Review of the Auckland February 2021 COVID-19 Outbreak and New Zealand's current COVID-19 Outbreak Response Capability

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PROFESSOR PHILIP HILL & DR DEBBIE RYAN ON BEHALF OF THE COVID-19 INDEPENDENT CONTINUOUS REVIEW, IMPROVEMENT AND ADVICE GROUP

Overview from the Chair

New Zealand has done incredibly well in keeping out and eliminating community cases of the COVID-19 virus. We can be very proud of our efforts to date. At the heart of the pandemic response are our central government agencies, operational agencies and community providers that have worked tirelessly to deliver a world-class response that is envied by many across the globe.

As we are witnessing in real time, COVID-19 is a constantly evolving virus that continually presents new threats. At the same time, we are moving into an increasingly vaccinated world with greater freedoms at the border. As such, to continue to be successful and remain world-class, the COVID-19 Response System needs to be a learning system in which we seek lessons and innovations to continuously improve to keep ahead of the evolving risks within our changing context.

We hope this report will contribute to this learning system appro ch through the recommendations for continuous improvement we have set out be ow.

Sir Brian Roche

Chair of the COVID-19 Independent C ntinuous R view, Improvement and Advice Group

Summary

Aotearoa New Zealand is o track for an historic achievement of keeping a pandemic virus at bay until a vaccine is rolled out. The country's COVID-19 response has successfully elim nated community outbreaks, now including one due to a new variant virus – 'the Auckland February 2021 Outbreak' (the Outbreak). This report reviews the manageme t of the Outbreak and the state of the outbreak response system (the COVID 19 Response System)[1].

[1] The outbreak response system for the purpose of this review is defined as central government and peripheral agencies that are involved in responding to outbreaks of COVID-19 as well as other system actors such as business communities, Māori, Pacific and other diverse communities, the general public and so forth.

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Review of documents (including central and peripheral[2] self-reviews) and interviews with multiple parties revealed that there have been significant improvements in the outbreak response, before and since the Outbreak and that there are several opportunities across the COVID-19 Response System for change to improve it further.

Significant improvements in the outbreak response were identified in the following areas (including self-reviews by the Ministry of Health (the Ministry) and the Auckland Regional Public Health Service):

- central and peripheral connectivity, coordination and networking
- mobility of response teams virtually and physically
- table-top planning
- development of an early aggressive approach
- wrap around supports
- community engagement
- epidemiological support, and
- commitment to continuous improvement.

Opportunities across the COVID-19 Response System to improve the response were identified in several areas, the most important being the following:

- the formation and execution of the early aggressive approach to an outbreak, including contact definitions
- COVID-19 Response System capacity to contain a large community outbreak
- leadership of an outbreak response
- communication at multiple level
- early surge capacity
- scenario planning and stress testing
- resourcing of the Public Health Units
- external peer review and accountability
- tiredness and burnout, and
- maintaining trust of the community.

The Ministry's self review documentation identified several key issues to be addressed but was disjointed and not comprehensive. The Ministry's reviews did not provide evidence of COVID 19 Response System performance against key indicators or provide timelines or measurable goals for actions to improve performance.

Several recommendations from previous reports remain to be acted upon and others have not been completed. Some decisions about what is important and not important have been made by the Ministry, against previous recommendations, with limited external peer review and accountability.

[2] Peripheral refers to agencies outside of central government agencies (for example, Auckland Regional Public Health Unit, the Northern Region Health Coordination Centre).

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Key recommendations arising from this rapid review of the Outbreak are listed below. Each of these recommendations needs a timeframe for completion to facilitate the planning of implementation of continuous improvement actions. We have included suggested timeframes in brackets based on what we consider reasonable but reflecting urgency.

1. The early aggressive response to an outbreak should be fully formed as a proper plan and approach. (1 month)
2. Nationally important documents and plan changes should undergo mandatory expert external peer review in their planning and completion, monitored by the Minister's office. (Immediate and enduring)
3. The new contact definitions should be removed. Individuals should simply be aware of whether they are a close or a casual contact and what, for the part cula outbreak, they need to do, as defined in the outbreak plan. (Immediate)
4. The COVID-19 Response System capacity necessary to contain a large out eak should be clarified and agreed, then established properly, in luding wit adequate resource and staffing. (3 months)
5. Leadership of an outbreak needs to be clarified and adjusted accordingly, adopting an improved consultative approach betwe n th cen re and periphery and the need for a primary role for the publi health specialists. (1 month)
6. Scenario planning and COVID-19 Response Syst m stress testing should be done, coordinated by Department of the Prime Minister a d Cabinet specialists, and completed in an agreed timeframe. (Immediate and constant)
7. The design of interventions needs o ensure equity and access for diverse communities, whānau-centred wellbei g metr cs are required for monitoring and evaluation, and all messaging hould reflect the hard work and collective action of the South Auckland commun ty. (Immediate and enduring)
8. Strategies for addressing tiredness and burnout, while injecting freshness and ongoing self-refl ction and self-criticism should be evident and implemented at all levels. (Immediat and constant)

A number of othe recommendations are outlined in the report.

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List of abbreviations

Auckland Regional Public Health Service	ARPHS
District Health Board	DHB
Department of the Prime Minister and Cabinet	DPMC
Incident Management Team	IMT
Ministry of Health	The Ministry
National Contact Tracing Solution	NCTS
Northern Region Health Coordination Centre	NRHCC
Public Health Unit	PHU
Technical Advisory Group	TAG
Te Kawa Mataaho Public Service Commission	PSC

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Introduction

New Zealand's team of five million is on track for an historic achievement of keeping a pandemic virus at bay until a vaccine is rolled out. The country's COVID-19 response has successfully eliminated community outbreaks, now including one caused by a new variant virus – 'Auckland February 2021 Outbreak' (the Outbreak), which is the focus of this review.

The Outbreak diagnosed 15 cases, 89 close-plus contacts, 2150 close contacts and 3775 casual-plus contacts[3]. Several cases were associated with Papatoetoe High School. With the 'early aggressive' approach taken, there were a similar number o contacts managed as in the August 2020 outbreak, which had more than ten times the number of cases diagnosed. The index case worked at a workplace with bord r workers who are required to be tested regularly. However, this individual was not required to be tested, but had been tested relatively regularly volunt rily

The aim of this review (the Review) was to provide the Minister for COVID-19 Response reassurance that previous recommendations related to the COVID-19 outbreak response have been acted upon in a timely as ion, that there have been appropriate lessons and action taken from the Outbreak including planned timely and measurable improvements to the COVID-19 Response System, and to provide assessment and recommendations independent of the nternal reviews.

Methods

This report is based on a review of documentation obtained from the contributing organisations (Appendix 1), and nterviews and information provided by key people (Appendix 2). The review commen ed with a half day of meetings with the Ministry in Wellington (Director G neral of Health, the COVID Directorate, Office of the Director of Public Health, National Investigation and Tracing Centre) followed by a day of meetings with ARPHS, the NRHCC, the Principal of Papatoetoe High School, and Healthline. We lso met with Whānau Ora commissioning agencies, South Auckland providers and ep sentatives from Te Rōpū Whakakaupapa Urutā (Urutā)[4].

A snowball ampling approach[5] (drawing on networks of the committee and interview pa tic pants) was used to identify interviewees able to provide insights to specific aspects of the response for continuous improvement and or testing of robustness of processes and systems.

[3] Source: Ministry of Health, *Auckland February Outbreak 2021 – Internal Review of the Auckland February Outbreak 2021 Response.*

[4] Urutā is made up of some of the nation's leading Māori medical and health experts including Primary Care Specialists, Public Health experts, Public Health Physicians, Māori Nurses and iwi leaders.

[5] Emmel N. 2013. *Sampling and choosing cases in qualitative research: A realist approach*. Sage.

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Interview participants were invited to reflect on their lessons from the Outbreak, with open questions evolving to more targeted questions for triangulation and refining of emerging themes from the interviews and review of documents.

Analysis of the data collected involved separate theme formation and then collation and expansion, discussion with the COVID-19 Independent Continuous Review, Improvement and Advice Group (the Group) members, assessment of practice against relevant models, protocols and guidelines for infectious disease control, outbreak management, public policy and health system and service improvement and equity. We combined a strategic overview perspective with exploring particular operational details as they arose and if of strategic relevance.

The report was fact checked by DPMC staff who took comprehensive notes during all the interviews and was sent to the Ministry, PSC and DPMC leadership, for fact-checking before being finalised.

The content of this report is based on the Review carried out in the time allocated. The Review commenced on 30 March 2021 and concluded on 23 April 2021.

Commendations

1. The connections between central and peripheral components of an outbreak response have improved considerably with respect to both planning and execution. In Auckland the NRHCC and ARPHS have a working relationship which functions very well.
2. Coordination and networking of the outbreak response teams have probably improved the capacity of the COVID-19 Response System to handle an outbreak.
3. The potential to move teams physically and virtually around the country has also probably improved the capacity of the COVID-19 Response System to handle an outbreak.
4. Testing result turnaround times were maintained at a high standard throughout the Outbreak. Time to contact isolation also performed well above target levels throughout. The following is a summary of the performance against indicators[6] during the outbreak (provided upon request, by ARPHS):
    - P001: Time notification to case interview: 100%
    - P002: Time case notification to isolation/quarantine of contact: 93%
    - P003: Time from close contact identification to isolated/quarantined: 100%
    - P004: Proportion of Identified Contacts traced: 100%

[6] The indicators are from the Verrall report, *Rapid Audit of Contact Tracing for Covid-19 in New Zealand*, April 2020.

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- P005: Regular Monitoring and follow-up of cases and contacts completed: 94%

5. Table-top exercises prior to Christmas improved the COVID-19 Response System's ability to coordinate itself in the event of an outbreak at certain events over the summer holiday period.
6. A shift towards formalising an aggressive early approach to community case and contact management is understandable and a good use of the COVID-19 Response System capacity to attempt early elimination.
7. There has been a focus on equity through building Pae Ora and Pacific teams at ARPHS and working with Whānau Ora commissioning agencies and local providers to ensure matching of staff with community need.
8. The introduction of formal incident management team (IMT) leadership in the Ministry and in Auckland has been successful, especially with respect to a whol COVID-19 Response System response. The central and the periph ral teams work well together.
9. Wrap around care and supports for contacts, for example if ex ect d to miss work, has advanced significantly. Extensive work has gone into l nking he public health instructions to availability of appropriate wrap a ound supports.
10. The engagement between ARPHS in particular and apatoetoe High School was excellent during the Outbreak (despite requirements beyond Alert Level 4 for some individuals and households) leading to high compliance with directions.
11. The Ministry has increased its epidemiologist expertise working across directorates. This has potential to enhance the quality and robustness of the Ministry's processes.
12. There has been improvement in the science advice available within the Ministry through its Science and Insight group.
13. From the limited in orma ion provided to the Review, the Ministry has taken some steps already that are relevant to addressing some of the themes identified below. For example, p otoco s are being developed in consultation with the Ministry of Education w th re pect to a case in a school.
14. There is wo k underway by DPMC to improve the management of the geographic/ egional boundaries under Alert Level 3. This may include more fac litation of operational flexibility in the orders that are made (eg. to allow changes in procedures in real-time to reduce long queues) and possibly an extended grace period to allow people to return home without being caught in long queues.
15. There is work underway by the DPMC to improve the COVID-19 National Resurgence Response Plan further, which is an excellent document already. These include, for example, a new checklist for the decision-making chain.

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Major themes identified

1. **Formation and execution of the early aggressive approach to an outbreak.** The shift to formalise an aggressive early approach to community case and contact management, including the new contact definitions is not fully or properly formed as an approach, with issues including but not necessarily limited to the following:
   a. It is not described in the latest Ministry COVID-19 Resurgence Plan.
   b. **Contact categories.** Two new contact categories (close plus and casual plus) were developed by the Director of Public Health's group, for what boiled down to only two extra requirements for contacts. We consider that the extra complexity for what were only two changes to requirements under certain circumstances is excessive.

      While well intended, the process used goes against the basic underlying principles of contact definitions in public health outbreak management. Contact definitions should primarily be defined by the actual level of con act. The new categories changed contact definitions within the same levels o contact.

      It is completely reasonable to change what close a d/o casual contacts are required to do in a particular outbreak scen rio. And in some situations, known increased risk may lead to some individuals be ng classified as close contacts beyond standard exposure evaluation. For examp e, 'playground transmission' in a school is well described in infectious diseases public health as a significant risk.

      Individuals in an outbreak simply need to know if they are a close or a casual contact and what is expected of them. This should be clear for each outbreak in the outbreak plan. What is required of close and casual contacts can change according to the scenario. System readiness for differences in what may be required for par icular outbreak scenarios is a good thing, so much of the work to enable the readi ess of the COVID-19 Response System for differences in requiremen s has not been wasted. This work has continued since the Outbreak.

      New cont ct categories were supposed to increase clarity. Ironically, they facilitated blurring of the boundaries between them in practice, increasing conf sion. For example, more than 1600 casual contacts were relabelled as close contacts, with no mechanism for determining the actual denominator. Given the requirements for close contacts, this is suboptimal.

      There is no evidence of review of international evidence in favour of, or against, the new definitions. There was no evidence of mandatory external review and advice (see below). While there was some consultation with Medical Officers of Health, this did not take into account the time that would be needed for them to provide thoughtful considered feedback.

      There was incomplete resolution of concerns raised about unnecessary complexity – senior public health specialists we spoke to about the new

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definitions all stated significant concerns about complexity. General practitioners found the new definitions unworkable in practice, abandoning them when deciding who they should test as they found them too restrictive. Members of the community also found the definitions confusing, which contributed to 'non-compliance'. This was a particular problem when members of the same household were placed in different categories.

Interviewees noted that there was inadequate consideration of operational challenges for public health practice, general practice, support agencies, DHB staff practice, and information provided to diverse communities (eg translation of written material for contacts and cases about welfare support took five days); and the new definitions were introduced at short notice to those who had t operationalise them.

c. **Piloting and stress-testing.** There was a lack of piloting or stress-testing of the early aggressive approach to an outbreak. The need for scenar o planning and stress testing the COVID-19 Response System has been identifie in p evious reports and needs to be actioned. To solely rely on lesson from actual outbreaks is unnecessarily risky.

d. **Focus.** There was little consideration of opportunity costs of the early aggressive approach, specifically how to make sure the focus on the highest risk individuals was not decreased. For example, was here too much time pressure on field teams conducting interviews, po entially compromising the amount and depth of information obtained?

e. **Performance indicators.** There was lack of any performance indicators specific to the early aggressive approach (leading to expectations, for example, that only 100% follow-up i ac eptable), beyond the 'Verrall report indicators'[7].

f. **Communications.** There did not appear to be a clear plan for communication about an early a gress ve approach, with mixed messaging across various platforms, including paper, media, social media, briefings and the Ministry's website.

g. **Sustainabi ity.** There was a lack of clarity on how long the approach can be sustained fo , or how exactly it will transition to a more standard sustainable approach for an outbreak that is more complicated/advanced than initially ealised.

2 **External advice and peer review.** The Ministry has disbanded Technical Advisory Groups (TAGs), other than the one for vaccines, and now will seek advice from experts at their discretion and is not necessarily accountable with respect to how it responds to this advice. The risk is that advice is not sought despite it being needed and is not heeded when it should be. This is relevant to the COVID-19

[7] Verrall A. April 2020, *Rapid Audit of Contact Tracing for COVID-19 in New Zealand*,

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Surveillance Strategy and other important documents and to changes in definitions and criteria. Two key examples where a major incorrect decision could have been avoided through high quality peer review, are the changes to the testing criteria in mid-2020, and the changes to the contact definitions in 2021.

3. **System capacity to contain a large community outbreak.** Despite the previous recommendations about the COVID-19 Response System's capacity in multiple reports, the Ministry appears to have been developing advice based on the assumption that the need for capacity to surge to be able to trace the contacts of 1000 cases per day is now obsolete. It should remain straightforward to calculate the capacity under different alert levels (which have different numbers of close contacts per case) when the standard outbreak management approach is used, and this can serve as a benchmark. If it is seen as an advantage for planning to extrapolate this capacity to the early aggressive approach, that would seem fine.
4. The Ministry has stated that it prefers to consider capacity in terms of numbers of contacts that can be traced. This is not unreasonable. However, no target capacity for the number of contacts to trace per day has been specified and the present capacity has not been clarified. We do not accept that it is reasonable to not have clarity on the capacity of the COVID-19 Response System on the basis that it is complicated. Since the original recommendation in the Verrall report, Singapore (population 5-6 million) and Melbourne (population 5-6 million) had outbreaks that reached over 900 and 700 cases per day respectively, and Israel (population 10 million) went from very low numbers of cases to over 10,000 cases per day as recently as January 20, 2021. None of these outbreaks appear to have been due to new variants, which now complicate the picture further. Even if a lockdown back up is actioned, Public Health Units (PHUs) will still have to do contact tracing around all cases of an outbreak.
5. <u>The risk of a large outbreak in New Zealand is real.</u> If an outbreak is advanced already when it is detected, or an early aggressive approach fails, the 'back-up' surge capacity should continue to be substantial. This capacity is necessary at least until a large proportion of New Zealand's population is vaccinated and it will remain important to have substantial capacity after that and into the future. At present there is no clarity about the level of vaccine coverage that could lead to a deliberate reduction in outbreak management capacity. In our view, if one uses 10-30 close contacts per case as a guide, we agree with the previous report of September 28, 2020, which suggested that New Zealand would struggle to maintain high system performance of contact tracing for a prolonged period with 100-200 cases per day. It is not clear at all how long New Zealand could sustain the early aggressive approach. We do not agree with the Ministry's assertion stated to us that it is not necessary to increase the standing or surge capacity in New Zealand or the assertion that this is not possible because there is a lack of an available workforce.

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6. **Leadership of an outbreak.** In New Zealand, leadership of an outbreak is complex, involving the PHU, NRHCC (Auckland), Ministry leaders and politicians, operating under and interlocking with the complex architecture of government. To work, this requires a high quality integrated and seamless model, collaboration and collegiality. As part of this complexity, the unintended consequences of directives and orders are not necessarily fully considered, despite there being some checks and balances in place. A more consultative approach around 'directives', with strong mandated PHU leadership, at least for Auckland outbreaks, would seem optimal, and ARPHS state they are able to take up this role. There is no formal strategy for outbreak control in New Zealand, with clear stated accountabilities. While the introduction of formal incident management team leadership in the Ministry and in Auckland has been very successful, the tactical public health leadership from the Ministry is not seen as optimally integrated into the whole COVID-19 Response System approach. More explicitly, public health l ade s could benefit from incorporating some of the tools used by IMT le ders Furthe more, the IMT review report after IMT stand-down and the Ministry's *Auckland February Outbreak 2021 – Internal Review of the Auckland February Outbreak 2021 Response* (Internal Review) are not well integrated.
7. **Scenario planning and stress testing.** Despite repea ed recommendations about scenario planning that would produce specific pl ns for situations where cases are identified in particular settings, there appear to be few if any such scenario plans and no clear leadership around initiating them. It is pleasing that this has been identified as an area for action in th Ministry s Internal Review report, but it is not clear how much thinking has been don about which scenarios need a plan beyond two that have already had cases. The lack of specific scenario plans was evident when there was a case in an apartment block in Auckland. It was also evident when there were cases in a high school in this Outbreak. While it was felt that there needs to be flexibility to treat each situation in a real-world outbreak on its merits as it unfold it seems clear that scenario planning remains relevant, at least for the ea ly period when little is known about the extent of the outbreak in a location. We id ntified that DPMC in particular have high level expertise in coordinating he production of scenario plans for emergencies and could coordinate their completion relatively easily in consultation with public health sp cialis s and the Ministry.
8. **Tiredness and burnout.** We identified evidence of tiredness and burnout across he response, at all levels. Many individuals volunteered that they were tired and burnt out, others stated on questioning that they were tired, and others manifested clear signs without necessarily recognising it themselves or attributing them to tiredness and burnout. Staff were clearly placed, or placed themselves, under unreasonable time pressure even between outbreaks. We noticed reduced capacity, compared to previously, within the Ministry in particular to consider that an approach might not be the right one, to weigh up alternative approaches, or to be self-critical in depth. The default position was defensive and not reflective.

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Given the chronic intense scrutiny from informed and uninformed critics, along with heavy workloads and the responsibility to keep the country safe, these things are understandable and expected. However, we did not identify any leader throughout the response who has a unique irreplaceable skillset and we saw only limited evidence of active application of strategies to address tiredness and burnout. Of relevance, in contrast we note that the Prime Minister has now appointed three senior ministers with responsibility for Health during the pandemic (Ministers Little, Hipkins and Woods), not to mention the Associate Ministers.

9. **Maintaining trust of South Auckland communities who have borne the burden of repeated outbreaks and lockdown requirements.** We heard about a range of issues experienced by diverse groups. Families with children with a disability were sometimes left without carer support. Messaging about 'bubble' and limiting purchases of grocery items impacted large households wi h multigenerational families who share resources or provide ca e for elderly family members in other households. Families struggled with long que es at supermarkets and were prevented from buying the quantities of essential food items they required (for example a household with m ny small children could only buy one can of infant formula). Health care workers and staff of Managed Isolation and Quarantine Facilities faced stigma and being turned away from health services (for example retinal screening for a health worker wi h diabetes). There are high levels of fear and anxiety in the community, older members are reluctant to go out and families kept their children away from school even after the alert levels had changed. From conversations with Sou h Auckl nd community provider stakeholders, it appears that the COVID-19 Response System has not anticipated or addressed unintended consequences such as these.

10. The experiences of South Auck and communities and the well documented barriers to accessing services by Māori, Pacific and other groups highlight the need for implementing policie (eg l ckdowns) and communications that are made relevant for diverse communities. An equity approach requires that resources are organised and targeted to ensu e access and utilisation of services by those who are underse ved. Appropriate monitoring and evaluation, community and family centred m tric are also required to support quality improvement and the design of ecovery interventions. A wellbeing focus to support South Auckland commun ties as part of recovery requires a change in the approach of the response from managing risk and detecting threats to ensuring that those who do not have voice in the COVID-19 Response System receive the care and the services they need and are entitled to.

11. **Overcoming unconscious bias.** Community leaders discussed a sense of a narrative whereby South Auckland is regarded as more likely to host an 'out of control' outbreak, requiring aggressive alert level changes, than other areas, not just based on population density, but on preconceptions about compliance and about the population in general. The approach to who was required to stay in

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quarantine was expressed as "…brown people go to Jet Park, Pākehā people can isolate at home…". The sense of this narrative was reinforced when individuals were blamed in media sessions and by comments in the media.

12. In contrast, South Auckland communities have acted collectively to mobilise resources through marae, faith-based communities, sports clubs and other networks to respond to emerging issues and support high levels of compliance with instructions. Māori and Pacific health providers in particular played a key role in advocating for and responding to and supporting community action. The people of South Auckland have the vast majority of the heroes of the response – working in many of the high-risk facilities and border workplaces. The narrative should be the opposite of the one that has been portrayed; it should be one of a popula on that has kept New Zealand safe through doing the hard jobs and coming together to eliminate outbreaks. We also heard a strong case for a strategic priori y o e rly vaccination of the whole South Auckland community.

Other themes identified

13. **Optimising communication.** There were disconnects betwe n communications requiring changes to plans and the ability to op rationali the changes at multiple levels.

    Directives (mostly from the Ministry) were g ven with unrealistic timelines as to how soon the operational aspects can be put n place.

    Consultation with PHUs was not optimal the turnaround time for giving feedback was often unrealistic in the context of heir workload. Optimal consultation would require a small group of Medical Officers of Health being identified and then consulted from planning th ough to implementation. More upfront information is needed on what is eing planned centrally.

    Messaging to General P actices was also suboptimal. General Practitioners reported that t ey co ld not manage the dense messaging that they received. Advice to them often comprises multiple paragraphs and pages, when they would prefer a few short bullet points, with appendices for explanation if necessary.

    Senior DHB staff contacted us, identifying problems with the lack of clarity on guidelines for hospital staff in relation to the outbreak and the different kinds of ases and contacts.

    There was a disconnect between different communications to contacts of cases regarding their test results – for example they might get a text with a negative result but because of information flow processes within the COVID-19 Response System, they may not be released from self-isolation for another day.

    There were inconsistencies at times between what was said by the Ministry and what was on their website. Loss of public confidence from poor integration of

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communications and operations and 'layered misunderstandings' is a significant risk.

Interviewees suggested that communications, including those at 1pm briefings, should include messaging from South Auckland community leaders.

It was pointed out that there are opportunities for communications to drive good public health strategy, such as taking the opportunity to encourage people to be up to date on their other vaccinations and to help mitigate other risks associated with the pandemic.

14. **Early surge capacity**. It is clear that the demand in the first two days of outbreak management led to long waiting times at testing facilities and on calls to Healthline. The Ministry and DHBs do not think that this could be avoided in the future, noting the high numbers of 'worried well'. However, we probed t is issu further through interviewing providers in South Auckland. It was clear t us that they felt that there is scope for earlier stand-up of testing fac lities. They specially could not understand why the facility in Otara had been closed i the first place or the delay in reopening, noting that people are more likely to go to facility that they were already aware of. It appears that DHBs may hav been too focused on specific locations in South Auckland rather than on wider South Auckland accessibility to testing.

15. **Utility of the COVID Tracer App**. We requested and obtained a brief summary of the performance of the COVID Tracer App (the App) during the outbreak, from ARPHS. Only five of 15 cases used th App in his outbreak. We understand that there were only two Bluetooth alerts one was at a beach where the contact was thought to be highly improbabl , suggesting a possible problem with the settings.

    The following challenges wer ide tified:

    - There is no easy way to track contacts identified and traced as a result of a push notifica ion in the App, for example contacts are not categorised in the National Contact Trac ng Solution (NCTS) tool.
    - Shared phones may provide locations/scans for multiple people, making it inappropr ate to rely on the information in the App.
    - Not all c ses use it consistently, it is a more effective tool when all information is captured.
      The level of detail in the scans may not provide all the data to support the loc tion of interest – for example, use at a mall in general rather than every store visited.
    - It is difficult to track when push notifications are used and which case and exposure were connected to this push.

    Benefits of the App that were identified:

    - It supports a diary for cases which can be easily used to provide details including dates/times for contact tracing locations and longer history periods for source investigations.
    - Ability to use locations to quickly push notifications to members of the public.

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- Faster data entry for locations from data pulled from the App.

16. **Resourcing of ARPHS and other PHUs.** While the issue of the length of contracts for COVID-19 staff that was previously identified has been resolved, ARPHS core funding and position vacancies (ARPHS has a $3.6 million deficit and 25 FTE at ARPHS are currently needed) impact the COVID-19 response capacity in Auckland, especially for early diversion into an outbreak response. The Ministry has indicated that the 'chequebook is open', at least with respect to COVID-19. The DHBs believe the fault lies in the funding allocated centrally that they distribute. The current situation compromises the capacity of ARPHS to conduct its normal non-COVID-19 activities and to transfer its own staff into COVID-19 outbreak management to improve capacity.

Table. Details of the 25 FTE shortfall at ARPHS in 2021 (provided by ARPHS)

Team	FTE (approx)	Roles include:
Systems, Intelligence and Planning	4	policy; emergency management
Health Improvement	7.5	health promoters; 1FTE NCSP-Register
Environmental Health	2	Health Protection Officers
Communicable Diseases	10	Public Health Nurses (7FTE are transferred and charged to COVID)
Medical	1.5	FTE transferred and charged to COVID
	25	

17. **Optimising supports for cases and contacts in an outbreak.** While wrap-around care for contacts has advanced significantly, anticipation of the needs that would otherwise become evident several days later could be improved, through early needs assessment on initial phone calls and by the contact tracing teams on the ground. Seven-day availability of key government departments to those affected by an outbreak was identified also as an area for improvement and has been addressed. The advances in provision and coordination of the wrap-around response in Auckland may not play out so seamlessly in other regions, as the approach is not nationally standardised. There was concern raised about those who do cash jobs and the effect of being unavailable to an employer on the likelihood of being selected again for work after coming out of isolation.

18. **Shaping the agenda for modelling.** Whilst the Ministry has epidemiological support through existing employment, we believe there is merit in further strengthening epidemiological perspectives. There is no epidemiologist on the Governance Group (including Ian Town and Juliet Gerrard) for modelling, although there has been one consistently on the Modelling Steering Group of officials (the Ministry, Treasury, DPMC, etc.) since December 2020. It would seem important, given the complexities of the issues going forward, to strengthen the public health

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and epidemiology expertise on both these committees, including individuals from outside the Ministry.

19. **Alert level changes during the recent outbreak.** While the alert level change decisions during the recent outbreak appeared reasonable to us, they do not appear to have been subjected to critical review. In particular, the process that was followed in the decision to go into Alert Level 3 the second time on the basis of a case where the source was known beyond reasonable doubt and Auckland was already at Level 2 (and whether external advice was sought in this decision), should be reviewed against guiding criteria in the resurgence plans.

20. **Management of contacts outside of Auckland.** Asymptomatic contacts who ended up outside of Auckland tended to be managed centrally. Those who ne ded wrap-around supports tended to have those managed locally, usually with appropriate providers. This created a situation whereby local PHUs were not awa e of contacts in their area unless they actively searched for them on the NCTS

21. **Testing access and facility issues.** There appear to be subpopulat ons that still find it difficult to access testing. For example: some families struggled to get to testing stations due to lack of transport, so location of te ting centres by public transport routes was important; there is high value in ocati g t sting stations in places where they have been before and were ffecti e there; older people and others with heightened anxiety preferred not to go out; and those with disabilities found access difficult. There was also an issue with privacy at the testing facilities, with people being required to volunteer hea th information in front of strangers, which was especially an issue if they were not n their vehicles.

22. **Operational components of country bubble .** Connectivity within the Ministry on specific relevant sub-speciali t xpe tise in relation to 'bubbles with other countries' was raised. It was suggested that expertise around the operational details, linked to international health regulations etc., should be more clearly incorporated into t COVID-19 response. Furthermore, at the time of this review, it was not clear if the implications of bubbles with Australia and other countries on ARPHS practic had been well worked through (eg. arrival of individuals with symptom).

23. **Prevention of an outbreak.** The index case in the Outbreak was not required to be tested regularly despite sharing space at a workplace with border workers on a regular testing regime. She was on a voluntary fortnightly testing regime but went on holiday as a test was due. This has issues for the classifications of border workers in relation to testing, frequency of testing, the ongoing lack of availability of saliva testing and the protocols around going on leave in relation to testing that is scheduled.

24. **Other metrics of success.** While the Verrall indicators are important for a large outbreak eliminated over many weeks, they might need to be adjusted for the early aggressive approach. It is also important to consider person and family-centred metrics about how people are enabled to comply and outcomes of

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isolation/quarantine. These should be brought together in feeding back to consider unintended consequences and opportunities for improvement.

25. **Wastewater testing.** The use of wastewater testing is appealing, as it applies molecular tools to practical outbreak management. However, its sensitivity to detect a case appears to be suboptimal and its specificity to acute infection is limited by the fact that it picks up fragments of unviable pathogen. As such it may well not be epidemiologically justified for use in an outbreak.

26. **Strategic leadership and management complexity**. We recognise that this is a complex situation and that the level of complexity requires and places significant demands on leadership. It must be acknowledged that this has delivered results that New Zealand can be proud of. Having said that, we note that during the review we encountered numerous examples where managerial complexity seemed excessive, and where strategic leadership could be enhanced. The number of different, albeit often well-run, coordinating entities is huge[8]. As noted in previous reports, this complexity requires clarity of accountability and decision rights, and was highlighted as an area for improvement. Examples include those identified in this report:
    - the lack of key performance and quality indicators beyond those in the Verrall report
    - the limitations of the early aggressive approach to an outbreak;
    - communication disconnects
    - unaddressed staff burnout; the need to maintain the trust of the South Auckland population, and
    - limited self-reflection and openness to external scrutiny.

27. **Building a centre of excellence for operational public health emergency response.** It is clear even to the casual observer that ARPHS is becoming the centre of excellence with respect to operational public health emergencies and COVID-19 in particular. It has eliminated two dangerous outbreaks of COVID-19. It would seem sensible for there to be a business case created to specifically evolve part of ARPHS into a national resource for preparedness and response with capacity to serve the country as and when required. Ultimately it would need to be properly housed and resourced, while having key linkages in place. Its role in empowering and enabling other PHUs would need to be defined[9].

28. **Maintaining preparedness amongst other PHUs.** ARPHS is now the centre for COVID-19 operational outbreak management excellence, while other PHUs have

[8] For example: there are over 200 people employed in the Ministry's COVID-19 Directorate alone; there are groups in Ministry of Business Innovation and Employment, Customs, Ministry of Foreign Affairs and Trade, Ministry for Primary Industries, Ministry of Transport and the DPMC and other offices; and there are technical and modelling groups with representatives from multiple entities; and in Auckland there are three DHBs, an IMT run by NRHCC, and an IMT at ARPHS.

[9] Also, the newly announced body Health New Zealand that will take over the planning and commissioning of services and functions of the existing 20 DHBs.

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had little recent experience. Their preparedness is not necessarily optimised to the same extent. This operational excellence should be used to inform the policy going forward.

Update on previous recommendations from Ministerial reports

We identified 21 relevant previous recommendations from the previous Ministerial reports[10], relevant to the outbreak response and 11 activities that were identified previously as initiated already by the Ministry. The latest of these reports was submitted on September 28, 2020 and given to the Ministry at the same time. We asked for an update as to the progress on each of these. This was requested from the Ministry on April 6 and provided on April 21 and is presented in the append ces. We have the following comments on the updates:

1. The updates display, consistent with our commendation tha there has been a significant body of work done over the last year to impro e th outbreak response, across a range of areas.
2. Of the 21 recommendations, three have a stat s of complet d and remainder the status of 'ongoing'. This is of concern, although some of this could be a labelling/understanding issue as several with 'ongoing' status could be labelled as 'completed'. It is important that recommendations are aligned with actions that are measurable and have a target completion date.
3. The statements from the Minis ry in elat on to external peer review are not consistent – for example the TAGs have been disbanded, so they are not mandatorily consulted.
4. The statement about target d test ng and encouraging people with symptoms to have a test is ambiguous. It should be absolutely clear that anyone presenting with symptoms hould have a test.
5. In keeping with he la k of timelines in the update, there is no clear timeline for saliva t sting to be introduced into routine practice. Indeed, this recommendation should not be labelled as completed, as saliva testing has not been properly introduced into practice.
6. The process around ensuring that changes to major documents has proper external review and consultation is not adequate, when put up against the recommendation's steps.
7. There is confusion about the label 'stress-testing'. A real outbreak should not be seen as a formal 'stress-test'. It is an outbreak that challenges the COVID-19 Response System.
8. The resource issues that have been raised around PHUs have clearly not been fully addressed and the timeline to wait for the annual budget is not in

[10] Surveillance and testing report (September 2020); Recommendations from last Auckland outbreak rapid review; Final Report on the Contact Tracing System (July 2020);

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keeping with the urgency of a pandemic. The actual amount earmarked for PHUs from the December 2 funding provision is not stated.

9. The lack of clarity around the capacity of the COVID-19 Response System is addressed elsewhere in this report, as are the issues with the new contact definitions.
10. It is difficult to determine exactly how the leadership of an outbreak works from what is stated. This is addressed elsewhere in this report.
11. Outbreak scenario planning for whole-of-system readiness is still inadequate. However, the Group understands that there is work underway to complete this. It was stated that this is, at least in part, an issue of capacity to do this work. However, the recommendations from previous reports were clear that this is a high priority.
12. The 25 FTE shortfall in core capacity of the ARPHS (described elsewhere in this report) would suggest that the ability to maintain quality of non-COVID-19 public health activities is, in fact, currently heavily compromised.

Internal reviews (ARPHS and the Ministry of Health)

We requested documentation of internal reviews of the February 2021 outbreak from the Ministry and ARPHS. The Ministry conducted an IMT internal review and an overall internal review. We note that the ARPHS 'review' is preliminary. The methodology used for the Ministry's overall review did not have a focus on measurable key performance and quality indicators – either the ones previously used for outbreaks (Verrall indicators) or others that may have been developed since. There is no epidemiological summary or critical analysis of the outbreak – in particular the proportion of different types of contacts who became test positive. There is no analysis of the utility of the modelling that informed critical decisions. There is no evaluation of any type of the performance of the COVID tracer App. There is also no human capacity evaluation or financial assessment. Several of the themes that we have identified were not identified through the internal review. Some of these issues were identified in the IMT review (see below).

Ministry of Health overall internal review

We have the following comments on the findings and recommendations as stated in the Ministry's overall internal review:

1. With respect to positive feedback: while the testing capacity matched demand after day two, the demand for testing on the first two days of the outbreak management was not adequately met by the availability of testing, while the laboratory testing capacity was never exceeded.
2. We have not seen any document describing 'ring vaccination', which is probably not a practical option. It was partially effective as a post-exposure measure in smallpox outbreak management, but smallpox has a much longer incubation period than COVID-19, providing a longer period for post-

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exposure protection to have an effect. Early vaccination of the South Auckland population is worthy of consideration.

3. The need around capacity does not state any specific target.
4. It is encouraging that staff burnout is identified as a risk.
5. It is encouraging that communication and engagement is earmarked as an area for improvement.
6. It is encouraging that the need for more clarity around alert level changes is identified.
7. The need to further optimise 'readiness frameworks' and roles and responsibilities is commended.
8. Privacy issues are important, but also extend (as described elsewhere in this report) to activities in the testing centres.
9. The need to have more foresight and anticipation during the management of an outbreak is commended. There is a need for better mandated strategic decision-making.
10. The need to enhance the approach to the classification of contacts and communication to contacts is commended. However, there only a very limited evaluation of the performance of the new contact definitions.
11. There are a number of recommendations that seem to relate to findings that are not mentioned in the findings section.
12. With respect to the recommendations:
    a. The actions should be measurable and a time for their completion should be stated and then reported on going forward.
    b. Standardisation of wrap-around support across DHB regions is not addressed.
    c. While capacity of the COVID-19 Response System is earmarked for improvement, there is no clarity about what the target standing or surge capacity of the COVID-19 Response System is.
    d. It is encouraging that scenario planning is mentioned, but there is only limited evidence of thinking about exactly which scenarios are targeted, beyond those that have had outbreaks already. The benefits of working with DPMC on scenario and surge plans should be encouraged.
    e. Resourcing of PHUs should be an urgent item with a clear timeline.
    f. It is commendable that the implications of the vaccine rollout on staff that are needed for outbreak management is to be monitored. It would seem sensible for there to be quantifiable measures associated with these assessments.
    g. Ministry internal signoff process is not as clearly defined as it should be, especially in relation to major documents.
    h. Plans to improve Standard Operating Procedures, protocols and checklists are commended.
    i. Addressing equity issues across the response is commended.

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j. A dedicated active central documentation archive was previously recommended in Ministerial reports.
k. The work to clarify roles and responsibilities during an outbreak response is commendable. Relevant documentation should be part of the deliverables for these.
l. It is not clear how the action to complete a situational review and forward-thinking response strategy at the start of an outbreak relates to the outbreak plan that PHUs create at the start of each outbreak.
m. It is not clear what changes are envisaged to the new contact classifications.

Ministry of Health's IMT review

The Ministry's IMT review was put together at the time the IMT was stood down. We have some comments on this review:

1. It provided a summary of the statistics, with input from public health specialists, from the Outbreak as of 12 March, covering testing numbers, with various stratifications, and results according to conta t category, plus results from welfare checks, wastewater testing and genomic equencing. There is very limited critical analysis of the statistic limit d mainly to interpreting the positive wastewater result and the genomics.
2. There is a memo from the Director General of Health about classification of contacts which had reasonable coverag of the issues arising from the changes to the contact definitions. The st ted decision to not make the new definitions fixed on an ongoing bas s is in the context of some lack of clarity over whether they will cont nue in some form or other. As a minor point, the suggestion that the new UK variant might have a longer incubation period does not make sense. If anything, the incubation period might be expected to be shorter, compromising case contact management, but there is as yet no proof of this
3. There is a low diagram about the decision to do secondary contact tracing (conta ts of contacts). However, this does not include any rationale based on tim from xposure, which should be a crucial consideration.
4. There s a summary of the work to match case contact categories with prov sions of wrap-around support. There was clearly a large body of work required to make these linkages.
5. There is a useful summary of the process around genomic sequencing and the results, and timeframes.
6. There is a 'February Cluster Debrief' document. The following issues, for action were identified:
    a. The need for genome sequencing results within a day
    b. Confusion around the new definitions warranting further investigation
    c. Suboptimal communication with a case about testing

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d. Timeliness of contact tracing and consistency of communications, requiring more engagement with the Ministry of Education and more translation of messages
e. Readiness of PHUs beyond Auckland, warranting measures to make sure this is retained
f. Legal powers around testing and self-isolation at the beginning of an outbreak, to be adjusted to enable authority to be invoked at the start of an outbreak response
g. Lack of clear checklist for advice to Cabinet on factors relevant to alert level change decisions
h. Boundary and QR code issues, warranting review of definitions and issues related to transiting through a boundary, police checkpoints and waiting times (especially for returning to Auckland), and
i. Communications issues related to translation into multipl languages.

7. There is a document about resurgence and review of alert lev ls in response to the Outbreak by the office of Minister Hipkins at the tim of second case being diagnosed.
8. There is a memorandum on government proto ols for disea e controls in schools, a joint document from the Ministry of Health and the Ministry of Education. This is a reasonable attempt tow rd completion of a scenario plan for a case in a school.
9. There is a brief memo on media inform tion leaks, with mitigation steps outlined.

Auckland Regional Public Health Service's internal eview

The ARPHS internal review was a re atively informal process and the documentation provided is very preliminary. We ave the following comments on the information provided:

1. The impact of the new contact definitions, including from the compliance requirements on contacts, was emphasized and is consistent with statements from the int rviews conducted for this report.
2. The negat e impact of some criticism in the media of ARPHS had a tangible effect on the morale of the staff.
3. The drive from Wellington for information led to some information being released at a time that was not optimal for the management of the outbreak.
4. The suggestion that ARPHS could play a more strategic role going forward is supported by our report findings (also refer to recommendation 28 in the 'Other Recommendations' section).

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Recommendations for Continuous Improvement

IMPROVEMENTS IN PLANNING			
System-level outcome			
Improved strategic and operational planning will increase the readiness and responsiveness of the COVID-19 Response System. This will reduce the risk of the severity of an outbreak and ensure the COVID-19 Response System can shift from an early aggressive approach to more sustainable response activities.			
		Recommended timeframe	**Suggested accountable agency/group**
Key recommendations	The early aggressive approach to an outbreak should be fully formed as a proper plan and approach.	1 month	Ministry of Health
	Scenario planning and COVID-19 Response System stress testing should be done, coordinated by DPMC specialists, and completed in an agreed timeframe.	Immediate and ongoing	Department of the Prime Minister and Cabinet
Other recommendations	Scenario plans associated with the 'bubble' with Australia, and potentially other countries, should be completed in consultation with PHUs (especially ARPHS), showing clear responsibilities and accountabilities, and addressing resource implications.		Department of the Prime Minister and Cabinet

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LEADERSHIP AND DECISION-MAKING			
System-level outcome			
Leadership and decision-making responsibilities will be clearer, will be positioned at the right level in the COVID-19 Response System and decisions will take into account the right expertise. This will increase system efficiency, the quality of decision-making and ultimately improved COVID-19 Response System outcomes.			
		Recommended timeframe	**Suggested accountable agency/group**
Key recommendation	Leadership of an outbreak needs to be clarified and adjusted accordingly, adopting an improved consultative approach between the centre and periphery and the need for a primary role for the public health specialists.	1 month	Ministry of Health
Other recommendations	The Group should explore in more depth issues of strategic leadership and managerial complexity in the COVID-19 response, as these are beyond scope of this report.		Minister for COVID-19 Response

SYSTEM CAPACITY AND CAPABILITY			
System-level outcome			
The COVID-19 Response System will be ready to respond to an outbreak that is not contained through the early aggressive response. The risk of fatigue and burnout of workers will be reduced through adequate resourcing and staffing which will improve productivity and allow space for self-reflection and innovation. There will be less reliance on key individuals to continuously deliver and reduce risks associated with single points of failure.			
		Recommended timeframe	**Suggested accountable agency/group**
Key recommendations	Strategies for addressing tiredness and burnout, while injecting freshness and ongoing self-reflection and self-criticism should be	Ongoing	Public Service Commission

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	evident and implemented at all levels.		
	The COVID-19 Response System capacity necessary to contain a large outbreak should be clarified and agreed, then established properly, including with adequate resource and staffing.	3 months	COVID-19 Chief Executives Board
Other recommendations	The impact of the needs of the vaccine rollout on the capacity to respond to an outbreak should be actively monitored and measurable as part of the continuous improvement process.		COVID-19 Chief Executives Board
	The plans for early surge in capacity in the availability of testing and phone advice should be further improved in consultation with providers, to reduce wait times in the first two days of the management of an outbreak.		Ministry of Health
	The staff shortfalls in ARPHS, and presumably other PHUs, should be urgently resolved.		Ministry of Health
	PHUs outside Auckland should continue to receive opportunity to maintain and improve their capability to manage an outbreak.		Ministry of Health
	A business case should be put together to establish a centre of excellence for operational outbreak management in Auckland. It should accommodate a phased approach which makes it possible for ARPHS to perform this		Ministry of Health

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	role, in part, during the COVID-19 pandemic.		
	To reduce the chances and impact of outbreaks, we recommend that the Minister for COVID-19 Response reviews the strategic case for early vaccination of the whole South Auckland population.		Minister for COVID-19 Response

COMMUNICATIONS			
System-level outcome			
Simplification of contact definitions will in turn simplify communications, reduce confusion and increase compliance among those who are willing to comply. Appropriate time and processes for quality feedback will ensure that the response aligns with good public health practices and will ensure that key information is filtered up to the decision-makers.			
		Recommended timeframe	**Suggested accountable agency/group**
Key recommendations	The new contact definitions should be removed. Individuals should simply be aware of whether they are a close or a casual contact and what, for the particular outbreak, they need to do, as defined in the outbreak plan.	Immediate	Ministry of Health
Other recommendations	Improved communications, especially allowing appropriate time for quality feedback, are needed across the response, taking into account the concerns raised in the communications theme in this report. As part of this, a process should be agreed whereby the release of information to		COVID-19 Chief Executives Board

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	Wellington should be guided by whether it is in the best interests of the outbreak response at the time.		
	If contacts end up being managed outside of the 'outbreak area' because they are physically located outside the outbreak area, notification of the local PHU of that area should be mandatory, regardless of whether the information is accessible on NCTS.		Ministry of Health

EXTERNAL EXPERT INPUT			
System-level outcome			
Strategic and operational plans and decisions will be based on up-to-date scientific evidence and knowledge which will increase the likelihood of optimal COVID-19 Response System outcomes.			
		Recommended timeframe	**Suggested accountable agency/group**
Key recommendation	Nationally important documents and plan changes should undergo mandatory expert external peer review in their planning and completion, monitored by the Minister for COVID-19 Response's office.	Immediate and ongoing	COVID-19 Chief Executives Board
Other recommendations	A small group of experienced Medical Officers of Health, who are currently in public health unit practice, should be appointed in an advisory capacity to provide public health specialist review and input into any decisions and plans that require operational changes to be made.		Ministry of Health

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	Given the complexity and unknowns around the future planning that is needed, epidemiology and public health specialist expertise should be introduced on the Governance Group for modelling and increased on the Steering Group for modelling, to make sure that the questions that drive modelling work are optimal and informed directly by a range of specialist views.		Ministry of Health
	The role of wastewater testing during an outbreak should be properly refined and subjected to expert peer review.		Ministry of Health

WELFARE, EQUITY AND DIVERSE COMMUNITIES			
System-level outcome			
COVID-19 is less likely to increase or introduce hardship and exacerbate societal inequities (particularly economic and health). The stigma and discrimination experienced by South Auckland communities (or other communities that experience future outbreaks) will be reduced.			
		Recommended timeframe	**Suggested accountable agency/group**
Key recommendation	The design of interventions needs to ensure equity and access for diverse communities, whānau centred wellbeing metrics are required for monitoring and evaluation, and all messaging should reflect the hard work and collective action of the South Auckland community.	Immediate and ongoing	COVID-19 Chief Executives Board

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Other recommendations	An approach to efficient rapid needs assessment at initial phone contact should be explored and piloted, to capture needs that are immediate as well as those that are likely to come up over the following days.		Caring for Communities
	The wrap around support approach should be standardised, where possible, across the country, while being sensitive to the needs of populations such as South Auckland.		Caring for Communities
	Access to testing should be optimised for those who continue to have restricted access. Privacy issues at stand-up facilities should be identified and resolved.		Ministry of Health

EVALUATION AND MONITORING			
System-level outcome			
Improved evaluation and monitoring will increase the quality of information that goes into policy and planning development, and strategic and operational decision-making. This will ensure that the COVID-19 Response System continuously improves, and the risk of adverse outcomes is lessened.			
		Recommended timeframe	**Suggested accountable agency/group**
Recommendations	The IMT and other internal reviews of the Ministry should be rationalised into one review, and the recommendations and action points integrated as part of that. The method should be formalised and include a full epidemiological summary and analysis of the outbreak. With		Ministry of Health

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	respect to the recent outbreak, an epidemiological analysis should be presented to the Minister for COVID-19 Response. This should address key questions around the transmission of the UK variant in this outbreak and the utility of and the risk associated with the early aggressive approach. It should explore specific practices such as the justification for broad application of isolating contacts of contacts and the need for asymptomatic casual contacts to isolate until they have a negative test result.		
	The decisions to change alert levels, especially the second Alert Level 3 in the Outbreak, should be critically reviewed and reported on to the Minister. This should include the modelling that informed the decisions and take into account the fact that the second level 3 lockdown decision was made when Auckland was already at Alert Level 2 and the key case of concern had a known source. As part of this, unconscious bias with respect to changing alert levels and the South Auckland population should be explored.		Department of the Prime Minister and Cabinet
	The COVID tracer development team should review the utility of the App from the recent outbreak and make adjustments accordingly,		Ministry of Health

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	in consultation with ARPHS in particular.		
	Risk settings for workers at the border should be reviewed and adjusted for the workplace of the outbreak's index case and similar workplaces.		Border Executives Board
	Performance Indicators that consider person and family centred metrics about how people are enabled to comply, and outcomes of isolation/quarantine should be explored for inclusion in the completion of the plan for the early aggressive response to an outbreak.		Ministry of Health
	All recommendations from this and previous reports should be translated into planned actions and these should have a clear target date for completion. They should then be actively monitored and reported upon to the Minister for COVID-19 Response regularly (monthly is recommended, as maintaining status of a list that is established should not be cumbersome). It is unlikely that 100% of recommendations prove to be useful. This simply needs to be made clear, with justification.		Department of the Prime Minister and Cabinet

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Appendices

Appendix A	List of documents reviewed for this report
Appendix B	List of those interviewed for this report
Appendix C	Initial preliminary summary of ARPHS learnings and actions from the Feb Outbreak (source ARPHS)
Appendix D	Ministry of Health Update of previous recommendations

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APPENDIX A: List of documents reviewed for this report

Agency	Document title
Auckland Regional Public Health Service	Informal documentation on their internal review of the Outbreak
Department of the Prime Minister and Cabinet	AOG COVID-19 message grid – 14 February 2021
Department of the Prime Minister and Cabinet	COVID-19 National Resurgence Response Plan v1.0 December 2020
Department of the Prime Minister and Cabinet	How are you feeling, Auckland – Moana Research 12 March 2021
Department of the Prime Minister and Cabinet	Sentiment in Auckland and South Auckland - TRA
Department of the Prime Minister and Cabinet	Summary of Auckland Research
Ministry of Health	Manatū Hauora COVID-19 Resurgence Plan Version 3.0B Draft 19 April 2021
Ministry of Health	Auckland February Outbreak 2021 – Internal Review of the Auckland February Outbreak 2021 Response
Ministry of Health	Aotearoa New Zealand's COVID-19 Testing Plan – Published 26 January 2021
Ministry of Health	Aotearoa New Zealand's COVID-19 Surveillance Strategy – Published 26 January 2021
Ministry of Health	COVID-19 Testing Guidance for the health sector – Effective 4 March to 14 April 2021
Ministry of Health	COVID-19 Weekly Surveillance Reports – Week ending 7 March 2021 – 21 March
Ministry of Health	Genome data from the February Auckland Cluster – current state of knowledge and scenarios – 24 February and 28 February 2021
Ministry of Health	STA COVID-19 Pātaka Knowledge Hub – COVID-19 Science Updates 12 March - 26 March 2021
Ministry of Health	STA COVID-19 Pātaka Knowledge Hub – Request for Advice – 26 March 2021
Ministry of Health	COVID-19: Guidance on contact categories and their management – 07 April 2021 Version 3.4
Ministry of Health	COVID-19 Latest COVID-19 health key messages – 14 February 2021
Ministry of Health	Auckland February Outbreak 2021 – Internal Review of the Incident Management Team Response

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APPENDIX B: List of those interviewed for this report

Agency, organisation or role	Interviewee name
Auckland Regional Public Health Service	s9(2)(a)
Auckland Regional Public Health Service	s9(2)(a)
Auckland Regional Public Health Service	s9(2)(a)
Department of the Prime Minister and Cabinet	Ben White
Department of the Prime Minister and Cabinet	Cheryl Barnes
Department of the Prime Minister and Cabinet	Graham MacLean
Healthline	s9(2)(a)
Healthline	s9(2)(a)
Mangere Budgeting Services	s9(2)(a)
Ministry of Health	s9(2)(a)
Ministry of Health	s9(2)(a)
Ministry of Health	s9(2)(a)
Ministry of Health	s9(2)(a)
Ministry of Health	s9(2)(a)
Ministry of Health	Dr Ashley Bloomfield
Ministry of Health	s9(2)(a)
Ministry of Health	s9(2)(a)
Ministry of Health	s9(2)(a)
Ministry of Health	s9(2)(a)
Ministry of Social Development	s9(2)(a)
Ministry of Social Development	s9(2)(a)
Northern Region Health Coordination Centre	s9(2)(a)
Northern Region Health Coordination Centre	s9(2)(a)
Northern Region Health Coordination Centre	s9(2)(a)
Northern Region Health Coordination Centre	s9(2)(a)
Northern Region Health Coordination Centre	s9(2)(a)
Papatoetoe High School	s9(2)(a)
Pasifika Futures (Whanau Ora Commissioning Agency)	s9(2)(a)
Pasifika Futures (Whanau Ora Commissioning Agency)	s9(2)(a)
Pasifika Futures (Whanau Ora Commissioning Agency)	s9(2)(a)

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South Auckland primary care provider	s9(2)(a)
Te Kawa Mataaho Public Service Commission	Peter Hughes
Te Kawa Mataaho Public Service Commission	s9(2)(a)
Te Kawa Mataaho Public Service Commission	s9(2)(a)
Te Rōpū Whakakaupapa Urutā (National Māori pandemic group)	s9(2)(a)
Te Rōpū Whakakaupapa Urutā (National Māori pandemic group)	s9(2)(a)
Te Rōpū Whakakaupapa Urutā (National Māori pandemic group)	s9(2)(a)
Te Rōpū Whakakaupapa Urutā (National Māori pandemic group)	s9(2)(a)
Te Rōpū Whakakaupapa Urutā (National Māori pandemic group)	s9(2)(a)
Turuki Health Care	s9(2)(a)
Turuki Health Care	s9(2)(a)
Waikato District Health Board	s9(2)(a)
Waikato District Health Board	s9(2)(a)
Waikato District Health Board	s9(2)(a)

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APPENDIX C: Initial preliminary summary of ARPHS learnings and actions from the Feb Outbreak (source ARPHS)

What went well from a systems perspective:

- The improved ability of the parts to operate a whole of system approach – improved working with other PHUs, Healthline, NITC on areas such as agreeing release of information on locations of interest, contact classification and actions, and following the outbreak we have improved escalation pathways and processes
- The ability to utilise a national network of PHUs to support outbreaks which is ess ntia due to the other pressures on DHB surge workforce with MIF staffing, testing and now vaccinations as well
- The leverage of national system to support manaaki e.g. MSD however furth r wo k is required for this to operate efficiently and as part of the wider manaaki ne work – a key focus going forward is on how there can be better proactive support del ver when whole communities impacted and work with the current networks al eady in place and provide visibility to PHUs on this
- There have also been improvements on Intel working across the system between national, regional and local with agreed areas of responsibi ties nd boundaries
- Working with Papatoetoe High School - their re ponsiveness
- Rapid scale up and support from the metro Auckla d DHBs to support contact tracing.

What didn't go so well

- The impact of changing classification of contacts during an outbreak on the whole system (impacted on public information, perception, trust, capacity)
- the driver for information to be c nfirm d by media stand up timeframes rather than when public health risk assessment has been fully completed
- Negative media reporting which impacted on staff morale
- Expectation for complianc vi ts of contacts and the potential negative impact on ongoing public health relat onships with these people

Areas that ARPHS c uld be proactive in contributing to and planning for including OB control in post vaccina ion environment:

- Contribution to devel ping strategic national policy questions such as the following:
  - Impact f vacc nation on CCM and testing algorithms
  - Impac of vaccination on border opening/elimination strategy
  - Impact of vaccination pockets on equity of COVID immunity and hence population response
  - Impact of border opening on re-emergence of other diseases (flu, measles etc)
  - Managing non-COVID outbreaks whilst we have CRU operating
  - Likely staffing changes as other fields re-hire staff to other areas and ARPHS deals with fall-out of staff who left when their roles became COVID-support roles to some extent (e.g. policy and HIT teams)
  - Likely population health changes post-pandemic- impact on poverty, alcohol use, mental health etc

Areas ARPHS could be actively involved in for central planning including implications of any move from elimination strategy

- Refer to list above and also:

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- Development of centre of outbreak response excellence due to ARPHS knowledge and experience
- COVID policy development especially with borders opening/quarantine free travel
- The impact of a national Public Health Agency impact on Public Health workforce (nationally and locally) and surge readiness
- Public Health intelligence especially local/regional views

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APPENDIX D: Ministry of Health Update of previous recommendations

Information request on behalf of the Covid-19 Continuous Improvement Review and Advice Group – Update on status of previous recommendations

Surveillance and testing report (September 2020)			
Recommendation	**Assigned**	**Action Assigned**	**Status**
1. There needs to be more consistent use of language in Ministry of Health documentation on COVID-19 surveillance and testing, with new versions of documents being more clearly identified so changes can be easily tracked. There should always be a current complete set of documentation easily available on the Ministry website.	Science and Insights & Comms	The COVID-19 Surveillance Strategy and testing plan were reviewed & updated in November 2020; new documents were posted on the MOH website in January 2021: https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-response-planning/covid-19-surveillance-strategy https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-response-planning/covid-19-testing-plan-and-testing-guidance. Key changes incorporated in the surveillance strategy include • an explicit objective for the timely identification of cases and contacts for public health management, identified as a key driver for the rest of the surveillance activity • an explicit objective to monitor and ensure equity	**Completed** - A further review of the Surveillance Strategy and Testing Plan is due by June 2021. As part of that process a further check of consistency of language will be completed.

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		• a new objective to engender public and stakeholder confidence and participation in the p ndemic response • greater clarity on surveillance activities that will be undertaken. The testing plan has not changed signifi antly but has been simplified to outline the approach for esti g at a high level. During the review, the Minis ry identified an opportunity to simplify the suite of strategies plans and guidance and has renamed the documents to better reflect their purpose.	
2. Accountability lines should be clarified and be more explicit. While the Ministry of Health should clearly continue to be the lead agency in determining policy positioning and the setting of standards which need to be met with regard to all surveillance and testing strategies, other agencies and stakeholders should be given accountability, particularly in relation to designing and	Covid-19 Directorate DCE & ODPH Directorate & DPMC Covid-19 Response DCE	MOH works closely with DHBS and their Public Health Units (PHUs) to support them to implement or assist in their implementation of sur eillance ctivities. ESR co lect the COVID-19 notifications on the MoH's behalf (as a notifiable infectious disease to the medical officer of health under the Health Act 1956). This is collected from registered health practitioners and/or laboratories, loaded into EpiSurv so the data can then be analysed. There are key relationships between ESR, the PHUs and ODPH and the PHUs in relation to infectious disease surveillance and in the case of COVID-19; the laboratories and PHUs.	**Ongoing**

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implementing operational elements.			
3. There should be updated surveillance and testing plan which has benefitted from the input of a broader range of public health expertise and should also address forward workforce planning.	Science and Insights	The COVID-19 Surveillance Strat gy and testing plan was reviewed & updated in November 2020. T is incorporated input from a broad range of publi health areas, including ESR and the Ministry's COVID 19 Technical Advisor Group, which includes Public Health and Epidemiological expertise from Across New Zealand and the wider Ministry. The refresh of the strategy will have input from an array of stakeholders (DHBs, PHUs, PHOs, EPI TAG, Review Group, Consumer Group, M nist rial SPHAG, MIQ TAG, Medical Officer Health, ODPH, Testing Ops, ESR, EP, CSA, Policy, Response, Māori directorate, Pacific Directorate and MIQ ops)	**Completed –** testing and surveillance plans are reviewed on an ongoing basis
4. The testing plans should have clear and consistent messages for the public so that the basic strategy does not change over time. The core message should be that anyone w th	GM Testing	This is the way that testing plans and guidelines are operationalised. As part of the November 2020 review, the Ministry identified an opportunity to simplify the suite of strategies, plans and guidance and to rename documents to better reflect their purpose. The Surveillance Strategy provides an overview of all our surveillance activities, the Testing Plan outlines the range of tests and their role, and the regularly	**Completed**

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symptoms should have a test, then additional messages aimed at particular population groups may change over time.		updated Testing Guidelines for clinicians explain how testing is targeted to particular groups. The website also co tinues to encourage people with symptoms to have a test. There is a regular fortnightly review p oces including ODPH, science & insights and communications to ensure appropriate advice to the health sector and the public.	
5. Priority should be given to broadening the range of testing methodologies employed. In particular, saliva testing as a complementary methodology should be introduced as soon as possible to increase acceptability of testing across workforces and the community.	Strategy & GM Testing	We continue to review testing methodologies and their use in the surveillance strategy, th most recent review was February 2020.	**Completed**
6. Every effort should be made to steadily reduce the turnaround time for delivering test results so that regular testing becomes more effective.	GM Testing	Several initiatives have been implemented to reduce turnaround time for test results, this includes the roll out of electronic ordering (paperless, streamlining of pre-analytical processes and reduction in duplication of data entry). There has also been a move to use the Connected Health Network which supports real-time delivery of results from labs to MoH. We have increased the information available about	**Ongoing**

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		where to get a test on the Ministry/DPMC websites a d have undertaken improvements to the COVID-19 trace app Further work has been done to look at acces for Māori (see HR20210606).	
7. The importance of community engagement in the design and delivery of ongoing surveillance should be emphasised especially amongst Māori and Pacific communities and wherever possible DHBs should be given the flexibility to design and implement surveillance and testing regimes and be held accountable for their delivery.	Science and Insights	As part of the November 2020 review m ltiple groups were consulted. This included the Ministry of He lth M ori and Pacific Directorates. Interactive dashboards that epo t on cases, border testing, community testing, contact tracing, nd ri k maps are widely available within the Ministry and t DHB Public Health Units (PHU) and to some Primary Health Organisa ions (PHO) which encourages local adaption. Our Pacific Health t am has undertaken reviews of our Pacific response and have adapted new actions as a result. The Pacific Hea th team has conducted two rounds of research post the Augus outbreak with Pacific families in South Auckland. This identified a range of insights on how to improve future response and management activities. A few key adjustments we've made to date for the Pacific COVID-19 response include: • Early engagement with Pacific leaders at ARPHS/NRHCC to provide support and to ensure consistency across regional and national response activities.	**Ongoing**

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		• Greater focus on social and mental wellb ing support for families, especially those in managed isolat on. • Clarity and consistency between loca and national communications, that go out t the public and wider health sector.	
8. The Committee believes that in future any changes to the testing plan and criteria for testing, including during an outbreak, should include input from the Director of Public Health and be subject to the following: • Rapid peer review by the epidemiology reference group, including Māori and Pacific expertise, and possibly other external experts; • Consultation in relation to the ability to operationalise and message the change; • Formal adjustment of all relevant documentation and	Science and Insights	The Director of Public Healt and othe s from within the office have and will be invited to have input in all changes to the Testing Plan. They are also members of the In ident Management Team during an outbreak and c ntribute t decisions made about testing. The Epidemiology Subgroup of the Technical Advisory Group has been disbanded (as have all the Subgroups), but its previous members form part of the Expert Advisory Network, which is drawn upon for input, as we r view the Surveillance Strategy and Testing Plan. The Ministry also has epidemiologists in the Science & Insights group that provide day to day and long-term advice around testing technologies.	**Ongoing**

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• A proper process to ensure all messaging and Healthline guidance are adjusted in real time and are appropriate.			

Recommendations from last Auckland outbreak rapid review			
Recommendation	**Assigned**	**Action Assigned**	**Status**

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1. A programme of stress testing should continue, as should the ongoing implementation of the other recommendations of the previous CTAC report. That stress testing should involve a variety of scenarios such as a church event, a residential apartment block of a community event. The diversity of the scenarios should be designed to test preparedness and response. It may not be possible to stress test every scenario in good time. So, it would be useful for list of scenarios and associated plans to be available. For example: what exactly is the plan when there is a case or cases in an apartment block, such as occurred more recently? Not : The response to this	GM Response & DPMC Covid-19 Response	Over the past 14-months the system has been 'stress-tested' regularly, this includes a range of community outbreaks that have provided in-depth and tangible lessons learned to apply in future responses. A national sector ba ed 'st ess-test' was planned for August 2020, however this was cancelled due to the August Auc land outbreak. Since August, there has been sev ral d stinct outbreaks that the National Investigation and Tracing Centre (NITC) and the sector have had to manage. Following each outbreak, debriefs are held to ensure reflection and key learnings are identified and applied. All PHUs have been involved in actively contributing to outbreak management, whilst the outbreaks have primarily occurred in the Auckland region, this process has seen involvement from PHUs across the country managing contacts e.g., follow up of symptomatic contacts by the PHUs.	**Ongoing**

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recommendation is shared with other recommendations		SOPS and MOUs have been developed fo lowing outbreaks, one such example has bee in the approach to managing apartment blocks or working with schools. PHUs have provided feedba k that their involvement in managing contacts has pr vided real-time learning and local capability has been able to improve as a result. An extensi resurgence planning exercise occurred in November and December 2020 with key documents and processes updated to reflect the summer holidays. This included planning for outbreaks at summer sites and holiday hot spots. Further testing and scenario planning also took place in April 2021, pending the introduction of quarantine free travel with Australia.	

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2. The capacity and financial sustainability of the Public Health Units needs to be urgently addressed and provision of human and financial resource adjusted accordingly with a 24-36 month timeline in mind. The need for a sustainable funding model that addresses both historical funding issues and the additional pressures from COVID-19 needs to be considered by Ministers as a matter of priority.	Population Health and Prevention National Contact Tracing programme development work	The Ministry is due to finalise and announce COVID-19-related funding for the 2021/22 finan al year. This also includes considering an initiative to support additional placements in PHUs for adva ced trainees in the public health medicine specialist training programme. The Ministry is also currently evi wing the tenure of PHU contracts in prepara i n fo core contract renewal for the 2021/22 financial y ar. Contracts will not be finalised until after Budge 21 decisions are announced.	
3. Work to achieve a common understanding within the system as to what the actual capacity is within the system and the time frames and requirements for it to be deployed as part of any surge capacity. Note: The response to this recommendation is	GM NITC	Over the course of 2020, the NITC developed a national preparedness plan for case investigation and contact tracing. This was in response to Dr Ayesha Verrall's rapid audit on contact tracing. The plan outlined how the NITC and PHUs would work together across the system to manage up to 1000 cases per day. The planning assumptions for this level of capacity were based on a relatively small number of contacts per case and the NITC worked with each PHU to understand how we would	**Completed - ongoing**

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shared with other recommendations.		increase capacity to a target level. Ea h PHU were asked to build a surge workforce. A delegation framework was cri ical to enable contact tracing work distribution across the system. The NITC worked with the PHUs to establish a national delegation model to enable safe and consistent assignment of contact ma agement work between PHUs and the NITC during c mmunity outbreaks. The delegation model was activat d fo both the August 2020 and November 2020 outbreaks as well as the January 2021 and February 2021 Auckland outbreak to support ARPHS to manage the response. The recent community outbreaks of January 2021 and February 2021 (in particular) have highlighted that the number of contacts we have actively followed up and managed is far higher than the assumptions in the original capacity plan. It is the Ministry's view that a more appropriate measure of the contact tracing systems capacity is the number of contacts that can be managed in a timely manner. Our experience to date demonstrates	

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		that the contact tracing system is able sc le quickly and can respond to and manage large con act numbers. As well as increasing loca capac ty within PHUs, the NITC has worked alongside re resentatives from the 12 PHUs to develop the COVID 19 National Outbreak Response Teamwork programme. Work is currently underway to formalise the arrangements of the work programme. The cap city nd apability that the contact tracing system require will dapt as borders open through the establ shment of quarantine free travel zones (QFTZ). Following the February 2021 outbreak, the NITC managed 6 500 contacts over a short period of time. Since then th re has been a focus on ensuring New Zealand's contact tracing system has the capacity to manage wider community outbreaks. From January 2021, alongside managing outbreaks, the NITC has progressed the following key pieces of work to enhance contact tracing capacity, including: • The development of a comprehensive referral protocol to escalate and actively manage groups	

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		that require follow-up, including home visits if required and to; • Refine the criteria and ra ge of public health measures that may be used to manage any potential transmission o disease within a managed iso ation facility (MIF).	
4. Communications between the Ministry and the PHUs around outbreak management should continue to be optimised which reinforces the previous recommendations around accountabilities and decision rights.	Group Manager Response & Director ODPH	PHUs engage with Māori and Pacific health leaders, iwi, hāpu an thei c mmunities to determine appropriate loc l solution and support is in place to ensure equitable outcomes for Māori and Pacific communities. The Pae Ora model, developed within ARPHS, supports Māori staff to be directly involved in contact tracing for Māori. In addition, the Ministry has contracted a Whānau Ora Commissioning Agency to enable access to alternative contact details for Pacific contacts in the community and to provide wraparound manaaki/welfare services. The NITC has an enhanced third-party provider capability that has increased the diversity of the workforce and has enabled matching callers based on ethnicity of contact when known.	**Ongoing**

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		There have been increased manaaki/welf re requirements identified due to the demographics of both the August 2020 and February Auckland 2021 utbreaks. Following a hui held with a wide range of internal and external stakeholders in January 2021, an equity reference group was established to support the COVID-19 public health strategic and operat onal work programme. The reference group combines public health projects across the COVID-19 directorate the Population Health and Prevention directora e and the public health transformation programme. The reference group meets regularly to provid feedback and input into planned workstreams and identifies how equity can be strengthened. An example of this input has been seen in the service sp cification that forms the basis of contracts with PHUs, and how they can increase contact tracing capacity for COVID-19. We have the Māori COVID-19 plan and the Pacific plan. The COVID-19 directorate has developed its Equity Plan and has received feedback through various huis and engagements that have helped us to better understand how we can continue to support Māori and Pacific communities. Pathways are now in place with each PHU to ensure the provision of assistance with the focus on Māori, Pacific and vulnerable populations.	

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CTAC report in mid-2020			
Recommendation	**Assigned**	**Action Assigned**	**Status**
1. The Committee considers that the semi-autonomous nature of operation of the Public Health Units (PHUs) together with their historical underfunding are problematic with respect to optimising the COVID-19 response (the response). The Ministry of Health (the Ministry) as the leader of the he th	Covid-19 Directorate, DDG Deborah & AOG	The role of public health and how public health is organised is part of a wide health and disability system. The COVID-19 response has provided unique opportunity to work on a national level to manage lo al o tbreaks. This has been enabled by the development of a national information technology platform, of which the National ontact Tracing Solution (NCTS) is a key piece of infrastructure. The NITC provides a central leadership and coordination function as well as an operational service that supports contact management. Through 2020 and 2021 there has been a significant body of work undertaken to strengthen the national public health network. This has	**Ongoing**

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system, needs to exert a stronger mandate to ensure a seamless, aligned national approach. Greater clarity is required over accountabilities and decision rights.		been a collaboration across different parts of the Min stry and resulted in creation of a Covid-19 Health System Response directorate.	
2. The Committee recommends that, as a matter of priority, the surge capacity of the system should be stress-tested. Novel assessment approaches may be needed in the context of zero case numbers. Note: The response to this recommendation is shared with other recommendations	GM NITC Directorate ODPH	Over the past 14-months the system has been 'stress-tested' regularly, with a range o community outbreaks. This has provided in-depth and tangible lessons hat will be applied in future responses. A nat onal s c or based 'stress-test' was planned for August 2020, how ver this w s cancelled due to the August Auckland outbreak. Since August, there have been a number of outbreaks which the NITC and the sector have been actively involved in managing. Following ach outbreak, debriefs are held to ensure reflection and key learnings are identified and applied. All PHUs have actively contributed to the management of outbreaks. These outbreaks have predominantly occurred in the Auckland region but have also involved PHUs across the country managing contacts e.g., follow up of symptomatic contacts by the PHUs.	**Ongoing**

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		PHUs have provided feedback that their involvement in managing contacts has provided real time learning with loca capability improving as a result.	
3. The Committee recommends that continued effort and focus should be given to the detailed preparedness plans being developed by individual PHUs. Note: The response to this recommendation is shared with other recommendations.	GM NITC & GM Response	Over the course of 2020, the NITC developed a national preparedness plan for case investigation a d c ntact tracing. This was in response to Dr Ayesha Verrall's rapid audit on contact tracing. The plan outlined how the NITC and PHUs would work together across the system to manage up to 1000 cases per day. The planning assumptions for this level of capacity we e ba d on a relatively small number of contacts per case and the NITC worked with each PHU to understand how we would increase capacity to a target level. Each PHU were asked to build a s rge workforce. A delega ion fr mework was critical to enable contact tracing work could be distributed across the system. The NITC worked with the PHUs to establish a national delegation model to enable safe and onsistent assignment of contact management work between PHUs and the NITC during community outbreaks. The delegation model was activated for both the August 2020 and November 2020 outbreaks as well as the January 2021 and February 2021 Auckland outbreak to support ARPHS to manage the response. The recent community outbreaks of January 2021 and February 2021 (in particular) have highlighted that the number of contacts we have actively followed up and managed is far higher than the assumptions	**Completed - ongoing**

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		in the original capacity plan. It is the Ministry's view that a more appropriate measure of the contact tracing systems capacity is the number of contacts that can be managed in a timely manner. Our experience to date demonstrates that the contact tracing system is able scale quickly and can respond to and m nage large contact numbers. As well as increasing local cap city within PHUs, the NITC has worked alongside representative from the 12 PHUs to develop the COVID-19 National Outbreak Response Teamwork programme. Work is currently underway to f rmali e the arrangements of the work programme. The capacity and cap bility that the contact tracing system requires will adapt as borders op n through the establishment of quarantine free travel zones (QFTZ). Following the February 2021 outbreak, the NITC managed 6,500 contacts over a short period of time. Since then there has been a focus on ensuring New Zealand's contact tracing system has the capacity to manage wider community outbreaks.	
4. The Committee recommends that the Contact Tracing system more strongly reflects the needs of Māori, Pasifika and other vulnerable groups, including those in rurally isolated areas. There is more c pe o	GM NITC	PHUs engage with Māori and Pacific health leaders, iwi, hāpu and their communities to determine appropriate local solutions and support is in place to ensure equitable outcomes for Māori and Pacific communities. The Pae Ora model, developed within ARPHS, supports Māori staff to be directly involved in contact tracing for Māori. In addition, the Ministry has contracted a Whānau Ora Commissioning Agency to enable access to alternative contact details for Pacific	**Ongoing**

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employ and/or utilise staff and systems within already established Māori and Pasifika health and social service providers where these providers have existing links to their communities. The system should also identify and meet specific needs of Māori and Pasifika (e.g. alternative isolation arrangements or more language options).		contacts in the community and to provide wraparound manaaki/welfare services. The NITC has an enhanced third-party provider capability that has increased the diversity of the workforce and has enabled matching callers with based on ethnicity of contac when known. There have been increased manaaki/w lfare requirements identified due to the demographics of bo h the August 2020 and February Auckland 2021 outbreaks. Following a hui held with a wide range of internal and ext rnal takeholders in January 2021, an equity reference group was established t support the COVID-19 public health strategic and oper tional work programme, that combines public health projects across the COVID-19 directorate, the Population Hea th and P evention directorate and the public health transfo mation programme. The reference group meets regularly to prov de feedback and input into planned workstreams and identifies how equity can be strengthened. An example of this input has been seen in the service specification that forms the basis of contracts with PHUs, and how they can increase contact tracing capacity for COVID-19. We have the Māori COVID-19 plan and the Pacific plan. The COVID-19 directorate has developed its Equity Plan and has received feedback through various huis and engagements that have helped us to better understand how we can continue to support Māori and Pacific communities. Pathways are now in place with each PHU to ensure the	

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		provision of assistance with the focus on Māori, Pacifi and vulnerable populations.	
5. The Committee recommends that the Ministry should be instructed to clarify and, if necessary, tag the funding directly to PHUs so District Health Boards (DHBs) are just a pass through.	GM NITC	To enable PHUs to respond to the COVID-19 pandemic, one-off funding of $30 million was allocated v a tw separate tranches of $15 million in March 2020 and October 2020. This funding was to support PHU capacity and capability aro nd contact tracing and preparedness for 2019/20 and 2020/21. On 2 December 2020, the Cabinet Business Committee agreed to additional funding over 2020/2021 and 2021/2022 to suppo t th ongoing health system response to COVID-19. Part of this funding will be provided to the PHUs to maintain and adapt their conta t tracing capacity and response planning. Financial reporting will be a p rt of contract monitoring.	**Ongoing**

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6. The Ministry of Health should develop a COVID-19 outbreak preparedness plan that includes how to rapidly scale case identification and contact tracing and regain control. The plan should specify the task-shifting arrangements between PHUs and NCCS and any additional resource required to deal with up to 1000 cases per day while maintaining high performance. Note: The response to this recommendation is shared with other recommendations.	GM NITC	Over the course of 2020, the NITC developed a national preparedness plan for case investigation and contact tracing. This was in response to Dr Ayesha Verrall's rapid audit on contact tracing. The plan outlined how the NITC and PHUs would work together across the system to manage up to 1000 cases per day. The planning assumptions for this level of capacity were based on a relatively small number of contacts per case and the NITC worked with each PHU to understand how we would increase capacity to a target level. Each PHU were asked to build a surge workforce A delegation framework was critical to enable contact tracing work distribution across the system. The NITC worked with the PHUs to establish a national delegation model to enable safe and consistent assignment of contact management work between PHUs and the NITC during community outbreaks. The delegation model was activated for both the August 2020 and November 2020 outbreaks as well as the January 2021 and February 2021 Auckland outbreak to support ARPHS to manage the response. The recent community outbreaks of January 2021 and February 2021 (in particular) have highlighted that the number of contacts we have actively followed up and managed is far higher than the assumptions in the original capacity plan. It is the Ministry's view that a more appropriate measure of the contact tracing systems capacity is the	**Completed**

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		number of contacts that can be managed in a timely manner. Our experience to date demonstrates that the contact tracing system is able to scale quickly and can respond to and m nage large contact numbers. As well as increasing local capaci y wit in PHUs, the NITC has worked alongside representatives from he 12 PHUs to develop the COVID-19 National Outbreak Response Teamwork programme. Work is currently underway to formalis the arrangements of the work programme. The capacity and capability h t the contact tracing system requires will adapt as borders open through the establishment of quarantine free travel zones (QFTZ). Following the February 2021 outbreak, the NITC managed 6,500 contacts over a short period of time. Since then there has been a focus on ensuring New Zealand's contact tracing system has the capacity to manage wider community outbreaks.	
7. The Committee recommends that the Ministry should both lead and accelerate the exercise of establishing standard operating procedures to be adopt d nationally acro the	GM NITC GM Response	The NITC are collaborating with PHUs to develop a suite of national SOPs to support the national implementation of contact tracing and case investigation. This will also provide guidance of expectations for PHUs. Specific SOPs have been developed across a range of response activity, inclusive of:	**Ongoing - It is anticipated that the case investigation and contact tracing SOPs work will be**

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health system. Some form of standardisation and/or normalisation is very important both to understand what is going on and where the emerging pressure points are and to assist the easy transfer of staff across PHUs as volume and need requires – the less variation across PHUs, the lower the learning curve for those involved. The new standard operating procedures should be developed in consultation with PHUs to understand and incorporate what works on the ground.		• Use of genome sequencing. • Enhance sit rep and case investigation repor ing. • Enhanced alert level advice protoc ls. An extensive planning exercise was he d regarding resurgence planning with every DHB and PHU present to contribute and review plans.	**completed by end of June 2021.**
8. The Committee encourages the Ministry to look beyond the immediate caseload an to take a worst-case	NITC GM Response	Ensuring a cohesive approach to infectious disease management is part of the work undertaken by the Public Health and Primary Care Transformation directorate.	**Ongoing**

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scenario and plan appropriately. A well-functioning community and economy needs a high-quality well-informed and resourced Contact Tracing system as both a disease control measure and an insurance plan. This can also be extended to other communicable diseases such as the measles outbreak in 2019.		There is an extensive body of work underway that looks to balance the requirements for prompt response management under QFT arrangements and the New Zealand Vaccination Programme. An internal group within the Ministry works to ensure effective public health advice. The Ministry is actively supporting AOG and policy work in this area.	
9. The committee recommends that it be made clear, and the public are clear on, who will lead a specific outbreak response and be the go to person for public engagement. This may be a different person in different regions, of course.	GM Response	As our system has evolved, the Response structure has also developed. The Incident Management Team (IMT) is the lead within the Ministry, with representatives from the relevant agencies involved as well as the PHUs. There is an expectation that the Ministry will manage national expectations whereas the PHU will manage regional expectations. There is extensive collaboration to ensure effective national and regional response.	**Ongoing**

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a. Outbreak scenario planning, with specific scenarios identified at the border and in the community, including a holistic approach to outbreaks that include plans for regional alert level changes, travel restrictions etc, and the provisional triggers for decisions on each to be made. The key responsibilities and who is allocated them should be clear.	GM Response GM Planning & Advisory	With regard to personal travel exemptions: A TTX had been scheduled to explore system and process design changes ba ed on our learnings from August. This didn't happen earlier due to th scenario happening twice with the two alert level changes f r February and March. Learnings from these two instances have fed into ongoing process of improvement and will continue to be refi ed during 'peace' time when the team's capacity allows.	
b. Stress-testing. In addition to basic individual component stress-testing: starting with a relatively small 'artifical outbreak' the whole system response should be stress-tested. Creating an artificial outbreak may require expert input to optimise its design. Public communicat on will need to be a key	GM Response GM Planning & Advisory	Over the past 14-months the system has been 'stress-tested' in regular y, with a range of community outbreaks. This has provided in-depth and tangible lessons that will be applied in future responses. A national sector based 'stress-test' was planned for August 2020, however this was cancelled due to the August Auckland outbreak. Since August, there have been a number of outbreaks which the NITC and the sector have been actively involved in managing. Following each outbreak, debriefs are held to ensure reflection and key learnings are identified and applied.	**Ongoing**

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component. Note: The response to this recommendation is shared with other recommendations.		All PHUs have actively contributed to the managem nt of outbreaks. These outbreaks have predominantly occurr d in he Auckland region but have also involved PHUs across the country managing contacts e.g., follow up of symptomatic ontacts by the PHUs. PHUs have provided feedback th t their involvement in managing contacts has provid d real tim learning with local capability improving as a result	
c. A full risk identification and risk mitigation document should be brought together and subjected to expert review across the range of disciplines involved.	DCE COVID-19 Response	There has been a r cent review and overhaul of risk register content across all function areas. This has enabled the reduction of listed risks to be reduced. Most risks have been closed and some have been redefin d as a tive issues for resolution. Thi work has further been broken down into themes and aligned to the Ministry risk matrix. This is now is part of a coordinated regular SLT review update, that then allows for better distribution of resource and prioritisation of work. The risk management system currently in use has been reconfigured to best align with the vaccination and MBIE's risk and issues management systems. MOH are also exploring a dedicated and more fit for purpose CAMMS risk management platform.	**Completed - ongoing**

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A-K Recommendations			
Recommendation	**Area**	**Action Assigned**	**Status**
A. Active central documentation archive.	Advisory & Planning	The Ministry of Health have rolled out M365 which provides a platform for a central documentation archive. One Drive document storage, SharePoint Sites and soon Teams will allow for access to the central documentation archives. The next point of action is to plan and implement the change management/platform migration in how teams can utilise the central documentation archives to integrate efficient single source of truth information into daily operations.	**Ongoing**
B. Stronger Maori outbreak management capacity, available on a national scale. Although more Maori leadership at all levels of the response is recommended.		Cultural advisors are included in the response. There is an ongoing body of equity work undertaken by the Directorate and feedback from this review will inform that wider work programme. The focus in this review was on how we could strengthen our equity response. The Ministry has given priority to working with Māori as Te Tiriti partners and set up an Establishment Advisory Group for the national public health system that has majority Māori and Pacific membership. Further options for partnership with Māori in the design, delivery and monitoring of public health services, are currently being explored with Whānau Ora organisations. The Ministry is also working with PHUs to strengthen their relationship with Mana Whenua.	**Ongoing**

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C. Improved timeliness of redeployment of staff into the contact tracing team. This needs to happen quicker.	s9(2)(a)	The February outbreak demonstrated the effective delegation of work throughout the country. This enabled New Zealand's contact tracing system to manage 6500 contacts, most of which were identified over a five-day period. This enabled the affected PHU to prioritise their work, to most effectively manage the response, and to then delegate specific tasks to other PHUs. This significantly reduced the need to redeploy staff across the country. Examples of delegated tasks include; the case investigation process within managed facilities, the follow-up of symptomatic contacts, as well as the use of Regional Public Health as an 'additional' team that ARPHS could utilise for the response management. During this response, some staff with specialised expertise were deployed to ARPHS at short notice to support the response, this proved to be an effective approach to national use of resources.	**Ongoing**
D. Engagement with Maori and Pacific communities around the dedicated facility for positive cases and their families, and other aspects. Collaboration should		The response decision framework is continually enhanced in consultation with the Directorate's equity advisor. Cultural advisors are also included in the response. There is an ongoing body of equity work that is being undertaken by the Directorate and feedback from this review will inform the wider work programme. The focus in this review is how we can strengthen our response with other ethnic groups.	**Ongoing**

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be the focus, not compliance.			
E. Optimisation of NCTS, including increasing ability to meet the needs of backwards and forwards source and cluster event risk mapping, through interaction with the NCTS team in Wellington.	s9(2)(a)	The NCTS redesign project is currently underway, this includes enhancements to support our ability to complete more comprehensive source investigation within the system, as well as improving the underlying model to complete monitoring activities and risk categorisation. The redesign project has involved comprehensive engagement with Public Health Working groups including Clinical Advisory groups. The project is scheduled to be implemented by July 2021.	**Ongoing**
F. Ongoing application of whole genome sequencing and related tools to outbreak management protocols.	s9(2)(a)	This has and will continue to be an integral part of outbreak management. Recently genomic sequencing has been crucial to identifying new variants of SARS-CoV-2 such as B.1.1.7 (originating in the UK), B.1.351 (South Africa) and P.1 (Brazil). Genome sequencing is critical to understand the prevalence of these variants in the global community and our MIQF. Phylogenic mapping has been used to understand genetic linkages between cases. SOPs have been developed to facilitate rapid modelling and to assist in decision making.	**Ongoing**

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G. Testing strategies to optimise early detection of an outbreak.	s9(2)(a)	Day 0/1 testing was implemented early in January 2021, to ensure that positive cases arriving at the border could be quarantined as soon as possible. In addition, voluntary saliva testing was made available for border workers in managed quarantine and dual use facilities on 25 January 2021 to improve surveillance among this group. The surveillance strategy has been reviewed and was published before Christmas. All testing models are regularly reviewed. The surveillance strategy is next due to be reviewed June 2021, and will be inclusive of public health clinicians and epidemiologists' input and review.	**Completed**
H. Continuing focus on quality and compliance of MIQs. And continuing improvement in cultural protocols.	GM Border & MIQ MBIE	**Continuing focus on quality and compliance of MIQs, and the continuing improvement of cultural protocols.** MIQF are based in five regions, with the health teams run by the respective DHBs. The support that each region offers varies considerably. There is very strong support offered to Māori returnees from Auckland, Rotorua and Hamilton RIQs. Auckland have put together a framework that outlines actions that lead to a more equitable situation for Māori. Rotorua and Hamilton have strong links with the local iwi, and work closely to ensure that support and resources provided to returnees are culturally appropriate. MBIE (who are in charge of the operations of MIQF), recruited a Director of Māori at the end of 2020 who is the national MIQF iwi liaison and advisor on cultural competencies. *Community Quarantine* We are currently writing service specifications to help inform decisions around managing and supporting quarantine/isolation of community cases and close contacts. These are still in draft but will include reference to what we are expecting in regard to placement and the wrap-around services. This includes:	**Complete - ongoing**

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		prioritising resources and mobilising Māori and Pacific providers to meet Māori and Pacific needs; addressing the complexities of language, culture, family and spiritual needs, and the financial impacts of self-isolation/quarantine; keeping families in one place as much as is possible, recognising the multi-generational and multi-family dynamics in these communities. **More detailed information about how the regions provide support** MIQF are based in five regions, with the health teams run by the respective DHBs. Each region has a different approach to supporting equity in MIQF, as outlined below: • **Auckland:** A MIQF framework has been developed that outlines actions that would lead to a more equitable situation for Māori. Some of these actions include access to cultural support through the Māori health team, welfare support for whānau at Jet Park and cultural support over the phone for Reo speakers. Additionally, there is access to bespoke solutions for Māori, including phone access to a Māori pharmacist, cultural support for unaccompanied minors and health screening that is now done in a more mana enhancing and understanding way. If there is a death in MIQ a kaumatua will go in and ensure the room is blessed before it is reused. • **Rotorua:** Lakes DHB utilise their wellbeing navigators to provide specific support to Māori in MIQ. The navigators are easily identifiable in bright shirts and have access to a vast range of resources to support returnees. They have good links with MSD, WINZ and emergency housing and can also provide Māori Health support, and culturally specific support to	

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		bereaved returnees. In addition, the Navigators support wellbeing and welfare needs, provide support to guests with onward travel and also engages the returnees with national events such as Māori Health week and Māori language week. The welcome pack provided to returnees on arrival gives returnees information on how to access Māori Health and wellbeing sources and provides national Māori Health foundation items. The Rotorua RIQ now has a good relationship with the local iwi (Te Arawa), but did have a few problems in the beginning due to the speed at which the hotels were required to be set up and open. This didn't allow for the opportunity to formally engage with iwi prior. There is Te Arawa representation in meetings twice a week and they have been involved in organising powhiri for the NZDF MIQ leads. The DHB consult iwi when hiring new wellbeing navigators and make sure resources provided are culturally appropriate. • **Hamilton** Waikato DHB have included Te Puna Oranga since the setup of the MIFs and have implemented a Pou Tiaki support service. Pou Tiaki are an integral and valuable part of the team who provide cultural support to returnees and workers within the facilities. They have helped returnees to attend Tangi via video link and supported whanau through bereavement. They have assisted with exemption applications and supported returnees who have needed to contact MSD with issues ranging from somewhere to outward accommodation to mobile phone access. In addition, Pou Tiaki support returnees with a number of cultural activities such as weaving, Ti Rakau and low impact Zumba, they are always there at arrivals and departures, to greet, welcome and farewell.	

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		• **Wellington** – CCDHB have an agreement with their Māori Health unit, if challenges arise they will be available to virtually work with either the staff, or the guest involved. • **Canterbury:** CDHB do not provide any specific support services or activities for Māori. Note that MBIE, who are in charge of the operations of the MIQF, recruited a Director of Māori at the end of 2020 who is the national MIQ iwi liaison and advisor on cultural competencies. More broadly in relation to continuous improvement, Ministry of Health leads the Infection Prevention and Control audits. There is an audit tool in place that is updated regularly based on the MIQ Operations Framework and IPC Standard Operating Procedures. This is regularly refreshed after each round of audits. An update to the audit tool is planned in the next few weeks to incorporate changes from the most recently updated MIQ Operations Framework and the IPC SOPs (due for release on 13 April). This will include updates to the framework and SOPs in response to the Pullman Incident Review (i.e. around controlling/reducing returnee movement). The updated tool will then be used for the next cycle of audits.	
I. Clarity over how the Wellington component of the leadership of an	Planning & Advisory	Adjustments have been made to documentation used and there has been attendance by subject matter experts at the IMT and All of Government response function meetings. Detailed risk assessment and checklist documentation is initiated via IMT activations (listed within SOP's). Strategic	**Ongoing**

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outbreak sits with the Director of Public Health specialists - who are more clearly designated to this task, in a sustainable manner.	GM Response	epidemiologists/science and insights team members are now attending the AoG meetings to ensure detailed science led, health driven de ision-making.	
J. Strengthening of epidemiological expertise within the Ministry.	Planning & Advisory		
K. Ability to maintain quality of non-COVID public health activities.	Other parts of ministry Work Programmes	There is ongoing communication with PHUs to address core functionality and operational prio ities To enable this, most if not all work under the Health Assessment & Surv illance Public Health Capacity Development, Health Promotion and Preventive Interventions core functions that is not related to the COVID-19 response should be adjusted in line with health imperatives and prioriti s	**Ongoing**

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