



Thursday, 17 September 2020

To the Chief Executives of the Northern Regional District Health Boards:

As clinical leads for Northern Regional Adult Critical Care services we wish to express our concerns around provision of both adequate Critical Care capacity, and available negative pressure areas within Critical Care, for patients with COVID-19.

Currently we are concerned that these issues have not yet been addressed using a regional networked approach that is adequate to allow us to manage potential further waves of increased community transmission of COVID19.

The main points to consider in such planning would be:

Estimated ICU case load

The most realistic scenarios for the current community case numbers have estimates of ICU admissions across the region that range from between 1 to 4 further cases over the next 2-4 weeks. A more pessimistic scenario, with increased transmission on de-escalation of alert levels, predicts up to 11 new ICU cases across the region over the next few weeks.

Furthermore, as elimination from the community may not be likely, relaxation of the regional alert level to level 1 may see transmission increase again in the community and a further wave of cases in late October - November. Whilst this current wave has been largely linked to a single cluster there remains the potential for a larger increase in future waves with multiple clusters, such as that currently seen in Victoria, Australia.

Transition to ICU level care for hospitalised patients has been higher than in the first wave of NZ cases and may remain higher for future waves than anticipated, due to the demographics and co-morbidity burden of the affected population.

Access to critical care beds may become inequitable if certain demographics are differentially affected by community outbreaks and a regional approach to critical care provision is not central to the Northern Region policy.

Current Adult ICU capacity in the Northern Region

Current baseline adult ICU capacity (public) and available negative pressure rooms within critical care are delineated by DHB as per the table below. The ICU provision of ventilated beds per 100,000 census population is given at the bottom of the figure. This figure is considerably lower than baseline capacity in Australia (9.0 per 100k) and the United Kingdom (6.6).

	Baseline ventilated beds (adult)	Total physical spaces	Negative Pressure Rooms available
ADHB	35	50	2
CMDHB	16	25	4
WDHB	8	14	4
NDHB	7	9	5
Total Northern Region	66	98	15
ICU Ventilated Beds /100k population	4		

Rationale for negative pressure areas for patients with COVID19

With current estimated numbers of critical care admissions with COVID19, a strategy of attempting to contain these patients within negative pressure areas would be the most prudent in terms of preventing cross-transmission to health care workers and other patients. The rationale for this is:

- There is increasing recognition that aerosolization and airborne transmission are important in the spread of COVID19¹. Standard recommendations for diseases that have significant airborne transmission are that patients should be placed in appropriate negative pressure rooms and ICUs in other jurisdictions have already implemented this practice.^{2,3}
- Current experience in Victoria, Australia suggests increased healthcare worker infection through workplace acquisition. This highlights the need to ensure staff safety⁴, particularly for nursing staff who may be in the same room as patients with COVID19 for up to 12 hours. Healthcare worker infections lead to the need for isolation of multiple members of staff with subsequent impact on admitting capacity for the ICU.
- Cross-infection to staff and patients will also result in an increase in community transmission and case numbers.
- PPE usage, particularly N95 masks, will be higher if patients are cohorted in the open area as all staff working in these areas will have to use airborne PPE. Supply chains to NZ for PPE, particularly around alternative N95 masks, have been fragile.

Recommended actions for Northern Region DHBs

We strongly feel the following actions should be considered by all Northern Region DHBs, working collaboratively with their critical care units:

- Existing applications for building work and facilities to improve critical care negative pressure capability across the region should be expedited.
- Available critical care negative pressure capability should be monitored by DHBs on at least a daily basis when cases of COVID19 exist in the community or in managed isolation facilities. This would facilitate decisions regarding distribution of patients across the region and discussion of interhospital transport considerations.
- Attention is given by all DHBs to maintaining an adequate nursing workforce, through ongoing recruitment, to allow surge capacity for the scenario where case numbers increase significantly in the region. This also includes the ongoing orientation of non-ICU nurses as an auxiliary workforce, as outlined by the Ministry of Health. We believe budgetary resources have been provided by the MOH to backfill nursing positions to allow this.
- Given the regionalised nature of Critical Care services provided for this geographic area, decisions about distribution of COVID patients who may require critical care should be made with the involvement of regional Critical Care units. These decisions would be best supported by the formalisation and resourcing of a Critical Care network which would co-ordinate with the Regional DHB group. The regional Critical Care Network should have access to up to date health intelligence regarding the potential ICU case load during a further wave of community transmission. Decisions about distribution would need to be made in the context of potential case load and regional ICU negative pressure room capacity as well as general ICU capacity across the region
 - Although the final decision on patient transfers would rest with the ICU clinical staff, we believe a regional understanding and agreement at CE level, focussed initially on the prioritisation of ICU negative pressure bed resource would be very helpful for resolving conflicting priorities. We would be very happy to help draft such a workflow prioritisation document
 - An alternative model of designating a single hospital for COVID patients requiring ICU level care needs consideration, but is not one we support. Should this be supported however, it would allow development of ICU negative pressure capability in a less ad hoc way than is currently occurring. This would also require consideration to be given to the regional transport system for these patients.
- Consideration should be given in the longer term to upgrading critical care facilities across the region. This should aim to increase critical care capacity at all DHBs to a suitable regional per capita figure appropriate for a major population centre, and include a minimum standard negative pressure capacity and the ability to cohort patients safely using flexible design principles.

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References

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2. Liew, M.F., Siow, W.T., MacLaren, G. *et al.* Preparing for COVID-19: early experience from an intensive care unit in Singapore. *Crit Care* **24**, 83 (2020).
3. Lee, S.Y., Choi, S.H., Park, J.E. *et al.* Crucial role of temporary airborne infection isolation rooms in an intensive care unit: containing the COVID-19 outbreak in South Korea. *Crit Care* **24**, 238 (2020).
4. Martina Ferioli, Cecilia Cisternino, Valentina Leo, Lara Pisani, Paolo Palange, Stefano Nava. Protecting healthcare workers from SARS-CoV-2 infection: practical indications *European Respiratory Review* Mar 2020, 29 (155)