PUBLIC HEALTH COMMUNICATION CENTRE AOTEAROA

Management of Auckland’s border and COVID-19

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Analysis of countries with reasonable quality data implies that the risk of Covid-19 infection for most vaccinated international arrivals is typically less than the current risk for Auckland residents.

Current MIQ requirements for vaccinated arrivals to Auckland could therefore be dropped for most, without increasing the risk for Aucklanders. It would also be consistent to require tight control measures (vaccination, testing, and potentially some home quarantine) for people travelling from Auckland to other parts of NZ to help maintain elimination in those places (to give time for improved vaccination coverage).

Image by Luke Pilkinton-Ching, University of Otago Wellington

If you're at the supermarket in Auckland, would you be at more risk of being infected with the pandemic virus causing Covid-19 by someone fully vaccinated who arrived from overseas this morning, or from an average Aucklander who happens to be there at the same time? What about if you're in Northland or Waikato?

It is genuinely hard for these risks to be quickly estimated and so in this blog we systematically investigate how risk of infection in fully vaccinated arrivals compares to risk of infection in Aucklanders, and in people in the rest of Aotearoa New Zealand (NZ). Based on that comparison, we assess whether current Managed Isolation and Quarantine (MIQ) requirements on one hand, and lack of quarantine between Auckland and other regions on the other, appropriately reflect the actual relative risks of Covid-19 infection between different locations.

At present, NZ requires all inbound international travellers to enter MIQ for 14 days, and undergo repeated PCR tests. Arrivals are also required to submit a negative PCR test result carried out 72 hours or less prior to departure from their source country. Increasingly, many arrivals are already fully vaccinated before departure. Meanwhile, although NZ still seems to have an elimination strategy for areas outside Auckland, not all Aucklanders need to show a negative test to cross the boundary into other parts of NZ; there are no vaccine requirements; and none are required or requested to self-quarantine, regardless of destination or vaccination status.

While daily case numbers are rising in Auckland, at the time of analysis (7 November 2021), the 7-day average number of new community cases per day was 138 in Auckland, and 7.0 for areas outside Auckland with known Covid-19 community transmission (Northland and

Waikato), making population incidence rates respectively 83 and 5.2 per million people per day.

These rates are still low by international standards, but the Auckland rate is already higher than rates for all Australian states except Victoria, and some other jurisdictions. However, raw rate comparisons, local or international, don't take into account the reduced risk for vaccinated and/or tested individuals.

The CDC reports that risk of Delta infection in the unvaccinated is 4.6 times higher than the risk in people who are vaccinated,[1] meaning case rates in the vaccinated are reduced. Using the estimated distribution of Covid-19's latency period, and an active infection period of 10 days,[2] we've calculated that testing 72 hours prior to international departure when travelling to NZ reduces the number of active and latent Covid-19 infections entering the country by about half (methodology available on request).

These risk reductions mean that while the daily case rate for Covid-19 in Aucklanders is 83 per million per day, with Auckland DHBs now having 72% of the total population fully vaccinated, the case rate in the vaccinated (unadjusted for testing rates) can be estimated to be 15 cases per million people per day. That's still much higher than the overall case rate in the rest of NZ.

Auckland's total case rate of 83 per million per day is higher than the case rate in many countries, and higher than the vaccinated case rate in many more.

In Canada, for example, after adjusting for their lower testing rate, there could be 130 new cases per million people per day. While this rate is higher than in Auckland, their vaccination rate is 75%. That means their case rate in the vaccinated is estimated at 68 new cases per million people per day, less than Auckland's 83. So if you're at the supermarket in Auckland, a fully vaccinated person randomly teleported from Canada is less likely to infect you than an average resident Aucklander in the aisles.

However, the risk from vaccinated international arrivals is even less than that, because they're tested before they travel. For example, for a traveller from Denmark, where the daily new case rate is 290 per million people per day, although the 156 rate in the 76% who are vaccinated is still higher than the rate in Auckland, half of those cases are excluded by pre-departure testing. That testing brings the Covid-19 case rate in vaccinated, 72-hour tested people in Denmark down to 79 cases per million per day, lower than in Auckland.

Globally, after applying some testing thresholds and adjustments to make sure reported case numbers are meaningful, there are relatively few source countries of incoming travellers where the requirement for more intensive controls such as quarantine might be justified by their actual risk of infection relative to Auckland (ie, 10 out of the 61 jurisdictions who met testing thresholds – the United Kingdom, Czechia, Greece, Austria, Switzerland, Finland, Norway, Latvia, Georgia, Iceland, Luxembourg, and Andorra). Testing on arrival would bring this list down to just Austria, Georgia, and Latvia.

As a further example of the risk imbalance, let's consider India. India is currently one of six countries on NZ's "very high risk" list, meaning only citizens and their immediate family are able to enter NZ from there, and not other visa holders. India has a reported daily case rate of 8.65 cases per million people per day. However, although they carry out 90 tests for every positive case (well above the WHO recommended range of 10 to 30 tests), their population testing rate is still low (0.7 tests per 1,000 people per day, compared to our 5.5).

If they tested at the same rate as NZ, they could have 65 cases per million per day. That's still lower than Auckland. Their vaccination rate is 24%, so their case rate in vaccinated travellers would probably be only 16 per million per day. After pre-departure testing, that drops further, to 8 per million per day. That's almost as low as the 7.0 rate in Covid-19 outbreak areas outside Auckland.

Jurisdictions where the risk of infection in pre-tested, vaccinated travellers was less than in Covid-19 outbreak areas outside Auckland included Hong Kong, Taiwan, and the United Arab Emirates.

For vaccinated Aucklanders to reduce their infection risk to the same level as other Covid-19 outbreak areas of NZ, they would need to quarantine until a negative result from a test taken 72 hours after starting quarantine.

Results for some example locations are shown in Table 1.

Table 1. Sample of jurisdictions with incidence rates for reported Covid-19 cases, testing, vaccination, and vaccinated cases, and quarantine test day to match risk to Covid-19 outbreak areas outside Auckland.

Location	New reported cases (7-day average)	New reported cases per million per day	Estimated case rate adjusted to NZ test rate*	Percentage fully vaccinated	Estimated case rate in the vaccinated	Estimated case rate in the tested and vaccinated
Reference jurisdictions						
Auckland	138	83.1		72.0	41.4	21.0
Northland + Waikato	7.00	5.69		59.0	2.30	1.17
Total NZ	206	29.2		64.2	17.6	8.90
Jurisdictions where the estimated case rate for vaccinated, tested individuals was higher than the case rate in Auckland						
Austria	6,600	730	*730*	62.5	310	157
Norway	1,280	233	529	68.7	245	126
United Kingdom	37,800	555	*555*	67.1	254	129
Jurisdictions where the estimated case rate for vaccinated, tested individuals was lower than in Auckland, but higher than in Covid-19 outbreak areas outside Auckland (Northland + Waikato)						
ACT, Aus.	12.1.	28.1	55.2	79.7	31.9	16.2
NSW, Aus.	232	28.4	*25.3*	75.5	15.1	7.6
VIC, Aus.	1,204	181	181	70.7	88.2	44.7
Canada	2,230	58.6	130	74.7	67.9	34.4
Chile	1,870	97.4	160	79.5	92.1	46.7
Denmark	1,690	290	*290*	76.0	156	78.9
France	6,650	101	135	68.2	63.0	31.9
India	12,000	8.65	57.7	24.3	15.5	7.85
Iran	9,150	108	409	44.4	136	69.1
Malaysia	5,210	159	207	75.1	109	55.3
Portugal	909	89.3	148	87.4	102	51.5
Russia	39,200	269	312	33.8	92	46.8
South Korea	2,150	42.0	249	76.2	134	68.0
Spain	2,070	44.3	126	80.0	73.2	37.1
Sweden	797	78.5	216	68.2	101	51.0
USA	73,000	219	325	57.1	128	64.6
Vietnam	6,170	62.8	312	27.5	86.4	43.8
Jurisdictions where the estimated case rate for tested, vaccinated individuals was lower than in Auckland and the rest of NZ						
All other Aus. states	0 – 1.43	0 – 2.31	0 – 2.31	53.0 – 64.8	0 – 0.86	0 – 0.40
Hong Kong (China)	2.57	0.34	*0.34*	58.8	0.14	0.07
Saudi Arabia	45.4	1.29	*1.29*	61.4	0.54	0.27
Taiwan	5.43	0.23	*0.23*	36.2	0.07	0.03
UAE	79.0	7.91	*7.91*	87.3	5.43	2.75

*italics = unadjusted as NZ testing rates were lower

Comment

Given the limit it imposes on the right of NZers to enter their country, any requirement for MIQ must be risk based and consistent in order to be justified. With tested, vaccinated travellers from many jurisdictions having a lower risk of Covid-19 infection than Aucklanders; with no vaccination or quarantine requirements for Aucklanders permitted to travel outside Auckland; and with the decision to allow many known positive cases in the current outbreak to isolate at home in Auckland, current MIQ requirements for tested vaccinated travellers have become inconsistent and arbitrary.

Furthermore, filling MIQ rooms with arrivals who typically have a lower infection risk than Aucklanders wastes limited MIQ space. Public health would be better served by having those rooms available for community cases, when their homes are not suitable for home isolation.

Effective management of the Covid-19 pandemic depends on effective risk assessment and management. Part of this process is based on achieving reasonably consistent thresholds for what is an acceptable risk in relation to the strategy being pursued. Auckland has switched to a suppression strategy (ie, to minimise the impact of Covid-19 on public health and keep the case load from overwhelming the healthcare system) where some level of Covid-19 risk is accepted. One benchmark for this acceptable risk threshold is set by the fact that hundreds of Covid-19 cases are now isolating at home rather than in tightly managed MIQ facilities.

By contrast, health authorities in the rest of NZ still seem to be pursing an elimination strategy, to protect their populations from harm, and to allow social and economic activity to continue with minimal interference, based on Alert Level 2 settings. For these areas, the acceptable level of Covid-19 risk is very low.

There are multiple implications of this analysis:

- Most vaccinated international travellers arriving in Auckland do not require quarantine and will probably only need monitoring and testing at most. Some extra monitoring and testing (and in some instances still a few days in a facility-based quarantine) may be required for the unvaccinated; and for those coming from higher incidence jurisdictions such as the UK (Table 1), or jurisdictions where case rates relative to Auckland cannot be well estimated.
- Most vaccinated international travellers destined for other parts of NZ could now fly into Auckland, and then travel on to other parts of the country on the same testing and quarantine conditions as for Aucklanders (see next point).
- The boundary around Auckland needs to be strengthened to minimise the risk of infected people travelling to other parts of NZ which are still pursuing elimination, at least until such time as the entire country has reached an agreed vaccination target (90% fully vaccinated). These measures should include vaccination, pre-travel testing, and potentially an additional home quarantine requirement and a post-travel test on arrival in other parts of NZ.
- If the Government takes a less stringent approach to the Auckland boundary than we recommend, and Aucklanders are not required to quarantine on arrival in other parts of NZ, then most vaccinated international travellers should not be required to either.

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