

THE FINANCIAL COST OF COVID-19 IN THE AUSTRALIAN CRITICAL CARE SYSTEM

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Background: COVID-19 has inundated health services worldwide, placing extraordinary demand on Intensive Care Units' (ICUs) specialised personnel, equipment, and care coordination. An understanding of resource requirements and cost is necessary to enable efficient planning, respond dynamically to demand, and deliver consistent quality care for critically ill COVID patients. The objective of this study was to estimate the operational costs for COVID patients admitted to ICUs in Australia.

Methods: A top-down gross costing model was employed utilising The Short Period Incidence Study of Severe Acute Respiratory Infections (SPRINT-SARI Australia) database, a prospective national observational dataset of critically ill patients with COVID-19 admitted to Australian ICUs. Clinical data including demographics, per-day organ supports, nurse-to-patient ratio, ICU length of stay, and ICU mortality were analysed from February 2020 to September 2021. Cost coefficients enabling adjustment for number of organ supports were derived from the United Kingdom's 2019/20 National Cost Collection data. Extra-corporeal membrane oxygenation was costed separately using published Australian data.

Results: There were 1545 patients admitted to 60 ICUs, representing 13,788 ICU bed-days during the study period. The estimated total cost of ICU care across the study period was \$87,253,628 (AUD). Median [IQR] ICU cost per patient was \$27,100 [\$13,535 – \$67,801]. Absolute cost per ICU admission ranged from \$4511 to \$554,627. There were significant differences in median ICU cost between survivors and non-survivors (\$27,071 vs \$75,720, $p < 0.001$), those invasively ventilated versus not (\$70,089 vs \$18,067, $p < 0.001$), and those who underwent ECMO versus not (\$27,071 vs \$63,209, $p < 0.001$).

Conclusion: COVID is a significant source of resource strain over and above baseline ICU operations. Our results are likely an underestimate, and future micro-costing work would be beneficial.

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