PUBLIC HEALTH COMMUNICATION CENTRE AOTEAROA

Time to stop dodging bullets? NZ's eight recent border control failures

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Nick Wilson, Leah Grout, Amanda Kvalsvig, Michael Baker

There have been eight distinct border control failures in Aotearoa/NZ relating to the pandemic virus that causes COVID-19, since early August 2020, equivalent to one every two weeks. In this blog we briefly detail these failures and argue the case for an urgent review and upgrading of the country's defences against this highly infectious pandemic virus, including: shifting to a risk-based approach to border management (a *traffic light system*), fine-tuning the Alert Level system to incorporate mask use, and enhancing contact tracing.

Overall, Aotearoa/NZ has done extremely well by international standards by adopting and

pursuing a goal of eliminating community transmission of the pandemic virus that causes COVID-19.[1] It has sustained the lowest COVID-19 mortality rate in the OECD.[2] However, since early August there have been reports of eight distinct border control failures, equivalent to one every two weeks, with details in the Table below. Six of these failures were associated with Managed Isolation and Quarantine (MIQ) facilities, one was associated with work at a port, and one remains of unknown origin (although this Auckland August outbreak was probably also MIQ facility related) (Table 1). Of the six MIQ facility failures, five involved workers (three health workers, a defence worker and a maintenance worker) and one was a returnee infected in a facility. The three health workers and the defence worker were all infected in those MIQ facilities used for managing infected cases (as opposed to facilities used for quarantining people not known to be infected). One failure resulted in a large outbreak (179 cases, 3 deaths), but the others were successfully contained at under six cases each (as per the time of writing). This total of eight failures is probably an under-estimate given the likelihood that some community cases arising from border control failures were never detected (eg, genomic epidemiology has shown that "only 19% of virus introductions into New Zealand resulted in a transmission lineage of more than one additional case"[3]).

This high failure rate is unacceptable from a border control perspective (with the goal of protecting NZ from outbreaks of COVID-19), as well as from an occupational health perspective (for protecting workers from a potentially fatal infection). Therefore, there is a need for an urgent review of the country's border control arrangements. Such a review could give consideration to a "traffic light" system for border controls,[4] with more rigorous controls (such as pre-flight testing and home quarantine) prior to travel from "red zone" countries where the pandemic is out of control. Indeed, for people coming from such high risk countries, there is a case for having purpose-built facilities established at a place like Ōhakea air base.[5] Upgrading the standards of personal protective equipment (PPE) in all these facilities, especially those facilities holding known cases, is probably also warranted,[6] [7] as is reducing potentially hazardous practices such as having shared exercise areas.[8] Other systematic improvements could include requiring people in MIQ facilities to remain in their rooms until they had a negative 3-day test result and provision of nicotine replacement therapy (for smokers) to support this practice where required.

The Alert Level system should be upgraded so that for the coming months (eg, until a *traffic light* system is operationalised) the whole country could be shifted to Alert Level 1.5. This Level should include mandated masks on public transport (as being discussed by the Government for mid-November) and mandatory scanning-in using the Government's NZ COVID Tracer App for people entering high-risk indoor public places (to facilitate contact tracing if an outbreak occurs). The Alert Level system in general could be upgraded with additional levels so that it is better able to guide risk reduction measures without the need to resort to lockdowns (Alert Levels 3 and 4).[9] Work needs to rapidly progress on digital technologies to facilitate more rapid contact tracing (including adding Bluetooth functionality to the current COVID Tracer App as appears to be proceeding,[10] and development of the COVID Card[11] for people without smartphones).

The continuing pattern of border failures and associated outbreaks is a serious reminder that complacency is a real threat to NZ's continuing COVID-19 elimination status. Despite positive news about the effectiveness of vaccines, they are unlikely have an impact for many months. The rising intensity of the global pandemic means that NZ will need to increase the effectiveness of its pandemic response for the foreseeable future. Fortunately, there are multiple ways of reducing COVID-19 risk for Aotearoa/NZ. As described here, we

can learn from systematically reviewing and improving our current risk managements systems. We can also learn from successful practices used in Asian countries such as Taiwan, which recently marked 200 days without domestic COVID-19 transmission.[12]

Figure: A MIQ facility in Auckland where people who are infected with the pandemic virus causing COVID-19 are kept in isolation (photo: Luke Pilkinton-Ching, University of Otago)

Table 1: List of border control failures relating to the SARS-CoV-2 pandemic virus reported for New Zealand since 1 August 2020 (up to 15 November 2020)

Event	Extent of community spread	Likely cause and additional details
Auckland August outbreak	A total of 179 known cases, with 3 deaths	***Cause:*** The cause of this outbreak remains unknown, but work on the genetics of the pandemic virus probably provides the best clue to this being a Managed Isolation and Quarantine (MIQ) facility failure: “There are a large number of similar genomes which are from the UK, which would seem to suggest the UK is the most likely source of any unknown importation.”[13] This was at a time when 40% of cases in NZ MIQ facilities did not have genomic work on the virus infecting them (ie, there was not enough complete virus in the samples). These authors[13] also estimated that there was only a very tiny risk of this outbreak being a continuation of the March/April spread of the pandemic in NZ: “Our Bayesian phylogenetic analysis … estimates that there is a 0.4% probability that case 20VR2563 is in the “sister clade”’ of the Auckland cluster.” Finally the chance of the outbreak being from contaminated imported food was also considered very unlikely: “Our Bayesian phylogenetic analysis … shows that the estimated mutation rate on the branch leading to the cluster is not a lot smaller than elsewhere in the tree, lending little weight to the possibility that the virus lay dormant on packing material for a long period of time.” ***Additional details:*** This outbreak predominantly impacted Pacific peoples (61% of cases), Māori (22%) and younger people aged <20 years (34%). One of the deaths was in a man in his 50s,[14] and another death was in a GP (but it is not known to us if his infection was work related). There were probably very large social and economic impacts from this outbreak as Auckland had to move to Alert Level 3 for a time, and the rest of the country to Alert Level 2. As Auckland returned to Alert Level 3, Auckland Council’s Chief Economist predicted that Level 3 restrictions would result in the loss of 250 jobs and $60-75 million in GDP each day.[15] Furthermore, the Treasury estimated that the reintroduction of Alert Levels 2 and 3 would reduce September quarter national GDP growth to 12%, more than two percentage points lower than anticipated under continued Alert Level 1.[16] No investigation report of this outbreak has yet been published.

Event	Extent of community spread	Likely cause and additional details
MIQ facility maintenance worker infected (August) / The “Rydges hotel case”	A single worker, no further cases identified	***Cause:*** A shared lift environment in a MIQ facility (used for quarantine) was the source suspected by officials,[17] with the sharing being only minutes apart.[13(p8)] The genomic sequencing indicated the same virus infecting the worker as per a recent returnee in the same facility.[13(p8)] While the officials concluded that there was “surface contamination”,[17] it is unclear why shared air space was excluded as infectious aerosols are increasingly being proposed as an important transmission route.[18] ***Additional details:*** No full investigation report of this border failure has yet been published.
MIQ facility nurse infected (September) / The Jet Park facility	A single worker, no further cases identified	***Cause:*** This was a work-related infection associated with a MIQ facility used for isolating infected cases, given that the case was linked via genomic sequencing to 3 cases within the facility.[19] Some details of the full investigation report were provided to the media and these suggested that while the nurse wore PPE, there was a period where the associated patient did not have a mask on during treatment.[20] This situation could have contributed to a failure of the PPE worn by the nurse. ***Additional details:*** The Ministry of Health have not released the full investigation report to the media.[20]
Returnee-related outbreak / Christchurch MIQ facility (September)	The returnee and 2 others	***Cause:*** This person was thought to have been infected within a MIQ facility before then moving into the community, according to the Ministry of Health.[21] The official hypothesis was that infection was transmitted “via the surface of a rubbish bin which was used by another returnee who was likely infectious at the facility”. It is unclear why an infectious aerosol and shared air space was excluded as a transmission route. ***Additional details:*** This infected returnee appears to have then infected another person (the Ministry suggest this may have occurred on a charter flight after leaving the MIQ facility).[21] A household contact was also reported as becoming infected.[22] No investigation report of this outbreak has yet been published.

Event	Extent of community spread	Likely cause and additional details
Port worker outbreak (October) / “marine employee” outbreak	The worker, two workplace contacts, one household contact	***Cause:*** This maintenance worker was probably infected in the course of working on an international cargo ship. Genome sequencing has indicated that the same virus subtype was found in the crew of the relevant ship (when testing was conducted in Queensland where the ship subsequently went).[23] Potentially this infection came into NZ via infected crew flying from the Philippines into NZ to join their ship (since such arrivals were not routinely tested at this time). ***Additional details:*** Two of this worker’s workplace contacts also became infected[24] and also one household contact.[25] No investigation report of this outbreak has yet been published.
MIQ health worker (Case A) in Christchurch (November)	A single worker, no further cases identified	***Cause:*** This was a work-related infection associated with a MIQ facility used for isolating infected cases. Both this case (and “Case B” below) had the virus genome sequencing linked to infection in a group of international mariners in the MIQ facility but with different virus subtypes in each case.[26] “The finding supports the current theory that there were two separate events infecting both workers at the facility.” ***Additional details:*** At the time of writing investigations were still proceeding into the infection of this case and also “Case B” (below). These cases of infected health workers appear to have contributed to MIQ nurses threatening strike action if they are not supplied with improved PPE.[7]
Another MIQ health worker (Case B) (see above)	A single worker, no further cases identified	***Cause:*** This was a separate work-related infection associated with a MIQ facility – see in the row above.

Event	Extent of community spread	Likely cause and additional details
“November quarantine” outbreak / Defence Force worker outbreak	The worker, a co-worker and 3 others (to date)	***Cause:*** This was a work-related infection in a Defence Force worker associated with a MIQ facility (used for isolating known infected cases). “The genome sequencing we have conducted on Case A’s test result shows a direct link to two returnees who are part of a family group in the quarantine facility.”[27] ***Additional details:*** One Defence Force related co-worker (Case B) was infected by Case A. This co-worker then appeared to have infected one close contact (Case C).[28] Genomic sequencing also indicates that Case A has the same viral lineage as a community-based case (Case D).[29] A close contact of Case D was also reported infected[30] (on 15 November, albeit with investigations still proceeding at the time of writing). Associated with these cases, the Prime Minister has made statements around the need for further risk reduction (eg, avoiding face-to-face meetings with border-facing workers and these workers wearing masks on planes).[31]

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