How intensive care has adapted to the changing face of COVID-19 in Australia

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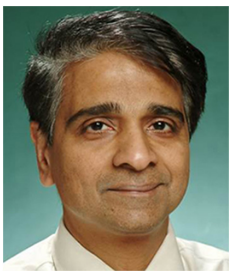
The changes in the characteristics of the pandemic and in our health care responses have been anything but gradual

The continued evolution of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) means that Australia is at risk of further waves of coronavirus disease 2019 (COVID-19). This issue of the *MJA* includes the third report on the Short Period Incidence Study of Severe Acute Respiratory Infection (SPRINT–SARI) Australia, an observational study of COVID-19 in Australian intensive care units (ICUs).[1,2]



Begum and colleagues[3] found marked differences in the characteristics of the three COVID-19 waves during February 2020 – November 2021. Despite the shorter length of the third wave (four months), the proportion of ICU beds occupied by patients with COVID-19 (19.1%) was larger than during the first (4.6%) and second waves (2.8%). The median age of patients (54 years; interquartile range [IQR], 41–65 years) was lower than in waves one (58 [IQR, 49–68] years) and two (64 [IQR, 54–72] years); the proportion of patients without other medical conditions was smaller during the third wave than the preceding two waves, and the median time from hospital to ICU admission longer. Newer treatments, such as prone ventilation, non-invasive ventilation, and steroid and intereukin-6 antagonist therapies, were broadly adopted during the third COVID-19 wave. Further, risk-adjusted in-hospital mortality was highest during the third wave, despite similar APACHE II severity of illness scores on admission for all three waves.

The 4C mortality score, a scoring system more specific for COVID-19, was found to better predict in-hospital mortality for ICU patients in the United Kingdom.[4] A recent study of 149 patients in Australia found that ICU admission 4C scores overestimated risk of death (predicted, 23%; actual mortality, 16%),[5] but a larger study is needed to check these findings and to calibrate the use of this measure in Australian ICUs.

The study by Begum and colleagues[3] was strengthened by its prospective collection of data from ICUs across Australia and the separate analyses of the three waves. In contrast, overseas reports on ICU care and outcomes have been retrospective analyses and chiefly focused on the first two waves or combined waves.[6,7] Their report suggests that the most recent recommendations by the National COVID-19 Clinical Evidence Taskforce[8] have been widely implemented. The authors derived ICU demand patterns from another collaborative large data project, CHRIS (Critical Health Resource Information System), a real-time national ICU capacity database that, like the SPRINT-SARI database, relies on daily updates by local ICU staff.[9] With the broad adoption of clinical electronic information systems in intensive care, a government-funded integrated data system could seamlessly collect information on ICU use, staffing, patient interventions, and outcomes. This would reduce the burden of data collection for clinical staff, and provide decision makers with up-to-date information in times of crisis.

The SPRINT-SARI group provided feedback to individual ICUs every three months, allowing them to benchmark their use of ICU interventions and outcomes against other units. This should be encouraged in future studies.

SARS-CoV-2 will not rest in its evolution, and nor should we. The finding by Begum and her co-authors[3] that risk-adjusted in-hospital mortality was highest during the third wave is concerning; it had generally been lower during the second than the first wave.[2,6] The impact of adopting beneficial treatments identified by clinical trials needs to be examined in more detail, to determine, for example, the appropriate use of prone ventilation or the optimal steroid dose. A recent multinational randomised controlled trial found that 12 mg dexamethasone may be more beneficial than the typically employed 6 mg dose.[10]

Begum and colleagues[3] found that 75% of third wave intensive care patients had not received a COVID-19 vaccine (compared with 8.5% of Australians aged 16 years or more at the end of the wave[11]), and only 5% had received two doses (compared with 85% of Australians aged 16 years or more[11]). The low vaccination rate in people requiring intensive care is consistent with the finding of a recent study that the Pfizer–BioNTech vaccine (four shots) protected against critical illness following infection with the Omicron variant, despite viral evolution.[12] During the third wave in Australia, the median age of intensive care patients with COVID-19 was lower than during previous waves.[3] As younger people are generally more mobile and socially active, public health measures such as vaccination, mask wearing,

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and isolation remain important for mitigating the burden on intensive care services.

During the first pandemic wave, 56% of people with COVID-19 in Australian ICUs had been infected outside Australia,[1] but most infections during subsequent waves have been locally acquired. More ICUs cared for COVID-19 patients as case numbers increased (44, 53 and 59 of 78 participating ICUs during the first, second, and third waves).[3] The fact that most Australian ICUs suitable for caring for people with COVID-19 contribute data to SPRINT-SARI enhances the value of the findings by Begum and colleagues, facilitating benchmarking, maintaining high quality ICU care, and informing decisions by governments and health care planners.

It is notable in the report by Begum and her co-authors that, for many parameters, the proportions of incomplete data were largest during the third wave, possibly reflecting pressure on ICUs. In our experience, research and clinical staff at some sites were called upon to care for patients for extended periods. The impact on staff and resources should be further investigated, hopefully shedding more light on this critical question.

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