

Australian and New Zealand Intensive Care Society

Centre for Outcome and
Resource Evaluation

Adult Patient Database
Activity Report 2017/2018

Acknowledgments

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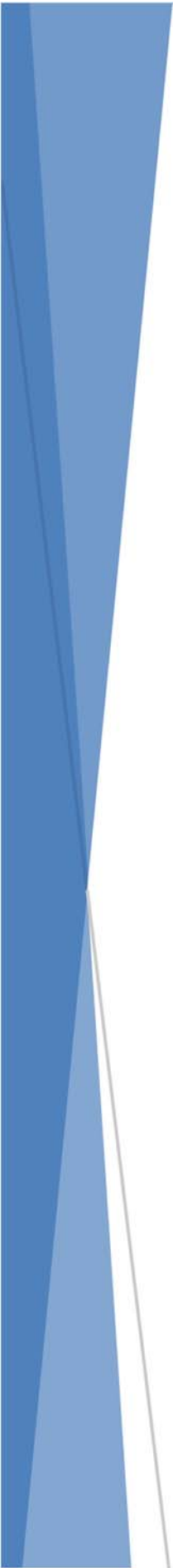


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OUR AIMS

To guide best clinical practice and improve the quality of Intensive Care in Australia and New Zealand.

To host innovative registries that engage with the Intensive Care community to promote improvements in critical care outcomes through benchmarking, monitoring, education and support of research activities.



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About ANZICS CORE

CORE hosts and manages 4 registries to which contributing ICUs across Australia and New Zealand submit de-identified data.

- The Adult Patient Database (APD) collects data on admissions to adult ICUs.
- The Australian and New Zealand Paediatric Intensive Care (ANZPIC) Registry collects data on children admitted to specialist Paediatric Intensive Care Units (PICUs) and those patients under the age of 16 who are treated at a number of adult units that look after critically ill children.
- The Critical Care Resources (CCR) Registry collects data through an annual survey on ICU infrastructure, staffing and processes.
- The Central Line Associated Blood Stream Infection (CLABSI) Registry collects data related to central line infections in Australian ICUs.

CORE is unique in that it offers an overview of ICU performance and resources across regional, state, federal and international jurisdictions. ANZICS CORE provides ICU Registry Services to Oman, Iran and Hong Kong.

The data collected are used to monitor, benchmark and report on Intensive Care performance, providing bi-national and jurisdictional comparison of outcomes and individual unit based reports. Jurisdictional data review committees have access to reports relevant to their jurisdictions, providing information about Intensive Care Services across their respective health systems and the performance of ICUs under their jurisdiction.

Our Strategic Objectives

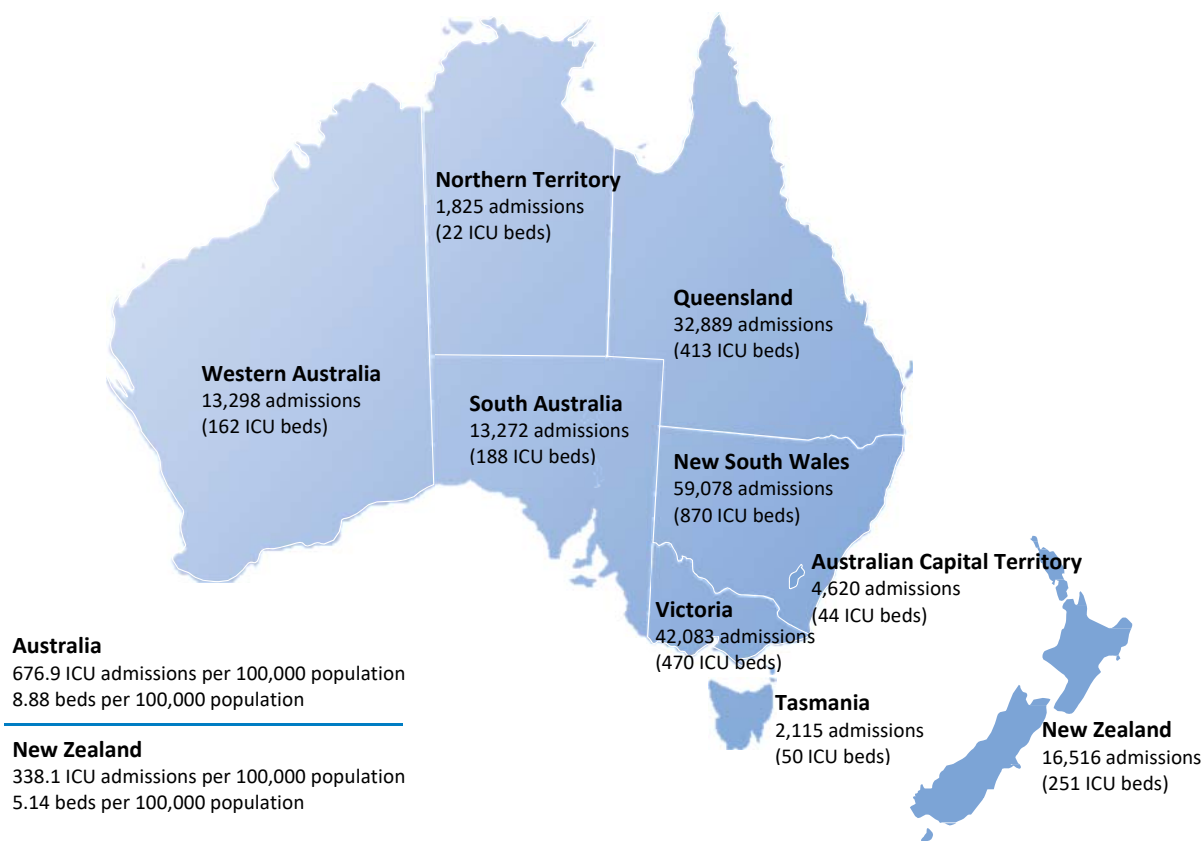
- To benchmark and monitor ICU activity, performance and patient outcomes
- To provide timely and relevant information to clinicians, the public, policy makers, health care providers and funders
- To work with the Intensive Care community to prioritise activities to improve care of the critically ill
- To develop activities of CORE through local, national and international collaboration

How we achieve these objectives

- Collecting, analysing and publishing data submitted from contributing ICUs
- Providing a mechanism for reporting of Intensive Care outcomes
- Striving for compatibility with other national databases, including those held by the Australian Institute of Health and Welfare
- Being a source of data for Intensive Care research activities
- Promoting research activities to gain a greater understanding of critical illness, its management and outcome

Profile of Intensive Care Admissions Services

Figure 1: A profile of all ICU admissions and ICU beds across Australia and New Zealand 2017/18



Source of admissions numbers: APD, ANZPICR.

Source of beds numbers: CCR 2017/18 and Absolute Minimum Survey 2017/18. Note: Beds numbers are for PICUs and general/adult ICUs.

Population estimates as at 30th June 2018 were 24,992,747 for Australia and 4,885,500 for New Zealand.

Sources:

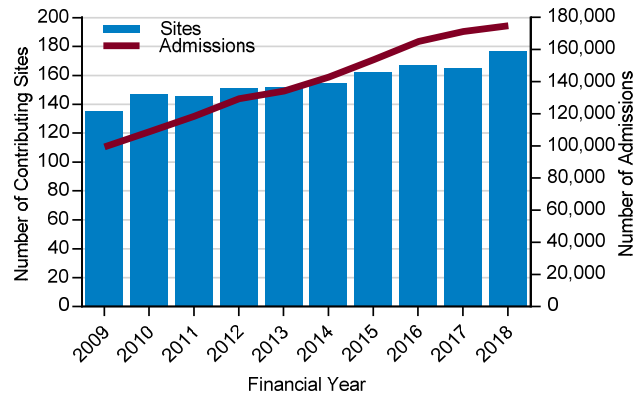
http://nzdotstat.stats.govt.nz/wbos/Index.aspx?_ga=2.227011870.2048874141.1547617034-720109120.1547617034#

http://stat.data.abs.gov.au/Index.aspx?DataSetCode=ERP_QUARTERLY#

Adult Patient Database (APD)

The APD holds more than 2.4 million individual ICU episodes of care making the APD one of the largest repository internationally of ICU data for benchmarking and auditing purposes. Figure 2 shows the trend in admissions and number of contributing sites over the last 10 years.

Figure 2: Contributions to the APD



Source: APD. Figure includes all admissions reported to the APD (including patients below 16 years of age)

Summary of APD data

Who is contributing to the APD in 2017/18?

Of the 206 General adult ICUs (non PICU) across Australia and New Zealand:

- 90.4% (160/177) Australian and 58.6% (17/29) New Zealand ICUs contributed to the APD
 - 95.2% (40/42) of all adult tertiary ICUs
 - 91.7% (33/36) of all adult metropolitan ICUs
 - 72.4% (42/58) of all adult rural/regional ICUs
 - 88.6% (62/70) of all adult private ICUs

Clinical outcomes for adult patients

- Total adult admissions to the APD 172,916 (158,604 from Australia, 14,312 from New Zealand)
- Observed hospital mortality in adult patients was 7.7% in Australia and 10.4% in New Zealand
- Predicted risk of death in hospital for adult patients was 7.7% in Australia and 9.4% in New Zealand (based on the Australian and New Zealand Risk of Death (ANZROD) mortality prediction algorithm)
- Continued decline in the Standardised Mortality Ratio (SMR) from 2007 - 2017
- Limited variation in the SMR over five years for all submitting sites for the following presentations: chronic obstructive pulmonary disease, infectious diseases, stroke and gastrointestinal malignancy
- Variation of after-hours discharge across 40 Tertiary ICUs is reported from 1.6% to 38.9% (mean of 16.5%)

Auditing and Benchmarking ICU Outcomes

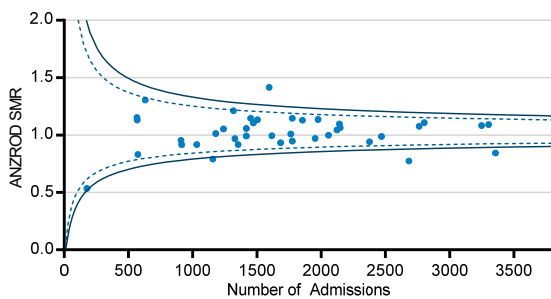
The Standard Mortality Ratio (SMR) is commonly used as a key indicator of quality and safety to monitor and benchmark ICU performance. The SMR is a ratio of the actual number of deaths divided by the predicted number of deaths at each ICU. The predicted number of deaths in adult ICUs is derived from the ANZROD calculation tool.

Adult Intensive Care

To identify units with outcomes that are potentially significantly different to their peer group, SMRs are presented on a funnel plot. The SMR for each site is plotted against the number of admissions for that site for the appropriate reporting period. Control lines, taking the shape of a funnel, are based on the mean SMR of the group. Figure 3 shows the 2017/18 funnel plots for each APD hospital classification.

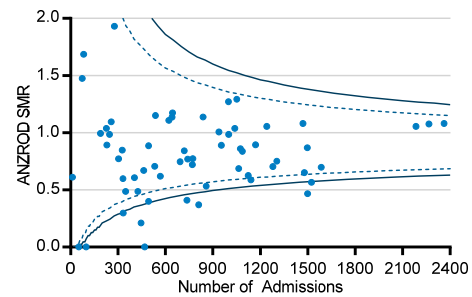
Figure 3: ANZROD SMR funnel plots 2017/18

Tertiary Hospitals



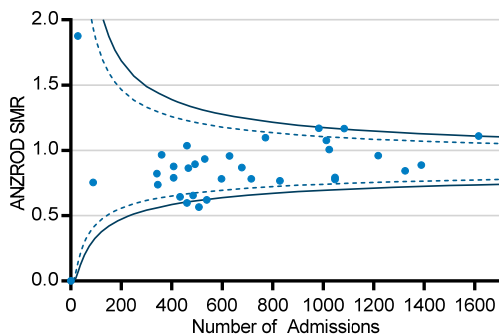
Source: APD

Private Hospitals



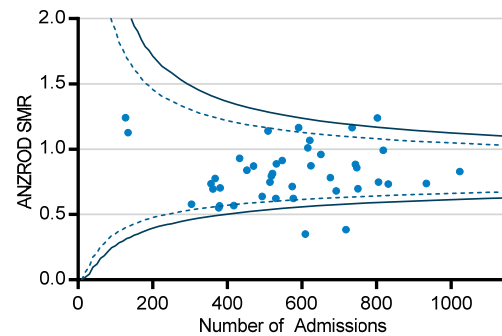
Source: APD

Metropolitan Hospitals



Source: APD

Rural Hospitals

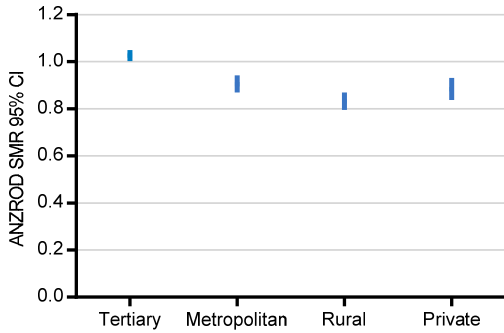


Source: APD

ANZROD Standard Mortality Risk

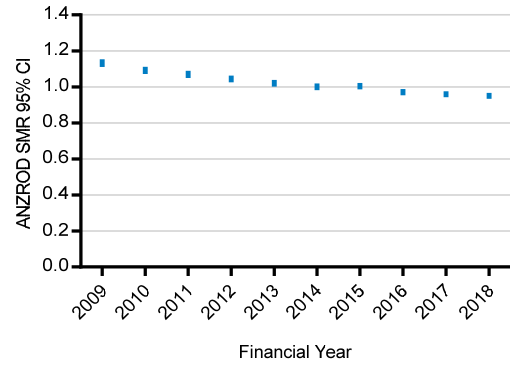
Figure 4 shows SMR based on the Australian and New Zealand Risk of Death (ANZROD) model for each hospital classification. Figure 5 illustrates a down ward trend from 2009 of the SMR based on the Australian and New Zealand Risk of Death (ANZROD) model which start to plateau from 2014.

Figure 4: ANZROD SMR (95% CI) for ICUs by hospital classification 2017/18



Source: APD

Figure 5: ANZROD SMR (95% CI) – 10 year trend

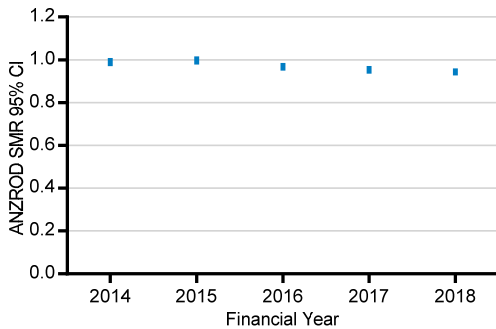


Source: APD

Figure 6 shows SMR based on the Australian and New Zealand Risk of Death (ANZROD) model for ICUs within Australia and New Zealand.

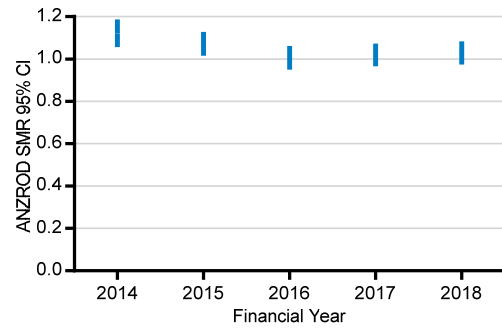
Figure 6: ANZROD SMR (95% CI) for ICUs in Australia and New Zealand – 5 year trend

Australia



Source: APD

New Zealand

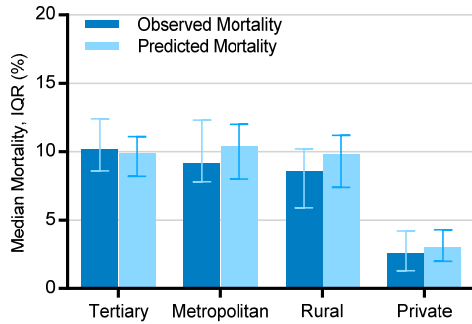


Source: APD

Observed and Predicted Mortality

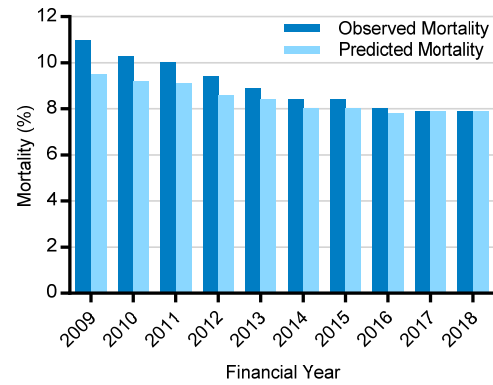
Figure 7 shows the observed and predicted mortality by hospital classification. Private hospital ICUs had a higher proportion of planned elective surgical admissions and an associated lower risk of death. Both observed and predicted mortality declined from 2009 until 2016 where trend has remained constant (Figure 8).

Figure 7: Observed and predicted hospital mortality



Source: APD

Figure 8: Observed and predicted hospital mortality – 10 year trend



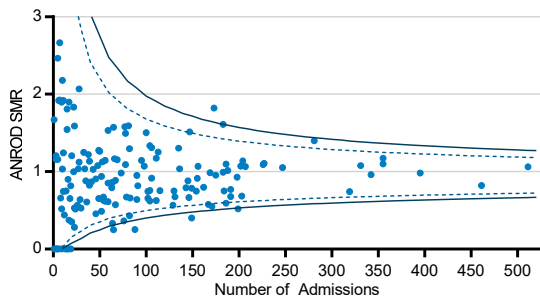
Source: APD, predicted mortality derived from ANZROD calibrated to 2011/2012

Variation in Outcomes

Improvements in practice can be best achieved by identifying variation in outcomes. The funnel plots in Figure 9 show the SMRs for four common diagnostic groups from 2014-2018. The majority of sites are within the funnels indicating the variation of practice is within an acceptable range.

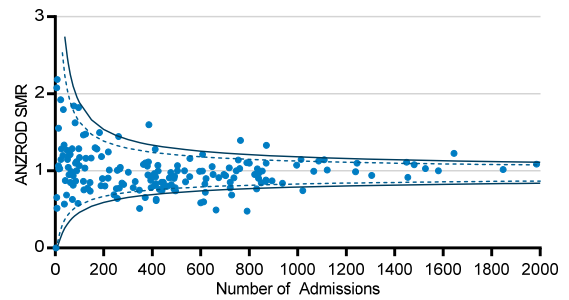
Figure 9: Mean SMR for various diagnostic groups – 5 year trend

Chronic Obstructive Pulmonary Group



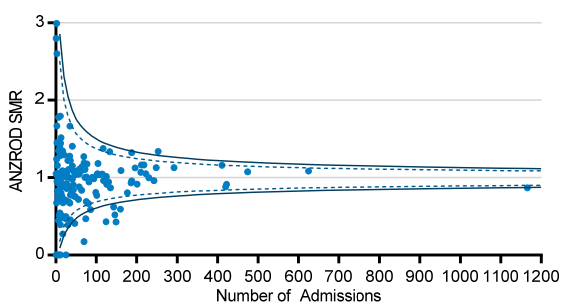
Source: APD

Infectious Diseases Group



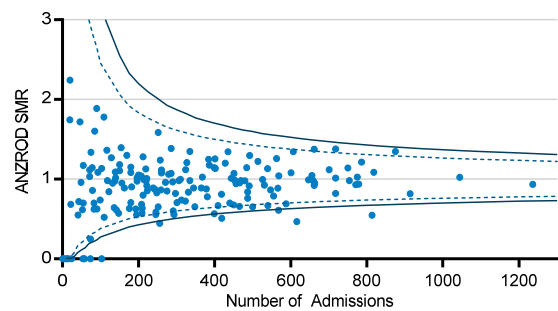
Source: APD

Stroke Group



Source: APD

Gastro-Intestinal Malignancy Group



Source: APD

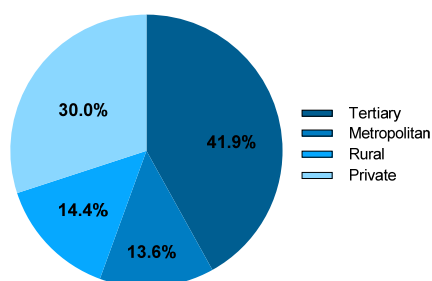
ICU Admissions and Discharges

Admissions

The ANZICS APD compares ICUs against their peer group using the following hospital classifications: tertiary, metropolitan, rural/regional and private. These classifications are based on hospital location, the level of services available and similar case mix (Figure 10).

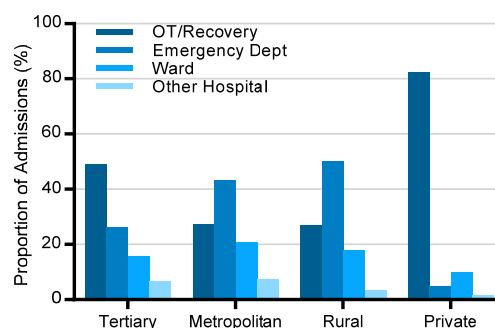
- In 2017/18 private ICUs had a higher proportion of patients admitted from operating theatre or recovery, most of these admissions were planned admissions following elective surgery.
- Metropolitan and rural hospitals had the highest proportion of ICU admissions from emergency departments. Of the public hospitals (tertiary, metropolitan and rural), tertiary ICUs had the highest proportion of admissions from operating room and recovery (Figure 11).

Figure 10: Admissions to adult ICUs by hospital classification 2017/18



Source: APD

Figure 11: Source of admission by hospital classification 2017/18

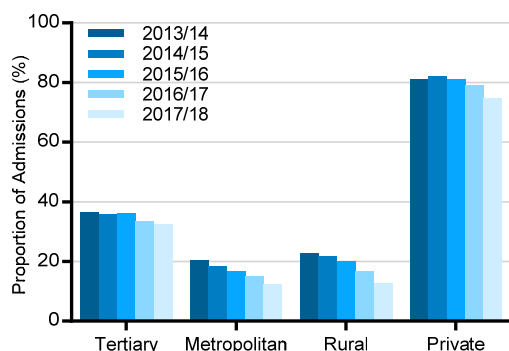


Source: APD, OT - Operating Theatre

Elective Admissions by Hospital Classification

The overall rate of planned elective surgical admissions to ICUs has declined across all hospital classifications over five years with highest proportion of planned elective surgical admissions in the private hospital ICU's. (Figure 12).

Figure 12: Elective surgical planned admission by hospital classification – 5yr trend



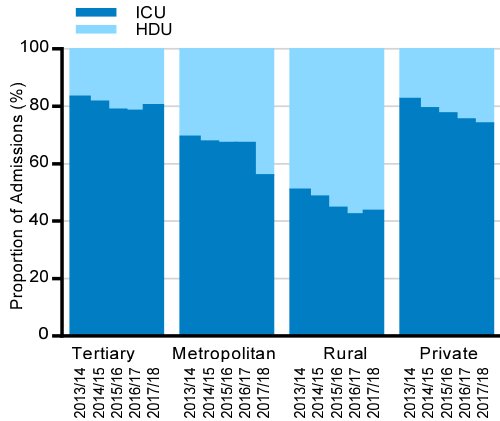
Source: APD

ICU and HDU Admissions

The proportion of ICU type admissions compared to HDU type admissions in tertiary sites has remained relatively constant with minor fluctuations, metropolitan, rural and private ICUs continue to have an increasing proportions of HDU type admissions (Figure 13).

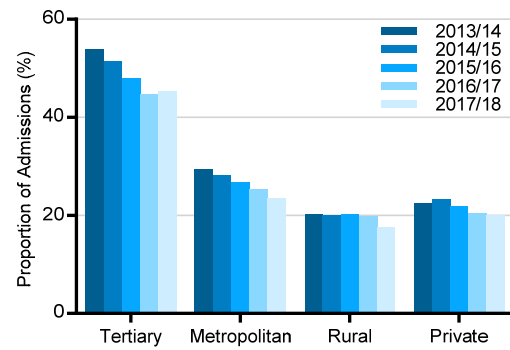
Tertiary and private hospital ICUs had the highest rates of ventilation. The overall rate of invasive ventilation declined from 2014 – 2018 predominantly in tertiary and metropolitan ICU’s with an exception of 2018 where there was a slight increase in the rate in tertiary units (Figure 14).

Figure 13: Changes in care type across hospital classifications – 5 year trend



Source: APD

Figure 14: Invasive ventilation across hospital classification – 5 year trend



Source: APD

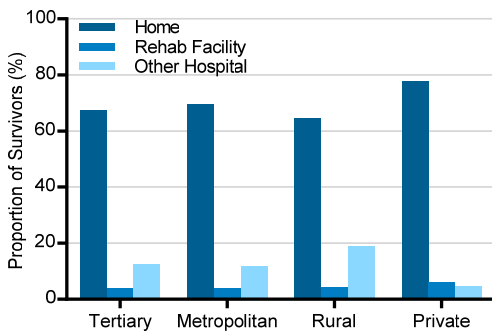
Note that patients requiring mechanical ventilation after the first 24 hours of ICU admission are not represented in this data.

The overall **rate of readmission to ICU** from 2014 - 2018 has remained unchanged at 2%.

Discharge Destination

The discharge destination of patients differed between the hospital classifications. Rural ICUs transferred a higher percentage of patients to other hospitals, while Private ICUs had a higher percentage of patients discharged to rehabilitation facilities (Figure 15).

Figure 15: Destination on discharge from hospital following ICU admission 2017/18, by hospital classification

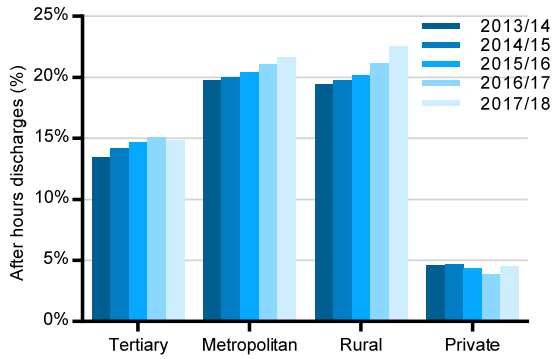


Source: APD

After-hours Discharge

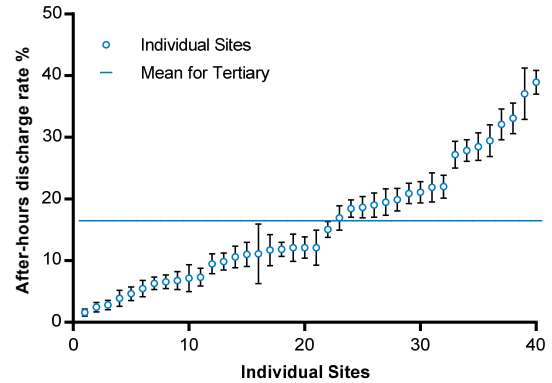
Figure 16 shows the percentage of after-hours discharge at adult ICUs across different hospital classifications. Figure 17 shows continued wide variation of after-hours discharge across the 40 Tertiary ICUs from 1.6% to 38.9% (mean of 16.5%). After-hours discharge from ICU is associated with an increased risk of death^{1,2,3}.

Figure 16: Adult ICU patients discharged between 6pm and 6am by Hospital Classification – 5yr trend



Source: APD

Figure 17: After hours discharge by tertiary sites 2017/18

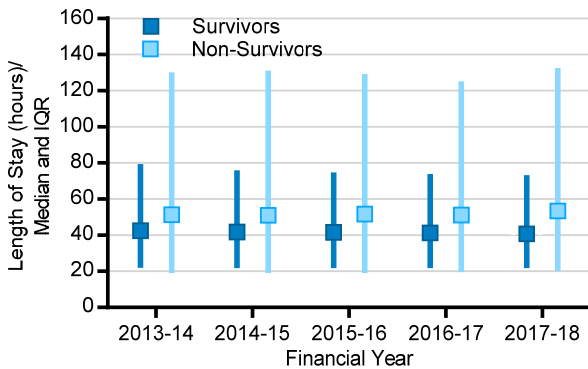


Source: APD

ICU Length of Stay

The ICU length of stay for survivors and non survivors has remained relatively constant from 2014 – 2018 (Figure 18).

Figure 18: Length of stay for ICU survivors and non-survivors (median and IQR) – 5yr trend



¹ Gantner D, Farley K, Bailey M, Huckson S, Hicks P, Pilcher D. Mortality related to after-hours discharge from Intensive Care in Australia and New Zealand, 2005-2012. *Intensive Care Med.* 2014 Oct; 40(10):1528-35.

² Pilcher DV, Duke GJ, George C, Bailey MJ, Hart G. After-hours discharge from Intensive Care increases the risk of readmission and death. *Anaesth Intensive Care.* 2007 Aug; 35(4):477-85.

³ Goldfrad C, Rowan K. Consequences of discharges from Intensive Care at night. *Lancet.* 2000 Apr 1; 355(9210):1138-42.

Appendix 1 – Profile of APD Admissions (2017/18)

Table 1: Characteristics for admissions to adult ICUs from APD

	Australia	New Zealand	Australia and New Zealand
Patient Characteristics			
Total Adult Admissions	158,604	14,312	172,916
Median Age in years (IQR)	65 (51-75)	62 (48-72)	65 (51-75)
Male	56.1%	59.7%	56.4%
Planned Admissions after Elective Surgery	40.0%	33.9%	39.5%
Invasive Ventilation in first 24 Hours of ICU	30.3%	35.9%	30.8%
Median Length of Stay in ICU in days (IQR)	1.7 (0.9-3.2)	1.4 (0.8-2.8)	1.7 (0.9-3.1)
After-Hours Discharges to Ward (1800 – 0600)	14.0%	11.6%	13.8%
Readmissions	3.9%	4.1%	3.9%
Source of Admission			
Ward	15.0%	16.0%	15.1%
Operating Theatre/Recovery	53.4%	49.5%	53.1%
Emergency Department	25.4%	28.3%	25.6%
Other Hospital	6.0%	6.2%	6.0%
Severity of Illness – Scores			
Median APACHE III Score (IQR)	47 (34-63)	51 (38-68)	47 (34-63)
Median APACHE II Score (IQR)	14 (10-19)	15 (11-20)	14 (10-19)
Severity of Illness – ANZROD Predicted Risk of Death			
Mean Predicted Risk of Death	7.72%	9.40%	7.86%
Median Predicted Risk of Death (IQR)	1.65% (0.53-6.46)	2.16% (0.69-8.60)	1.69% (0.54-6.64)
Outcomes			
ICU Mortality	5.05%	7.69%	5.26%
Hospital Mortality	7.65%	10.42%	7.88%
ANZROD SMR (95% CI) (IQR)	0.94 (0.93-0.96)	1.03 (0.97-1.1)	0.95 (0.94-0.97)
Survivors (admitted to hospital from home) discharged home	58.53%	55.41%	58.27%
Survivors (admitted to hospital from home) discharged to a chronic care facility	3.28%	3.59%	3.30%

Readmissions are reported as the proportion of patients discharged alive from their first ICU admission who have one or more readmissions to ICU within the same hospital stay.

Please see Appendix 3 for an explanation of the scoring systems used by CORE.

Source: APD

Note: Above calculations are based on APD data submitted to CORE as of 9th July 2019.

Appendix 1 – Profile of APD Admissions

Table 2: Top 5 admission diagnoses for patients admitted to adult ICUs

Australia	Number	Percentage
CABG Surgery	9,051	5.7%
Orthopaedic Surgery	8,507	5.4%
Other GI diseases	6,938	4.4%
GI Surgery for Neoplasm	6,459	4.1%
Laminectomy / Spinal cord surgery	5,774	3.6%
New Zealand	Number	Percentage
CABG Surgery	1,193	8.3%
Valvular Heart Surgery	729	5.1%
Cardiac Arrest	542	3.8%
Sepsis, other than urinary	510	3.6%
Drug Overdose	507	3.5%

Table 3: Top diagnoses groups* for patients admitted to adult ICUs by mortality rate

Australia	Number	Mortality Rate %
Cardiac arrest	3,074	50.2%
Stroke & intracerebral haemorrhage	2,779	28.2%
Head injury +/- multi-trauma (operative and non-operative)	2,179	17.6%
Subarachnoid haemorrhage (operative and non-operative)	1,577	17.1%
Sepsis & other ICU infections (not pneumonia)	12,868	15.9%
Pneumonia	5,501	14.9%
COPD	3,024	12.8%
GI Malignancy	12,013	6.3%
New Zealand	Number	Mortality Rate %
Cardiac arrest	542	49.3%
Subarachnoid haemorrhage (operative and non-operative)	177	35.0%
Stroke & intracerebral haemorrhage	343	35.0%
Pneumonia	463	18.8%
Head injury +/- multi-trauma (operative and non-operative)	353	17.6%
COPD	158	14.6%
Sepsis & other ICU infections (not pneumonia)	1297	13.9%
GI Malignancy	1015	10.3%

* Individual APACHE diagnoses have been collapsed into broader diagnostic groups to ensure more than 100 patients per group

Source: APD

Table 4: Contributing hospitals and number of admissions reported to the APD

Note: some hospitals report data from separate ICU's within their hospitals (177 ICUs/174 hospitals)

Hospital Classification	Australia		New Zealand	
	Number of ICUs	Number of ICU Admissions	Number of ICUs	Number of ICU Admissions
Tertiary	33	62,931	7	9,546
Metropolitan	29	21,350	4	2,200
Rural/Regional	37	22,468	5	2,513
Private	61	51,855	1	53
Total	160	158,604	17	14,312

Source: APD

Appendix 2 – APD Contributing Sites

Jurisdiction	Hospital Classification	Hospital ICUs
ACT	Tertiary	Canberra Hospital
	Metropolitan	Calvary Hospital (Canberra)
	Private	Calvary John James Hospital
		National Capital Private Hospital
NSW	Tertiary	Concord Hospital (Sydney)
		John Hunter Hospital
		Liverpool Hospital
		Nepean Hospital
		Prince of Wales Hospital (Sydney)
		Royal North Shore Hospital
		Royal Prince Alfred Hospital
		St George Hospital (Sydney) CICU
		St George Hospital (Sydney) ICU
		St George Hospital (Sydney) ICU2
		St Vincent's Hospital (Sydney)
		Westmead Hospital
		Wollongong Hospital
		Metropolitan
	Blacktown Hospital	
	Calvary Mater Newcastle	
	Campbelltown Hospital	
	Fairfield Hospital	
	Gosford Hospital	
	Hornsby Ku-ring-gai Hospital	
	Northern Beaches Hospital	
	Sutherland Hospital & Community Health Services	
	Rural / Regional	Bathurst Base Hospital
		Coffs Harbour Health Campus
		Dubbo Base Hospital
		Goulburn Base Hospital
		Grafton Base Hospital
		Griffith Base Hospital
		Lismore Base Hospital
		Manning Rural Referral Hospital
		Orange Base Hospital
		Port Macquarie Base Hospital
		Shoalhaven Hospital
		Tamworth Base Hospital
		Tweed Heads District Hospital
		Wagga Wagga Base Hospital & District Health
		Wyong Hospital
	Private	Gosford Private Hospital
		Hurstville Private Hospital

Jurisdiction	Hospital Classification	Hospital ICUs
NSW <i>continued</i>	Private	Kareena Private Hospital
		Macquarie University Private Hospital
		Mater Private Hospital (Sydney)
		Newcastle Private Hospital
		North Shore Private Hospital
		Norwest Private Hospital
		Prince of Wales Private Hospital (Sydney)
		St George Private Hospital (Sydney)
		St Vincent's Private Hospital (Sydney)
		Sydney Adventist Hospital
		Sydney Southwest Private Hospital
		The Chris O'Brien Lifehouse
		Westmead Private Hospital
		Wollongong Private Hospital
NT	Metropolitan	Royal Darwin Hospital
	Rural / Regional	Alice Springs Hospital
QLD	Tertiary	Gold Coast University Hospital
		Mater Adults Hospital (Brisbane)
		Princess Alexandra Hospital
		Royal Brisbane and Women's Hospital
		The Prince Charles Hospital
		The Townsville Hospital
	Metropolitan	Caboolture Hospital HDU
		Ipswich Hospital
		Logan Hospital
		Queen Elizabeth II Jubilee Hospital
		Redcliffe Hospital
		Robina Hospital
	Rural / Regional	Bundaberg Base Hospital
		Cairns Hospital
		Hervey Bay Hospital
		Mackay Base Hospital
		Mount Isa Hospital
		Rockhampton Hospital
	Private	Toowoomba Hospital
		Brisbane Private Hospital
		Buderim Private Hospital
		Gold Coast Private Hospital
		Greenslopes Private Hospital
		Holy Spirit Northside Hospital
John Flynn Private Hospital		
Mater Health Services North Queensland		
Mater Private Hospital (Brisbane)		
Noosa Hospital		
Pindara Private Hospital ICU		

Jurisdiction	Hospital Classification	Hospital ICUs
QLD <i>continued</i>	Private	St Andrew's Hospital Toowoomba
		St Andrew's War Memorial Hospital
		St Vincent's Hospital (Toowoomba)
		Sunnybank Hospital
		The Wesley Hospital
SA	Tertiary	Flinders Medical Centre
		Royal Adelaide Hospital
		The Queen Elizabeth Hospital
	Metropolitan	Lyell McEwin Hospital
	Private	Ashford Community Hospital ICU
		Calvary North Adelaide Hospital
		Calvary Wakefield Hospital
		Flinders Private Hospital
		St Andrew's Hospital (Adelaide) ICU
		The Memorial Hospital (Adelaide)
Western Hospital (SA)		
TAS	Tertiary	Royal Hobart Hospital
	Metropolitan	Launceston General Hospital
	Rural / Regional	North West Regional Hospital (Burnie)
VIC	Tertiary	Alfred Hospital ICU
		Austin Hospital ICU
		Monash Medical Centre-Clayton Campus
		Royal Melbourne Hospital
		St Vincent's Hospital (Melbourne)
		University Hospital Geelong
	Metropolitan	Box Hill Hospital
		Dandenong Hospital
		Footscray Hospital
		Frankston Hospital
		Maroondah Hospital
		Sunshine Hospital
		The Northern Hospital ICU
	Rural / Regional	Albury Base Hospital
		Ballarat Health Services
		Bendigo Health Care Group
		Central Gippsland Health Service
		Goulburn Valley Health
		Latrobe Regional Hospital
		Mildura Base Hospital
		Northeast Health Wangaratta
		South West Healthcare (Warrnambool)
		Western District Health Service (Hamilton)
		Wimmera Health Care Group (Horsham)
	Private	Cabrini Hospital
		Epworth Eastern Private Hospital

Jurisdiction	Hospital Classification	Hospital ICUs
VIC <i>continued</i>	Private	Epworth Freemasons Hospital
		Epworth Geelong
		Epworth Hospital (Richmond)
		Holmesglen Private Hospital
		John Fawkner Hospital
		Knox Private Hospital
		Melbourne Private Hospital
		Peninsula Private Hospital
		St John of God (Berwick) ICU
		St John of God Hospital (Bendigo)
		St John Of God Hospital (Geelong)
		St Vincent's Private Hospital Fitzroy
		The Bays Hospital
		The Valley Private Hospital
		Warringal Private Hospital
Western Private Hospital ICU		
WA	Tertiary	Fiona Stanley Hospital
		Royal Perth Hospital
		Sir Charles Gairdner Hospital
	Metropolitan	Armadale Health Service
		Joondalup Health Campus
		Rockingham General Hospital
	Rural / Regional	Bunbury Regional Hospital
		St John of God Midland Public & Private
	Private	Mount Hospital
		St John Of God Health Care (Subiaco)
		St John Of God Hospital (Murdoch)
	NZ	Tertiary
Auckland City Hospital DCCM		
Christchurch Hospital		
Dunedin Hospital		
Middlemore Hospital		
Waikato Hospital		
Wellington Hospital		
Metropolitan		North Shore Hospital
		Tauranga Hospital
		Timaru Hospital
		Whangarei Area Hospital
Rural / Regional		Hawkes Bay Hospital
		Hutt Hospital
		Nelson Hospital
		Rotorua Hospital
		Taranaki Health
Private		Southern Cross Hospital (Hamilton)

Source: APD

Appendix 3 – Scoring Systems

Prognostic models are used to provide case mix-adjusted analysis for comparison between units and as a foundation for research into therapeutic efforts and the economics of care in the ICU. During 2015/16, the APD used ANZROD as the primary risk of death model. While an estimated ANZROD probability of death is calculated for each patient, the aim of ANZROD is to estimate the expected mortality for a population (or unit) overall.

All readmission episodes to ICU are excluded from calculation of predicted mortality, observed mortality (ICU and hospital) and the Standardised Mortality Ratio (SMR).

ANZROD

ANZROD provides better adjustment for case-mix variation than APACHE III-J. The use of eight separate equations allows more appropriate weighting of individual components for each diagnostic group. ANZROD was originally developed and calibrated so the observed and predicted mortality for Australia and New Zealand matched each other in 2011/2012. Thus the SMR in 2011 was 1. It will undergo recalibration again soon. ANZROD is calculated using the worst physiological values in the first 24 hours of ICU admission with less exclusions than APACHE III-J and applies the weighting of diagnostic groups. All initial admissions to ICU aged 16 years and over are included with the following exclusion criteria:

- Age < 16 years
- Unknown hospital outcome
- All physiological variables are missing
- Palliative care and organ donation admissions
- Readmissions

APACHE III-J (3rd revision, 10th recalibration)

The APACHE III-J predicted risk of death is calculated using the worst physiological values in the first 24 hours of ICU admission, age, pre-ICU length of stay, type of admission (planned/unplanned), chronic health status prior to hospital admission, ICU source of admission and a more specific diagnostic reason for ICU admission (as compared to APACHE II). APACHE III-J takes into account whether Acute Myocardial Infarction (AMI)/heart attack patients have received thrombolytic therapy and also includes cardiac patients, taking into account whether these patients have received multiple grafts. The exclusion criteria for the APACHE III-J reports include:

- Length of stay < 4 hours
- Age < 16 years
- Unknown hospital outcome
- Missing or non-valid APACHE III diagnostic codes
- 16 physiological variables required for the APACHE III-J score calculation are all missing

Abbreviations

ACSQHC	Australian Commission on Safety and Quality in Health Care
AMI	Acute Myocardial Infarction
ANZICS	Australian and New Zealand Intensive Care Society
ANZROD	Australian and New Zealand Risk of Death
APACHE	Acute Physiological, Age and Chronic Health Evaluation
APD	Adult Patient Database
CABG	Coronary Artery Bypass Graft
CCR	Critical Care Resources Registry
CERS	CORE Enterprise Reporting System
CI	Confidence Interval
CICM	College of Intensive Care Medicine
CORE	Centre for Outcome and Resource Evaluation
FTE	Full Time Equivalent
GI	Gastrointestinal
ICU	Intensive Care Unit
IQR	Interquartile Range
NICRSC	National Intensive Care Registry Steering Committee
OT	Operating Theatre
SMR	Standardised Mortality Ratio

Glossary

After Hours Discharge	Discharge of a patient from ICU between 1800 and 0600.
Available beds	A bed with advanced life support capability that is fully staffed and funded.
Chronic Care Facility	A facility that provides rehabilitative, restorative, and/or ongoing skilled nursing care to patients or residents in need of assistance with activities of daily living. Long-term care facilities include nursing homes, rehabilitation facilities, inpatient behavioural health facilities, and long-term chronic care hospitals.
Critical Care Nurse	A nurse who has completed a post-registration critical care qualification.
Elective Admission	A planned admission to ICU following elective surgery.
Emergency Admission	An unplanned admission to ICU. An admission to the ICU for urgent care or treatment.
Hospital Mortality	Proportion of patients with an ICU admission that died in the same hospital admission.
ICU Mortality	Proportion of patients that died in ICU.
Observed Mortality	Proportion of patients who died in hospital following a stay in ICU and only includes admissions that meet the criteria for an SMR. <i>Note: SMR exclusions differ depending on the predictive model being used.</i>
Predicted Mortality	Proportion of patients predicted (by a disease severity model) to die in hospital following a stay in ICU and only includes patients that meet the criteria for an SMR. <i>Note: SMR exclusions differ depending on the predictive model being used.</i>
Readmission	A readmitted ICU patient is a patient who survived ICU and has had at least one readmission, excluding direct transfers to or from ICU/HDU. Readmission includes all readmissions; it is not equivalent to the ACHS indicator ≤ 72 hours.
Standardised Mortality Ratio	The SMR presents the number of deaths that occur as a proportion of the number of deaths that might be expected based on a disease severity model such as APACHE III-J or PIM3, which aims to take into account confounding factors such as disease severity and age. 'Expected deaths' therefore reflects outcomes that have been achieved internationally across hospitals seen to be delivering best practice treatment. An SMR below 1 represents a lower than expected mortality rate.
Ventilated	Patients provided with continuous support via oral/nasal intubation or tracheostomy by means of a mechanical device that augments or replaces respiratory effort.

