

Discussion Paper 2021/03

A COVID-19 Situational Report: Beyond Aotearoa New Zealand's Fortress as at 1 September 2021



Wellington Airport, 29 August 2020

MCGUINNESS INSTITUTE
TE HONONGA WAKA

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In Memory

The Institute is dedicating this discussion paper to Sir Michael Cullen (5 February 1945–19 August 2021). Sir Michael was a visionary leader who was committed to New Zealand and its young people. He served as Deputy Prime Minister of New Zealand, Minister of Finance, Minister of Tertiary Education and Attorney-General.

Sir Michael attended a number of policy workshops the Institute hosted with the New Zealand Treasury and was always gracious, inspiring and witty. He sought outcomes that prioritised equality and equity of opportunity and was an exceptional public policy innovator who understood the intricacies and effects of the components of public policy on different populations of New Zealanders. In June 2020, he wrote our Think Piece 35: ‘Where next? A Garden of Eden or a Slough of Despond?’. His words continue to resonate. He closed his think piece by noting:

The COVID-19 crisis will be looked back on in the future as a key moment in our history. Whether it will be seen as a disaster or the beginning of a better age will depend on the honesty, courage, and unity we, as a nation, can show over the next couple of years. It is time to move beyond self-congratulation on what we did during the crisis. It is time to reckon with the much harder task of fulfilling the promise inherent in that time for our children and grandchildren.

1.0 Introduction

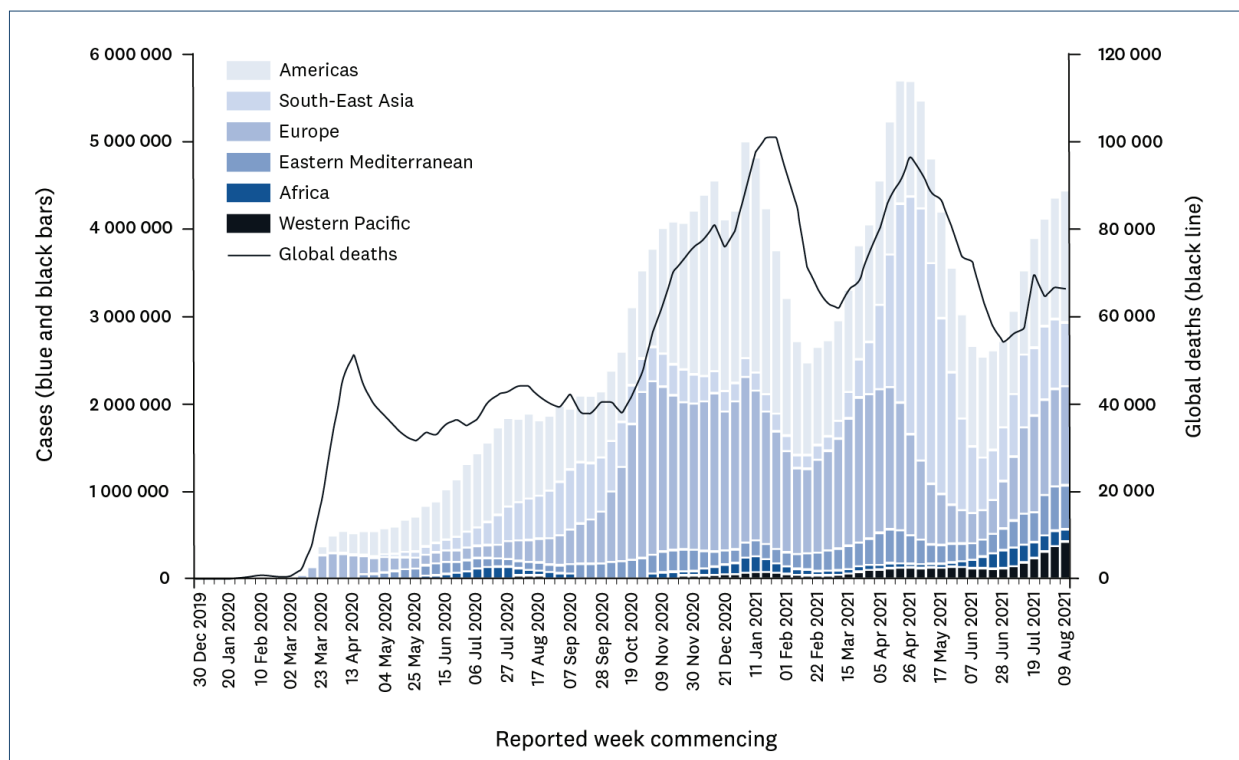
This paper is a situational report on where we are today. It explains our understanding of the current status of COVID-19 globally and makes some observations about the way forward. It concludes that the complete lockdown that began on 18 August 2021 is worth the effort but we need to put equal effort into exploring our options and considering the long-term impacts of the decisions we make today. Aotearoa New Zealand, and in fact all countries, should work to both support and also demand better from WHO, COVAX, CDC, SAGE, GHSA and other key health and risk management institutions. But, most importantly though, Aotearoa New Zealand must also find ways to redesign our own constitutional framework so that we do not suffer from constitutional stress, and this means creating a place and space for anticipatory governance in Government so that we can engage earlier with the crises we will face in the 21st century.

1.1 Background

With New Zealand at Alert Level 4 at the time of writing, it is time to look beyond our shores and reflect on the global situation. This discussion paper highlights why our current lockdown is so important. It also aims to provide renewed momentum to repair the fortress rather than simply plaster over the cracks. Below is a brief outline of the current state of COVID-19 globally – what we know, what we don't. It is time to provide more foresight when considering our strategic options and engage earlier with emerging issues. This means being proactive and strategic rather than reactive, tactical and operational; focusing on the war, not the battle.

Last week, at least 66,000 people died from COVID-19 globally, a much higher weekly figure than we were seeing in early April 2020 (see Figure 1).

Figure 1: Global cases and deaths, reported weekly by WHO¹



1.2 Limitations, assumptions and disclaimer

- This paper focuses on the Pfizer vaccine due to it being the New Zealand government's vaccine of choice. The first dose of Pfizer was given only 10 months ago in the UK, hence we expect more detailed research results will emerge in coming months.
- This is a risk management perspective, rather than an epidemiological perspective. There is a risk our understanding of certain scientific terms are incorrect or that we have quoted sources that are not reliable. Where possible, we have used WHO, COVAX, SAGE (UK) and CDC (US) or reputable news agencies, such as the BBC.

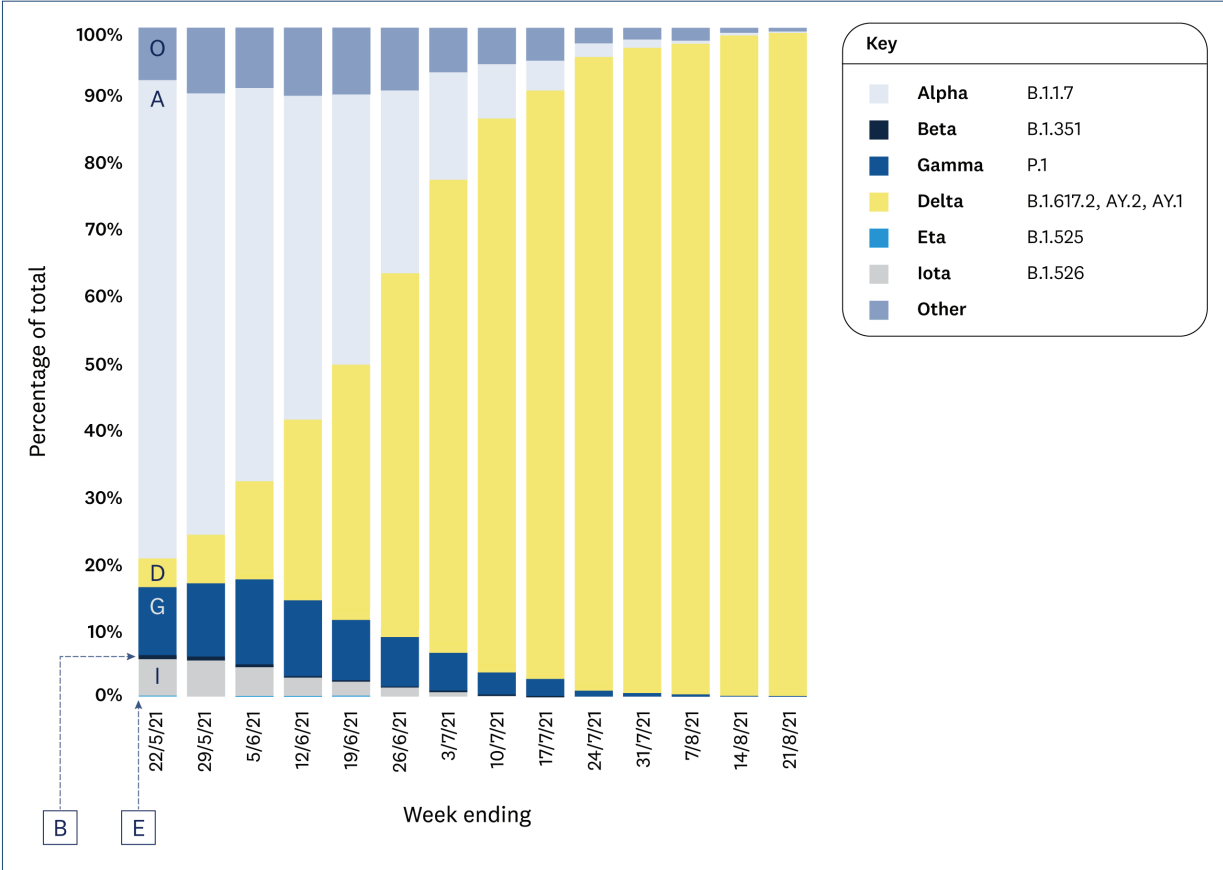
2.0 Insight: What we know (and do not know) about COVID-19

2.1 What we know: The known knowns

Below is a list of high-level observations about COVID-19 as at August 2021.

- The virus continues to evolve, with Delta the dominant variant.² The World Health Organization (WHO) keeps a list of Variants of Concern (VOC) and Variants of Interest (VOI).³ The rise of the Delta variant is best understood when reviewing the results from the US; see Figure 2.

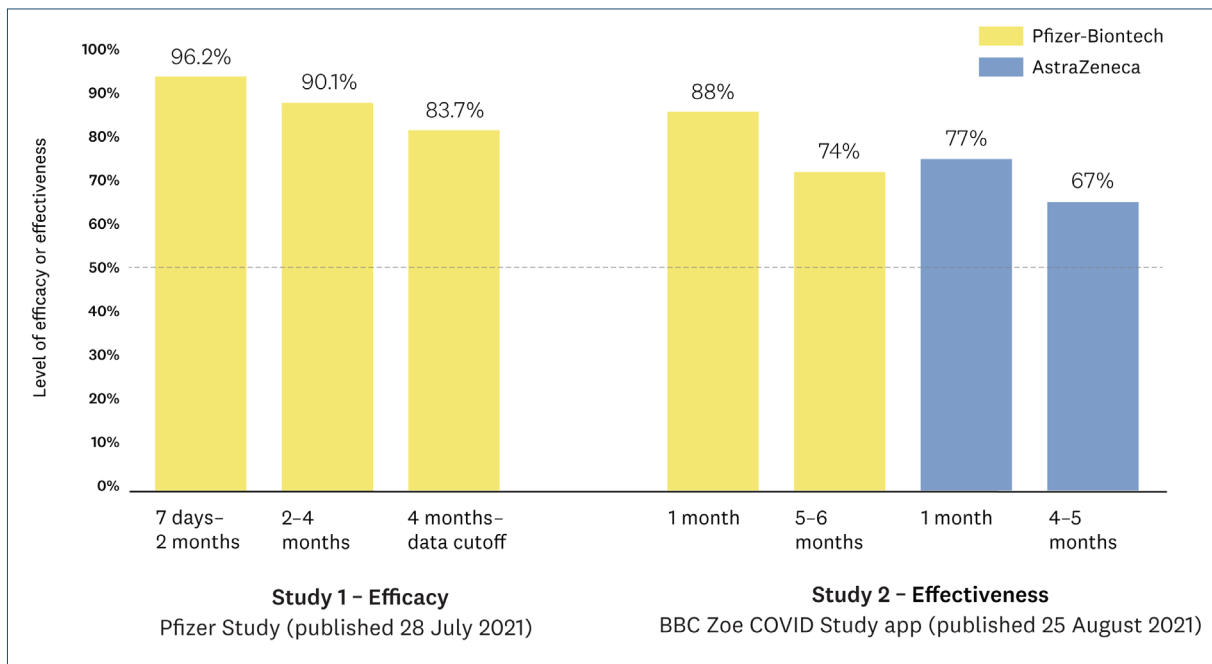
Figure 2: US variant proportions by week⁴



- The total number of reported deaths since the start of the pandemic is almost 4.4 million people; although it is almost certainly much higher.⁵ To put this in perspective, according to WHO, in 2020 the second most common cause of death was strokes, killing around 6 million people annually.⁶
- Despite high vaccination rates in the UK, the virus is still circulating; the latest ‘R range’ for England is 1.0 to 1.1, and the current ‘growth rate range’ for England is 0% and +2% (27 August 2021), see endnotes for detailed explanation.⁷ The vaccination programme is reducing hospitalisation and deaths (Public Health England suggests around 84,600 deaths and 23 million infections have been prevented so far) but experts are waiting to understand the extent vaccine effectiveness may decrease over time in order to consider whether boosters are either prudent or necessary. Some say the trigger point will be when the level of effectiveness falls below 50 percent.⁸
- The UK National Health Service has established 15 long-COVID clinics just for children, as part of a £100 million expansion of care for those suffering from ongoing chronic health conditions following COVID-19.^{9,10}
- The Pfizer vaccine does decrease in effectiveness over time but to some extent this was expected. Recent research shows that the efficacy of Pfizer’s vaccine steadily declines to about 84% six months after a second dose (see Figure 3). The latest data from Israel (yet to be peer reviewed), of the efficacy against the Delta variant, shows waning immunity and less protection from severe illness. The CEO of Pfizer,

Albert Bourla, believes a booster will increase antibodies five times in younger people and by 11 times in older people, but more analysis is required.¹¹

Figure 3: Vaccine efficacy and effectiveness after the second dose ^{12,13}



- The UK Scientific Advisory Group for Emergencies (SAGE) noted in July 2021 that there was a risk that the current environment in the UK and overseas creates a petri dish where Delta is rampant at the same time as a wide range of vaccinated and unvaccinated people socialise. This could lead to a new variant, immune to the current vaccines, emerging and spreading quickly through the community before being identified (due to testing and genome sequencing being overwhelmed).¹⁴ As we go to print, South African scientists have uncovered a new strain (C.1.2), which shows the characteristics of increased transmissibility. In May it accounted for 0.2 per cent of the genomes sequenced in the country, but by July it is 2 per cent. It is now being assessed for effectiveness against a range of vaccines.¹⁵ These new variants risk severely slowing down the development of new vaccines, and more importantly, risk creating the perfect environment for new variants to emerge.
- The vaccination rollout is very uneven and unequal. It is worth highlighting that much of the current media commentary on the pandemic has focused on the UK and USA. Meanwhile, in Africa, the vaccination rate still hovers around 2 per cent.¹⁶ Many wealthy countries have vaccinated over 66 per cent of their population, while just 1.1 per cent of people in low-income countries have received their first dose.¹⁷ The supply and logistics issues over vaccines create a tension between those suggesting a booster shot is part of the solution and those that consider a more ethical approach, with better long-term outcomes, would be vaccinating all those who would like to be vaccinated with one or two doses before providing a third dose to those that are healthy and already vaccinated.¹⁸
- The UK announced in August 2021 that they have signed a deal with Pfizer-BioNTech for 35 million vaccine doses, to be delivered in the second half of 2022. This is part of ‘plans for ensuring the country remains ahead of the virus for years to come and for any future booster programmes, as well as working to make the UK a global centre of excellence for the next generation of vaccines’. Importantly, the UK is also one of the largest donors to COVID-19 Vaccines Global Access (COVAX); the UK has announced it will donate 100 million doses within the next year.¹⁹
- Delta has been called the game changer. In July 2021 it was found that ‘[a]n individual infected with the original strain of the virus would, on average, become able to transmit the virus between three and four days after exposure, in the 48 hours before developing symptoms or testing positive. In contrast, it appears that someone infected with the Delta variant may be able to infect others within a day or two of being exposed’.²⁰ In August 2021, a *Nature* article states ‘[e]merging data suggests that Delta could spread more readily than other coronavirus variants among people vaccinated against COVID-19’.²¹ This and other studies has led to the UK and US changing their guidance on wearing masks. Most recently the UK and US have re-instigated mask wearing in indoor settings, even for the fully vaccinated.^{22,23,24,25,26,27}

- Recent research shows the challenge of relying exclusively on immunisations to move past the pandemic. There are situations where ‘[p]eople who recovered from a bout of COVID-19 during one of the earlier waves of the pandemic appear to have a lower risk of contracting the Delta variant than those who got two doses of the vaccine from Pfizer and BioNTech’.²⁸
- Dr Maria Van Kerkhove, WHO COVID-19 Technical Lead, believes the current surge in Delta cases is due to four factors:
 1. Delta’s ability to be transmitted more easily due to increases in virus loads and earlier transmission
 2. Uneven vaccine rollout
 3. Increased social mixing
 4. Inadequate and inconsistent use of existing tools (e.g. distancing, masks etc.)²⁹

A 29 July 2021 Lancet expert consultation begins its observations about the way forward with the following statement:

We can conclude that COVID-19 will continue to pose many challenges over the coming years. The economic, cultural, and health consequences of the pandemic are already immense and societies may need a long time to recover. The increasing availability of vaccines will bring significant relief over the next months, but if not accompanied with comprehensive strategies and public support they alone will not protect from further damaging outbreaks in the coming years. Limited uptake of vaccines and declining public adherence to NPIs [non-pharmaceutical interventions] impede the way out of the pandemic and in the worst case new VOCs [variants of concern] can render current vaccines less effective.³⁰

Closer to home, Australia’s Prime Minister Scott Morrison has said he plans to reopen the country at a 70–80 per cent vaccination rate and treat Delta like the flu, but experts consider the proposed vaccination rate is too low. A recent Australian study suggested this might result in 25,000 fatalities and 270,000 cases of long-COVID (assuming 80 per cent vaccination coverage for those over 16).³¹ Similar modelling in New Zealand is taking place, with similar results. Lead author Professor Colin Simpson, of Victoria University, tried to predict how many people would need to be immunised for herd immunity, which age groups should be targeted first, and in what order. The report found that re-opening New Zealand’s borders without hard measures like lockdowns could lead to more than 11,000 hospitalisations – and more than 1000 deaths – even if we manage to vaccinate nine in 10 of all Kiwis.³²

2.2 What we do not know about COVID-19: The known unknowns

We do know a lot more than we did in January 2020, but in August 2021 it is useful to identify what we do not know. This is an indicative list based on the above research:

- The origin of the ancestral strain of COVID-19.
- A detailed scientific understanding of how Delta is more transmissible.
- The extent someone can get Delta a second time (and with what impacts).
- Whether it is possible to develop a rapid COVID-19 test that can deliver accurate results (e.g. minimal false negatives and false positives).
- The extent Delta could become more problematic in terms of transmissibility and severity.
- Better ways of managing patients with the disease (e.g. a treatment, therapy or drug) and protecting people from the disease (e.g. non-pharmaceutical interventions [NPIs]).
- How to manage and treat long-COVID.

- What causes long-COVID, and the long-term health impacts of COVID-19 (particularly for pregnant women, babies and children).
- The extent those who are fully vaccinated are (i) protected against infection, (ii) protected against severity and (iii) protect others from transmission. It will be important to understand how all three might wane over time. Arguably each is deserving of its own research stream.
- The scientific evidence supporting boosters, particularly for at risk populations (e.g. those that have respiratory issues, have a BMI above 35, or have diabetes).
- The long-term health impacts of existing vaccines.
- Whether a lifelong immunity vaccination is possible.
- The extent new variants of concern might emerge or existing ones become more problematic; and the extent new vaccines might need to be developed.
- The extent other zoonotic diseases may emerge or be already circulating.

2.3 What we do not know we do not know: The unknown unknowns

Any experienced historian will know of times when the unexpected happened, something that changed the path ahead completely. There has been an extraordinary global effort to get us to where we are today, particularly in terms of the pace and scale of the response. We can expect science to continue to evolve, leading to new discoveries and medical trials. For COVID-19, it might be that it mutates into a milder form with less transmission. It is important to be observant and create space in our thinking for the unexpected, what we call the unknown unknowns.

3.0 Hindsight: What we did (or did not) do well

Next, it is important to evaluate what the world is doing well and what it is not. By doing this, we can reduce the risks from COVID-19, other future pandemics and, even more importantly, other global crises. Below is our summary, but for those that want a deeper understanding of the failures, we suggest you read the independent report, *COVID-19: Make it the Last Pandemic* (May 2021), co-chaired by former Prime Minister, the Rt Hon. Helen Clark Co-Chair and H.E. Ellen J Johnson Sirleaf.³³ What is clear is that the current WHO needs a complete overhaul to make it fit for purpose.

Evidence of a lack of foresight can be illustrated by the recent WHO urgent request for a ‘US\$ 7.7 billion appeal to stem surge of dangerous variants and save lives everywhere’. The news release states that the Delta variant is on path to become the dominant strain worldwide as a surge in the highly transmissible variant increases urgency for vaccinating large numbers of vulnerable people and that ‘rising infection rates resulting in increased hospitalizations are overwhelming health systems and leaving many countries in urgent need of life-saving oxygen’. It also notes that the ‘testing rates in much of the world is too low, especially low- and lower-middle-income countries – leaving much of the world blind to how the disease is evolving and vulnerable to new variants’. The funds would be used as follows:

Funding the Rapid ACT-Accelerator Delta Response (RADAR) urgent appeal for US \$7.7 billion would enable: significantly increased testing and better surveillance to detect and protect against new variants; more oxygen to treat the seriously ill and save lives; vital personal protective equipment (PPE) to protect health workers; the rolling out of emergency response and delivery support for the effective delivery and deployment of COVID-19 tools, including in humanitarian contexts; and continued research and development (R&D) so that tools remain effective. ... The US\$ 7.7 billion is ... needed urgently within the next four months.³⁴

This section is divided up into two parts: The World and New Zealand.

3.1 Part A: The World

3.1.1 What the world did well

- The medical doctors in Wuhan were quick to identify and communicate the existence of a new virus.
- Within a month of the first case being reported to WHO, the full genome sequence of the virus (the ancestral COVID-19) was published in the *New England Journal of Medicine* (24 January 2020).³⁵ This enabled tests and vaccines to be developed quickly and now enables experts to track variants.
- Close to real-time reporting in an interactive form by country. (See for example Johns Hopkins University, Worldometers and OurWorldInData).
- A diverse range of vaccinations have been created and tested in a short period of time.
- Rapid home tests for use by citizens have been created for the virus (although this means the strain is not being monitored on every test). (See for example the UK tests, see Box 1.)
- COVAX has been established.

Box 1: UK Home testing kits

(i) A polymerase chain reaction (PCR) test

The NHS suggests that if you have a high temperature or a new continuous cough, or if you've lost your sense of smell or it's changed, you use a polymerase chain reaction (PCR) test as soon as possible. A PCR test kit can be sent to your home or you can book an appointment at a walk-in or drive-through test site.³⁶

(ii) A rapid lateral flow test

The NHS suggest you should do a rapid test twice a week (every three to four days) to check if you have the virus. They state: 'If people test positive and self-isolate, it helps stop the virus spreading' and 'you can order rapid lateral flow tests to be sent to your home' or attend a rapid lateral flow test site. Research shows rapid tests are 99.9% accurate. This usually involves rubbing a long cotton bud (swab) over your tonsils (or where they would have been) and inside your nose.³⁷

3.1.2 What the world did not do well

- We have been unable to find the origin of the virus.
- We were slow to respond to calling COVID-19 a pandemic. WHO did not call COVID-19 a pandemic until 11 March 2020 when it stated: 'We have therefore made the assessment that COVID-19 can be categorised as a pandemic'.³⁸ The world needs a better alert system for global catastrophic biological risks. For example, the process by which WHO decides whether to declare a Public Health Emergency of International Concern (PHEIC) under the International Health Regulations should be reviewed and arguably should include a category for a 'potential' PHEIC so as to provide an early warning system to the world.
- We have been slow to recognise masks as a key tool to reduce transmission. It was not until April 2020 before the CDC³⁹ changed their advice and June 2020 before the WHO⁴⁰ changed their advice. Since then, the WHO mask wearing protocols have become much more detailed.⁴¹ In May 2021, the CDC confirmed that transmission can occur more than six feet away from an infectious source.⁴²
- There has been slow and uneven strain surveillance using the full genome sequence.
- We have allowed for an inequitable vaccine rollout. There may be many factors contributing to COVAX not being able to achieve its goal, but the continued private ownership of vaccines and a lack of government/public manufacturing capability to scale production may be contributing factors.
- We have inadvertently created a risk of extending the pandemic, by creating an ideal environment for new variants to emerge.⁴³
- We have not provided equitable access to the latest tools to manage COVID-19, including testing potential patients, tracing COVID-19 in the community, protecting healthcare workers (e.g. with PPE and cleaning products) and treating COVID-19 patients with remedial agents (including oxygen, therapy or drugs).
- We have no global register for pandemic stocks (such as masks) or COVID-19 vaccines. We have not yet developed a global research strategy and a public portal (for all research to be verified and uploaded). Instead, we are seeing some countries develop ad hoc research initiatives, but these globally relevant insights may be missed without an integrated approach. See Box 2.
- There is no major investment or co-ordination in zoonotic diseases, such as establishing a new organisation and creating a global disaster fund to manage such risks. A UN report, *Frontiers 2016: Emerging issues of environmental concern* noted: 'Around 60 per cent of all infectious diseases in humans are zoonotic as are 75 per cent of all emerging infectious diseases. On average, one new infectious disease emerges in humans every four months'.⁴⁴ See Figure 4.

Box 2: UK Research

(i) New Variant Assessment Platform (NVAP)

In May 2021, Public Health England (PHE) established a platform to detect and assess new variants of SARS-CoV-2 around the world. It aims to deploy the UK's unique sequencing and virus assessment capabilities to help other countries respond to COVID-19 and strengthen global health security.⁴⁵ On 7 July 2021, it announced the first five countries to benefit: Brazil, Ethiopia, Kenya, Nigeria and Pakistan.⁴⁶

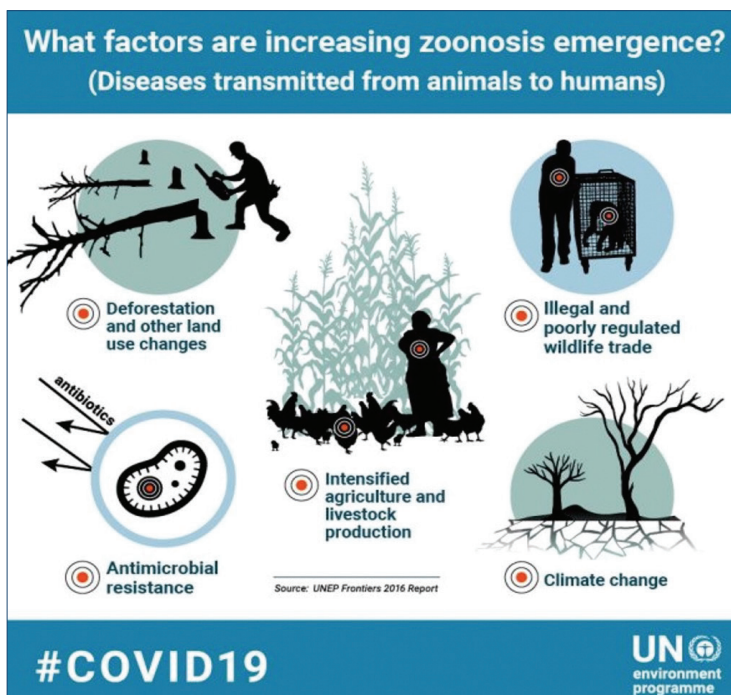
(ii) Ongoing long-COVID research

In July 2021, the UK government announced the establishment of 15 new studies across the UK to expand research into long-COVID. This initiative will ideally support thousands of vulnerable people, backed by nearly £20 million through the National Institute for Health Research (NIHR).⁴⁷

(iii) Antibody surveillance programme

In August 2021, the UK launched an antibody surveillance programme across the UK to gain a better 'understanding of the protection provided by antibodies generated following COVID-19 infection and vaccination'. The initiative is for surveillance only and the numbers will be limited to 8,000 per day.⁴⁸

Figure 4: What factors are increasing zoonosis emergence?⁴⁹



- There is no international vaccination system that records the type of vaccination, the batch, when provided and by whom, and provides a photo ID or fingerprint card system (i.e. one backed by the recognised international standards and conformity assessment system).
- We have not used expansive 'what-if' scenarios to imagine and develop a Plan B in case the virus outpaces the vaccines.

3.1.3 Where did the world fail?

We conclude that countries have tended to operate in isolation, in their own interests, and in some cases, in the interests of a few. Game theory suggests that individuals are better off if they work in cooperation, because the overall payoff to each player is better when they work together. In contrast, if players focus on individual payoffs, that may result in a phenomenon known as Tragedy of the Commons – where resources are used inefficiently and everyone loses. This theory is arguably being played out at a time when co-operation will deliver better outcomes for us all.

Too often, governments focus on the short-term, trying to be politically popular and expedient. In the context of the pandemic, this has meant that officials were overly optimistic, treating the vaccine as a silver bullet. Instead, they should be deploying a wide range of tools and practices that are necessary to address complex issues, and using early warning systems to build their health systems capability.

If the pandemic is assessed as a dress-rehearsal for other global crises, such as climate change, we are in deep trouble. To address the pandemic, the world needs a science-led response that is well communicated, fast moving, anticipatory, adaptive, equitable and leverages global collaboration. This is also what is needed to respond to climate change.

3.2 Part B: New Zealand

Currently there has been no independent review of New Zealand's overall response to date, but aspects of the response have been independently reviewed, such as the Independent Review of COVID-19 Clusters in Aged Residential Care Facilities (May 2020), the Office of the Auditor-General's (OAG) review of the Management of personal protective equipment in response to COVID-19 (June 2020), and also their review of Preparations for the nationwide roll-out of the COVID-19 vaccine (May, 2021).^{50, 51, 52} Although these deep dives are extremely useful, the Institute has been one of a number of organisations advocating for a comprehensive review of the whole response. Others include the former Prime Minister, the Rt Hon Helen Clark, the leader of the Act Party David Seymour and Maxim Institute.^{53, 54, 55}

3.2.1 What New Zealand did well

The list below is tentative, but we consider this type of analysis is useful for the discussion further below.

- New Zealand's 'tyranny of distance' did become our saviour. Using a farming metaphor, it was easy to close the gate if you are a small, isolated, sparsely populated, country at the bottom of the world. We were fortunate, and hopefully in another month, we will be fortunate again and the current lockdown will end. But we must be pragmatic.
- We established the Epidemic Response Committee, chaired by the opposition during the first lockdown.
- The government used instruments in its power, such as calling a State of Emergency. These instruments have been further adapted since our first Alert Level 4 in March 2020.
- The government generally communicated alert levels well.
- Our border and medical teams have worked hard.
- We have put in place a wage subsidy and other instruments to support the economy.

3.2.2 What New Zealand did not do well

- We were slow to close the borders (which did lead to an outbreak and fatalities).
- Our border is leaky, causing outbreaks. Instead of purpose-built MIQ accommodation, we have had to customise hotels and locate COVID-19 patients in our biggest cities.
- Our MIQ system for citizens overseas has been unnecessarily fraught.
- Logistics around PPE and other equipment has been challenging, including the independent supply of mask production in New Zealand (both medical and P2/N95 masks).

- Our vaccination rollout has been slow. Also, initial gaps between vaccination doses were three weeks when research indicates an eight-week gap would give better immunity long term. Figures 5 and 6 illustrate the different shape of the curves; the Institute has been proposing New Zealand’s curve should look more like that of the UK – with a fatter gap between the first and second dose lines.⁵⁶ The first community case since February was reported on 17 August 2021,⁵⁷ see Figure 6.

Figure 5: NZ COVID-19 vaccinations⁵⁸

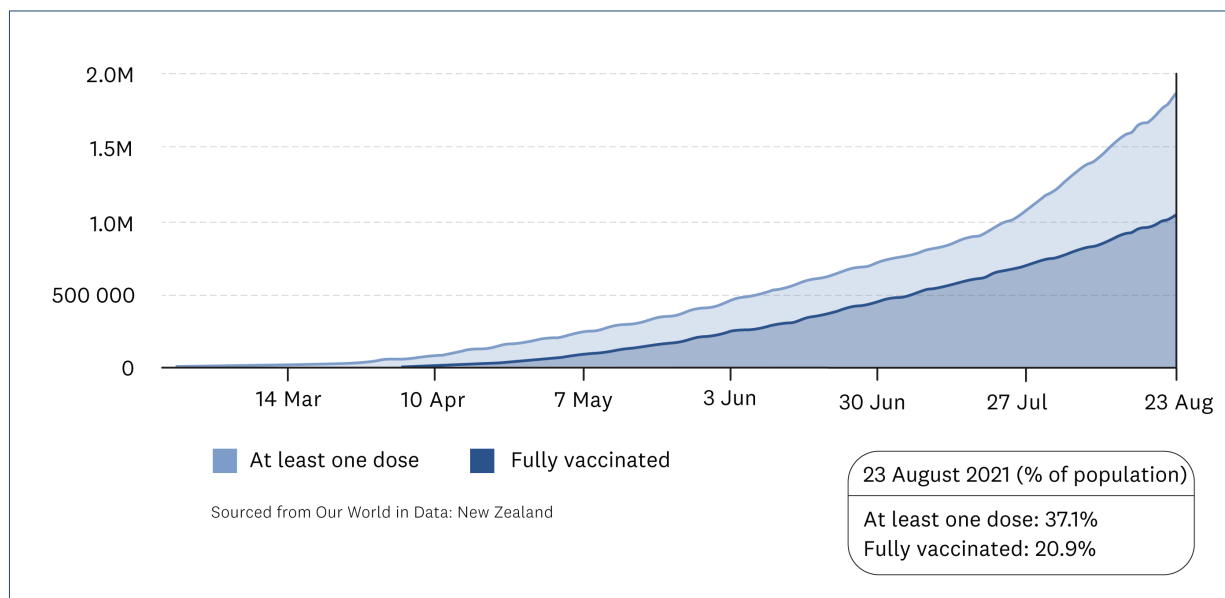
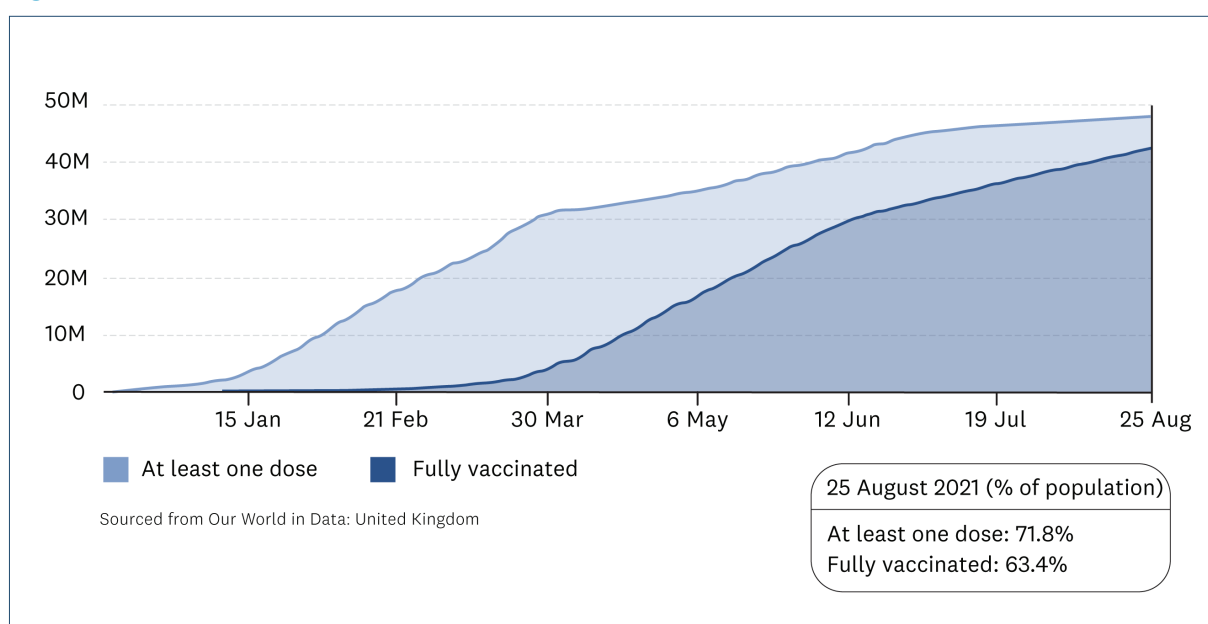


Figure 6: UK COVID-19 vaccinations⁵⁹



- We have failed to build our healthcare capability for a gradual opening of the border (such as building up our National Reserve Supply [NRS]).⁶⁰ Figure 7 shows the low stock of vaccinations; however, this may be due to world supply and the need for the world to also supply countries ravaged by COVID-19. Figure 8 shows very little change since January 2020 for P2/N95 masks. The Institute believes vaccines should be included in the NRS, and the NRS should be made public monthly and audited during a pandemic. See the detailed recommendations in our *Survey Insights: An analysis of the 2020 NZNO PPE Survey (May 2020)*. The survey of NZNO members was conducted between Wednesday 22 April and Monday 4 May 2020 (13 days).⁶¹
- We have yet to consult widely on building a strategy for a gradual opening up.
- Wastewater testing and saliva testing for border workers could have been introduced earlier.

Figure 7: New Zealand's vaccination stock (doses) ⁶²

Note: Vaccine available for distribution is stock (in doses) held at central warehouses. It does not include stock in transit or available at sites ready for use.

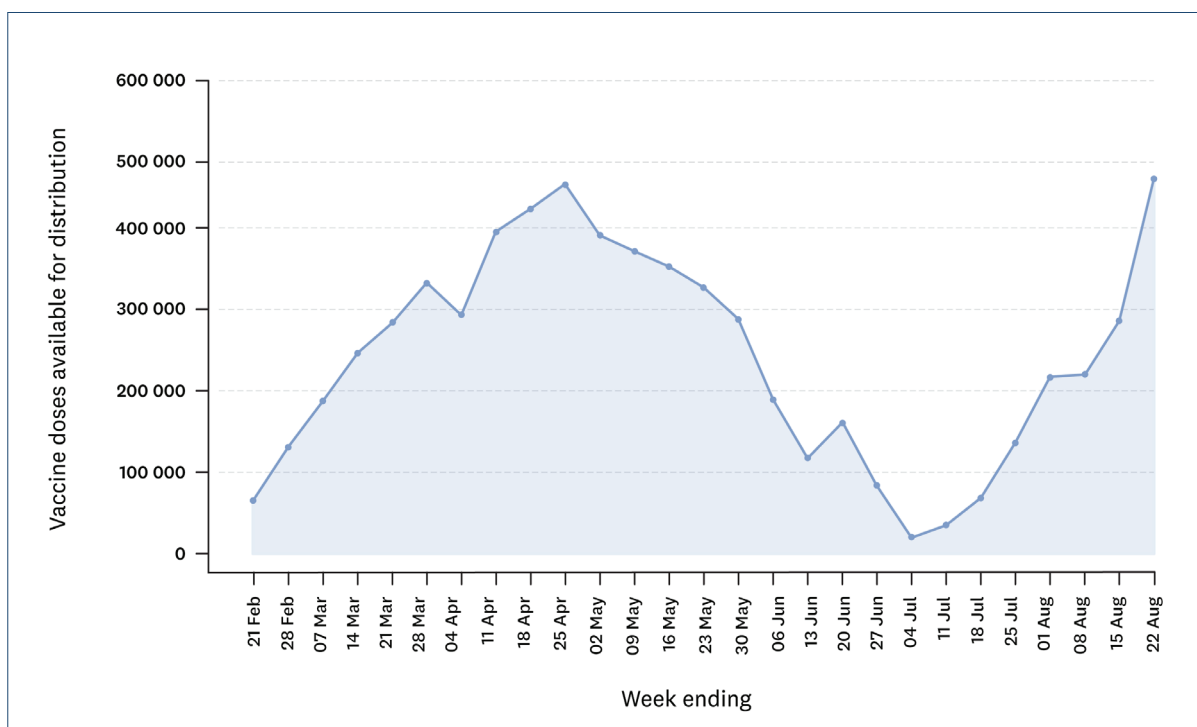
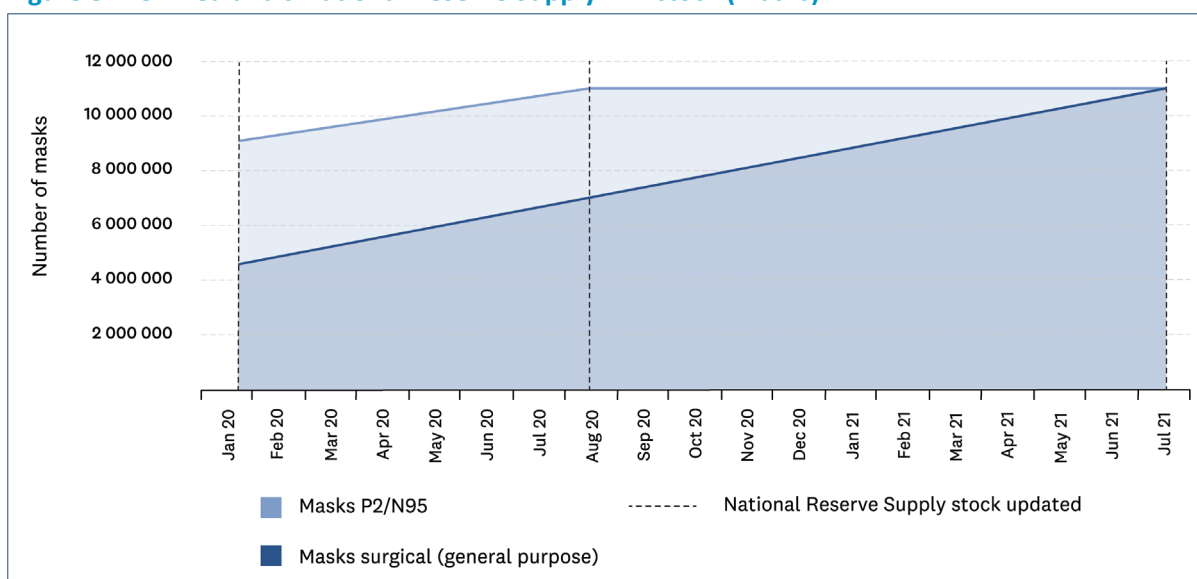


Figure 8: New Zealand's National Reserve Supply PPE stock (masks) ⁶³



3.2.3 Where might New Zealand fail?

It was both logical and easy to close the border. New Zealand's first reported case of COVID-19 was confirmed on 28 February 2020 – almost a full month after most of Europe and the United States.⁶⁴ We stumbled through the first outbreak, sometimes because people on the ground responded quickly and sometimes because of good luck. Arguably, New Zealand has done very little to improve the inner workings of our healthcare system to prepare for an outbreak we cannot control. We have no reason to believe that we will be unique – our healthcare system will become overstretched. Vaccinations will help, but it may not be the silver bullet we had envisaged. Where New Zealand may fail, and in the Institute's mind, it is the worst kind of failure, is because we knew what was going to happen but we failed to make the effort to prepare.

4.0 Foresight: What the future might look like

4.1 What will a COVID-19 world look like in say 2025, 2040 or beyond?

In February 2021 (pre-Delta), *Nature* asked ‘100 immunologists, infectious-disease researchers and virologists working on the coronavirus whether it could be eradicated. Almost 90% of respondents think that the coronavirus will become endemic’ – meaning that it will continue to circulate in pockets of the global population much like the seasonal flu.⁶⁵

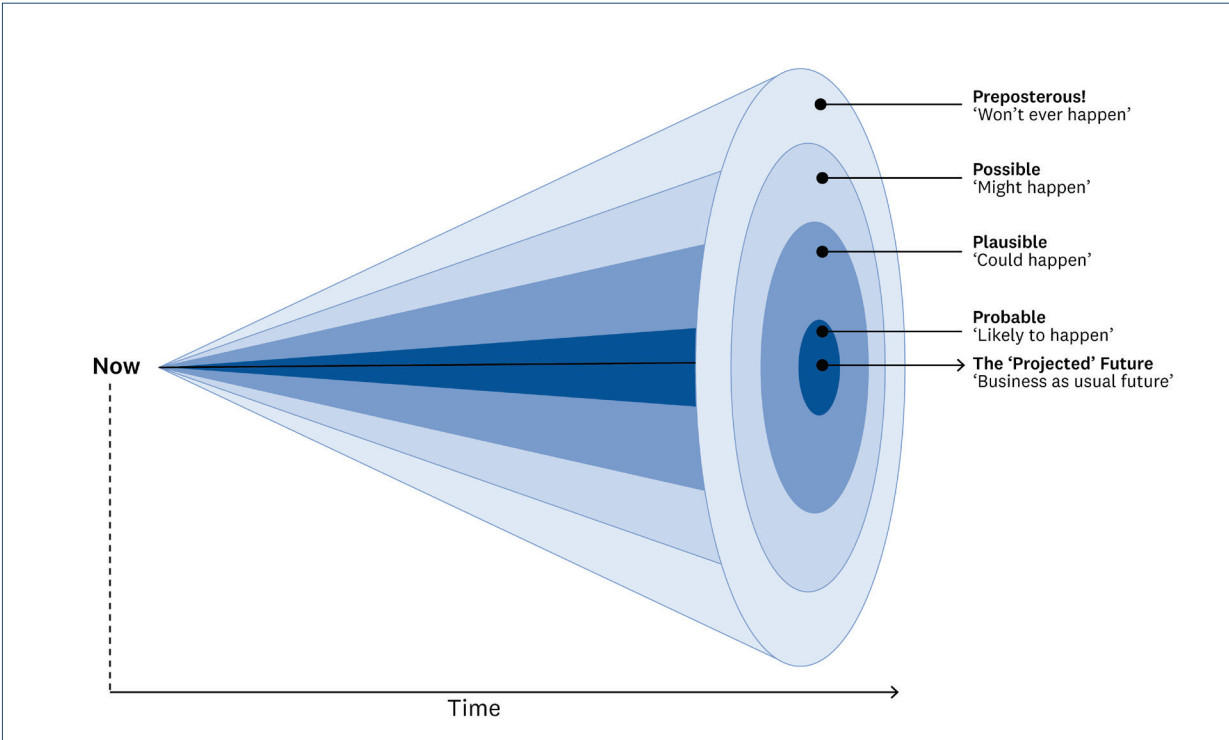
The UK and the US are examples of countries undergoing the transition from living without COVID-19 to living with it. However this transition is costly and brings with it its own stresses and strains. As noted earlier, mask wearing is still recommended indoors, rapid lateral flow tests are still being completed (sometimes two or three times a week), polymerase chain reaction (PCR) tests are still being performed to see if COVID-19 is present and, in some cases, vaccination cards are necessary to attend large events or get a job. Remote working is still ongoing; a poll of 520 London business leaders found that almost half expect this trend to continue even after the pandemic finishes. The same poll noted that current concerns were not being driven by a fear of getting COVID-19 at the office, but while commuting.⁶⁶ There is a strict range of protocols that people are still needing to apply as part of their new normal.

In February 2021, the International Science Council (ISC) established the global ‘COVID-19 Scenarios Project’ to assist our broader understanding of the options that exist. They will focus on mid-term and long-term horizons. A February 2021 *Lancet* article on the topic stated:

Decisions to be made in the coming months need to be informed not only by short-term priorities, but also by awareness of how those decisions are likely to affect the ultimate destination. Providing such analyses to policy makers and citizens should assist informed decision making.⁶⁷

Foresight is an exceptional tool for exploring the possible or even the preposterous futures (as illustrated in Figure 9). Unlike tracking a path into the future (which is what projections or modelling try and do), explorative scenarios seek out what might happen, with a focus on the sequence of events, second and third level effects and plausible narratives. An expert futurist is unlikely to be an expert at any specific area of study, but they will be curious, open to new ideas and seek out new voices – many will be analytical and most will be collaborative.

Figure 9: Cone of Plausibility



4.2 How can the world become a better manager of this and future pandemics?

This is an important question but one that requires a lot more research. The failures mentioned in Section 3.1.2 provide a very brief insight into the challenges of managing a pandemic: you need to get a lot of things right, which means you need to be on the continual lookout for the weakest link. Our view is that the whole system needs to be redesigned and re-purposed. This means not just redefining the purpose of WHO, but the purpose of the global healthcare system. There is no doubt that WHO have worked very hard to manage this and other pandemics; however, the organisation must be suffering from institutional stress and fatigue. Much of the stress must be coming from lack of funding and from their own and international expectations.

There is an ongoing tension in management theory between which comes first – structure or strategy. It would seem timely to map the existing system and analyse the existing funding model. In particular, it seems timely to understand whether the current structure is fit for purpose and whether the strategy delivers on that purpose. If the purpose is to keep the citizens of the world safe, it will fail and possibly fail seriously unless major countries, such as the UK, China, France, Germany and the US collaborate and invest in better systems. Section 3.2.1 highlights some of the components, but a whole systems approach would look at the extent to which the purpose is being achieved, what obstacles exist and where alignment and capabilities could be better integrated and, where necessary, increased.

4.3 How can New Zealand transition safely?

How bumpy the transition will be from an elimination strategy (being zero cases in the community) to a suppression strategy (where we try and control COVID-19) is still extremely uncertain. Importantly, we are open for people to exit but not to easily enter, and that distinction is going to be important. For example, enabling ‘MIQ at home’ with GPS tracking (via an electronic bracelet) for those that can self isolate at home may be a safer and more cost effective option.

Like Singapore and a number of similar countries, New Zealand needs to find a soft way of making entry smoother, while at the same time managing the risks of overwhelming our healthcare system and disrupting our economy with too many lockdowns. Singapore has developed a strategy that provides a high degree of certainty for citizens, including a scheme that allows vaccinated people into the country from countries with minimal COVID-19 using a Vaccinated Travel Pass (VTP). The scheme excludes children under 12, who are not vaccinated. Travellers must undergo multiple COVID-19 tests while in Singapore (a pre-departure test within 48 hours of the scheduled flight, an on-arrival test at Changi Airport and post-arrival tests on days three and seven at a designated clinic in Singapore).⁶⁸

First, it has set itself an unusually high bar for vaccination: It won't begin to reopen until 80% of its population have been double-jabbed. By contrast, Britain lifted restrictions with about 65% fully vaccinated. Second, even when it reaches that threshold in early September, Singapore will reopen with a whimper rather than a bang. On Sept. 8, Singaporeans will be allowed to travel without quarantining on their return—but only to two countries with low rates of COVID-19, Brunei and Germany. For the time being, mask-wearing will remain mandatory, contact-tracing apps will remain in use, and restaurants will still have to abide by the 10:30 p.m. curfew.⁶⁹

New Zealand's decisions about the future should be informed solely by comparing New Zealand with other countries, but with a risk assessment of the possible challenges that lie ahead. This broader view, what is happening beyond the walls of the fortress, and, in particular, how the pandemic might evolve, is extremely important. It should inform our opinions on how much we are prepared to hunker down and fight the war on Delta. Section 2.2 outlines our understanding of the science to watch out for, but there will also be new and unexpected unknowns – what are often referred to as the unknown unknowns.

It is important to identify early what might influence this decision to open up entry into New Zealand. It will not be as simple as focusing on the level of vaccination. For example, what happens if the goal is set at 85 per cent but 15 per cent of the population decide not to be vaccinated (or are too young)? Another problem New Zealand policy makers might face is what we should do if the science finds that immunity falls below 50 per cent over a 12-month period. For example, should we hold off on transitioning until those vaccinated in the first half of 2021 are given boosters (say in the first half of 2022)? There is an argument that as those vaccinated early were the high-risk border and healthcare workers, we should not open our borders to new arrivals until they receive boosters. If this is to happen, our long vaccination rollout would become a rolling vaccination process.

The New Zealand Strategic COVID-19 Public Health Advisory Group's report (June 2021, made public 11 August 2021) acknowledges the challenge of a decrease in the effectiveness of vaccines. The report notes: 'It is not inconceivable that, by the end of the year, there could be an established variant that is significantly resistant to the vaccine'.⁷⁰ However, if the status quo prevails, there are things we can do now to get the country prepared. We would argue that even if the status quo does not prevail and the world is faced with emerging or new variants, these actions will still hold the country in good stead. Below are a few suggestions:

For the individual

- Get any urgent and arguably non-urgent medical treatments sorted in the short term (this includes dentistry, that knee problem or anything that might flare up over a lockdown) and keep a good supply of medication, basic food, home-school equipment/games/crafts for children and home office resources.

For the country

- Create systems to support those who need assistance during lockdown in terms of goods, medical support and other resources, particularly those in isolation awaiting test results (to counter existing inequities).
- Build up the National Reserve Supply (ideally with MOH keeping stock levels public on their website). This enables citizens to have confidence that the country does not have PPE stock issues, and, in particular, medical staff can have confidence they will not bring home COVID-19. Trial rapid lateral flow tests and polymerase chain reaction (PCR) tests, and purchase in bulk to add to the National Supply Reserve.
- Complete an audit of every hospital in the country for COVID-19 management. If the same team goes around the country doing this, a protocol could be developed that means hospitals can put in place optimal processes for patients and staff. Train staff to deal with COVID-19 patients in ICU. Liaise with and learn lessons from the UK and US hospitals.
- Develop rules (to put in place bottom lines) and standards (to guide judgement) in consultation with key players such as medical experts, business and school communities. This could include teaching mask and flu etiquette, the use of rapid lateral flow testing and recalibrating the education system for home-schooling with a particular focus on removing inequities. One area that needs urgent work is funerals and tangihanga during Alert Level 4; these should be allowed. For example, the current protocol could be changed to use a range of tools such as (i) pre-testing (e.g. using a rapid lateral flow test), (ii) use of P2/N95 masks and (iii) limiting numbers (to say 30 people who then agree to self-isolate for two weeks at home and be tested at day 11).
- Suggest the medical community, government and business undertake supply-chain risks to identify and purchase additional back-up stock.
- Improve logistic skills in central government. This could include training courses to help policy people understand choke points, supply chain risks and stock level management systems.
- Update the 2017 New Zealand Influenza Pandemic Plan: A framework for action, along with the multitude of supporting papers, including the 2013 National Health Emergency Plan National Reserve Supplies Management and Usage Policies.
- Consult with the public on ways to manage the elimination strategy or suppression strategy and liaise with and learn from other countries like Singapore – what worked and what did not. Develop a detailed, and perhaps staged, approach. For example, would it be possible to adopt a suppression strategy for the North Island, two months before the South Island?
- Determine trigger points for a move to a suppression strategy, listing items to be implemented in advance (like the above) so that we create a high-level of certainty for businesses and society in general.
- Provide a non-partisan approach, proving more clarity and scrutiny over government at times of Alert Level 4 (whoever is in power). This means that a standard process is put in place. For example, Alert Level 4 automatically leads to a state of emergency, to an adjournment of Parliament, and the re-establishment of the Epidemic Response Committee. Box 3: Check List for Policy Analysts overleaf puts forward a few questions for policy analysts to consider.

- Lastly, and most importantly, it is timely to consider better embedding foresight into government. The advent of the Long-term Insights Briefings (established under the Public Service Act 2020, Schedule 6, clauses 8 and 9) is a step in the right direction, in that it aims to make available in the public domain a report by chief executives at least every three years that provides (i) information about medium- and long-term trends, risks and opportunities that affect or may affect New Zealand and New Zealand society and (ii) information and impartial analysis, including policy options for responding to these matters. However, at times of significant change and uncertainty we believe we should also create a new component in the machinery of government that is responsible and able to guide foresight across government agencies and for the wider public more generally. This is particularly relevant at a time when New Zealand is faced with three crises. Our view is that we need a foresight institution, one that is close to government but also independent of government.

The urgency to do this is not being lost on others, as indicated in a recent article on why the US needs a department of the future. The Institute has reviewed the history of New Zealand’s Commission for the Future and suggest it be re-established with more support than it had in the 1980s. This new organisation should be independent of government. The organisation’s tasks could include: to prepare a generational plan, to support the long-term aspects of the existing resource management reform, to facilitate and/or create reference climate scenarios, to produce a risk assessment for New Zealand and to co-ordinate the Long-term Insights Briefings. The Long-term Insights Briefings are currently managed by the DPMC. In our view the Briefings should be managed independently of government. A more detailed explanation on the generational plan and the reform can be found in the Institute’s recent submission on the Parliamentary paper on the exposure draft of the Resource Management Natural and Built Environments Bill (to learn more, see an endnote on additional papers and proposals).⁷¹

Box 3: Check List for Policy Analysts

Institutional governance and management

What have we learnt and do our current institutional settings (government and public sector) need to change to deal with pandemic-like events?

Institutional infrastructure

Do we have the short- and long-term capability and capacity to deal with disruptive events and, if we do not, what will be required to address this?

Institutional policy settings

Do our settings promote long-term thinking or short-term reactive approaches? If the latter, how do we change this? Do they encourage innovation, adaptability and reflective learning? What is the plan to move from elimination to suppression? Do we have a set of principles to shape and drive decision making?

Interdisciplinary collaboration

Do our settings promote collaboration and knowledge and evidence sharing to glean insights that can inform and shape approaches to different threats and challenges? In other words, do we encourage cross-sector and cross-discipline collaboration? Is this a serious gap in our defences?

Information

How do we ensure that the public is best educated on evidence-based strategies and approaches as part of an elimination or suppression strategy?

Equity of outcomes

How do our policy settings ensure that the most vulnerable are prioritised? How do we ensure that we do not increase marginalisation and reinforce bias? How do red zone countries integrate back into the mainstream? For example if Africa is 2 per cent vaccinated, what is the timeframe for reintegration, and what are the economic and social costs?

5.0 The challenges we face – a noisy world

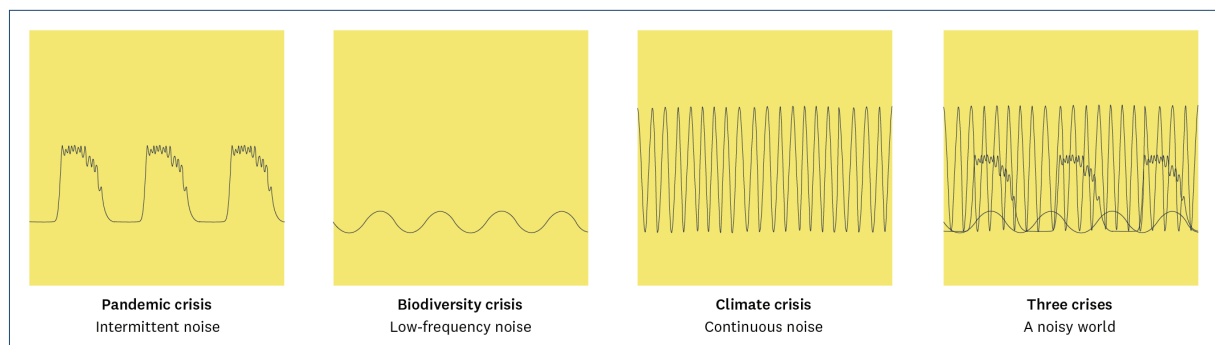
These are interesting times. We are facing three crises at once – a pandemic crisis, a biodiversity crisis and a climate crisis. Futurists often explore trends and wild cards in terms of noise, in much the same way as an experienced triage doctor will be worried about the quiet pale person rather than the person screaming for help.

Noise can be described in terms of pitch and pattern. In futures speak, the pandemic crisis delivers an ‘intermittent noise’. It, therefore, attracts lots of attention and any response is relatively immediate (in that any action taken today has a direct impact tomorrow). In contrast, the biodiversity crisis delivers a ‘low-frequency noise’ and therefore gathers little attention and minimal action. Another example of a low-frequency noise might be our vulnerable communities; history reminds us that those challenged by poverty often carry an uneven distribution of the burden during times of disruption.

However, the climate crisis is far more nuanced. Climate change delivers a ‘continuous noise’ but it is deafening – we hear the noise, we get alarmed, we get fearful, but any action taken today will not be felt until 2040 (and then of course it is too late). What we face today are three types of noises, but all at once (see Figure 10). This means we need to design our systems to:

- prepare and rebuild between the ‘intermittent noise’
- seek out the ‘low-frequency noise’
- be proactive and informed so as not to be overwhelmed by the ‘continuous noise’.

Figure 10: Three crises – three different types of noise



The public policy strategy should focus on putting in place incentives and penalties today that reward those that take action (and penalise those that don't) tomorrow, in order to deliver optimal outcomes in 2040. Even having the ability to anticipate does not equate to the willingness to act. This means we need to develop climate policy that acts more like the pandemic lockdown response – actions that can be measured and rewarded in real-time (such as a carbon tax) but at the same time work towards positioning Aotearoa New Zealand well in 2040. Not easy, but possible.

The second arm of the strategy could focus on the strong relationships/commonalities that exist between the three crises. This means if we focus on climate and biodiversity, there are likely to be some fundamental win-wins (e.g. reducing wildfires), including a reduction in future pandemics (as illustrated in Figure 4 on page 14, found on the UN SDG 15: Life on Land website page). This is often what is referred to as a systems approach, where money and resources are used to achieve co-benefits or integrated outcomes.

The July 2021 *Lancet* expert consultation (mentioned above) summed this up well when it noted that because COVID-19 is most likely a zoonosis:

The connections between animal, human, and environmental health are complex and require systems thinking. More focus on this interconnectivity should be placed in education, to foster awareness of the importance of human actions on such large scales. As we move further into climate change, a range of serious health issues will become more common. A One Health framework as part of a planetary and global health perspective to study and manage these will be helpful.⁷²

It is important to assess and compare pandemics so that we can learn lessons. Our forebears did this for us in 1919, when the Governor-General of the Dominion of New Zealand established the Influenza Epidemic Commission. The Institute would like to see a Royal Commission established in regard to COVID-19, much like the aims of the Commission set up just over 100 years ago:

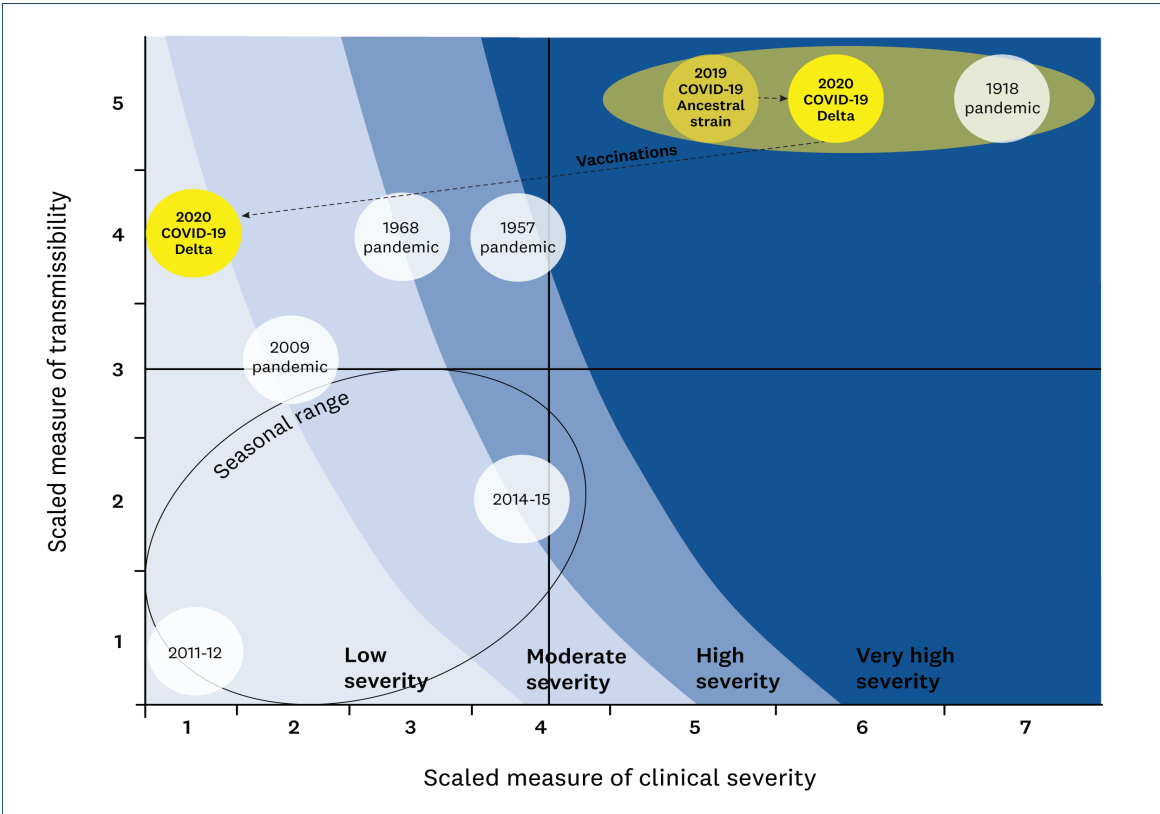
A [1919] Commission to inquire into and report as to the following matters, namely:—

1. The causes of the introduction and extension of the recent epidemic of influenza in New Zealand.
2. The best methods of preventing or dealing with such occurrences in future.
3. All matters connected with the arrival in New Zealand waters of the s.s. Niagara and the s.s. Makura in respect to their bearing on the introduction or extension of the epidemic.
4. The administration of the Public Health Department and of local authorities with regard to their responsibilities in relation to the epidemic, and generally in regard to public health.
5. The proper relation of local authorities to the Public Health Department in respect of the prevention or suppression of infectious diseases, and generally in regard to public health.
6. The efficiency of the quarantine arrangements in New Zealand.⁷³

Although the CDC has not updated their Pandemic Severity Assessment Framework (PSAF) for COVID-19, a group of Brazilian scientists did this and suggested the range was likely to be similar to the 1918 pandemic (they added the yellow cigar-like shape in Figure 11 below). The Institute has added the COVID-19 yellow circles to explain our understanding of the situation since April 2020, however this is imprecise. Ideally the PSAF should be revisited and reviewed as we consider this type of analytical framing is essential if we are to learn the lessons of the past.

Figure 11: The 2017 CDC Pandemic Severity Assessment Framework (PSAF) (updated) ⁷⁴

Note: This 2017 CDC graph was updated in 2020 by a group of Brazilian researchers, and in 2021 by the Institute to reflect our understanding of Delta.



6.0 Constitutional stress

There are very good reasons why New Zealand and other countries move to a non-partisan model at times of war. Done well, a non-partisan approach brings the best experts, thinkers and leaders together to consider all the evidence, seek out a range of different voices and implement decisions in a considered and logical manner. Instead of fighting each other, they fight the antagonist. This is what we should be doing in the case of COVID-19.

However, when under stress, many leaders have a tendency to do the very opposite – they dumb down and reduce their circle of advisers. They also seem loath to seek out opposing views. If they do seek out advice, they often revert to the same old experts, rather than taking time to reflect on what is different, who needs to be in the room, what information is required and how best to make a decision.

To put this another way, opening New Zealand's borders could arguably be better determined through a form of participatory democracy, such as a regular conscience vote in Parliament or even a referendum. Ideally, this would include a debate on our preferred future based on the evidence and what is important to us – helping to create a space and place for us to think and act long term. What is clear is that thinning the border membrane or removing the fortress entirely will deliver a new set of problems, costs, stresses and, unfortunately, fatalities (the costs to the UK of the additional testing kits, the 15 long-COVID clinics for children and the healthcare system pivoting away from assessment and treatment of other illnesses must be the tip of the iceberg).

New Zealand needs timely and in-depth research, a well-supported and agile healthcare system and a decision-making process that is going to deliver a durable way forward. It is true that there are a lot of unknowns, but there are also many knowns. As the *Lancet* expert consultation makes clear, the complete global elimination of COVID-19 seems unlikely but local elimination could become the norm in some settings:

If achieved, local elimination offers clear advantages over mitigation or suppression with continued virus circulation, at least until sufficient protection against severe symptoms is granted in the population. ... To achieve said target, a clear, evidence-informed, and context-relevant strategy, as well as concerted efforts and actioning are crucial.⁷⁵

This confirms what Dr Maria Van Kerkhove (WHO) recently pointed out, that the countries that use all the tools in their tool box are more likely to deliver sustainable outcomes for their citizens.⁷⁶

The reality is New Zealand might need to move to a suppression strategy where we try and control COVID-19 rather than adopting the elimination strategy (being zero cases in the community). What we do not want or need is for this current outbreak to push us into a suppression strategy, as we are not ready.

This transition, combined with the zero emissions transition, will place a great deal of stress on our public service and our constitutional framework. In reality, we suspect parts of the public service are suffering from fatigue (not surprisingly). At a time when the public service is under high levels of stress, we still believe it is critically important to invest early and discuss how we are going to manage the emerging constitutional stress. We suggest the government undertakes more consultation in order to use the skills and resources outside of the public service and create more checks and balances inside the public service. Smooth transitions are not the just government's problem, but the problem of all New Zealanders.

The counter-factual, as in to leave our frameworks as is, will only add more uncertainty and complexity to an already overwhelmed system. Mistakes will be made. As the late Sir Michael Cullen mentioned (see page 6), this is a key moment in our history, and success will depend on our honesty, courage and unity.

7.0 Time to build governance systems that deal with the fat tails problem

We need to separate ‘COVID-19 operational planning’ from ‘New Zealand’s strategic thinking’. This means creating a team to think broadly about all three crises and reflect, think, integrate, consult, recalibrate and pivot. While MOH aims to improve the existing COVID-19 response, the second team would focus on redesigning New Zealand so that it is ‘fit for the future’ – two different work streams with two different information requirements and skill sets.

Constitutional stress is on the increase. This means redesigning our constitutional framework is now urgent. Our current government system has been in a reactive mode for ten years, since the Christchurch earthquakes and the terrorist attacks, and we urgently need to re-establish a proactive mode.

New Zealand needs a new independent organisation; one able to embed foresight in the public service and wider society more generally. This means analysing, consulting, seeking out expertise, undertaking risk assessments, building on Long-term Insight Briefings, creating reference climate scenarios and considering integrated approaches to all three crises (where possible, aligning the emissions transition with the COVID-19 suppression transition). Such an organisation would benefit from nonpartisan support; new institutions require ongoing care, guidance and reliable funding streams.

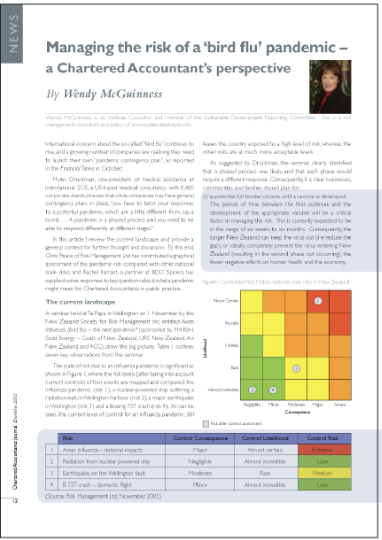
None of the three crises will wait for New Zealand to get our House in order. Instead, we need to move with lightning speed to better embed foresight, think strategically and get prepared. Box 4 outlines our suggestions for an independent foresight body.

Box 4: Tasks an independent foresight body might undertake include:

1. Supporting departmental CEs in the preparation, promotion (in particular, public consultation) and publishing of all Long-term Insights Briefings
2. Supporting the long-term aspects of the existing resource management reform
3. Facilitating and/or creating reference climate scenarios for Aotearoa New Zealand
4. Facilitating and/or creating COVID-19 scenarios for Aotearoa New Zealand (we are in a unique situation globally and we need to understand more about our options)
5. Preparing a risk register and assessment for Aotearoa New Zealand (say every year, looking out 10 years). This could be along the lines of the UK, but with longer horizons.⁷⁷
6. Preparing a regular generational plan (say every three years)
7. Reviewing the ability for the country to deal with constitutional stress, in particular our constitutional response to fat tail events when low probability/high magnitude events occur.

From the Institute’s perspective, a pandemic was on our radar in 2005 (see Figure 12) and again in 2015.⁷⁸ In both cases we got very little traction. This is a global phenomenon; scientists have been sharing with society the likelihood of a pandemic, and futurists have been using pandemics in their scenarios. The question then becomes, if governments knew this was possible, why were we not better prepared?

Figure 12: Excerpt from an article in the *Chartered Accountants Journal* (December 2005)⁷⁹



Managing the risk of a 'bird flu' pandemic – a Chartered Accountant's perspective
By Wendy McGuinness

The current landscape

A number of factors have led to a rise in the risk of a pandemic influenza pandemic. The World Health Organization (WHO) has estimated that there are currently 100-200 influenza pandemics in progress worldwide. The WHO has also estimated that there are currently 100-200 influenza pandemics in progress worldwide. The WHO has also estimated that there are currently 100-200 influenza pandemics in progress worldwide.

Risk	Control Consequence	Control Likelihood	Control Risk
1 Avian influenza – national impacts	Major	Almost certain	Extreme
2 Radiation from nuclear powered ship	Negligible	Almost incredible	Low
3 Earthquake on the Wellington fault	Moderate	Rare	Medium
4 B 737 crash – domestic flight	Minor	Almost incredible	Low

[A] potential full border closure until a vaccine is developed. The period of time between the first outbreak and the development of the appropriate vaccine will be a critical factor in managing the risk. This is currently expected to be in the range of six weeks to six months. Consequently, the longer New Zealand can keep the virus out (i.e. reduce the gap), or ideally, completely prevent the virus entering New Zealand (resulting in the second phase not occurring), the fewer negative effects on human health and the economy.'

We believe this is because governments are not set up to identify, think and act on low-probability/high-magnitude events. Therefore, we need to design governance systems that acknowledge and engage with the fat tail problem (see Figure 13). Arguably, pandemics, biodiversity and climate change are becoming more certain/high-magnitude events, in other words, the tail is getting fatter.

Delta has made the fat tail distribution quite a bit bigger than the ancestral (original) COVID-19. Therefore, understanding the properties of the negative extreme events becomes critical to preparing and, most importantly, surviving rare events.

Professor of Major Programme Management at Oxford University's Saïd Business School Bent Flyvbjerg has been pondering the same question and came to very similar conclusions in his December 2020 paper. He argues it is only a matter of time until we are hit with another pandemic alongside extreme climate and other extreme events. He also looked closely at COVID-19 to see if there are any basic principles for navigating extreme risk, for government, business and the public. His conclusions very much reflect our own:

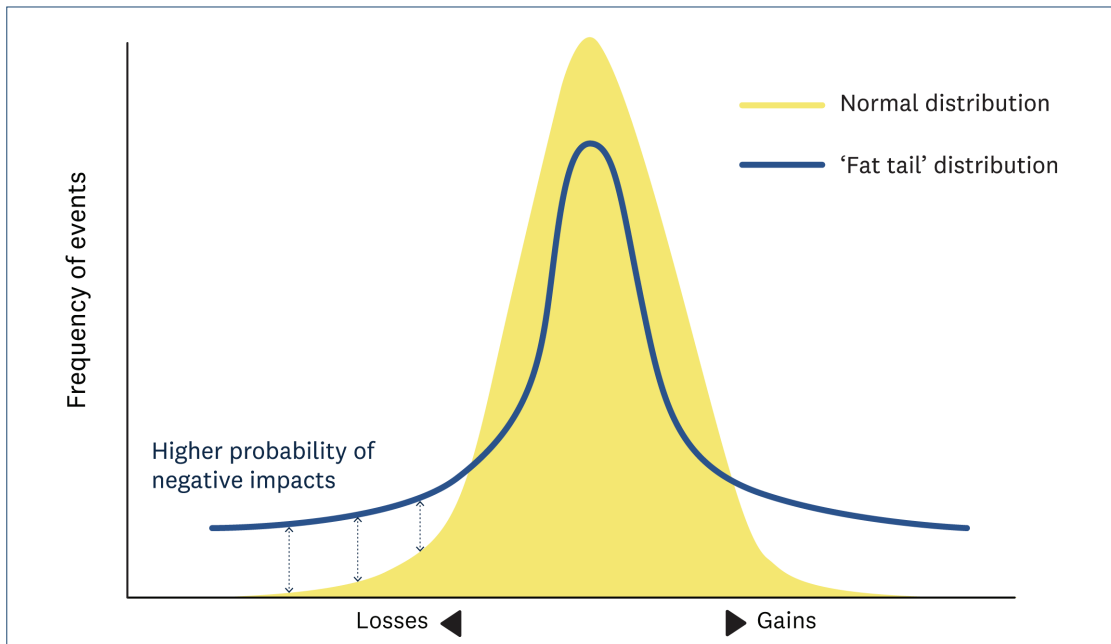
The COVID-19 pandemic has taught us what to do and not to do in the face of regression to the tail. Two lessons stand out.

First, everyone needs to be honest about, and keep in mind, that there will be more extreme events in the future. There will be more pandemics, and one of these will be worse than COVID-19. This uncomfortable fact follows directly from the fat-tailed distribution of pandemics and the associated law of regression to the tail.

Second, once leaders and citizens understand that pandemics involve regression to the tail, they will also understand how to handle the next pandemic. Specifically, four effective mitigation measures apply, when faced with regression to the tail:

- a) cutting the tail, by eliminating specific tail risks;
- b) using the precautionary principle, i.e., avoiding tail risk by taking a cautious approach;
- c) making sure the necessary contingencies are in place; and
- d) acting immediately, at blitz-like speed, and at scale, when the tail rears.⁸⁰

Figure 13: The fat tail problem



In the past we have not designed our governance systems to be reflective (to look backwards), to pause (to remove oneself from the operational noise) and to be proactive (to build an agile base to deal with not just one crisis, but an increasing range of crises). But we have that opportunity today to find new ways of dealing with a noisy world. Anticipatory governance can weave together hindsight, insight, foresight and oversight to help navigate what we are facing. No one can doubt that the future is going to be tricky, but so was the past. It is time to focus on the long game and the fat tail, and design a governance system that is going to give us the ammunition to fight the pandemic crisis, the biodiversity crisis and the climate crisis, simultaneously.

Abbreviations

CDC	Centre for Disease Control and Prevention
COVAX	COVID-19 Vaccines Global Access
DPMC	Department of the Prime Minister and Cabinet
GHSA	Global Health Security Agenda
ICU	Intensive Care Unit
ISC	International Science Council
MIQ	Managed Isolation and Quarantine
MOH	Ministry of Health
NIHR	National Institute for Health Research
NHS	National Health Service
NPIs	Non-pharmaceutical Interventions
NRS	National Reserve Supply
NSR	No Specific Response
NVAP	New Variant Assessment Platform
NZNO	New Zealand Nurses Organisation
OAG	Office of the Auditor General's
PCR	Polymerase Chain Reaction
PHE	Public Health England
PPE	Personal Protective Equipment
PSAF	Pandemic Severity Assessment Framework
RADAR	Rapid ACT-Accelerator Delta Response
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SAGE	Scientific Advisory Group for Emergencies
UN SDG 15	United Nations Sustainable Development Goal 15
VOC	Variants of Concern
VOI	Variants of Interest
WHO	The World Health Organization

Endnotes

Note: In addition to the endnotes below, the Institute has a *PandemicNZ* research project. It includes a detailed New Zealand timeline of events that is updated periodically and copies of past and existing MOH documentation. See <https://www.mcguinnessinstitute.org/projects/pandemic-nz>

1. 'The global number of new cases has been increasing for the last two months with over 4.4 million cases reported in the past week (9–15 August 2021), bringing the cumulative number of global cases to over 206 million'. 'Over all, the number of deaths reported remained similar, with over 66,000 deaths this week, as compared to the previous week.' See World Health Organization. (August 17, 2021). Weekly epidemiological update on COVID-19. Retrieved 26 August, 2021 from <https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19---17-august-2021>
2. 'Variants of SARS-CoV-2, the virus that causes the COVID-19 disease, are expected to continue to emerge. Some will emerge and disappear, and others will emerge and continue to spread and may replace previous variants. For example, the variant of the virus that caused the first U.S. COVID-19 cases in January 2020 is no longer detected among variants circulating in the country.' See Centers for Disease Control and Prevention. (n.d.). COVID Data Tracker. Retrieved August 26, 2021 from https://covid.cdc.gov/covid-data-tracker/?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fcases-updates%2Fvariant-proportions.html#variant-proportions
3. 'Most changes have little to no impact on the virus' properties. However, some changes may affect the virus's properties, such as how easily it spreads, the associated disease severity, or the performance of vaccines, therapeutic medicines, diagnostic tools, or other public health and social measures.' See World Health Organization. (n.d.). Tracking SARS-CoV-2 variants. Retrieved August 26, 2021 from <https://www.who.int/en/activities/tracking-SARS-CoV-2-variants>
4. See Endnote 3.
5. See Endnote 1.
6. See World Health Organization. (December 9, 2020). The top 10 causes of death. Retrieved 26 August 2021 from <https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>
7. 'The reproduction number (R) is the average number of secondary infections produced by a single infected person' and 'the growth rate reflects how quickly the numbers of infections are changing day by day.' See UK Health Security Agency. (August 20, 2021). Guidance: The R value and growth rate. Retrieved 26 August, 2021 from <https://www.gov.uk/guidance/the-r-value-and-growth-rate>
8. See Roberts, M. (August 26, 2021). Covid infection protection waning in double jabbed. BBC News. Retrieved August 26, 2021 from <https://www.bbc.com/news/health-58322882>
9. See NHS. (June 15, 2021). NHS sets up specialist young people's service in £100 million long-COVID care expansion. Retrieved August 26, 2021 from <https://www.england.nhs.uk/2021/06/nhs-sets-up-specialist-young-peoples-services-in-100-million-long-covid-care-expansion>
10. See Lewis, D. (July 14, 2021). Long-COVID and kids: scientists race to find answers. Nature. Retrieved August 26, 2021 from <https://www.nature.com/articles/d41586-021-01935-7>
11. See CNBC. (July 28, 2021). Covid immunity wanes 6 months after the Pfizer vaccine [Video]. CNBC from 0:1:42. <https://www.cnbc.com/video/2021/07/28/covid-immunity-wanes-6-months-after-the-pfizer-vaccine.html>
12. See Endnote 11.
13. See Endnote 8.
14. 'There are four major risks associated with high numbers of infections. These are an increase in hospitalisations and deaths, more 'Long-COVID'; workforce absences (including in the NHS); and the increased risk of new variants emerging. The combination of high prevalence and high levels of vaccination creates the conditions in which an immune escape variant is most likely to emerge. The likelihood of this happening is unknown, but such a variant would present a significant risk both in the UK and internationally'. 'High prevalence also presents a challenge to testing, contact tracing and sequencing. If PCR testing and genomic sequencing capacity are overwhelmed, it may not be possible to rapidly identify a new variant.' See Scientific Advisory Group for Emergencies. (July 7, 2021). SAGE 93 minutes: Coronavirus (COVID-19) response, 7 July 2021. Gov.UK, at para 91-10. Retrieved August 26, 2021 from <https://www.gov.uk/government/publications/sage-93-minutes->

[coronavirus-covid-19-response-7-july-2021/sage-93-minutes-coronavirus-covid-19-response-7-july-2021](https://www.bbc.com/news/health-56100076)

15. Rudra, N. (August 31, 2021). Scientists uncover new strain with ‘increased transmissibility’. [Australian Financial Review](https://www.africabusiness.com/news/56100076).

16. See Mwai, P. (August 6, 2021). Covid-19 Africa: What is happening with vaccine supplies. BBC News. Retrieved August 26, 2021 from <https://www.bbc.com/news/56100076>

17. For example, Seth Berkley, CEO of Gavi, The Vaccine Alliance, said: ‘If we’re not careful, booster vaccines could end up giving the coronavirus a boost’; see Gavi, The Vaccine Alliance. (August 9, 2021). If we’re not careful, booster vaccines could end up giving the coronavirus a boost. Retrieved August 26, 2021 from <https://www.gavi.org/vaccineswork/if-were-not-careful-booster-vaccines-could-end-giving-coronavirus-boost>

18. See Endnote 17.

19. See Department of Health and Social Care, and The Rt Hon Sajid Javid. (August 23, 2021). UK signs deal with Pfizer/BioNTech for 35 million vaccines. Gov.UK. Retrieved August 26, 2021 from <https://www.gov.uk/government/news/uk-signs-deal-with-pfizerbiontech-for-35-million-vaccines>

20. See Schive, K. (July 21, 2021). When should I be tested? How soon will I be contagious? Are things different with Delta? MITMedical. Retrieved August 26, 2021 from <https://medical.mit.edu/covid-19-updates/2021/07/are-things-different-delta>

21. See Subbaraman, N. (August 12, 2021). How do vaccinated people spread Delta? What the science says. Nature. Retrieved August 26, 2021 from <https://www.nature.com/articles/d41586-021-02187-1>

22. An April 3, 2020 article by NPR notes the CDC has changed its requirements regarding mask wearing: ‘The guidelines do not give many details about coverings beyond: “cloth face coverings fashioned from household items or made at home from common materials at low cost can be used as an additional, voluntary public health measure.”’ See NPR. (April 3, 2020). CDC Now Recommends Americans Consider Wearing Cloth Face Coverings In Public. Retrieved August 26, 2021 from <https://www.npr.org/sections/coronavirus-live-updates/2020/04/03/826219824/president-trump-says-cdc-now-recommends-americans-wear-cloth-masks-in-public>

23. A June 5, 2020 article by the World Economic Forum discusses that the change by the WHO in regard to mask wearing. For example: ‘The general public should wear non-medical masks where there is widespread transmission and when physical distancing is difficult, such as on public transport, in shops or in other confined or crowded environments.’ See Lacinia, L. (June 5, 2020). WHO updates guidance on masks for health workers and the public – here’s what you need to know. World Economic Forum. Retrieved August 26, 2021 from <https://www.weforum.org/agenda/2020/06/who-updates-guidance-on-masks-heres-what-to-know-now>

24. See CNBC. (February 7, 2020). Illumina CMO on working with China on coronavirus cure. [Video]. CNBC, from 0:0:20. <https://www.cnbc.com/video/2020/02/07/illumina-cmo-on-working-with-china-on-coronavirus-cure.html>. See also Endnote 35.

25. ‘A month and a half ago, the US Centers for Disease Control and Prevention (CDC) announced that fully vaccinated people no longer needed to wear a mask outdoors, or in most indoor situations, to protect themselves and others against Covid-19. The news was received with relief, but it raised concerns, too. After all, there’s yet to be conclusive evidence that vaccinated people cannot spread the virus, and the US population, though ahead of most of the world in the percentage of immunization, is still shy of herd immunity. As it turns out, yes—it was too soon. The World Health Organization (WHO) confirmed on June 25 that vaccinated people should continue to wear masks, especially as a protection against the highly contagious delta variant.’ See Merelli, A. (June 29, 2021). The WHO still wants you to wear a mask, even if the CDC doesn’t. Quartz. Retrieved August 29, 2021 from <https://qz.com/2025962/who-guidance-is-to-wear-masks-against-delta-variant>

26. The World Health Organization, for example, decided the general public should wear non-medical masks where there is widespread transmission and when physical distancing is difficult, such as on public transport, in shops or in other confined or crowded environments. See World Health Organization (December 1, 2020). Mask use in the context of COVID-19: Interim guidance. Retrieved August 26, 2021 from [https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-\(2019-ncov\)-outbreak](https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak)

27. See Endnote 15.
28. Bloomberg. (August 27, 2021). Past Covid-19 reduces risk of reinfection from Delta variant more than Pfizer vaccine. South China Morning Post. Retrieved August 31, 2021 from <https://www.scmp.com/news/world/middle-east/article/3146656/past-covid-19-reduces-risk-reinfection-delta-variant-pfizer>
29. See World Health Organization. (August 18, 2021). Live Q&A with Dr Maria Van Kerkhove on COVID-19 epidemiological situation and variants [Video]. YouTube, from 0:6:55. <https://www.youtube.com/watch?v=zZW3uMO17Wo>
30. E.N. Iftekhhar et al. (2021). A look into the future of the COVID-19 pandemic in Europe: an expert consultation. *The Lancet Regional Health – Europe*, 100185, pp 1-14, at p 7. [https://www.thelancet.com/journals/lanepc/article/PIIS2666-7762\(21\)00162-9/fulltext](https://www.thelancet.com/journals/lanepc/article/PIIS2666-7762(21)00162-9/fulltext)
31. See Burke, H. (August 24, 2021). Covid 19 coronavirus: Plan to reopen Australia will cause ‘substantial mortality’, experts say. *NZ Herald*. Retrieved August 26, 2021 from <https://www.nzherald.co.nz/world/covid-19-coronavirus-plan-to-reopen-australia-will-cause-substantial-mortality-experts-say/PQWRDHSAWUN4XNPYIL6EAU7JCM>
32. ‘Reaching the herd immunity threshold (HIT) with a vaccine of 90% VE against disease and 80% VE against infection requires at least 86 ♦ 5% total population uptake for $R_0 = 4 ♦ 5$ (with high vaccination coverage for 30–49-year-olds) and 98 ♦ 1% uptake for $R_0 = 6$. In a two-year open-border scenario with 10 overseas cases daily and 90% total population vaccine uptake (including 0–15 year olds) with the same vaccine, the strategy of targeting high-risk groups is close to achieving HIT, with an estimated 11,400 total hospitalisations (peak 324 active and 36 new daily cases in hospitals), and 1,030 total deaths.’ See Nguyen, T. et al. (2021). COVID-19 vaccine strategies for Aotearoa New Zealand: a mathematical modelling study. *The Lancet Regional Health-Western Pacific*, 15, 100256, at p 1. [https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065\(21\)00165-6/fulltext#%20](https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065(21)00165-6/fulltext#%20)
33. The Independent Panel for Pandemic Preparedness & Response. (2021). COVID-19: Make it the Last Pandemic. Retrieved August 27, 2021 from <https://theindependentpanel.org/mainreport>
34. See World Health Organization. (August 16, 2021). ACT-Accelerator launches urgent US\$ 7.7 billion appeal to stem surge of dangerous variants and save lives everywhere. Retrieved August 29, 2021 from <https://www.who.int/news/item/16-08-2021-act-accelerator-launches-urgent-appeal-to-stem-surge-of-dangerous-variants-and-save-lives-everywhere>
35. Zhu, N. et al for the China Novel Coronavirus Investigating and Research Team. (2020). A Novel Coronavirus from Patients with Pneumonia in China, 2019. *N Engl J Med*. 382, 727-733. Retrieved August 31, 2021 from <https://www.nejm.org/doi/full/10.1056/nejmoa2001017>
36. See Gov.UK. (n.d.) Get a free PCR test to check if you have coronavirus (COVID-19). Retrieved August 26, 2021 from <https://www.gov.uk/get-coronavirus-test>
37. See NHS. (n.d.) Regular rapid lateral flow coronarius (COVID-19) tests. Retrieved August 26, 2021 from <https://www.nhs.uk/conditions/coronavirus-covid-19/testing/regular-rapid-coronavirus-tests-if-you-do-not-have-symptoms>
38. World Health Organization. (March 11, 2020). WHO Director-General’s opening remarks at the media briefing on COVID-19 – 11 March 2020. Retrieved August 31, 2021 from <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>
39. See Endnote 22.
40. See Endnote 23.
41. See Endnote 26.
42. See Centers for Disease Control and Prevention. (May 7, 2021). Scientific Brief: SARS-CoV-2 Transmission. Retrieved August 26, 2021 from <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html>
43. See Endnote 15.
44. The report also says, ‘Over the last few years, several emerging zoonotic diseases made world headlines as they caused, or threatened to cause, major pandemics. These include Ebola, bird flu, Middle East respiratory syndrome (MERS), Rift Valley fever, sudden acute respiratory syndrome

(SARS), West Nile virus, and Zika virus disease.’ See United Nations Environment Programme. (2016). UNEP Frontiers 2016 Report: Emerging Issues of Environmental Concern, at 19. Retrieved August 26, 2021 from https://www.unep.org/resources/frontiers-2016-emerging-issues-environmental-concern?_ga=2.50822505.1774325929.1629849796-64670071.1629849796

45. See Public Health England and UK Health Security Agency. (May 20, 2021). Guidance: New Variant Assessment Platform. Gov.UK. Retrieved August 26, 2021 from <https://www.gov.uk/guidance/new-variant-assessment-platform>

46. See Public Health England and UK Health Security Agency. (July 7, 2021). PHE to provide genomic sequencing support to partners across the world [Press release]. Retrieved August 26, 2021 from <https://www.gov.uk/government/news/phe-to-provide-genomic-sequencing-support-to-partners-across-the-world>

47. Department of Health and Social Care. (July 18, 2021). New research into treatment and diagnosis of long-COVID [Press release]. Gov.UK. Retrieved August 26, 2021 from <https://www.gov.uk/government/news/new-research-into-treatment-and-diagnosis-of-long-covid>

48. ‘Antibodies take time to develop. Most people make antibodies within 28 days of being infected or vaccinated, but it can take longer. This survey uses 2 different antibody tests, one that can see past infection only and one that can see response to the vaccine. As an example, if an individual has had a COVID-19 vaccine but no prior infection, the first antibody test taken as part of this surveillance would likely display a negative antibody result in response to their new or past infection, and a positive result for the antibodies generated by their vaccine. Following the second antibody test, taken 28 days after the first, there would likely be a higher positive antibody result to the vaccine and a positive infection antibody result.’ See Department of Health and Social Care and the Rt Hon Sajid Javid. (August 22, 2021). Government launches UK-wide antibody surveillance programme [Press release]. Gov.UK. Retrieved August 26, 2021 from <https://www.gov.uk/government/news/government-launches-uk-wide-antibody-surveillance-programme>

49. United Nations Environment Programme (UNEP). (April 1, 2020). What factors are increasing zoonosis emergence? Facebook.

Retrieved August 31, 2021 from <https://www.facebook.com/unitednations/posts/10158453318040820>

50. Controller and Auditor General. (2020). Ministry of Health: Management of personal protective equipment in response to Covid-19. Office of the Auditor General (OAG). Retrieved 31 August, 2021 from <https://oag.parliament.nz/2020/ppe>

51. Controller and Auditor General. (2021). Preparations for the nationwide roll-out of the COVID-10 vaccine. Office of the Auditor General (OAG). Retrieved 31 August, 2021 from <https://oag.parliament.nz/2021/vaccines>

52. Ministry of Health. (May, 2020). Independent Review of COVID 19 Clusters in Aged Residential Care Facilities. Retrieved 31 August, 2021 from <https://www.health.govt.nz/publication/independent-review-covid-19-clusters-aged-residential-care-facilities>

53. See Murphy, T. (August 6, 2021). Coronavirus: Helen Clark wants full inquiry into NZ’s Covid-19 response. Stuff.co.nz. Retrieved August 29, 2021 from <https://www.stuff.co.nz/national/health/coronavirus/300075184/coronavirus-helen-clark-wants-full-inquiry-into-nzs-covid19-response>

54. See Devlin, C. (May 26, 2020). Coronavirus: ACT calls for Royal Commission to investigate Government response to Covid-19. Stuff.co.nz. Retrieved August 29, 2021 from <https://www.stuff.co.nz/national/politics/121634708/coronavirus-act-calls-for-royal-commission-to-investigate-government-response-to-covid19search?q=bolger+royal+commission+on+covid&rlz=1C5CHFA>

55. ‘Key Recommendations

(i) A Royal Commission of Inquiry should be appointed to begin an investigation into the actions taken by the Executive in responding to COVID-19.
(i) Parliament should pass legislation to ensure that the Official Information Act cannot be suspended or over- ridden during a state of emergency.

(iii) The standing orders of the House should formally protect the essential position of the leader of the opposition in a state of emergency.

(iv) At every stage of the political process, particularly in a state of emergency, civil society

- should be actively engaged and participating where appropriate.' See Van Dalen, D. (July 2020). Civic Defence Defining roles and preparing our democracy for the next emergency. Maxim Institute. Retrieved August 29, 2021 from <https://www.maxim.org.nz/article/civic-defence>
56. See McGuinness, W. (July 3, 2021). 3 weeks or 3 months: the vaccine does gap matters. Newsroom. Retrieved August 29, 2021 from <https://www.newsroom.co.nz/3-weeks-or-3-months-the-covid-dose-gap-matters>
57. McClure, T. (August 17, 2021). New Zealand reports first Covid-19 case in community since February. The Guardian. Retrieved August 31, 2021 from <https://www.theguardian.com/world/2021/aug/17/new-zealand-reports-first-covid-19-case-in-community-since-february>
58. See Endnote 56.
59. See Endnote 56.
60. The Institute considers this should be prepared and audited monthly during a pandemic. However, the current ad hoc update in the public arena is better than no information. See Ministry of Health. (August 13, 2021). Composition of the national reserve supply. Retrieved August 26, 2021 from <https://www.health.govt.nz/our-work/emergency-management/national-reserve-supplies/composition-national-reserve-supply>
61. McGuinness, W. (May 2020). Survey Insights: An analysis of the 2020 NZNO PPE Survey. The McGuinness Institute and New Zealand Nurses Organisation (NZNO). Retrieved August 31, 2021 from <https://www.mcguinnessinstitute.org/publications/surveys>
62. See Ministry of Health. (August 26, 2021). COVID-19: Vaccine data. Retrieved August 29, 2021 from <https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-data-and-statistics/covid-19-vaccine-data>
63. See Endnote 60.
64. McGuinness, W. (April, 2020). Think Piece 33: The Long Normal: Preparing the National Reserve Supply (NRS) for pandemic cycles. McGuinness Institute. Retrieved August 31, 2021 from <https://www.mcguinnessinstitute.org/publications/think-pieces>
65. See Phillips, N. (February 16, 2021). The coronavirus is here to stay – here's what that means. Nature. Retrieved August 29, 2021 from <https://www.nature.com/articles/d41586-021-00396-2>
66. Almost half of London companies whose staff can work from home expect them to do so up to five days a week after the pandemic finishes, and smaller businesses are more likely than larger ones to move ahead with remote working.
- That's according to a poll of 520 business leaders by the London Chamber of Commerce and Industry, which also found that slightly more companies said employees' main reason for concern about returning to the office was the risk of contracting Covid-19 when commuting – rather than at the office.' See Burden, L. (June 21, 2021). Bloomberg. Retrieved August 30, 2021 from <https://www.bloomberg.com/news/articles/2021-06-21/half-of-london-companies-plan-for-home-working-five-days-a-week>
67. 'The decisions of global agencies and governments, as well as the behaviours of citizens in every society, will greatly affect the journey ahead. There are many possible outcomes. At one extreme is the most optimistic scenario, in which new-generation COVID-19 vaccines are effective against all SARS-CoV-2 variants (including those that may yet emerge) and viral control is pursued effectively in every country in a coordinated effort to achieve global control. Even with international cooperation and adequate funding, this scenario would inevitably take a long time to achieve. The COVAX initiative is just an initial step towards addressing vaccine equity and global coordination for vaccine access, especially for lower income countries.¹² At the other extreme is a pessimistic scenario, in which SARS-CoV-2 variants emerge repeatedly with the ability to escape vaccine immunity, so that only high income countries can respond by rapidly manufacturing adapted vaccines for multiple rounds of population reimmunisation in pursuit of national control while the rest of the world struggles with repeated waves and vaccines that are not sufficiently effective against newly circulating viral variants.' [and] 'In developing its COVID-19 Scenarios Project, the ISC has consulted with WHO and the UN Office for Disaster Risk Reduction. The ISC has established in February, 2021, a multidisciplinary Oversight Panel made up of globally representative world experts in relevant disciplines to work with a technical team to produce the scenario map. The Oversight Panel will report within 6–8 months to the global community on the possible COVID-19 scenarios that lie ahead over the next 3–5 years, and

on the choices that could be made by governments, agencies, and citizens to provide a pathway to an optimistic outcome for the world.’ And there are many other intermediate or alternate scenarios. See Skegg, D., Gluckman, P., Boulton, G., Hackmann, H., Karim, S. S. A., Piot, P., & Wooten, C. (2021). Future scenarios for the COVID-19 pandemic. *The Lancet*, 397(10276), 777-778. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)00424-4](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00424-4)

68. See Min, A.H. (August 19, 2021). Singapore to launch its first vaccinated travel lanes with Germany and Brunei. ChannelNewsAsia. Retrieved August 29, 2021 from <https://www.channelnewsasia.com/singapore/germany-brunei-travel-lane-fully-vaccinated-shn-hong-kong-macao-2122796>

69. ‘Not that Singapore will allow life to return to normal. It is choosing to take it slow. First, it has set itself an unusually high bar for vaccination: It won’t begin to reopen until 80% of its population have been double-jabbed. By contrast, Britain lifted restrictions with about 65% fully vaccinated. Second, even when it reaches that threshold in early September, Singapore will reopen with a whimper rather than a bang. On Sept. 8, Singaporeans will be allowed to travel without quarantining on their return—but only to two countries with low rates of COVID-19, Brunei and Germany. For the time being, mask-wearing will remain mandatory, contact-tracing apps will remain in use, and restaurants will still have to abide by the 10:30 p.m. curfew.’ See Willis, S. (August 24, 2021). Singapore is trying to do what no other country has done: pivot away from COVID-zero. Will it work? *Fortune*. Retrieved August 29, 2021 from <https://fortune.com/2021/08/24/singapore-pivot-covid-zero-reopening-international-travel>

70. See the advice from the Strategic COVID-19 Public Health Advisory Group to Hon Dr Ayesha Verrall, Associate Minister of Health (Public Health):

‘By the end of 2021, we hope that a high proportion of adult New Zealanders (aged 16 and over) will have been immunised with the Pfizer-BioNTech vaccine. This should mean that, during an outbreak of COVID-19, fewer people will become infected, and even those who are infected will be less likely to require hospital treatment or to die. Nevertheless, there is now emerging evidence that this vaccine may generate a weaker immune response against certain new variants of SARS-CoV-2, even though it appears to be superior to several other vaccines in this respect. It is not inconceivable that, by the end of

the year, there could be an established variant that is significantly resistant to the vaccine’: at para 13.

‘In response to the question we have been assigned, the group concludes that an elimination strategy, as defined above, should still be viable as international travel resumes. Allowing more quarantine-free travel will increase the risk that SARSCoV-2 enters the community, and even with high vaccination levels there will be some clusters of infection and occasional large outbreaks. These can be stamped out by public health and social measures such as testing, together with rapid tracing and isolation of contacts, as well as physical distancing and mask-wearing where appropriate. Obviously an aim would be to minimise the need for raising alert levels, with the economic and social costs these impose. Nevertheless, some localised elevations of alert levels may be unavoidable after borders are reopened’: at para 15.

‘In our current view, the elimination strategy is still viable and, indeed, optimal as international travel resumes. It does not mean “Zero COVID”, but it does mean stamping out clusters of COVID-19 as they occur. The strategy should be reviewed regularly. Continuation of a successful elimination policy will require decision about processing travellers and strengthening public health measures within the country. Such considerations are implicit in some of the other questions our group has been asked to address’: at para 25.

Strategic COVID-19 Public Health Advisory Group. (June 10, 2021. Released August 11, 2021). Advice to Hon Dr Ayesha Verrall, Associate Minister of Health (Public Health). Retrieved August 29, 2021 from <https://www.beehive.govt.nz/release/government-releases-expert-advice-reconnecting-new-zealanders>

71. See Heacox, K. (August 27, 2021). Why America needs a Department of the Future. *The Guardian*. Retrieved August 29, 2021 from https://www.theguardian.com/commentisfree/2021/aug/27/why-we-need-a-department-of-the-future?CMP=Share_iOSApp_Other

Note: The Institute undertook an analysis of past future-focussed initiatives and identified seven lessons:

Lesson 1: Set clear goals Setting well-defined goals at the outset, which clearly indicate what the initiative is intended to achieve, is essential to a successful process.

Lesson 2: Establish context – both nationally and internationally

Lesson 3: Gain funding security Funding continues to be something that impedes the progress of futures work.

Lesson 4: Obtain positive engagement and support (especially in the very early stages) Future-thinking initiatives require enormous energy, teamwork, money and time, all of which can go unrecognised.

Lesson 5: Commit to being transparent.

Lesson 6: Develop linkage between initiatives.

Lesson 7: Invite government involvement
Government involvement in some of the initiatives discussed has proven to be successful.

Lesson 8: Report and measure progress – before, during and after the initiative.

See McGuinness, W., Foster, F., and Grace-Pickering, L. (March 2011). Project 2058: Report 11 A History of Future-thinking Initiatives in New Zealand 1936-2010. McGuinness Institute. Retrieved August 31, 2021 from <https://www.mcguinnessinstitute.org/publications/project-2058>

See also McGuinness, W. (March 2021). Natural and Built Environments Bill Parliamentary paper on the exposure draft McGuinness Institute. Retrieved August 31, 2021 from <https://www.mcguinnessinstitute.org/publications/submissions>

72. See Endnote 30, at p.10.

73. See Report of the Influenza Epidemic Commission (IEC) New Zealand. (1919), at p. 1. Retrieved August 31, 2021 from <https://www.mcguinnessinstitute.org/projects/pandemic-nz>

74. See Freitas, A. R. R., Napimoga, M., & Donalizio, M. R. (2020). Assessing the severity of COVID-19. *Epidemiologia e Serviços de Saúde*, 29(2). <https://www.scielo.br/j/ress/a/TzjkrLwNj78YhV4Bkxg69zx/?lang=en#>

Although the CDC has not assessed COVID-19 against the PSAF, their COVID-19 Pandemic Planning Scenarios include measures of viral transmissibility (including pre-symptomatic and asymptomatic disease transmission) and disease severity. The website page notes: ‘New data on COVID-19 are available daily, yet information about the biological aspects of SARS-CoV-2 and epidemiological characteristics of COVID-19 remain limited, and uncertainty remains around nearly all parameter values. [and it states] The parameters in the Planning Scenarios: Are estimates intended to support public health preparedness and planning; Are not predictions of the expected effects of COVID-19; Do not reflect the impact of any behavioral changes, social distancing, or other interventions; and Do not reflect the impact of

the emergence of novel SARS-CoV-2 variants.’ See Centers for Disease Control and Prevention. (March 19, 2021). COVID-19 Pandemic Planning Scenarios. Retrieved August 26, 2021 from <https://www.cdc.gov/coronavirus/2019-ncov/hcp/planning-scenarios.html#box1>

75. See Endnote 30, at p. 7.

76. See Endnote 29.

77. The UK National Risk Register outlines the key malicious and non-malicious risks that could affect the UK in the next two years, and provides resilience guidance for the public. The latest risk register was published in December 2020. See Cabinet Office. (December 18, 2020). National Risk Register 2020 edition. Retrieved September 7, 2021 from <https://www.gov.uk/government/publications/national-risk-register-2020>.

The UK also provides an assessment on climate change, see the 2017 UK Climate Change Risk Assessment. The next iteration due in 2022. See Cabinet Office. (December 18, 2020). National Risk Register 2020 edition, at p. 13. Retrieved September 7, 2021 from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/952959/6.6920_CO_CCS_s_National_Risk_Register_2020_11-1-21-FINAL.pdf.

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80. Bent Flyvbjerg is a Danish economic geographer. He is Professor of Major Programme Management at Oxford University’s Saïd Business School and the first Director of the University’s BT Centre for Major Programme Management. See Flyvbjerg, B. (2020). The law of regression to the tail: How to survive Covid-19, the climate crisis, and other disasters. *Environmental Science & Policy*, 114, at 617-618. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7533687>



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