particularly focused on those government agencies that provided critical services. As supply chains were disrupted, it emerged that the ICT equipment in the country was not sufficient for the demand that government agencies had. Therefore DIA also worked with MBIE to develop a prioritization framework for ICT equipment, connecting demand for Internet devices and the vendor community.

In some sectors, such as in Health, Education, Social Services and Taxation, we observed a rapid expansion of digital public services to accommodate limited face-to-face contact and overloaded call centres. Call centres became an important lifeline for some, especially the most vulnerable and digitally excluded. However, call centre technology and logistics were tested to the maximum and there was inter-organizational co-operation and collaboration on these. We know that some organizations stopped and reassessed what they were doing and redirected resources to supporting new virtual ways of working and delivering essential services during lockdown. For example, ACC redirected their digital product development resources to 'standing up' products that were then only on the drawing board, such as a tele-health interface to assist their providers to continue meeting clients' needs under lockdown. ACC's prior investment in its own call centre technology and capability also made them well placed to support other agencies such as MSD in this regard.

A new web-based source of trusted information using the branding *'Unite against Covid-19'* and website (*https://covid19.govt.nz*) was created by the all-of-government Covid-19 response group: a one-stop shop to inform, educate, support and enable New Zealanders to play their part on defeating the virus. The first version of the website did not use the common Web platform used for government websites and crashed. Once the website was then quickly migrated to the common Web platform to create stability it has performed very well ever since.

The *Unite against Covid-19* website was both symbolic of the all-of-government collaborative approach begun in late January 2020 and user-centric. It provided an information channel and public services dedicated to the Government's response; personal health and wellbeing; travel; business, work and money; community; and updates and resources. The website dealt with all aspects around Covid-19 in a user-friendly, clustered way, irrespective of which department of government was behind the scenes. Key messages from the website were also disseminated via Facebook, Twitter, Instagram, LinkedIn and Whatsapp. The updates and resources section included a number of important free government helplines for individuals and links to several authoritative websites such as the latest information about Covid-19-related scams and phishing attempts.

Regularly updated information, resources, public services and advice related to Covid-19 are also accessible via the websites and social media channels of individual government agencies. The MoH website for instance provided a daily update on Covid-19 cases in New Zealand and regular updates on other coronavirus issues, such as testing availability, advice for health professionals, advice for higher risk people, the provision of Personal Protective Equipment (PPE), the latest studies about the virus, contact tracing and border control measures (Wilson, 2020). In 2021 this was extended to information about Covid vaccines, and when they would be available to New Zealanders

In general, MoH's digital strategy aimed to embrace the growing opportunity that "digital" offers, which for MoH is very different to traditional "data capture" systems: this strategy has allowed MoH and the health sector to focus on new digital technologies and approaches in the development of the Covid-19 response. In line with this Digital Health Strategic Framework (see under 'policy context'), MoH has created cloud platforms and a data layer and adopted new approaches like continuous delivery and working in an agile way, providing MoH with the opportunity to start with a "Minimum Viable Product" (MVP) and then improve it. Another key development has been the development of a secure data and analytics platform that supports MoH's delivery of the Covid-19 response, in particular MoH's surveillance efforts, and has provided national-level data for the health system, government and the public. This platform has reduced the demands on District Health Boards (DHBs) for their own reporting and analytics. It has established a base for extension to other communicable diseases, a future vaccination register and to provide an early warning and surveillance response system.

A good example of MoH building an MVP and improving it along the way in a pandemic, is the National Contact Tracing System (NCTS). This system uses a cloud platform and records the interactions between individuals identified as cases, close contacts or casual contacts and Public Health Units (PHUs) or MoH. With the initial version built and released in only 1 week in March 2020,

there have been more than 21 releases of this system to further improve it since its introduction. MoH extended the NCTS with the Border Management and Workforce Testing Register (BMWTR) to register those who arrive back in New Zealand from overseas and enter Managed Isolation and Quarantine (MIQ) facilities, and those who belong to the border workforce and get regular Covid-19 tests. The BMWTR is linked to NCTS to allow MoH to follow up people out of MIQ back into the community, and reuses data models and concepts from NCTS. However, collaboration between multiple agencies at the border would have been easier with a national digital identity for each individual that can be used cross-government.

Another new application introduced by MoH that forms part of Covid-19 health response is the NZ COVID Tracer app. The QR code system was developed jointly by MoH and MBIE and enables the use of location identifiers. People can download this app to their mobile phones, sign in and enter their contact details. This app works by individuals scanning a QR code on a poster at all businesses and services they visit, which is linked to a New Zealand Business Number (NZBN) providing a precise geo-location of the place visited in the background. The app then keeps track of where someone has scanned so they have a record of where they have been. Later, an optional Bluetooth functionality was added to the app to collect data on who people have been in contact with. People can sign up for contact alerts so that the NZ COVID Tracer can let them know if they have checked into a location at the same time as a confirmed or probable case of Covid-19, and if they have been in contact with a confirmed or probable case. Individuals can also share their digital diary with MoH to aid contact tracing procedures for new Covid cases in the community. The QR codes are using the government standard (the Global Location Number (GLN)) to enable eInvoicing. For people without the app or a mobile phone, a physical diary kept by the individual and a physical register of visitors by businesses and services are promoted.

Initially there was a limited uptake of the NZ COVID Tracer app: businesses often failed to display readable QR codes and there was no coordination at the government systems level for collecting contact tracing information. As a result, private sector entrepreneurs jumped in the void and offered alternative contact tracer apps. The Office of the Privacy Commissioner (OPC) started to rate these apps for privacy protection and minimal data collection and in response to these feedback ratings developers adjusted their apps in line with privacy principles.

In developing the NZ COVID Tracer app MoH consulted with the Privacy Commissioner. A Privacy Impact Assessment was conducted on the privacy friendliness of the app. People's personal information and contact details they choose to register through the app are provided to MoH so contact tracers can quickly get in touch if they are identified as a close contact of someone who has

Covid-19; these personal details are not shared with other government agencies except where the agency is directly involved in the public health response and sharing the information is necessary for public health purposes during the Covid-19 pandemic. Other information recorded through the app, such as scanned QR codes, manual diary entries or contacts, are stored securely on people's mobile phones, with digital diary entries automatically being deleted after 60 days. No information is transmitted from people's phones and if they are identified as a confirmed or probable case of Covid-19 people can choose whether to share their digital diary with MoH.

The initial lack of coordination across the public sector also created conflicts in standards: besides the development and use of different apps, different workplace and hospitality registers and different QR codes came into use. This issue was managed by making it mandatory for businesses and workplaces to display an NZ COVID Tracer QR code for each location. An extensive communications campaign and the reality of further Covid community outbreaks in Auckland in August 2020 and February 2021 respectively, contributed to an increased uptake of the NZ COVID Tracer app to more than 2 million people by September 2020 and over 2.7 million users and 51 percent of users having enabled Bluetooth tracing in March 2021.

Another system developed by MoH is an MIQ Patient Management System. This addresses the other health needs of people coming back into New Zealand through MIQ. This new clinical records system allows health professionals on site to undertake health assessments, document health interventions and then send this information on to the person's registered General Practitioner once they leave MIQ.

MoH also developed a new digitised Covid-19 Immunisation Register to record every Covid-19 vaccination in New Zealand. The system is being continually built upon and is likely to eventually become the National Immunisation Solution which will track all childhood and adult vaccinations in New Zealand. A related tool currently under development is the digital consumer channel that will allow users to book and manage the vaccination process, see their vaccination history and should this be needed, create a vaccination appointment.

In general, reliance on science, facts, evidence, and data modelling, has been prominent in the New Zealand government's response to the pandemic. Using the newly developed secure data and analytics platform, MoH collects and provides data about individual cases of Covid-19, including data on any confirmed or probable cases of Covid-19, the number of people who have recovered, how many people are and have been in hospital, and case numbers by DHB, age and gender. Also, MoH provides data about significant clusters in New Zealand, and the number of tests completed each day and over the previous seven days. Furthermore, MoH commissioned modelling reports to

help understand the health outcomes and impacts on New Zealand of Covid-19 and to inform the response strategy. Real-time data about the number of cases, case demographics, case genomics of the virus and transmission of the coronavirus in New Zealand can also be accessed via the NZ COVID-19 Dashboard (https://nzcoviddashboard.esr.cri.nz) provided by the Environmental Science and Research Institute (ESR). This Dashboard also provides international comparisons on confirmed Covid-19 cases and deaths in New Zealand and those in other countries based on data reported to WHO.

In the early months, to further inform and educate New Zealanders about Covid-19, the PM conducted a series of Facebook Live sessions 'Conversations through Covid-19' where she interviewed experts and practitioners from various backgrounds. These included a session together with Health Minister David Clarke in which the importance of individuals' actions to prevent the virus spread were emphasised: regular hand washing; what social distancing is and why it matters; where to get help for those with possible symptoms; and avoiding panic buying of groceries (Wilson, 2020). At the same time that MoH's data gathering was focusing on the health effects of Covid-19, the New Zealand Treasury was focusing on the economic impacts on individuals and businesses. Other sessions in the PM's series involved an interview with a psychologist to explore ideas for coping with the stresses of the pandemic; with an experienced business mentor who works with entrepreneurs and small businesses, to explore how people can support small businesses and what small business owners can and should be doing; and with a business owner of an essential service that was permitted to operate under Level 4 to explore what they did to make that viable (Wilson, 2020).

Although New Zealand government agencies were heavily reliant on digital channels during the Covid-pandemic, they were conscious that 20 percent of New Zealanders do not or cannot engage via digital channels. International research has shown that in order for people to be digitally included, four dimensions need to be met: digital access, skills, motivation to want to use the devices, and trust to engage with government digitally. This implies that Internet access alone is not enough for people to be digitally included. As an amelioration to this problem, the coordinating government department for digital inclusion, DIA, initiated a collaboration with Maniakalaani, a trust supporting digital skills development in a group of schools in a low socio-economic part of Auckland, to develop a programme for digital skills support targeting 30,000 individuals and whanau. They also collaborated with MBIE to develop a skills training programme for small businesses, because it had become more apparent during lockdown that many small businesses didn't have an online presence and lacked know-how to change this situation. As a result these small businesses struggled during

Alert Level 2,3 and 4 response to do business online or face-to-face socially-distanced because they could not receive payments through a website which was needed for contactless service.

While elimination of community transmission of the virus within New Zealand was achieved by going hard and early into Alert Levels 4, 3 and 2 during April 2020, maintaining no community transmission of the virus under Alert Level 1 remained a challenge, as an August 2020, and again in February 2021, virus outbreak in Auckland demonstrated; retaining the public health gains while rebuilding the economy and avoiding going sharply backwards as other countries have done, relies on effectively managed barriers to entry and community monitoring through testing, and where needed speedy tracing of contacts.

The information sharing with the public initiatives described here were part of the government's deliberate strategy to enlist public support for the response. At the time of the Alert Level 4 lockdown New Zealanders' support for the Government's response proved strong: a Colmar Brunton poll undertaken in early April showed 88 percent of respondents believed they could 'trust the government to make the right decisions on Covid-19', compared to an average of 59 percent of people in G7 countries surveyed in the same poll (Wilson, 2020).

Creative solutions: the case of the Ministry of Education

Several of the government responses to the Covid-19 pandemic have been highly creative when business-as-usual was not an option. These creative solutions included:

- A high trust contract-based emergency income support solution: a wage subsidy scheme that basically required only a brief declaration from employers for access to it was initiated and if accepted included an audit. This is compared to the extensive paperwork and cautious decision-making that commonly applies. The scheme reused the portal developed during the earthquake response to deploy quickly and efficiently; and
- a school education solution: a home schooling package, which included learning resources, laptops and modems where needed, delivered directly to homes to support parents in helping children learn, along with the creation of two television channels (English medium and Māori medium), a radio channel (mainly for Pasifika students) and a hardcopy workstream, thus relieving teachers of some of the load associated with learning how to teach remotely for the first time (Wilson, 2020). Not only did the Ministry of Education (MoE) distribute laptops and modems to those families that are excluded from the Internet, the Ministry of Social Development (MSD) too provided mobile phones where needed to their clients.

The school education solution created a very rapid shift to distance learning: from the start of school Term 2, 15 April 2020, 800,000 students in 2,500 schools and Kura across New Zealand needed to continue learning from home while in lockdown, and for some ongoing.

With the help of schools and Kura and through an MoU with each telecom provider (Local Fibre Companies (LFC) and Internet Service Providers (ISP)), MoE identified approximately 115,000 students living in 55,000 households across New Zealand, who had no Internet or device. In some cases, devices were shared or owned by the school and not taken home. Further, some students had Internet access but with poor speed and/or data caps, which was a challenge because education use requires more bandwidth to be effective. This was especially the case in rural and remote areas. A partial solution to this challenge was provided by the major telecom providers who lifted data caps. Sadly this did not always extend to wireless technologies in rural New Zealand: here, datacaps were only lifted during the night which was not useful for continuing education use during the day. MoE also collaborated with Crown Infrastructure Partners (CIP) and MBIE on an infrastructure programme on overcoming capacity and coverage constraints but some connectivity infrastructure issues, especially in rural and remote areas, remain.

MoE spent a lot of effort understanding the demand for Internet access as data about household connectivity to the Internet is not publicly available in New Zealand. In general, the household is not a universal customer grouping for interventions across the public service, as these generally tend to focus on individuals. First, MoE needed to identify which students lived in which households, and secondly, they needed data about the connectivity status of those households. The latter information was collected under clear privacy constraints in MoUs developed with each ISP and fibre infrastructure providers early in the process. Student data was matched against every ISP's existing active Internet connections. The resulting delta list involved approximately 55,000 households and provided a focus for MoE's evolving efforts to create home Internet access for learners.

The quality of the student address data also turned out to be a challenging issue: not only did MoE need to figure out where a student actually lived in real-time, which could be a different address from usual under lockdown for instance, but also ISPs did not all use the same address standard exacerbating the challenge.

In order to find an Internet solution for each physical address, MoE targeted households individually and ideally looked for a solution supporting zero contact delivery to meet Alert Level 4 requirements. In total, approximately 115,000 devices were needed: however, as a result of restrictions on international air freight, only a limited supply was available in New Zealand. This

supply chain vulnerability leading to limited in-country availability of technology and resources was not initially a clear priority for the government and caused a first come, first served approach to the dissemination of Internet modems and devices. MoE rapidly identified that it could not provide support to all students in need and therefore identified a priority group of senior secondary school students (those studying towards NCEA in years 11, 12 and 13).

Schools also had approximately 16,000 devices which were still on school grounds: these devices were cleaned, configured and redistributed to student homes. This led to a balance of approximately 98,000 devices which were needed across all year levels. MoE supplied Internet modems and devices directly to approximately 25,000 student homes under Alert Level 4 conditions when only zero contact delivery was allowed: devices were left on the doorsteps to be retrieved and set up by the learner. For this reason zero contact delivery was further challenging, as devices needed to be preconfigured to work out of the box and a dedicated 0800 service helpline was set up to offer support. The type of device was determined by each school or Kura, as the devices became property of the schools following their receipt by the student or school. The limited supply of devices available resulted in a mix of Chromebooks, Windows laptops and iPads. A further 11,500 devices were distributed during the August 2020 virus outbreak, 4,000 of these in Auckland.

However, having Internet access is not enough for individuals to be digitally included, trust and skills of the user are also relevant: cybersecurity, in particular phishing scams, turned out to be a significant risk, especially for first time Internet users. To mitigate this risk, MoE worked with the Network for Learning (N4L) to operationalise a public DNS-based safety filter and MoE put a filter on all MoE configured and disseminated devices.

The impact of Covid-19 on Internet use in 2020

Research findings from an online survey amongst 1,000 people in November 2020 show us that daily Internet use in New Zealand in 2020 had increased to 96 percent of the New Zealand population, up from 94 percent in 2019 (Colmar Brunton, 2020). In 2020, 70 percent of New Zealanders had used the Internet at least daily at work, with an increase in people working from home more frequently. However, one of the main barriers to working from home was not having a fast enough Internet speed (24%). New Zealanders living rurally and/or those of 65 years and older were the least likely to have a fibre Internet connection. The top five of types of information that New Zealanders found of particular importance in 2020 are 1) news and current events (93%); 2) updates from family and friends (83%); 3) health information (82%); 4) government updates and services (80%); and 5) educational resources (77%). Also, New Zealanders were more concerned in 2020 that the Internet has misleading or wrong information (56%), compared to 2019 (48%). In

2020, 58 percent of New Zealanders decided not to use an online service because of security or privacy concerns.

Policy context

A number of policy developments in recent years contributed to New Zealand being able to respond to the Covid-19 threat quickly, digitally and effectively. A significant enabler was the national broadband infrastructure projects of the previous two governments which meant that large parts of the most populous parts of the country are connected by fast fibre or its equivalent.

The Strategy for a Digital Public Service, developed collaboratively by the group of departments working with the Chief Government Digital Officer, was launched by DIA in 2019. It built on work done under the previous government on Better Public Services targets which focused on getting more Kiwis and businesses being able to interact with government online. The Strategy paints a vision of a public service able to give New Zealanders the quality and experience of public services suited to their needs. It directs away from an agency-centred way of operating and puts people and businesses at the centre of government services by designing government services around the lives of New Zealanders and joining up government behind the scenes to achieve a unified public service. Minister Faafoi commented in the Foreword of the Strategy: "When we talk about digital we mean much more than new technologies and improving IT services. It has come to mean doing things differently, using new mindsets, skills and data, as well as technologies that have led to the development of new ways of working with which we are now so familiar". Research on successful digital projects in the public sector supports this approach (e.g. Controller and Auditor General, 2012)

Four outcomes are envisaged from the implementation of the Digital Public Service Strategy (DIA, 2020:15):

1. **Better results for New Zealand through a digital public service**: government has the capacity and capability to collaboratively address complex issues, and grow New Zealand's economic, social and environmental wellbeing;
2. **New Zealanders' experience with government improves**: government services are responsive to New Zealanders' needs and expectations, and are inclusive and accessible;
3. **A modern, agile and adaptive public service**: the public service is modern and continually adapting to change. With its partners, it has the skills, mindset, technology and data to operate at pace;

4. **A strengthened Māori-Crown relationship**: honours the Māori–Crown relationship. Develops and maintains an enduring relationship with Māori for the creation of a digital public service that's responsive to the needs and aspirations of all New Zealanders.

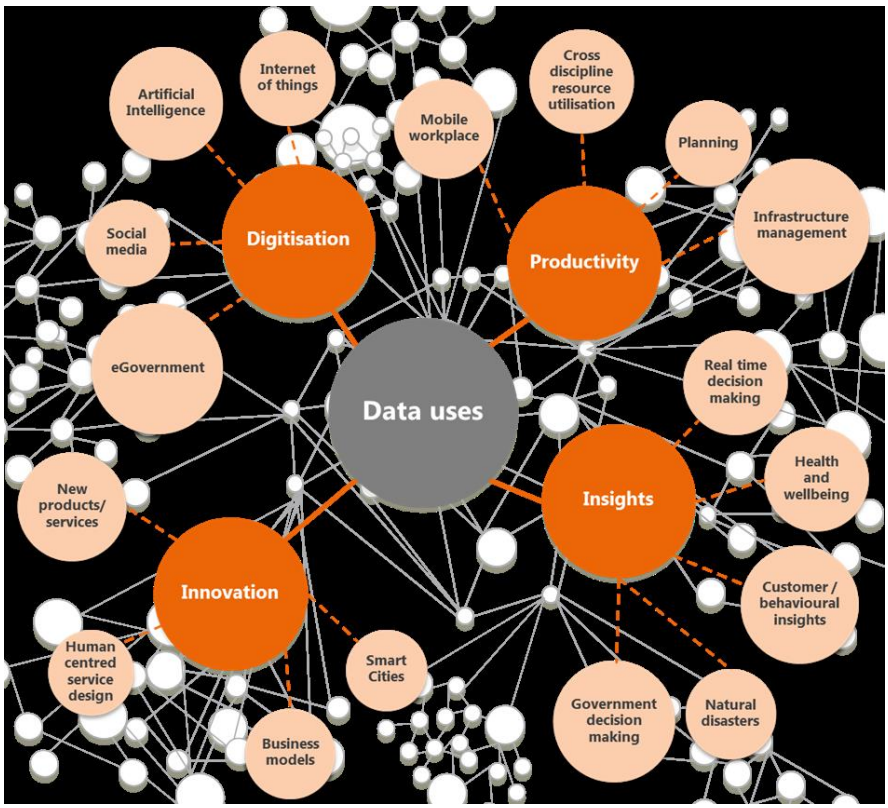
The Strategy has five digital focus areas:

1. *Designing integrated services for citizens and businesses*: in the future, New Zealanders won't need to know how government is organised to receive services, comply with their obligations, or find information. Integrated or automated services will make it easy for people to interact with government by providing a single place for people to address a particular need. Government will work together across agencies and with their partners to join up services for New Zealanders.
2. *Leadership, people and culture*: strong leadership is needed to drive public sector collaboration and cultural change. Leaders will be required to adapt the traditional way they've been operating, to adopt flexible, facilitative and non-hierarchical ways of working. Public service leaders will develop an organisational culture and environment, and provide their people with the appropriate skills, capability and knowledge to enable them to use new ways of working. For example, multidisciplinary teams will be empowered to make important decisions quickly, taking into account their customers' differences to provide them with a better experience;
3. *Foundations*: in the future, government agencies will be able to prioritise the creation of open Application Programming Interfaces (APIs) and components, standards, and datasets in the public service to allow government agencies, businesses, NGOs and others to reuse data, transactions and rules. Digital and data systems will enable collaborative work between government agencies and partners, such as iwi/hapū, local authorities and the private sector. Data transactions and rules will be published so government agencies and others can use them to innovate faster.
4. *Investment*: investment in digital, data and ICT take an all-of-government view to ensure future investment is targeted, efficient and creates public value. Behaviour change in the system will be needed to create more joined up services that focus on the complex needs of people and the environment as opposed to individual government agency objectives. There will be investments in public sector back-office

systems that are more efficient and effective resulting in productivity gains for the public sector and its customers.

5. *New ways of working*: the public service will be working together under a unified public service, across government agencies, to deliver outcomes. It will be flexible and mobile, and use appropriate practices to deliver better services for all New Zealanders. Digital and data systems will be compatible and interoperable, and multidisciplinary teams will have the skillsets, mind sets and knowledge of new ways of working. The public service will use human-centred service design, Agile project management methodology, systems thinking, futures thinking, and iterative development. Accessibility Standards will guarantee all New Zealanders can access government services. (DIA, 2020:20–30):

A parallel policy development, the New Zealand Data Strategy and Roadmap provides a shared direction and plan for New Zealand's data system (the people and organisations that collect and use data in New Zealand). The Data Strategy envisages data stewardship and use of data as a key enabler of innovation and interestingly draws government (national and local) and private sectors together in its vision (see Figure 1):



The Data Strategy and Roadmap and the Strategy for a Digital Public Service are closely aligned and critical to supporting each other's outcomes. Each is the responsibility of a designated all-of-government functional leader: the Chief Government Digital Officer (the CEO of the Department of Internal Affairs) and the Chief Data Steward (Chief Executive of Stats NZ) respectively. New Zealand's international collaborations through the Digital 9 Group of nations and the Open Government Partnership have encouraged and provided international benchmarks for these developments. The D9 countries have a track record in leading digital government, including designing services around users' needs and sharing open source solutions with other countries. As a group D9:

- shares world-class digital practices
- identifies improvements to digital services
- collaborates to solve common problems
- supports and champions the group's growing digital economies

They are committed to working towards the following principles of digital development:

- user needs (designing public services that work for citizens)
- open standards
- open source
- open markets
- open government
- connectivity
- teaching children to code
- assisted digital (committing to support all citizens to access digital services)
- sharing and learning from each other

During webinars debriefing and sharing experiences of operating under Level 3 and 4 lockdown, many public officials referred to how much they valued the publicly available trustworthy all-of-government data provided through StatsNZ as an enabler of their working at home in lieu of in-house, agency specific data sources. New Zealanders also saw Open Government in action through the sharing of information and data about Covid-19 from government agencies and other sources via the Covid-19 website.

Digital government systems, applications and services in the health sector were developed in line with the Digital Health Strategic Framework (MoH, 2019) created by MoH to highlight the need to support delivery of health services to people through the development of data

interoperability and the building of a health technology eco-system. Making use of the growing opportunity that "digital" offers, this framework consists of aspirational goals and enabling priorities, guidelines and resources for a health technology eco-system, which can evolve over time in response to a changing digital environment: the framework is a living document that is intended to be continually revised. The framework does not take a directive approach to implementing digital health services but allows agencies to make good decisions that move the sector in the right direction at the right pace (MoH, 2019). Collaboration, cooperation and innovation are encouraged under the framework; co-investment in digital health services that support the framework's strategic objectives is a requirement.

The following long-term aspirational goals or digital objectives are presented in the Digital Health Strategic Framework (MoH, 2019):

- People are in control of their own health information;
- Digital services and health information improve health outcomes and equity;
- Digital services enable health providers to deliver better services;
- Digital services increase the performance of the public health system; and
- Data insights provide evidence to make and support informed decisions.

The principles of the Digital Health Strategic Framework (below) are intended to underpin the actions of every participant in the digital health ecosystem. These principles are:

- Person centred;
- Customer led;
- Accessibility;
- Privacy and security by design;
- Cloud first;
- Maximise value.

Also of relevance for digital government services, especially as they evolved so quickly under the crisis conditions of the pandemic, was Parliament's passing of the Privacy Act 2020 (the Act). This new Act took effect from 1 December 2020, repealing and replacing the Privacy Act 1993. The key changes included[1]:

[1] https://www.justice.govt.nz/justice-sector-policy/key-initiatives/privacy/

- **Requirements to report privacy breaches**: If an agency (i.e. any organisation or person that handles personal information) has a privacy breach that causes serious harm or is likely to do so, it must notify the people affected and the Privacy Commissioner.
- **Compliance notices**: The Commissioner will be able to issue compliance notices to require an agency to do something, or stop doing something.
- **Decisions on access requests**: The Commissioner, rather than the Human Rights Review Tribunal, may make binding decisions on complaints about access to information. The Commissioner's decisions may be appealed to the Tribunal.
- **Strengthening cross-border protections**: New Zealand agencies must take reasonable steps to ensure that personal information sent overseas is protected by comparable privacy standards. The Act also clarifies that when a New Zealand agency engages an overseas service provider, it must comply with New Zealand privacy laws.
- **Class actions**: The Act permits class actions in the Human Rights Review Tribunal by persons other than the Director of Human Rights Proceedings.
- **New criminal offences**: It is an offence to mislead an agency in a way that affects someone else's information, and to destroy documents containing personal information if a request has been made for it. The penalty is a fine of up to $10,000.
- **Strengthening the Privacy Commissioner's information gathering power**: The Commissioner may shorten the timeframe in which an agency must comply with investigations and the penalty for non-compliance is increased from $2,000 to $10,000.

A further important development around digital public services is the recognition that not every New Zealander has the same digital service opportunities. Publication of the Digital Inclusion Blueprint by DIA in 2019 addresses the challenge of everyone in New Zealand being able to access and use digital technologies effectively to support the lives they want to lead. The Blueprint articulates a vision, context, government actions and next steps for digital inclusion (DIA, 2019:6). Being digitally included is defined as having convenient access to, and the ability to confidently use, the Internet through devices, such as computers, smartphones and tablets (DIA, 2019: 7). As there are gaps in our current understanding and knowledge of digital inclusion in New Zealand, the Blueprint has indicated the development of an evidence base for digital inclusion as a priority. Research by the Digital Inclusion Research Group (2017), identified some groups in New Zealand society as the most at risk of not being digitally included:

- Māori;
- Pacific peoples;
- families with children in low socio-economic communities;
- people living in rural communities;
- people with disabilities;
- migrants and refugees with English as a second language;
- offenders and ex-offenders;
- seniors;

- people with low housing stability;
- people with low incomes;
- people with low literacy levels;
- people with mental health conditions;
- people who choose not to go online;
- senior leaders in the public and private sector; and
- unemployed people

Subsequently, Grimes & White (2019) identified an additional group of people with a higher risk of digital exclusion: people living in social housing.

A further connecting thread to the policies referred to here is thinking that has led to the recently passed Public Service Act 2020 which repealed and replaced the State Sector Act 1988. The new Public Service Act aims to modernise the operations of the public service, creating a modern, agile and adaptive public service. It aims to foster a culture of open government, facilitate active citizenship and achieve better outcomes by establishing a more cohesive public service and collaborative ways of working across government agencies in order to address complex issues and individuals' needs. The Act provides for strengthened leadership across the public service, including system- and future-focused leadership that spans government such as the Government Chief Digital Officer role.

Learnings about digital government in New Zealand: **opportunities and threats associated with Covid-19**

The Covid-19 pandemic can be classified as a complex problem: such problems are not solvable at an individual organisational level, and need to be managed at the system-level of government where a holistic perspective is taken. In this more complex environment, the traditional public service bureaucratic and agency-siloed culture no longer fits: hierarchical ways of organising are slow, organisationally bounded, adversarial, suffer from information and resource deficits, based on narrow sectoral and technical expertise, and decision making power rests with only a few people. Complex problems on the other hand require leadership and collaboration across organisations with different interests and perspectives, such as the difference in perspective between social sector agencies focused on people's motivation and those agencies focused at enforcement. Such differences in perspective can be spanned through multidisciplinary teams, collaboration and co-production of services. New Zealand saw something of this approach, and adaptation of government processes in how the New Zealand government managed the Covid-19 pandemic. This was especially so in the communication leadership roles taken by the Prime Minister and Chief Executive of MoH,

Dr. Ashley Bloomfield, and the mostly behind the scenes, all-of-government approach to managing Covid-19, taken by the New Zealand government.

Research confirms that a different style of leadership is required for agile and collaborative public administration. It "is 'decentered' with the roles for leaders distributed widely across the network" (Imperial, Ospina, Johnston, O'Leary, Williams, Johnson, and Thomsen, 2016). Power no longer needs to sit with a few individuals but with many. Empathy and an ability to bring people together are critically important to establishing trust: the Facebook Live sessions of the Prime Minister seem to have contributed to that (Wilson, 2020). Information needs to come from open sources and organisations need to be adaptable to their environment. As a result, hierarchical organisations need to move further towards collaborative governance models and agile methodologies in order to tackle complex problems, such as Covid-19 and digital exclusion.

During the lockdown phase of the pandemic it was observed that public officials, as illustrated by the MoE example above, were open-minded and willing to reach out outside of government for help with solutions. Existing government silos and in particular not knowing what other government agencies are doing, got in the way of making faster progress: one example was an NGO being asked for the same information by multiple government agencies; a practice of better cross government coordination before the crisis could have prevented this situation to some extent. However, cross government coordination requires proper resourcing and having a bit of muscle behind it. A small and dedicated team at DIA do not currently have the resources to solve the urgent, complex problem of digital exclusion in New Zealand. The case of MoE also shows that sufficient necessary resources, such as Internet modems and devices, were not available in New Zealand during the pandemic.

Lessons

There are some lessons for New Zealand and its public sector in particular from its Covid-19 experiences.

1. *A different leadership style and agile and collaborative government are needed to manage the complex, systemic problem of the pandemic. Evidence of this leadership style and agile and collaborative government can be seen in the management approach of the New Zealand government. However, sufficient resourcing of complex issues such as digital exclusion need to be taken into account.*

This need for flexibility for managing complex problems is also reflected in the Public Service Act, the Strategy for a Digital Public Service and the Digital Health Strategic Framework: a modern, agile and adaptive public service is needed to deliver (better) outcomes and services for New Zealanders in a complex environment. Collaboration, cooperation, innovation and agile ways of working, including having cloud-based platforms with multiple capabilities that can be repurposed to meet a range of needs, are key underpinnings of the Digital Health Strategic Framework and led to several key digital health solutions in the Covid-19 response. In ongoing research under the Chair in Digital Government into the determining factors of successful projects of digital government, collaborative leadership and agile ways of working, including agile methods for technology developments are confirmed by interviewees as important factors for success. In earlier research by the Chair in Digital Government (OAG, 2012), the following six factors were acknowledged in successful digital government projects: understanding the environment and make the most of circumstances; being business-led, flexible and agile; having strong leadership and senior support; working effectively with the right people, including end users; using the right technology tools; and monitoring and understanding the benefits realized. We observe that these same success factors were also applicable to the digital government initiatives undertaken during the Covid-19 crisis, with the exception of working with end users, although in a few cases this was achieved online).

The lockdown created a situation where several modified or new online public services needed to be delivered within urgent timeframes. An example was funding to allow businesses forced to close to continue paying their staff. This is similar to the situation immediately after the 2011 Christchurch Earthquake when the Ministry of Social Development (MSD) successfully created the Earthquake Employment Support System in only six days to provide financial support to affected employers and employees. MSD operated the system in close collaboration with Inland Revenue Department (IRD) and Westpac and allowed employers and employees to apply for financial help by providing basic information using a secure online form (OAG, 2012:13). Because the Government anticipated that it would receive many applications and that, potentially, it would be difficult to telephone Work and Income, people were strongly encouraged to apply online (OAG, 2012:13). The lessons learned from this innovative case study at the time were (OAG, 2012:16-17):

- Enormous time and political pressures, such as reporting daily to the Minister and then the Minister reporting daily to the media, helped the team to plan, monitor, and report sharply;
- Strong support from political and senior leaders was critical and led to extremely tight control, with decisions made almost immediately;

- Senior project leaders effectively managed political expectations about technology-enabled benefits realisation. Politicians did not know how long it would take to set up the main technical requirements for delivering the planned benefits;
- The extreme and special circumstances allowed MSD to rethink its business processes, such as how to be provide services more timely, and differently, and the opportunities and implications of minimal verifying;
- The extreme and special circumstances allowed MSD to reflect on the high costs that are common in routine procedures in digital government projects. They learned that documents needed for routine procedures in digital government projects quickly become old and potentially less relevant because of fast-changing technical and business conditions in a crisis. While normally they help to predict things they can fit awkwardly with changing and/or changed business conditions;
- Strong team collaboration and great team commitment were critical in realising benefits quickly;
- Co-locating staff helped to overcome cultural differences between agencies that had to work together;
- Using rapid development methodologies allowed flexible innovation and reduced risks and cost. Being flexible meant the project team could deliver "on the fly", with relatively easy changes to the system when needed;
- Special privacy legislation created opportunities for public entities to better share information and allowed innovation in providing online services.

MSD appears to have leveraged their 2011 experience in 2020 by activating the same portal to deliver support funding within three days of the government's announcement (McLachlan, 2020).

2. *Success factors of digital government projects also apply to digital government initiatives undertaken during the pandemic, with the exception of working with end users. The lessons learned from a digital government initiative implemented in a crisis situation (the Christchurch earthquakes) are useful lessons for initiatives started in a pandemic.*

3. *Collaboration, cooperation, innovation and agile ways of working are key to effective digital solutions provided during a pandemic.*

4. *Having a cross-government digital identity for individuals would have enabled easier and more collaboration between government agencies.*

5. *Having cloud-based platforms supports collaboration and agile ways of working, and increases the ability of agencies to adapt policy settings very quickly.*

The annual Kiwis count survey commissioned by the Public Service Commission (PSC: the State Services Commission prior to the adoption of the new Public Services Act) gives us some insight into the pre-lockdown views and experiences of New Zealanders on the public services they have received and their trust in the public and private sectors. The latest Kiwis count survey used data collected between January 2019 and December 2019 and was published in June 2020. In total, 2,391 New Zealanders filled out the survey, with 71 percent doing this online.

In 2019, New Zealanders most often used face-to-face channels (37%) to access public services (SSC, 2020). The second most common channel was sending or receiving an email (16%), with the phone being the third most used channel (13%); the fourth and fifth respectively used web-based channels to access information online (12%) and transact online via a website or an app (11%); the sixth most commonly used channel was sending or receiving a letter (10%) whilst only 1 percent of the respondents used social media to get information or to give feedback (SSC, 2020). This suggests that New Zealanders still rely strongly on traditional channels to access public services. This can cause problems when public services are suddenly shifted to digital channels as we saw happening during the Covid-pandemic.

Respondents' satisfaction with digital channels was higher than their satisfaction with traditional channels: for instance, 88 percent of the respondents had their expectations met when transacting online with the public service, whilst 83 percent of the respondents had their expectations met using the face-to-face channel to access public services; 82 percent of the respondents who had looked for information online, had their expectations met compared to 69 percent of the respondents who had used the phone to access public services (SSC, 2020).

Respondents reported the following experience with digital public services in 2019 (SSC, 2020):

- Satisfaction with the layout: 77%
- Overall satisfaction with accessibility: 82%
- Ease of use: 81%
- Ease of finding the service or product: 74%

In general, people's satisfaction with public services in 2020 was higher than satisfaction with private sector services in 2019 (service quality scores are 77 versus 68 respectively).

Respondents over 65 years were more satisfied with both public and private sector services than other age groups. Respondents with a disability indicated a lower satisfaction with public services compared to those without. Māori reported a lower satisfaction with the quality of public services (73) than other ethnic groups: Asian (79), NZ European (78), and Pasifika (78) (SSC, 2020). Within a range of service quality scores between 38 and 88, there were five out of 43 commonly used public services that had a rating between 87 and 88, several of which are digital public services (SSC, 2020). These were:

- Applied for and/or received New Zealand Superannuation (88)
- Applied for or renewed a New Zealand passport (88)
- Used a Gold Card (88)
- Licensed or registered a vehicle (87)
- Registered a birth, death, marriage or civil union (87).

In 2019, based on their personal experience, 79 percent of the respondents indicated they trusted public services whilst nine percent of the respondents reported distrust (SSC, 2020). Trust in public services from personal experience increased as household income increased (SSC, 2020). Respondents from different ethnic groups reported similar results for trust based on personal experience (Asian: 79%; NZ European: 81%; and Pasifika: 76%), with the exception of Māori (65%). However, only 71 percent of respondents with a disability trusted public services based on their personal experience, compared to 79 percent without disabilities. During the Alert Level 4 lockdown, initially there were accessibility problems with the New Zealand Government's Covid-19 website and with the NZ Covid Tracer app, which were later fixed. These problems happened because disabled people with a need for printing and other digital access needs were not considered at the design stage of the development of these important communication and health tools. This experience could also have further affected trust levels of disabled people in digital public services.

In general, 49 percent of the respondents trusted the public sector brand in 2019, compared to 41 percent who had trust in the private sector brand (SSC, 2020). Trust in both the public and private sector brands was strongest in those respondents earning over $100,000 per year (SSC, 2020). Respondents with an Asian background trust most in the public sector brand (57%), followed by Pasifika (51%) and NZ Europeans (48%); Māori had the lowest trust (40%) (SSC, 2020). Distrust in the public sector brand was 11 percent in 2019. Respondents with a disability had lower trust in the public sector brand compared to other respondents (41% vs. 50%), and also had lower trust in the private sector brand (39%) compared to those without a disability (41%) (SSC, 2020).

Our research in 2010 into Kiwi's online experiences equally found that the majority of respondents had a high trust in the New Zealand government and its agencies and thought that government was working in the best interests of citizens; however, the contrary view was found more often among participants with a high dependency on social services; Māori; Pasifika; and self-employed participants (Lips et al. 2010). Furthermore, in the 2010 study, high service-dependent participants saw clear negative power imbalances and information asymmetries between themselves and public sector agencies (Lips et al. 2010). These negative feelings of distrust and powerlessness towards public sector agencies were also present among Māori and Pasifika participants with some subtle differences: for instance, Māori particularly were negative about the integrity and Māori language use of individual public service staff members; and Pasifika people found dealing with government agencies difficult and felt demeaned by the process (Lips et al. 2010).

From research undertaken in 2014, we know that New Zealanders have a relatively high trust in New Zealand central government agencies to protect their personal information, also compared to trust in other institutions and responses to similar survey questions overseas: 23 percent of the participants totally trusted New Zealand central government agencies to protect their personal information whilst 59 percent tended to trust New Zealand central government agencies (Lips et al. 2014). Health and medical institutions were trusted slightly more (87%) than New Zealand central government agencies (82%) (Lips et al. 2014).

6. *When the Covid-pandemic hit New Zealand, New Zealanders were strongly reliant on traditional channels to access public services. This caused problems when public services suddenly needed to shift to digital channels as a result of the pandemic. Especially vulnerable people: Māori, Pasifika and disabled people, groups who are also more likely to be digitally excluded, have lower trust in the public service as well as lower satisfaction levels with public services. These factors likely affect uptake of digital public services and need to be addressed to create more digital equity.*

Prior to the pandemic, both traditional and online channels were popular amongst individuals and businesses for interacting with government agencies. This is a similar finding to research conducted in 2016, where particularly the telephone channel but also face-to-face interaction with government had been used alongside and in addition to online channels, such as a website and email. Covid-19 saw a much higher dependence on online public service channels,

especially compared to face-to-face service provision which during the higher levels of the response 4,3 and 2 mostly was not an option.

The small businesses that participated in the 2016 research, indicated that they were willing to shift from traditional channels to online channels. The 2020 experience of the 350,000 business customers of all sizes, from the self-employed, to small business and large multinational employers, interacting with ACC through their customer-facing online, self-service channel is evidence in support of this willingness. 2016 research identified the following critical conditions necessary for a shift to online channels (Lips et al., 2016:6):

- Having functionalities that meet the needs of customers, such as online access to an expert staff member (e.g. via online chat), quick online response times and creating more options for raising non-standard issues (with restrictions on automated responses);
- User-centric design and navigation of websites, including more user-friendly online systems, step-by-step instructions and improved guidelines around changes in policy and regulations;
- Availability of end-to-end online services, including solutions around online government responses (e.g. not via a letter), the use of digital signatures and better Internet access in rural areas; and
- Better integration of services and increased information-sharing, including consistency across multiple channels and the re-use of non-sensitive information in integrated service provision.

One example where user requirements weren't always met during the pandemic response is the experience that people didn't always want to download the NZ Covid Tracer app as they were concerned about their data plan. To better meet user needs, MoH is looking into the provision of free Wifi for its App use, similar to the natural emergency response messaging.

It is critically important that government seeks social licence when developing digital tools and solutions, such as the NZ Covid Tracer app, which need to be taken up by New Zealanders in large numbers for the Covid-19 response to work. Unfortunately, the development of the app got underway without a social licence conversation being had with New Zealanders on the problem to be solved, how the technology would work, and its impact on human rights issues, such as privacy. Consequently, initially, we observed a low uptake of the NZ Covid Tracer app. InternetNZ tried to help out by running an online town hall and an open collaborative document for people to share views about technology and contact tracing. Hosting the event online rather than in person also

made it easier for people with accessibility needs to participate. InternetNZ synthesised views and provided the collaborative document to the public officials writing the advice for Cabinet.

7. *A user-centric approach needs to be taken in the design and development of (new) end-to-end digital public services, more so during a pandemic.*
8. *Co-design contributes to the development of successful digital solutions.*
9. *Internet access in remote and rural areas needs to be improved.*
10. *Seeking a social licence conversation about new technologies should be an integrated and formal part of the government process during a pandemic.*

The introduction and effective use of QR codes as part of the New Zealand contact tracing system shows that having basic applications is often sufficient to be successful in your Covid-19 response: there is no need to work with advanced and often expensive technology solutions.

11. *Basic technology solutions can be highly effective in managing Covid-19*.

New Zealand's response to the Covid-19 pandemic led to a situation in which people needed to rapidly shift from face-to-face public services to services provided via telephone and online. In addition, the NZ COVID Tracer app needed to work on smartphones as the only digital device of many people in New Zealand. Overloaded call centres tended to push consumers towards digital channels where this was an option for them but other alternative options mostly were unavailable. This relative inaccessibility of alternative channels had direct and profound implications for New Zealanders who are digitally excluded from the Internet.

We have detected an increased interest of government agencies during 2020 to manage digital inclusion which must be maintained and worked on if New Zealand is to become more digitally inclusive. MoE and MSD both tried to manage this situation during lockdown by handing out devices and Internet connections to people belonging to digitally excluded groups. However, from research into the digital inclusion and exclusion of over 65-year olds (Lips et al. 2020), we know that digital inclusion requires more than having access to the Internet. Several non-user types were found amongst this group of New Zealanders: besides seniors who don't have digital devices and access to the Internet, we identified seniors who can't afford to use the Internet; seniors who are unconfident to use the Internet; seniors who don't know how to use the Internet; and seniors who don't want to use the Internet (Lips et al. 2020). In total, seven different types of users and non-users were identified in this age group, thereby lending weight to the conclusion in the government's Digital

Inclusion Blueprint that we need to know more if we are going to create a more digitally included society given the diversity of those currently excluded: each of the seven types had different capabilities and needs if they were to make better use of digital services to improve their lives.

This diversity in capabilities and needs of Internet users and non-users and the lack of potential solutions for digital exclusion manifested themselves during the Covid-19 response: for instance, many people were not able to afford connectivity or devices at home. There were also people who didn't have the knowledge or skills to use the Internet solution packages so kindly provided. Alternative solutions, such as the use of free Wifi at public libraries and the provision of face-to-face support by organisations in the community, were not available. However the experience, particularly the case of MoE, also showed us that government could do something about affordable connectivity when it had to. The challenge now is to do more with the connectivity established and look at permanent solutions. After 6 months of funding available to MoE as an initial response, for instance, there is now an opportunity with approx. 46,000 (of the target 55,000) newly connected households to reach all household members, not just the school student. Also, many of MoE's customer segments overlap in either a single digitally excluded individual or different people in the same household across many public and private sector segments, presenting the opportunity for other service providers to consider delivery of digital services to formerly digitally excluded households.

The MoE case shows us that Internet basics, such as affordable connectivity and Internet devices and digital skills, need to be available to everyone for equitable access to public services to be possible for all under conditions such as those presented by Covid-19. And that a whole-of-government response is needed to step in where vulnerable New Zealanders can't afford them, and not just in times of crisis: Internet and the skills to use it, now sits alongside other basic reading and writing skills and infrastructure, such as electricity.

12. Internet basics need to be available to every New Zealander

In general, this points towards a critically important role of government in advancing digital inclusion and digital equity, not just for the purpose of accessing government information and services during crises such as a pandemic, but also for the broader purposes around facilitating wellbeing and economic prosperity.

This role has been acknowledged by government in the Digital Inclusion Blueprint but the question is whether the current government approach is doing enough: for instance, the current

government policy response towards digital inclusion looks at the capacity and capability of government but, with the exception of DIA's collaboration with the Manaiakalani Education Trust, doesn't consider building the capacity of communities to empower them and build digital capability within their communities. Another issue is that the current Blueprint for Digital Inclusion doesn't lock in government agency commitment. More permanent solutions to advance digital inclusion and digital equity will require a high level, Cabinet mandated, and progress-monitored digital inclusion strategy which supports interdepartmental collaboration, enables community input, and provides government funding. This funding will pay for itself in the benefits it brings for the wellbeing of New Zealanders and economic recovery.

13. *Government has a critically important role in advancing digital inclusion and digital equity to promote wellbeing and economic prosperity. A Cabinet mandated digital inclusion strategy is needed which supports interdepartmental collaboration, enables community input, and provides sufficient government funding to create wellbeing returns.*

The biennial survey 'Privacy Concerns and Sharing Data' provides us with recent insights about New Zealanders' attitudes to privacy and information sharing during the Alert Level 4 lockdown: the online survey was commissioned by the Office of the Privacy Commissioner and conducted by UMR Research between 31 March 2020 and 13 April 2020. The survey collected data from a nationally representative sample of 1,398 New Zealanders aged 18 years and older.

In 2020, although the special Privacy code of practice due to the Covid-19 pandemic allowed New Zealand government agencies to share personal information more easily, 61 percent of the respondents were either concerned (25%) or very concerned (36%) about government agencies sharing their personal information without permission; 20 percent were unsure and 19 percent were not concerned (Office of the Privacy Commissioner, 2020). This is higher than the results for the same question in 2018, when 52 percent were concerned or very concerned. It suggests that increasingly people are concerned about their privacy and the pandemic response exacerbated this concern. For health organisations sharing people's personal information without their permission, 51 percent of the respondents indicated to be concerned (24%) or very concerned (27%): this is up from 43 percent of people concerned or very concerned in 2018 (Office of the Privacy Commissioner, 2020). This finding appears consistent with the 2014 research that found Kiwis most concerned about the privacy of their health information (Lips et al., 2014)

These findings come from a time when having Covid-19 appears to be perceived by some as a stigma. Also, people who have Covid-19 can be identified based on location or age range. Another privacy concern during the pandemic is that apps involve huge collections of data, whether they are centralised or decentralised. So far, there is no international evidence that these apps make a material contribution to contact tracing: for example, Singapore's app for contact tracing was shown to enable tracing of six people, which demonstrates that we need to think about proportionality and efficacy in the use of new technologies. In general, the fact that there was close collaboration between New Zealand government agencies and the Privacy Commissioner on Covid-19 related digital channels for public services is encouraging.

In 2020, only 26 percent of the respondents agreed that they felt in control with how their personal information was used by government, compared with 35 percent who disagreed. This was even lower for personal information used by businesses: only 18 percent agreed that they felt in control, whereas 45 percent of the respondents disagreed with the statement. Just 24 percent of the respondents agreed with the statement that they had a good idea of what companies and the government do with their personal information, compared to 38 percent who disagreed (Office of the Privacy Commissioner, 2020). These findings suggest that the privacy-friendly NZ Covid Tracer app for necessary contact tracing activities to combat the virus spread in New Zealand has been welcomed by New Zealanders as a necessary and privacy conservative solution for contact tracing.

Lack of transparency around providing personal information to organisations was also found in earlier studies undertaken by the Chair in Digital Government in 2010 and in 2015. In the 2010 study, respondents provided their information to public sector agencies in order to get the service, but they usually did not understand how their information would be processed or used; why they needed to fill in multiple forms with the same information; how and how long their information would be stored or kept; and who would have access to their information (Lips et al. 2010) Furthermore, respondents showed limited knowledge about the sharing - or non-sharing - of information between agencies (Lips et al. 2010). The 2015 study into how New Zealanders manage their online personal information found that most respondents were so-called 'privacy pragmatists'. That is, although privacy was of importance to respondents, personal information in online transactions was traded for convenience, cost- and time-efficiency, and particular services (Lips et al., 2015). A study undertaken in 2014 found that only 25 percent of New Zealanders usually read and are able to understand privacy statements provided in online relationships with the public and private sector (Lips et al. 2014).

There are opportunities for more transparency around the collection, use and storage of personal information in digital public service provision. For instance, we noted an initiative taken by MSD to build up a searchable register and database after the initial employment benefits were provided to help with audits; a similar thing could be done with Covid-19 testing, with an opportunity to provide early signalling to those tested of the consequences of providing details, including what personal information is accessed by other government agencies.

14. *Privacy protection is an important issue for New Zealanders. Close collaboration between New Zealand government agencies and the Privacy Commissioner saw the emergence of privacy-friendly digital tools and services during the pandemic.*
15. *Transparency around the collection, use and storage of personal information in digital public service provision needs to be further promoted.*

During the Covid-19 crisis, New Zealanders have been exposed to scams exploiting the spread of coronavirus, such as phishing emails and telephone calls made by people, who claim to be health officials, asking for personal details. Information about scams was provided via links on the 'Unite against Covid-19' government website to authoritative websites on scams. However, phishing scams particularly were a problem for first time Internet users, as some householders connected via MoE's initiative experienced.

16. *Solutions for digital inclusion need to include alerts and support for dealing with cybersecurity scams.*

The New Zealand government's approach to Covid-19 has been marked by a willingness to listen to those with relevant expertise and to make decisions guided by evidence and scientific advice (Wilson, 2020). An important role in decision-making processes was played by the outcomes of data modelling and the use of data on Covid-19 cases and testing in New Zealand. These played also a critical role in reporting on Covid-19 by the media. At the same time, we could observe misinformation being disseminated to New Zealanders via digital channels, which was a barrier to getting accurate information on the Covid-19 pandemic. Partly, this issue was solved by government by launching a new dedicated website for the Covid-19 response and by MoH through authoritative information provision via its website.

17. *A New Zealand government agency needs to have primary responsibility for advising on misinformation about the Covid-19 pandemic.*

The experience with the Covid-19 pandemic shows us that the wider state sector workforce generally is not well prepared for working from home: in particular, connectivity infrastructure issues in remote and rural New Zealand remain. Also, a public register of households connected to the Internet is not currently available in New Zealand. Moreover, supply chain vulnerabilities and contest for in-country available technologies and resources during a crisis need to be taken into account.

At the same time, public officials were allowed to use Zoom in their digital interactions with a wide range of people and organisations, which promoted collaboration with non-government stakeholders to support government's response efforts. Other less-anticipated opportunities emerged during the Alert Level 4 lockdown: the Internet provided a better work life balance for government (and other) workers and better gender diversity through more flexible working.

18. *Government needs to be better prepared for Internet-based working from home. Issues around connectivity, a public register for household connectivity, and supply chains, need to be resolved.*

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