PUBLIC HEALTH COMMUNICATION CENTRE AOTEAROA

The Covid-19 experience in Aotearoa New Zealand and other comparable high-income jurisdictions and implications for managing the next pandemic phase

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In this blog we briefly explore the experience of the Covid-19 pandemic in several high-income Asia-Pacific jurisdictions: Australia, Japan, Singapore, South Korea, Taiwan, and Aotearoa New Zealand (NZ). These jurisdictions used a mixture of

elimination and suppression strategies to achieve low infection and mortality rates until the arrival of the Omicron variant which has forced a revised approach. Based on a comparison of responses we provide updated recommendations for the NZ Government around strengthening existing public health measures to reduce the immediate and long-term impacts from Covid-19.

Covid-19 has become one of the leading causes of death in Aotearoa New Zealand (NZ), with the Omicron variant (and its various sub-lineages such as BA.2.75, BA.4 and BA.5) spreading widely since the beginning of 2022. The country's move away from an elimination strategy at the end of 2021 to a suppression, and then a mitigation approach in response to widespread community transmission of Covid-19 was understandable. However, the shift has resulted in a significant reduction in public health protections and critical pressure on the health system (exacerbated by the current winter period). Using information about infection control approaches and case and mortality metrics, we have briefly examined several other comparable jurisdictions in the Asian-Pacific region to assess what NZ can learn from their experience with pandemic management.

During most of 2020 and 2021, NZ, Australia, Singapore and Taiwan pursued elimination strategies to exclude and eliminate community transmission of SARS-CoV-2 (the virus that causes Covid-19). All jurisdictions used this period in 2021 to achieve moderate to high vaccination coverage. Singapore moved away from elimination in July 2021 with a reopening roadmap, after widespread vaccination, development of health services, and universal relief packages. South Korea took a different approach to the emerging Covid-19 pandemic by placing greater emphasis on contact tracing (enhanced with digital technologies) along with control measures such as isolation/quarantine, testing, and physical distancing, and avoided general lockdowns of the population. Japan's approach to the Covid-19 pandemic does not fit the criteria for elimination either, but it did use lockdowns as a form of pandemic management, along with school closures and it maintained high compliance with public health and social measures to reduce transmission. However, the introduction of the Omicron variant in late 2021 resulted in widespread community transmission of Covid-19 in all of these six jurisdictions, and consequently changes to pandemic management strategies. For example, Australia, Taiwan and NZ have all gradually reopened their borders and largely removed traveller quarantine requirements, along with reductions in many public health and social measures such as physical distancing requirements.

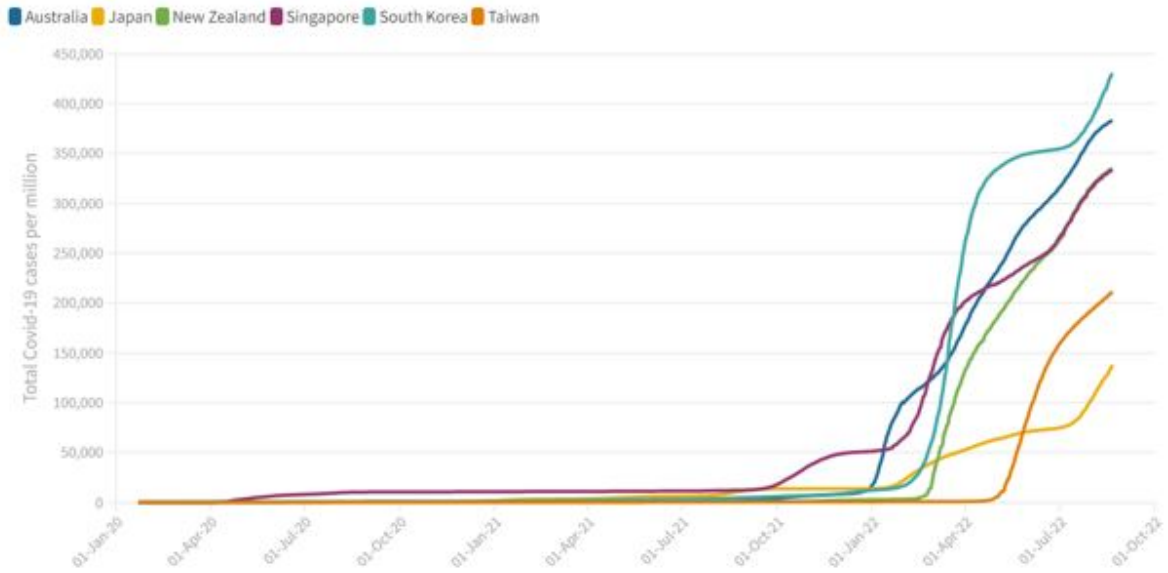
Covid-19 cases and deaths in NZ and five other jurisdictions

As shown in figure 1, the cumulative confirmed Covid-19 cases per million population in the selected jurisdictions increased substantially from late 2021 onwards, beginning with the period in which the Delta variant was predominant, and then accelerating with the Omicron variant in late 2021 onwards. Japan, followed by Taiwan, currently have the lowest proportion of cumulative confirmed Covid-19 cases.

When comparing the weekly average of new cases amongst these jurisdictions, South Korea has so far experienced the largest wave in 2022, reaching a peak in mid-March 2022 of ~7,814 cases per million (appendix figure 1). NZ and Australia have the next highest case peaks, with NZ reaching a peak in early March 2022 of ~4,294 per million and Australia's peak in mid-January 2022 of ~4,213 per million. To date, Japan has the lowest peak per million population, and Taiwan only shows evidence of one Omicron wave.

Figure 1: Cumulative confirmed Covid-19 cases per million population since the start of the

pandemic*



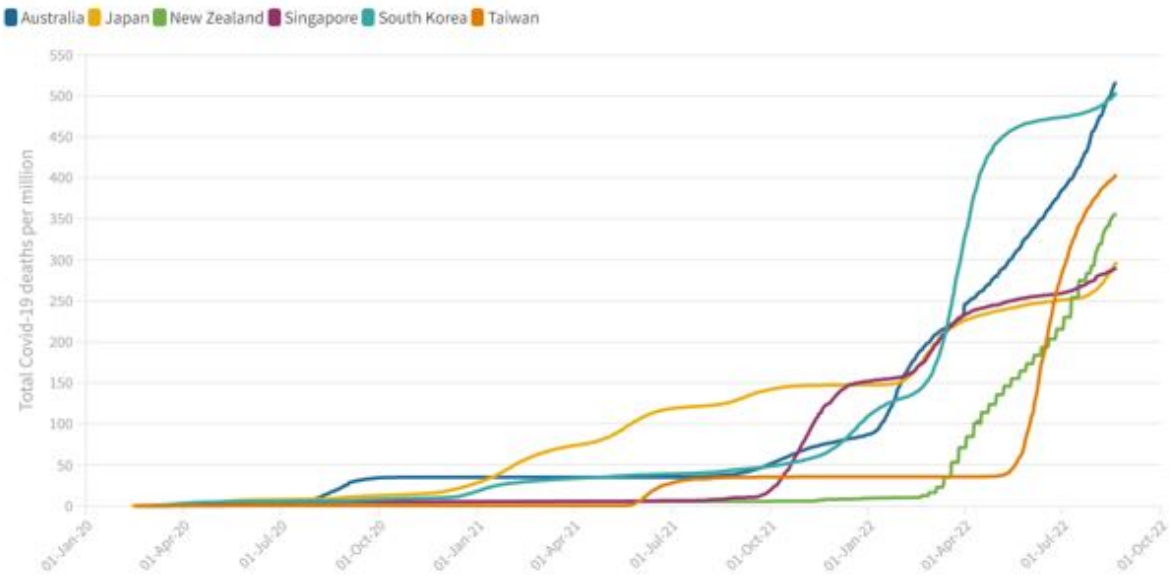
*Source: Our World in Data, sourced from Johns Hopkins University CSSE COVID-19 Data • https://ourworldindata.org/coronavirus
Data extracted 23 August 2022

Appendix Figure 2 shows the number of new Covid-19 deaths per million population using a seven-day rolling average. South Korea and Taiwan had the highest peak in new Covid-19 deaths, with South Korea's mortality peak occurring in late March 2022 at ~7 deaths per million and Taiwan's mortality peak occurring in early June 2022 at ~8 deaths per million. Smaller mortality peaks were seen throughout the pandemic period in Japan, Singapore, and to a lesser extent in Australia and NZ.

In terms of cumulative Covid-19 deaths per million, Australia and South Korea report the highest cumulative totals of ~516 and ~504 deaths per million respectively (figure 2). To complicate the picture, these cumulative totals are almost double those observed in Japan and Singapore, and do not always clearly relate to the number of confirmed (and reported) Covid-19 cases.

It is important to note that all of these comparisons will be influenced by differences in surveillance and reporting practices across these jurisdictions. These differences (particularly under-ascertainment) are likely to be much larger for case reporting than for deaths. For example, Our World in Data estimates lower cumulative testing per 1,000 people in Japan and Taiwan compared with NZ, Australia, and South Korea.

Figure 2: Cumulative confirmed Covid-19 deaths per million population*



*Source: Our World in Data, sourced from Johns Hopkins University CSSE COVID-19 Data • https://ourworldindata.org/coronavirus
Data extracted 23 August 2022

Excess mortality in NZ and five other jurisdictions

As we have described in a previous blog, examining excess mortality can provide information on mortality patterns that incorporates the impact of both direct and indirect deaths during the Covid-19 pandemic. Our World in Data describes the measure of excess mortality as the 'difference between how many people died during the pandemic, from any cause, and how many deaths would have been expected had there been no pandemic' (based on average deaths from 2005-2019). Essentially, this indicator enables us to explore the wider impact of the pandemic and avoids surveillance problems such as the impact of changes to Covid-19 death definitions (for example, the recent Covid-19 death definition change in NZ). It also captures impacts from other causes of death that may be influenced by Covid-19 and the various response measures. For example, border restrictions and public health protection measures in Australia and NZ in 2020 and 2021 meant that there were fewer detected influenza cases compared to pre-pandemic years, and below-average rates of influenza mortality. Furthermore, the large Omicron waves in 2022 have seen unprecedented Covid-19 hospitalisation rates globally, which may contribute to delayed or reduced healthcare provision for non-Covid-19 diseases/injuries due to stretched health services.

The patterns of excess mortality in the various jurisdictions have shown large fluctuations since the widespread transmission of Omicron, and to a lesser extent, Delta (figure 3). Although Australia, Taiwan, and Japan have all had periods of negative excess deaths at some point during the pandemic, only NZ (data up to 24 July 2022), has maintained reduced excess mortality (although the direction of the curve suggests that this reduction is decreasing in magnitude). NZ has -215 excess deaths per million, which equates to ~1,103 people in NZ not dying during the Covid-19 pandemic period relative to the expected numbers dying based on pre-pandemic estimates. Hypothetically, if NZ had experienced similar excess mortality per capita to other jurisdictions, we would have had additional deaths of ~1,856 (Japan experience), ~2,127 (Taiwan experience), ~2,577 (Australia

experience), ~3,798 (Singapore experience) or ~5,167 (South Korea experience) compared to NZ's current experience of ~1,103 fewer deaths than forecast. The latest estimates from Our World in Data suggest that there are now only nine jurisdictions globally (mainly small states, such as New Caledonia, Seychelles, and Antigua & Barbuda) that have negative cumulative excess mortality for the pandemic period, of which NZ has the largest population.

Figure 3: Excess mortality in six jurisdictions: Cumulative number of deaths from all causes compared to projections based on previous years, per million people*

* Source: Our World in Data, sourced from the Human Mortality Database (HMD) Short-term Mortality Fluctuations project and the World Mortality Dataset (WMD), Human Mortality Database, World Mortality Dataset • https://ourworldindata.org/coronavirus
Note: The cumulative difference between the reported number of deaths since 1 January 2020 and the projected number of deaths for the same period based on previous years. The reported number might not count all deaths that occurred due to incomplete coverage and delays in reporting.
Data extracted 23 August 2022

What could the NZ Government still do to improve the response to the Covid-19 pandemic?

The Covid-19 pandemic has been experienced differently in all six of these jurisdictions, both in terms of pandemic management, public health protections and restrictions, public adherence to control measures, and therefore varying levels of tolerance to the response measures used. For example, these jurisdictions have all had varying levels of stringency on school closure requirements, transport/travel, testing, contact tracing, use of masks, and vaccine policies, with NZ recording some of the highest stringency measures in 2020 and 2021 (appendix figure 3). The resulting epidemiological patterns that we can observe reflect the variable impact of these controls. In particular, they have been less effective and sometimes less stringent for the more transmissible Omicron variant, resulting in significant morbidity and mortality in these six jurisdictions, and also globally.

NZ used the elimination strategy to keep mortality low throughout the earlier part of the

pandemic (for both Covid-19 and non-Covid-19 deaths) allowing time for development and delivery of vaccines before widespread Covid-19 circulation. However, there still remain areas in which the pandemic response and management could be significantly improved to reduce the ongoing morbidity and mortality burden in NZ (table 1) and to protect health workers and health systems. We base some of these recommendations on the likely success factors (eg, higher booster use and higher mask use) for the other jurisdictions like Japan.

Table 1: Covid-19 pandemic public health measures and areas for improvement, along with our updated recommendations for the NZ Government

Public health measures and areas for improvement	Updated recommendations to the NZ Government
Choose a strategy to minimise Covid-19 infections and reinfections. In addition to morbidity and mortality from acute infection, the growing evidence about post-acute impacts of Covid-19 infection is concerning. For example, a recent study from the Netherlands suggesting that one in eight patients will develop **Long Covid** symptoms. Australia is already reporting significant health care burden from Long Covid in its population. A major retrospective study recently published in the Lancet using data on ~1.5 million patients from several nations (mainly the USA), found an increased neurological and psychiatric risk trajectories amongst adults even after two years following Covid-19 infection. Children in the study had an increased risk of serious complications including *'cognitive deficit, insomnia, intracranial haemorrhage, ischaemic stroke, nerve, nerve root, and plexus disorders, psychotic disorders, and epilepsy or seizures'*. These findings suggest that ongoing community transmission has the potential to cause significant and enduring impacts on both population health and health care services. There is also emerging evidence that hybrid immunity (from both Covid-19 vaccine and from previous infection) may be more effective in reducing the risk of reinfection compared to just immune protection conferred from (re)infection alone. However, this observation should not be interpreted as a reason to encourage infection itself because of the risk of post-acute effects of infection and the likelihood that future variants will evolve to evade immunity generated by earlier versions of the virus.	· We recommend that the NZ Government continue and extend public messaging about the impact of Covid-19 and reinforce the rationale for public health protections to reduce the burden from Long Covid. Messaging needs to be informed by the scientific evidence and may require greater unity across the political spectrum, as in the earlier parts of the NZ Covid-19 response. · Other aspects of the Covid-19 response could also be strengthened by developing a robust Covid-19 Action Plan for Schools (as described in our previous blog).

Public health measures and areas for improvement	Updated recommendations to the NZ Government
Increase vaccination and boosters which have played a large part in keeping mortality lower in these six jurisdictions compared to other nations such as the UK and the USA which experienced widespread Covid-19 outbreaks earlier in the pandemic, before mass vaccination. While uptake of booster vaccinations is steadily increasing, both NZ and Australia lag somewhat behind their Asian counterparts (appendix figure 4).	· We recommend that the NZ Government extend eligibility for the second booster (or fourth dose) amongst adults and extend eligibility for a first booster (third dose) to include children (under 16s). · Consideration could also be given to extending vaccine eligibility to under 5 year olds, as the Singapore Government is currently exploring. · Furthermore, the NZ Government needs to actively explore the use of next-generation bivalent vaccines that target both the Omicron variant BA.1 and the original SARS-CoV-2 strain as approved for use in the UK. · As research on pan-coronavirus vaccines progresses, it will also be important to identify vaccines that may offer broad and long-lasting protection to the NZ population. · Additional interventions to increase vaccine coverage should be considered.

Public health measures and areas for improvement	Updated recommendations to the NZ Government
	· We recommend that the NZ Government strongly reconsider its current position and develop a range of strategies to maximise the uptake and effectiveness of mask-wearing in educational facilities (for students, staff, and visitors), such as schools (from Year 1 upwards), colleges and universities, along with wider mandates for indoor facilities and health care facilities. This policy could be reviewed at 3 to 6 monthly intervals, depending on the pandemic situation.
Increase mask-wearing and improve ventilation in key indoor public environments. For jurisdictions like NZ and Australia, where there was no mask-wearing culture prior to Covid-19, the use of masks and mask mandates has not always sat well with the public, and at times, has been politicised. Jurisdictions like Japan, Singapore, South Korea and Taiwan already had established cultural norms for wearing face-masks prior to Covid-19, making introducing mandates arguably more acceptable to the public.	· At the same time, it may be appropriate to review the need for mask wearing mandates in some lower-risk settings such as shopping malls and other areas that can demonstrate good ventilation. · Mask policy should stipulate the need for high-grade respirator-style masks (eg, P2/N95), rather than lower performing surgical or cloth masks, along with free provision of respirator styles masks (both child and adult sizes) to the general public. This policy would need Government support through provision of high-grade masks to increase their uptake and maximise health equity. · It is also important to improve ventilation in key environments (such as education and healthcare facilities). There is also a need for research on the cost-effectiveness of different ventilation and air sterilisation options, such as assessing the use of UV-C light bulbs for decontaminating masks and potentially for decontaminating indoor spaces.

Public health measures and areas for improvement	Updated recommendations to the NZ Government
Emphasise the importance of self-isolation when sick. Self-isolation (staying home when sick and avoiding infecting other household members) remains a critical measure to interrupt transmission of Covid-19 and other infectious diseases.	· The NZ Government should continue to emphasise to the public the critical importance of isolating at home when sick with symptoms of an acute infectious respiratory disease (eg, cough, runny nose, fever). · Given that people with Covid-19 may be infectious for up to 10 days with 24% of closely tracked cases continuing to shed infectious virus 7 days post-symptom onset, it is important to maintain evidence-informed advice for when infected people can safely re-enter public life after an infection. This advice could include setting an appropriate isolation period followed by test-to-release using rapid antigen testing, and wearing a high-grade mask until day 10. · Ensure there is systematic support for self-isolation through sick-leave provision, supply of free RAT tests, and other measures, and provide advice about how to reduce the risk of transmitting infections to other household members.

NZ and some other Asia-Pacific jurisdictions chose elimination and tight suppression approaches to the Covid-19 pandemic and protected their populations from widespread infection until they could achieve high vaccine coverage. NZ has sustained one of the lowest excess mortality rates in the world. Omicron has changed the pandemic landscape substantially, requiring a regular reassessment of the optimum response strategy. As Aotearoa NZ navigates through this next phase of the pandemic, the NZ Government should look to other jurisdictions and strengthen public health measures to minimise both the immediate and the long-term impacts of the Covid-19 pandemic.

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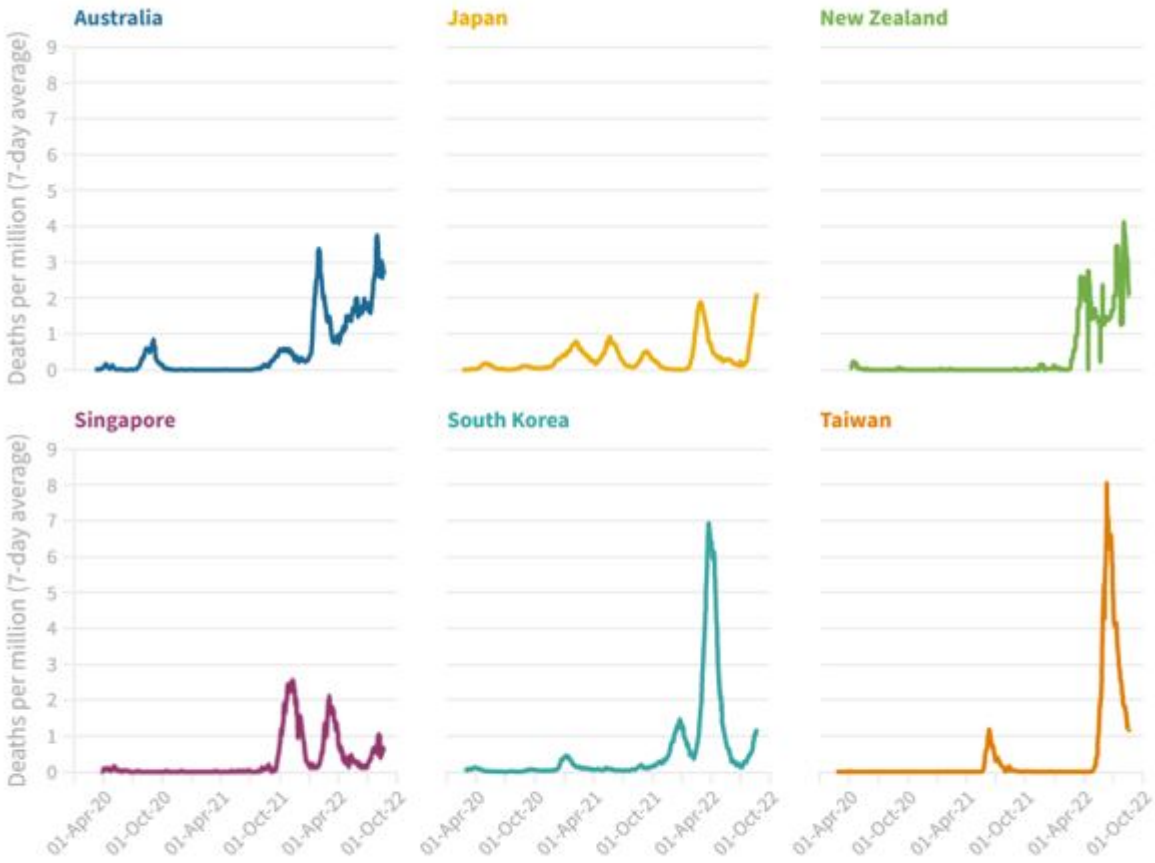
Appendix

Appendix Figure 1: New Covid-19 cases per million population in six jurisdictions since the start of the pandemic (7-day rolling average)*

*Source: Our World in Data, sourced from Johns Hopkins University CSSE COVID-19 Data
https://ourworldindata.org/coronavirus
Data extracted 23 August 2022

Appendix Figure 2: New Covid-19 deaths per million population in six jurisdictions since the start of the pandemic (7-day rolling average)*

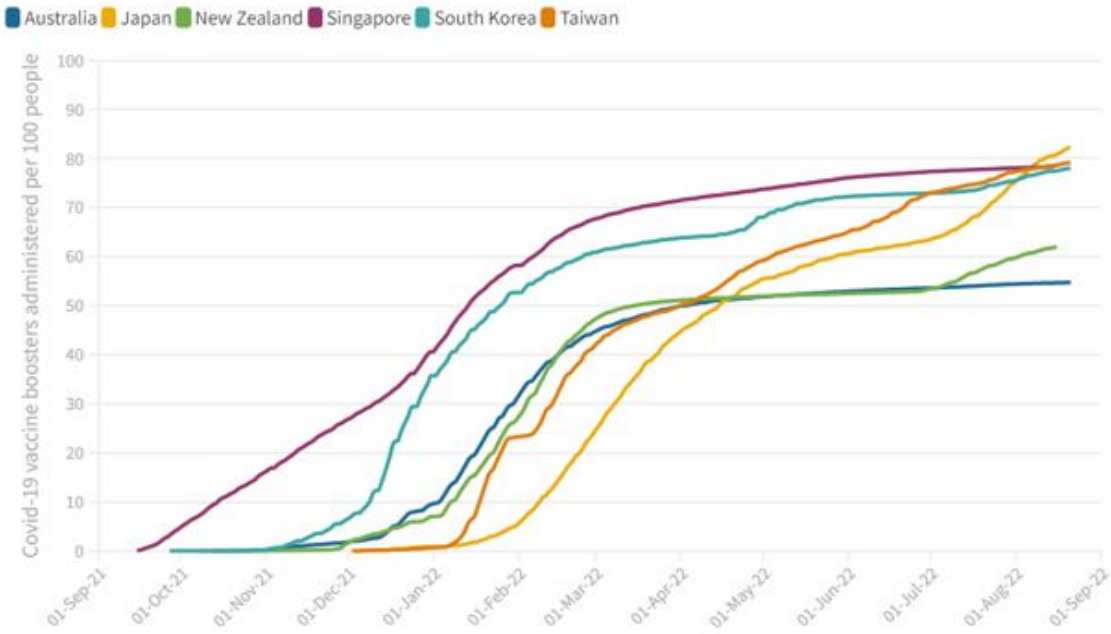


*Source: Our World in Data, sourced from Johns Hopkins University CSSE COVID-19 Data • https://ourworldindata.org/coronavirus
Data extracted 23 August 2022

Appendix Figure 3: Covid-19 Stringency Index (a measure of the intensity of public health control measures)*

* Source: Our World in Data, sourced from Oxford COVID-19 Government Response Tracker (OxCGRT), Our World in Data, Oxford COVID-19 Government Response Tracker (OxCGRT) • Data published by Hale, T., Angrist, N., Goldszmidt, R. et al. A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker). Nat Hum Behav 5, 529–538 (2021). https://doi.org/10.1038/s41562-021-01079-8
The stringency index is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest). Stringency Index can vary for vaccinated and non-vaccinated, so during these periods, a weighted average is used. Data extracted 23 August 2022

Appendix Figure 4: Covid-19 vaccine boosters (typically third and fourth doses) administered per 100 people*



* Source: Our World in Data • https://ourworldindata.org/coronavirus
Note: Total number of vaccine booster doses administered, divided by the total population of the jurisdiction.
Booster doses are doses administered beyond those prescribed by the original vaccination protocol.
Data extracted 23 August 2022

Source URL:
https://www.phcc.org.nz/briefing/covid-19-experience-aotearoa-new-zealand-and-other-comparable-high-income-jurisdictions