The implications of living with COVID-19 for intensive care in Australia

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Given the limitations of our resources, we need well planned processes for optimising health care should demand exceed capacity

The coronavirus disease 2019 (COVID-19) pandemic has led to both brief and prolonged lockdowns in Australia. The purpose of lockdowns and other public health containment initiatives is to minimise mortality and to prevent hospital overload, particularly in intensive care. It has been widely reported that increased demand stress is associated with higher mortality in intensive care units (ICUs), although it was recently reported that the relationship is somewhat complex.[1,2] Early modelling predicted that ICU resources would be overwhelmed in Australia,[3] but more recent forecasts, especially by models incorporating the impact of vaccination, have been more optimistic.[4,5]

Nevertheless, concern about the capacity of our healthcare system remains, especially in the news media. A reliable inventory of intensive care resources and surge capacity is therefore vital for efficient planning across all jurisdictions. The data employed by Litton and colleagues for their second inventory of these resources, published in this issue of the Journal,[6] were collected in a survey of all ICUs in Australia, and linked with data from databases that have long maintained an inventory of both human and some physical intensive care resources. They compared their findings with those of a similar assessment they undertook early in 2020.[7]

The major findings of Litton and his colleagues are that slightly fewer ICU beds were available in September 2021 than in March 2020, and that the ventilator shortage they had identified has been fully resolved; in fact, their number now considerably exceeds even the most optimistic surge bed number. Population-adjusted current bed availability varied widely, from 6.0 per 100 000 population in Western Australia to 10.8 per 100 000 in New South Wales. However, their most important finding was that the principal limiting factor to realising maximal surge capacity is the lack of trained staff, especially nurses. The maximum bed capacity that could be supported while maintaining current standards of practice (2566: an additional 383 beds) falls far short of the theoretical physical maximum (5623).[6]

The report by Litton and his co-authors is an extraordinary achievement. The survey and its 100% response rate are a credit to the intensive care community and the Australian and New Zealand Intensive Care Society. They reflect the outstanding professionalism and collegiality also evidenced by the timely development of clinical guidelines and the real time Critical Health Resources Information System (CHRIS), and by the contributions of intensive care staff to pandemic

response planning. The conclusions of Litton and colleagues are highly credible and informative. If anything, they may have overstated the actual surge capacity because they applied historical nurse-to-patient ratios, but did not account for staff infections, furlough and burnout, or the need for senior nurses for training, personal protective equipment (PPE) buddying, and supervision. Finally, the heavy PPE use, prone positioning, and high rate of extra-corporeal membrane oxygenation use that characterise treatment of patients with COVID-19 all increase the requisite nurse-to-patient ratio, even beyond 1:1.

What are our options should the demand for intensive care exceed supply? Few, it would seem. Recruiting supplementary staff, including re-employing retired nurses, may help. Changes in models of care can increase staff efficiency, but any systematic increase in capacity requires training new staff or upgrading the capabilities of those in related practice areas but with reduced demand during the pandemic. Specific upgrade training is labour-intense and only partially effective, as upgraded skills may not effectively translate into intensive care. Further, upskilled staff may require close supervision by more senior staff with an already expanded workload. Changing staffing standards is an essential aspect of the educational upgrade strategy, but reducing standards risks increasing patient mortality. Given the temporal and geographic differences in the COVID-19 pandemic in Australia, there is some scope for transferring patients to match supply and demand, and resources could be moved within and across jurisdictions to meet local needs. But the intransigence of federalist structures places limitations on this option.

Alongside these strategies, it is essential to plan for systematic, resource-based triage should demand approach or exceed supply. This entails denying access to potentially beneficial care (ie, admission to ICU) against the wishes of patients or their families. This would be controversial, but may be essential. Some planning has been undertaken in Australia, and quite detailed protocols have been developed overseas.[8,9] Principle-based

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ethics discussions have been published in Australia,[10] but not specific protocols.

Considerable uncertainty remains as Australia embraces the new paradigm of living with COVID-19. Consequently, we need to know the limitations of our resources and to have well planned processes for optimising health care (particularly ICU capacity) should that capacity be exceeded.

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