

Briefing

Covid-19 Health System Response: Oxygen Supply and Environmental Issues

Date due to MO:	11 November 2021	Action required by:	<N/A>
Security level:	IN CONFIDENCE	Health Report number:	20212282
To:	Hon Chris Hipkins, Minister for Covid-19 Response		
Cc:	Hon Andrew Little, Minister of Health Hon Dr Ayesha Verrall, Associate Minister of Health Hon Grant Robertson, Minister of Finance		

Contact for telephone discussion

Name	Position	Telephone
Darryl Carpenter	Group Manager – Testing and Supply, Ministry of Health	§ 9(2)(a)

Minister's office to complete:

- | | | |
|---|------------------------------------|--|
| <input type="checkbox"/> Approved | <input type="checkbox"/> Decline | <input type="checkbox"/> Noted |
| <input type="checkbox"/> Needs change | <input type="checkbox"/> Seen | <input type="checkbox"/> Overtaken by events |
| <input type="checkbox"/> See Minister's Notes | <input type="checkbox"/> Withdrawn | |

Comment:

Covid-19 Health System Response: Oxygen Supply and Environmental Issues

Security level: In Confidence **Date:** 11 November 2021

To: Hon Chris Hipkins, Minister for Covid-19 Response

Purpose of report

1. This report updates you on progress in improving the District Health Board (DHB) infrastructure that supplies oxygen for Covid-19 patients and manages the related air handling environment.

Summary

2. In October 2020 joint Ministers approved funding of \$35m to improve oxygen supply and environmental control (air management) systems at 12 DHBs.¹ This programme was based on preparing for an all of government scenario of there being 5,000 COVID cases nationwide, with a hospitalisation rate of 150 ICU-level patients and 600 ward-level patients.
3. Existing and upgraded infrastructure to date supports a minimum of 153 ICU and 537 ward beds for which oxygen supply and related environmental controls are not limiting factors in their use for COVID-19 patients, across all DHBs². This is in addition to the 326 Airborne Infection Isolation Rooms (AIIRs) already in place.
4. The oxygen medical gas supply chain has been prepared to scale up if necessary, with protocols in place should more oxygen be required across all 20 DHBs. This includes portable, emergency oxygen capacity that can be dispatched to any DHB at short notice.
5. The main centres of Dunedin, Canterbury, Capital & Coast, Hawke's Bay, Lakes, Counties Manukau, Auckland, Waitemata and Northland all have suitable bulk oxygen supply and storage in place. Works continue at Mid Central and Hutt Valley DHBs noting the established mitigations above.
6. We are now completing air management upgrades in the nominated ICU, ward and other areas. The upgrades ensure any increased oxygen concentration levels are managed, while reducing the risk of COVID-19 airborne transmission for patients and staff.

¹ Bay of Plenty, Canterbury, Capital & Coast, Counties Manukau, Hawke's Bay, Hutt, Lakes, Mid Central, Northland, Tairāwhiti, Taranaki and Waitemata DHBs.

² These bed numbers relate to the physical infrastructure capability and may not reflect the actual COVID-19 patient capacity of DHBs which will depend on workforce, medical equipment, co-location strategies and other factors.

7. There are two constraints for this work:
 - a. the ability to gain unfettered access to these areas, which is constrained by total bed availability at each hospital. Chief Executives at four DHBs were recently engaged where further opportunities exist to accelerate progress if better access could be facilitated.
 - b. some material shortages are being experienced which are causing delay in some cases
8. The implication of delays by DHBs and alert level changes has resulted in the timeline extending, with the majority of air management works now scheduled to complete by 31 December 2021 and some moving into January and February 2022. The extended timeline does not mean the DHBs cannot accept COVID-19 patients prior to the scheduled works being complete. Bulk oxygen supply is now secured for the DHBs identified as having deficient supply and is not impacted by this.
9. The situation regarding alert levels and case numbers remains fluid impacting access, materials and the construction workforce. There is the future risk of further timeline movements, however we remain focussed on 'as soon as possible' urgent delivery working across DHB, Ministry, consultant, construction contractor and supply chain teams.
10. Emergency works and portable solutions can be enacted at short notice to provide interim measures in response to a surge event. Other operational measures can be enacted to work around the limiting factors this programme is addressing. AIRs are not affected by the programme, are available, and will continue to be used when DHBs are managing small numbers of COVID-19 patients.
11. We are reviewing the assumptions on which the original business case was developed and reassessing these against the current New Zealand context of COVID-19 cases and management strategies. Recent modelling suggests that the programme deliverables will still support anticipated future scenarios, however we are exploring whether it would be prudent to undertake further works within the scope and appropriation for the programme as a further risk mitigation.
12. Our focus remains on completing the Oxygen Supply and Environmental Issues programme deliverables with due urgency and we will keep you apprised of progress.

Recommendations

We recommend you:

- a) **Note** progress made in implementing the oxygen supply and environmental issues programme. Yes / No
- b) **Note** across all DHBs, existing and upgraded infrastructure works completed to date supports a minimum of 153 ICU and 537 ward beds for which oxygen supply and related environmental controls are Yes / No

not limiting factors in their use for COVID-19 patients; in addition to the 326 Airborne Infection Isolation Rooms already in service.

- c) **Note** delays by DHBs, establishing access arrangements and from recent alert level changes has resulted in the timeline extending with the majority of air management works now scheduled to complete by 31 December 2021, but that bulk oxygen is not impacted by this with supply now secured for the DHBs identified as having deficient supply. **Yes / No**
- d) **Note** the fluid situation regarding changing alert levels impacting access, materials and construction workers, and that the is future risk of timeline movements, however the Ministry and DHBs remain focussed on urgent 'as soon as possible' delivery. **Yes / No**
- e) **Note** the extended timeline does not mean the DHBs cannot accept COVID-19 patients prior to the scheduled works being complete. Emergency works and portable solutions can be enacted at short notice to provide interim measures in response to a surge event. **Yes / No**
- f) **Note** that further analysis is being undertaken of the work programme deliverables against the current context of COVID-19 cases and management strategies, and an assessment made whether further works should be undertaken within the programme scope and appropriation. **Yes / No**



Bridget White
Deputy Chief Executive
COVID-19 Directorate
Date: 10/11/2021



Hon Chris Hipkins
Minister for Covid-19 Response
Date: 13/11/2021

I'd be concerned if we saw any further slippage in these timelines. CH

Covid-19 Health System Response: Oxygen Supply and Environmental Issues

Background

1. In October 2020, following Cabinet approval of a COVID-19 funding package [CAB 20 MIN 0328.25 refers] and submission of a detailed business case, joint Ministers approved funding of \$35m to improve oxygen supply and environmental control systems.
2. This business case responded to an all of government scenario of there being 5,000 COVID-19 cases nationwide, with a hospitalisation rate of 150 ICU-level patients and 600 ward-level patients proportioned nationally based on population.
3. The business case identified 12 DHBs which may struggle in providing oxygen in this scenario. It also identified improvements needed in the air management systems to reduce the risk of oxygen concentration levels and COVID-19 airborne transmission, both of which pose a health and safety risk to patients and staff. The 12 DHBs were Bay of Plenty, Canterbury, Capital & Coast, Counties Manukau, Hawke's Bay, Hutt, Lakes, Mid Central, Northland, Tairāwhiti, Taranaki and Waitemata.
4. Our last update to you was provided on 22 July 2021 [HR20210945 refers]. This paper provides you with a further progress update for the programme of work.

Progress to date

5. The work completed to date compares favourably to the original planning scenario. Conservatively across all DHBs, existing and upgraded infrastructure to date supports a minimum of 153 ICU and 537 ward beds for which oxygen supply and related environmental controls are not limiting factors in their use for COVID-19 patients³. This is in addition to the 326 Airborne Infection Isolation Rooms (AIIRs) already in place⁴ and suitable for COVID-19 patients prior to the scope of this programme.
6. The oxygen medical gas supply chain has been prepared to scale up if necessary. Regular and emergency protocols are in place to increase the national manufacture, storage and delivery of oxygen should this be required by any of the 20 DHBs. This includes portable bulk oxygen storage and conversion capacity that can be dispatched to any area in need, at short notice.
7. The main centres of Dunedin, Canterbury, Capital & Coast, Hawke's Bay, Lakes, Counties Manukau, Auckland, Waitemata and Northland all have suitable bulk oxygen supply and storage in place through a combination of existing and the improved

³ These bed numbers relate to the physical infrastructure capability and may not reflect the actual COVID-19 patient capacity of DHBs which will depend on workforce, medical equipment, co-location strategies and other factors.

⁴ Refer <https://www.health.govt.nz/news-media/news-items/covid-19-novel-coronavirus-update-25-february>

infrastructure. Works continue at Mid Central and Hutt Valley DHBs noting the established mitigations above.

8. We are monitoring overall oxygen usage associated with the Auckland surge event. Increases in total usage have been negligible, noting use of oxygen generally decreases when alert levels go up because of elective procedures being deferred.

Remaining upgrades to ICU and wards

9. With the upgrades to critical oxygen infrastructure in hand, the focus is now on completing air management upgrades in the nominated ICU, ward and other areas. The upgrades ensure any increased oxygen concentration levels in these areas are managed, while reducing the risk of COVID-19 airborne transmission for patients and staff through increased fresh air ratios, more air changes per hour, HEPA (high-efficiency particulate absorbing filter) filtration and directional airflow.
10. As previously reported, finalising and scheduling ICU and ward work has been problematic while each DHB has refined its COVID-19 operational response. This has been resolved with the main constraint now being the ability to gain unfettered access to wards and other areas to complete the upgrades. This requires each area to be vacated and patients relocated, which is constrained by total bed availability at each hospital.
11. The recent changes in alert levels have highlighted to DHBs the importance and urgency of completing the programme of works. Chief Executives at Capital & Coast, Mid Central, Hawke's Bay and Bay of Plenty DHBs, being the regions where access was proving most problematic, were recently engaged to discuss where opportunities existed to accelerate progress if unfettered access could be facilitated. These conversations have been successful in reducing the risk of delivery delay.
12. A summary of progress and the remaining work is included as **Attachment A**.

Managing the extended delivery timeline

13. The implication of delays by DHBs, establishing workable access arrangements and alert level changes has resulted in the timeline extending further, with the majority of air management works now scheduled to complete by 31 December 2021 and some moving into January and February 2022.
14. Bulk oxygen supply is now secured for the DHBs identified as having deficient supply and is not impacted by these delays.
15. The situation regarding alert levels remains fluid impacting access, materials and the construction workforce. Further timeline movements are likely, however, we remain focussed on 'as soon as possible' urgent delivery working across DHB, Ministry, consultant, construction contractor and supply chain teams.
16. The extended timeline does not mean the DHBs cannot accept COVID-19 patients prior to the scheduled works being complete:
 - a. The delivery has been staged to provide upgraded oxygen piping near to the areas, then progressively upgrade the areas to enable an increasing number of beds as soon as possible.

- b. Alternative operational measures can be enacted to work around the limiting factors this programme is addressing (for example, using other ward spaces with increased physical distancing between beds).
 - c. Emergency works can be enacted to provide interim measures sooner in the event of a surge event.
 - d. AllIRs are not affected by the programme, are available and will continue to be used when DHBs are managing small numbers of COVID-19 patients.
17. The programme remains on track to deliver within the allocated budget. At this stage, we estimate that the programme may come in \$1-2M under budget.

The changing context for the programme

18. The context for the programme is different to when the programme was approved 12 months ago. In particular, we now have COVID-19 prevalent in the community and there have been recent changes to the management strategies being employed to combat the disease.
19. Recent modelling indicates that the programme deliverables remain appropriate for many scenarios, particularly where vaccination rates are high. However, there are some scenarios where the original planning assumptions may be exceeded.
20. The programme is exploring whether there are additional works that may be appropriate to undertake to further strengthen the DHBs oxygen supply and environmental systems in the event of a surge. Any additional works would be undertaken within the scope and appropriation of the existing programme. As mentioned above, the existing works are estimated to be delivered under budget, and any further work would be funded from this underspend.

Linkage to the Health System Readiness Programme (HSRP)

21. The Ministry is advancing the COVID-19 Health System Readiness Programme (HSRP) which is being reported to you separately. The purpose of the HSRP is to ensure the health system is more agile, better equipped, more vigilant and increasingly responsive to the changing threat of COVID-19.
22. The Oxygen Supply and Environmental Issues programme deliverables are an input into the HSRP which will consider how other parallel and subsequent infrastructure improvements are prioritised, funded and actioned.

Next steps

23. Working in with the HSRP, our focus remains on completing the Oxygen Supply and Environmental Issues programme deliverables with due urgency and will keep you apprised of progress.

ENDS.

Appendix 1 – Progress Update , 8 November

DHB	Status	O2 Bulk Storage	O2 Convert to Gas	O2 Reticulation – Central	O2 Reticulation – Spaces	Air Interim	Air Permanent	Expected Completion
Northland	G	✓	✓	✓	WIP		WIP	Dec 21
Waitemata	A	✓	WIP	✓	✓	✓	WIP	Dec 21
Counties Manukau	A	✓	✓	✓	WIP		WIP	Feb 22
Lakes	G	✓	✓				WIP	Dec 21
Bay of Plenty	G		✓				WIP	Dec 21
Tairāwhiti	G		✓	WIP	WIP		WIP	Dec 21
Hawkes Bay	A	✓	✓	WIP	WIP		WIP	Feb 22
Taranaki	G						WIP	Jan 22
Mid Central	A	WIP	Sched	WIP	WIP		WIP	Feb 22
Hutt Valley	A	WIP	Sched				WIP	Feb 22
Capital & Coast	A	✓		✓	WIP	✓	WIP	Jan 22
Canterbury	G			✓	✓		✓	Nov 21

Key

✓ - Complete

WIP – Work underway

Sched – Work is scheduled but yet to start

Status

Green – On track

Amber – Immediate issue or future risk that may impact on the timeline. Mitigations in place

Red – Issue or risk that will impact delivery. Governance support required

Work completed but not shown:

- Supply chain optimisation (oxygen manufacture, network bulk storage and distribution)
- Emergency supply chain measures (supply of portable oxygen bulk storage, supplier emergency protocols)