The gap between doses matters!

Think Piece 37: June 2021

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This think piece explains why our current vaccination strategy delivers poor value to New Zealanders over the long term.

In a recent article published in Singapore,[1] the authors identified four key components to getting life back to normal: vaccination, testing, treatment and social responsibility. While the article focused on Singapore, the same key components are applicable to New Zealand.

Over the past few weeks there have been growing concerns in the media about New Zealand's slow vaccine rollout. This included a comment in the OECD's May 2021 Economic Outlook that: '[t]he pace of vaccination needs to accelerate to reduce the risks of new outbreaks and pave the way for full border reopening in 2022'.[2] This point was not lost on ACT leader David Seymour, who noted:

> After saying we would be at the front of the queue, New Zealand is now officially last in the OECD for the vaccine rollout ... According to "Our World in Data" [see Figure 1] New Zealand has fewer vaccinations per person than any other country in the OECD.[3]

New Zealand's first COVID-19 vaccination occurred five weeks after the UK's first vaccination, on 19 January 2021, but six months later, the difference between rollouts is stark.[4, 5] See Figures 2 and 3.

Kim Hill interviewed UK scientist Dr Chris Smith on 26 June 2021 on RNZ.[6] Smith explained that what saved the UK was a strategy which focused primarily on getting one dose in the arms of as many citizens as possible. The goal was to follow up with a second dose later (when supply amped up, approximately two to three months later).[7]

This approach has recently been shown to provide a second benefit: that, as suspected in December 2020, the bigger the gap between vaccinations, the better the immune response. Smith said they found '12 weeks was de rigueur';[8] a 12 week gap delivered the most robust, durable and resilient immune response.

Having a 12-week gap between doses would not only make it possible for New Zealand to rollout the vaccination to more people, but most importantly, would deliver more durable long-term protection. That is the message from the UK rollout – a 12-week gap will ensure New Zealand is in the best position to live with emerging COVID-19 variants for years to come.

On 31 December 2020 (updated on 26 January 2021), the UK's Joint Committee on Vaccination and Immunisation (JCVI) reported that:

- Short-term vaccine efficacy from the first dose of the Pfizer-BioNTech vaccine is calculated at around 90%
- Given the high level of protection afforded by the first dose, models suggest that initially vaccinating a greater number of people with a single dose will prevent more deaths and hospitalisations than vaccinating a smaller number of people with 2 doses
- The second dose is still important to provide longer lasting protection and is expected to be as or more effective when delivered at an interval of 12 weeks from the first dose.[9]

The report concluded:

> JCVI advises a maximum interval between the first and second doses of 12 weeks for both vaccines. It can be assumed that protection from the first dose will wane in the medium term, and the second dose will still be required to provide more durable protection. The committee advises initially prioritising delivery of the first vaccine dose as this is highly likely to have a greater public health impact in the short term and reduce the number of preventable deaths from COVID-19.[10]

The June 2021 guidance from Public Health England states:

> An interval of 28 days may be observed when rapid protection is required (for example for those about to receive immunosuppressive treatment). It may also be recommended that the interval between the two doses be shortened to less than 12 weeks in periods of high or increased disease incidence ... Evidence shows that delaying the second dose to 12 weeks after the first improves the boosting effect. Data from clinical trials shows that the efficacy of the AstraZeneca vaccine was higher when the second dose was given at, or after 12 weeks and a recent study of people aged over 80 years found that extending the second dose interval to 12 weeks for the Pfizer BioNTech vaccine markedly increased the peak spike-specific antibody response by three and a half times compared to those who had their second vaccine at three weeks.[11]

Figure 1: Vaccine doses administered per 100 people

Source: Our World in Data, as at 26 June 2021[12]

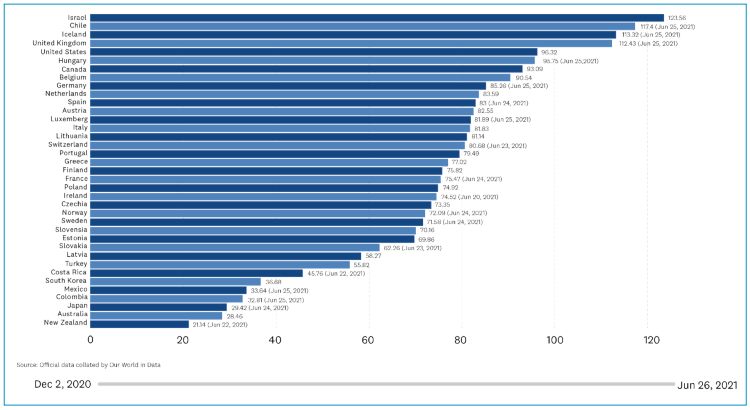


Figure 2: NZ COVID-19 vaccinations

Source: Our World in Data to 22 June 2021[13]

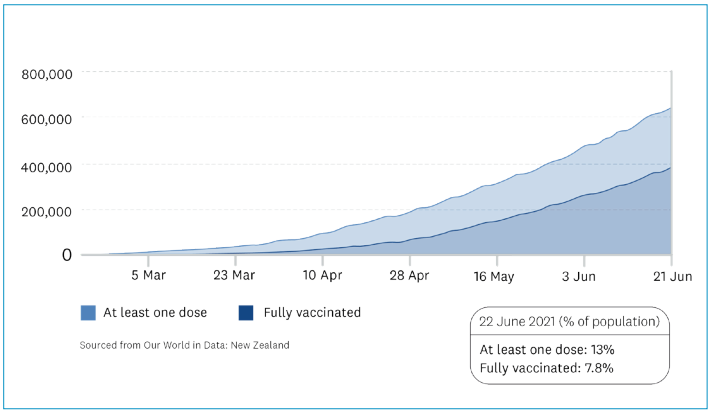


Figure 3: UK COVID-19 vaccinations

Source: Our World in Data to 25 June 2021[14]

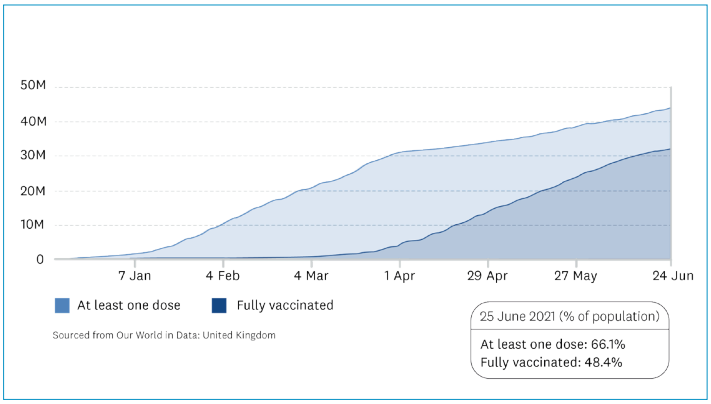


Figure 3 shows the impact of the UK's December 2020 strategy; of particular note is the difference between 'at least 1 dose' to 'fully vaccinated'.

In contrast, New Zealand went for an alternative strategy, focusing on optimising two doses for our most vulnerable citizens and minimising the gap between doses, in some cases, to as little as three weeks (see the resulting strategy in Figure 2).

This research tells us that a more successful rollout strategy for New Zealand should look like the UK in March 2021 than New Zealand in June 2021 (see Figures 2 and 3). Thus, success for New Zealand in say September 2021, would show a graph with more people having had 'one dose only' than 'fully vaccinated'.

New Zealand's rollout strategy, at a time when community cases are zero, should follow the UK's double-barrel approach. We need to:

1. Get as many first doses of the vaccine in New Zealanders' arms as quickly as possible so we can maximise impact if/when an outbreak occurs; and
2. Increase the gap between doses from three to 12 weeks (unless people are vulnerable, in which case the gap should be reduced to eight weeks). This approach provides maximum immunity and therefore better value for money.

A related issue is the vaccination certificates. The Singapore article states that the future is likely to evolve into something like the following: 'We [Singapore] will recognise each other's vaccination certificates. Travellers, especially those vaccinated, can get themselves tested before departure and be exempted from quarantine with a negative test upon arrival.'[15]

In response to recent events in Wellington, New Zealand has put its bubble with Australia on pause. However, as Singapore has made clear, we need to learn to live with COVID-19. For example, we could allow visitors to enter New Zealand quarantine-free if they carry a photo-ID vaccination card showing two doses, have a negative test on departure (before arriving in New Zealand) and sign a form to say they commit to using our COVID-19 Tracer app.

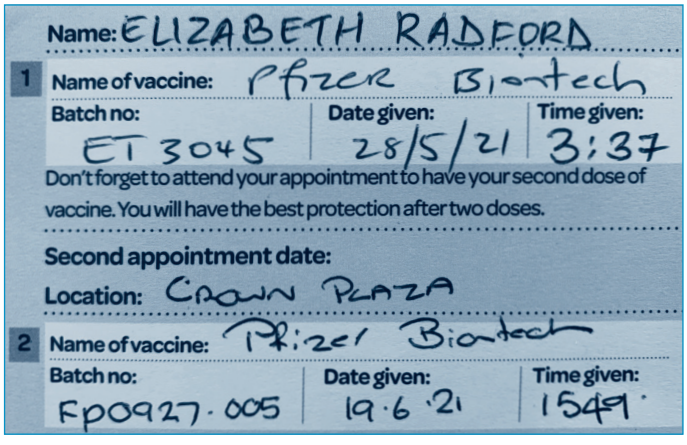
Secondly, New Zealand must improve its vaccination certificate, see Figure 4. It is currently a piece of card that could easily be photocopied. Importantly, there is no photo, address or individual NHI number. There is also no signature or number to identify the person that provided the vaccination. A certified vaccination card will be essential when we travel or when a few of us apply for a new job. No doubt there is work happening behind the scenes to remedy this, but a photo could have been collected at the time of the first vaccination and a verifiable certificate could have been posted out after the second dose. This is a missed opportunity.

Lastly, the booking system needs to be reviewed. It is very technology dependent and many older New Zealanders are struggling with the current system. The local medical centre seems a fairer and more robust solution for our most vulnerable and less technologically skilled. It is also difficult to ask vulnerable people to attend a vaccination centre which shares a lift with an MIQ hotel (as was my mother's experience). More work is needed in this area as well.

The Institute put together a detailed OIA request to MOH on 30 March 2021,[16] which was rejected by the ministry a month later because of the need for substantial research. Research is essential in times of change; we need to stay up to date and continue to review our strategy. What is happening right now really matters for the long term health of our people and our economy. It is in all our best interests for the government to adapt the vaccination process in such a way to deliver the optimal immune response against COVID-19.

Figure 4: NZ COVID-19 vaccination card

Source: Betty Radford (the author's 85-year-old mother)



References to the endnotes can be found on the McGuinness Institute website at https://www.mcguinnessinstitute.org/publications/think-pieces/. The Institute also maintains a New Zealand timeline of COVID-19 events, found here: https://www.mcguinnessinstitute.org/projects/pandemicnz/covid-19-timeline.

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Endnotes to Think Piece 37: The gap between doses matters!

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2 OECD. (2021, 28 May). New Zealand country note: OECD Economic Outlook, May 2021. Retrieved 27 June 2021 from https://issuu.com/oecd.publishing/docs/new-zealand-oecd-economic-outlook-may-2021 (p.1)

3 Scoop. (2021, 17 June). NZ Bottom Of OECD For Vaccines. Retrieved 27 June 2021 from https://www.scoop.co.nz/stories/PA2106/S00128/nz-bottom-of-oecd-for-vaccines.htm

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5 In the United Kingdom, the first Pfizer vaccination was given on 8 December 2020. BBC. (2021, 25 May). Covid-19 vaccine: First person receives Pfizer jab in UK . Retrieved 27 June 2021 from https://www.bbc.com/news/uk-55227325

6 RNZ. (2021, 26 June). Dr Chris Smith: Covid-19 science news. Retrieved 27 June 2021 from https://www.rnz.co.nz/audio/player?audio_id=2018801411. Chris is a consultant clinical virologist at Cambridge University, and one of BBC Radio 5 Live's Naked Scientists. He has been a regular interviewee with Kim Hill over the pandemic.

7 RNZ, 2021, from 26:30

8 RNZ, 2021, from 27:40.

9 Government UK. (2021, 26 January). Optimising the COVID-19 vaccination programme for maximum short-term impact. Retrieved 27 June 2021 from https://www.gov.uk/government/publications/prioritising-the-first-covid-19-vaccine-dose-jcvi-statement/optimising-the-covid-19-vaccination-programme-for-maximum-short-term-impact

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