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Australian and New Zealand Intensive Care Society:

Centre for Outcome and Resource Evaluation

Intensive Care Resources and Activity Report 2013/14

Australia and New Zealand Intensive Care

Resources & Activity Report 2013/14

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Contents

List of Figures

Executive Summary: Trends in Intensive Care Resources & Activity

This section provides an overview of key changes in activity and bed numbers as reported in the 2013/14 Critical Care Resources (CCR) Survey and also includes comparisons over five years from sites who have consistently submitted data over this period. Comparisons from year to year are complex as some units do not submit or complete a full survey each year. When making comparison over a number of years, units with incomplete data are excluded. There may be a bias towards the larger units who are more likely to have complete data every year. As a result the percentage change from 2012/13 to 2013/14 for a single item, may differ between a two or five year selection of units. For 2013/14, 165 of 207 (80%) units submitted a survey. Bed information was obtained from all units.

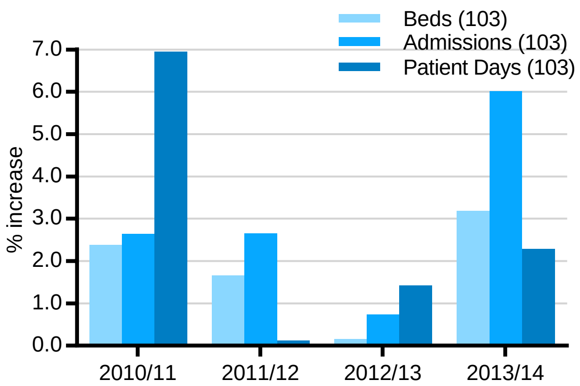
5 year summary

Over a 5 year period 103 units submitted available bed numbers, admissions and patient days. In 2013/14 there was a 3.2% increase in available beds, a 6.0% increase in admissions and a 2.3% increase in patient days for these units.

The increase in admissions is out of step with the increase in patient days. This however complements the 2.6% increase in admissions and 7.0% increase in patient days in 2010/11 (Figure 1).

The average annual increase over 5 years has been 1.9% increase in available beds, 3.1% increase in admissions and 2.8% increase in patient days.

Figure 1 Available Beds, Admissions and Patient Days over 5 years (103 units)



Beds

2013/14 saw a 2.6% increase in available beds (204 units with data over 2 years).

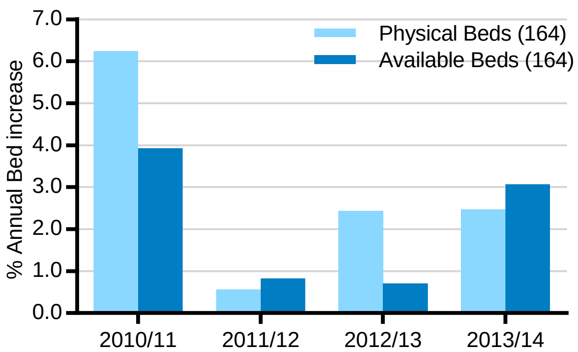
- 15 units decreased the number of available beds (total decrease 28, range 1-6 per unit).
- 39 units increased the number of available beds (total increase 85, range 1-5 per unit, median 2).
- 150 units had no change.
- The overall increase was 57 beds.

Regional and hospital classification differences

- Queensland had the largest increase of 7.8% (28 beds) followed by Victoria (14 beds) and Western Australia (9 beds).
- The increase in beds was proportionally higher for Tertiary and Rural units.

The 5 year bed trend is shown in Figure 2.

Figure 2 Physical and Available Beds over 5 years (164 units)



Executive Summary: Trends in Intensive Care Resources & Activity *Continued*

Admissions

There was a 7.3% increase in admissions in 2013/14 (148 units with data over 2 years).

1/3 had a decrease and 2/3 had an increase (range - 28% to 74%). Tertiary and Metropolitan units had the same % increase with Private units higher and Rural units lower.

Analysis by state is difficult because some states have small numbers of units and large biases from missing data. The larger states (NSW, VIC, QLD) had more units to review and increases of 5-8%.

Looking at changes in unit admissions over 5 years there was a 5.2%, 2.5%, -0.3% and 6.9% increase each year (based on 120 units). This averages to 3.1% but it is hard to identify why there is such variation over the past 2 years.

Patient Days

There was a 3.4% increase in patient days in 2013/14 (125 units with data over 2 years). This increase was predominantly in the Private units (12%) and least in the Tertiary units (1.9%). This increase is lower than the 7% increase in admissions.

1/3 of units had a decrease in patient days and 2/3 had an increase. The range was -23% to 85%.

Over 5 years the percent annual change has been 6.9%, 0.1%, 1.4% and 2.3% averaging 2.8% (103 units). The difference between the 3.4% change for a 1 year sample, and 2.3% change for the 5 year sample represents the bias from the higher proportion of Tertiary units in the 5 year sample.

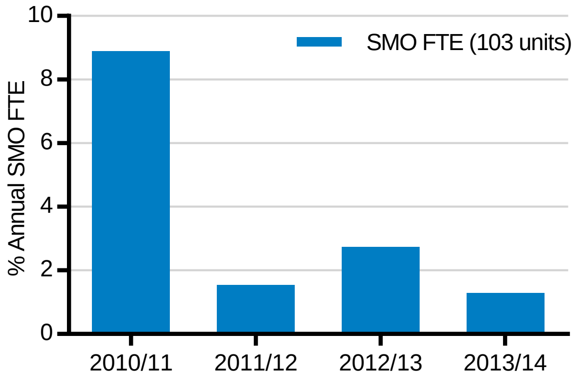
Nursing Staffing

Nursing Full Time Equivalents (FTE) over the last 5 years has increased by 7.3% (averaging 1.8% each year) which was proportional to the increase in activity in those units, so that the median RN FTE per 1000 patient bed days has not changed. Nursing vacancies have fallen slightly over the past three years and the vacancy rate for 2013/14 is 4.8%.

Senior Medical Officer Staffing

The Senior Medical Officer workforce has increased over the last 5 years with a rise in the total FTE of 15.1% (averaging 3.7% each year). Figure 3 shows the % increase in SMO FTE each year (103 units with data over 5 years).

Figure 3 Senior Medical Officer FTE over 5 years (103 units)



The median unit SMO FTE per 1000 Patient Days has not changed.

Most notable is the continued fall in the SMO vacancy rate from 9.2% 5 years ago to 2.8%. The actual number of vacant positions for 13/14 was 17 FTE (at the time of the survey).

Readmissions / Cancelled Elective Surgery / After Hours Discharges

These has been no change in Readmissions, Cancelled Elective Surgery and After Hours discharges in the last 4 years.

Ventilation

The % of patients invasively ventilated fell by 1% (consistent with previous trends) and now sits at 38%.

ICU/HDU

The proportion of patient admissions described as ICU (as opposed to HDU) has not changed over the past 5 years and remains at 70% for Australia and 61% for NZ.

Overview of CCR Survey 2013/14

Introduction

The Critical Care Resources (CCR) Survey is one of four registries administered by the Australian and New Zealand Intensive Care Society (ANZICS) Centre for Outcome and Resource Evaluation (CORE), a not-for-profit organisation located in Melbourne, Australia. The other registries managed by CORE are:

- The Adult Patient Database (APD), which collects data on adult admissions to ICUs;
- The Australian and New Zealand Paediatric Intensive Care (ANZPIC) Registry which collects data on ICU admissions of patients under the age of 16 years; and
- The Central Line Associated Blood Stream Infection (CLABSI) Surveillance Program, which collects data on ICU CLABSI rates.

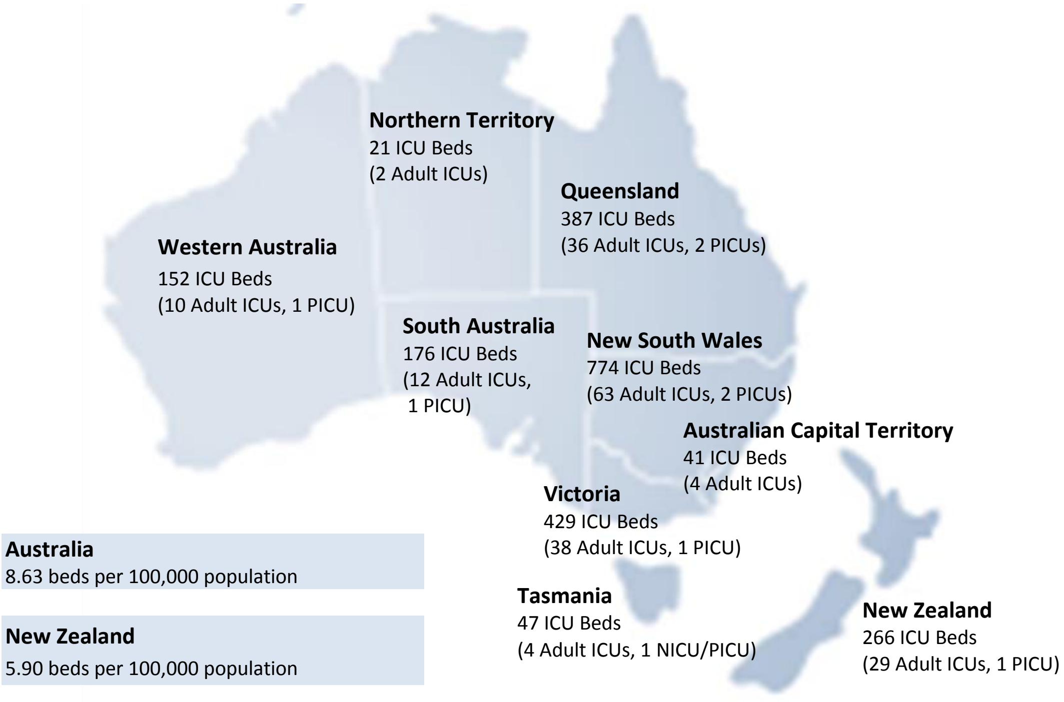
The CCR Survey has collected data on activity, resources and processes of care from Australian and New Zealand ICUs since 1993. Detail on the CCR Survey can be found at: http://www.anzics.com.au/pages/CORE/CCR.aspx

This report describes the changes in activity and bed numbers as reported in the 2013/14 CCR Survey as well as comparisons over 5 years from sites which have consistently submitted data over this period. In 2013/14 there were 207 ICU units in Australia and New Zealand, 205 units were invited to complete the survey with 165 units submitting a full survey. There were two additional units that submitted an incomplete year of data and one site that submitted post analysis. All sites that did not submit a survey in 2013/14 were contacted via phone and email to determine bed numbers, overall there were 2293 available beds and 2646 physical beds. All data included in this report was correct at the time of the survey.

Profile of ICUs across Australia and New Zealand

The figure below shows all available ICU and PICU beds in Australia and New Zealand based on data received through the CCR survey and follow up with non-contributing sites (Figure 1). Non-contributing sites are predominantly smaller rural and private ICUs that admit a small number of ICU patients.

Figure 4 Profile of Total Public and Private ICUs across Australia and New Zealand

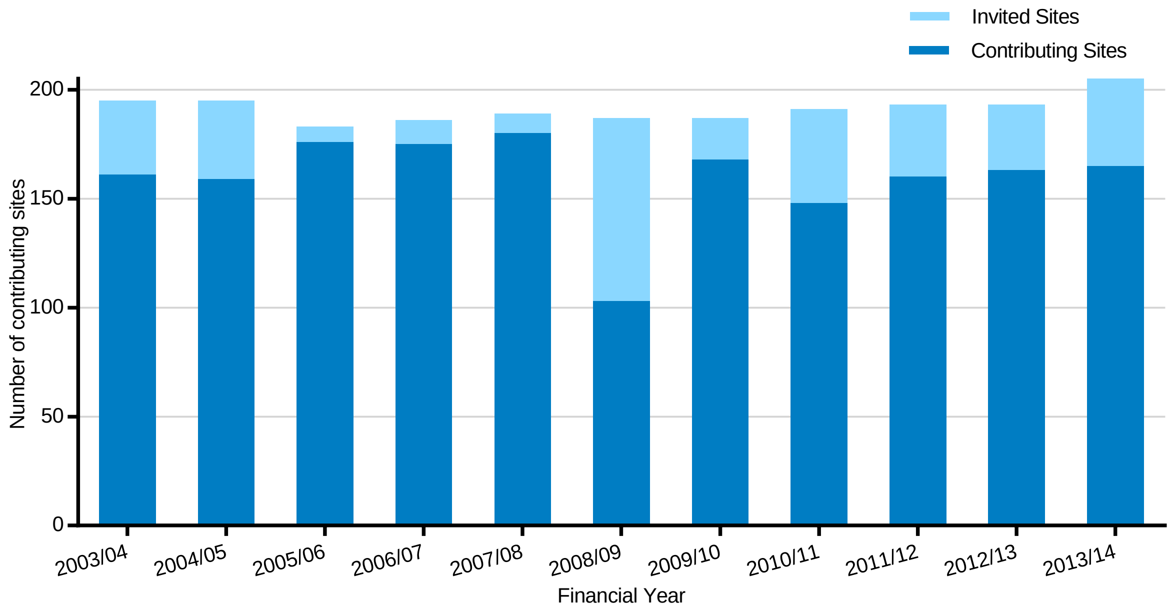


Source: CCR 2013/14 and follow-up by phone and email to obtain remaining bed numbers not reported through CCR. Population was 23,490,736 for Australia and 4,509,900 for New Zealand

Contribution to the 2013/14 CCR Survey

The 2013/14 CCR Survey was sent to 205 sites and had a response rate of 80% with 165 units across Australia and New Zealand contributing to the survey.

Figure 5 Contributions to CCR from 2004 to 2014



For the analysis over time, only data from units that consistently contributed to the survey for the years indicated were included. The number of contributing sites differs for each question so where relevant the number of sites included in analysis has been included with each graph throughout the report.

Below figure 5 shows that 151 units have consistently contributed to the survey over two years, with 14 sites who submitted in 2013/14 excluded from the two year analysis. Figure 6 shows that 121 units consistently contributed over a five year period with 44 sites excluded from the five year analysis in 2013/14.

Figure 6 Consistent Contributors over 2 years

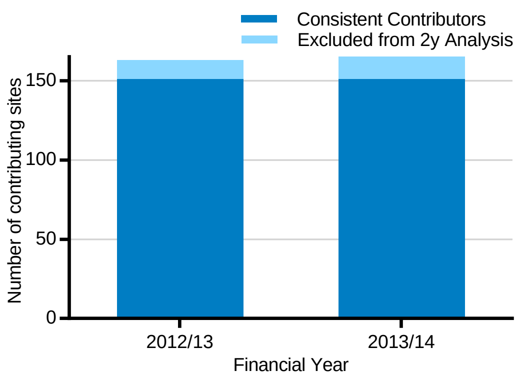
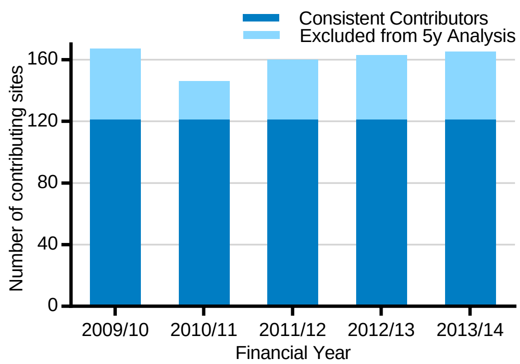


Figure 7 Consistent Contributors over 5 years



Summary of Intensive Care Activity & Resources in 2013/14

Who contributed to CCR?

165 units contributed to the CCR in 2013/14

- 37 Tertiary Hospitals
- 27 Metropolitan Hospitals
- 45 Regional Hospitals
- 49 Private Hospitals
- 7 PICUs

ICU Bed Stock

- 2,293 adult and paediatric ICU beds were available for use across Australia and New Zealand
- 8.63 ICU beds were available per 100,000 population in Australia, 5.90 ICU beds were available per 100,000 population in New Zealand

ICU Admissions, Discharges and Refusals

- 167,353 ICU admissions across 163 Australian and New Zealand ICUs (including PICUs)
- 12.8% of patients were discharged to the ward between 1800 and 0600 hours
- 38.2% of admissions at 149 units received invasive ventilation
- 1.75% of patients at 112 sites had elective surgery cancelled or deferred due to inadequate resources
- 2.7% of patients from 110 sites were refused admission due to inadequate resources

ICU Staffing Profile

- 1,137 senior medical positions at 154 units were employed in a total of 699.2 FTE and 90.3% of senior medical staff were Intensivists, across all units there was a vacancy rate of 2.48%
- 11,000 registered nurse positions at 160 units were employed in a total of 8,815 FTE
- 53.9 % of registered nurses at 138 units were trained in critical care nursing, across all units there was a vacancy rate of 4.8 %

Intensive Care Bed Stock

Physical Bed

A single patient care location fully configured to ICU standards. It is an actual bed, not a bed space.

Available Bed

A bed with advanced life support capability that is fully staffed and funded.

2013/14 Regional spread of ICU Beds in Australia

- 177 Intensive Care Units, 2,331 physical beds and 2,027 available beds
- New Zealand had 30 units, 315 physical beds and 266 available beds

Figure 8 Physical Beds per 100,000 population

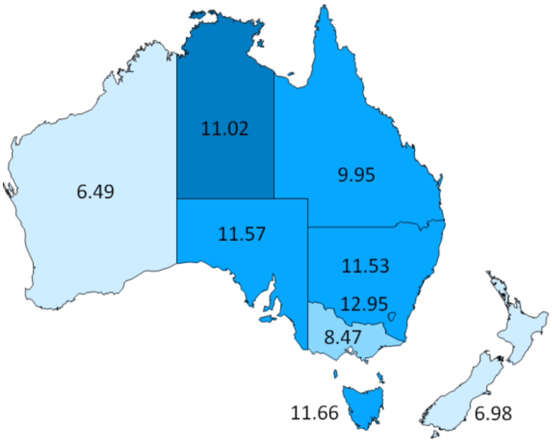
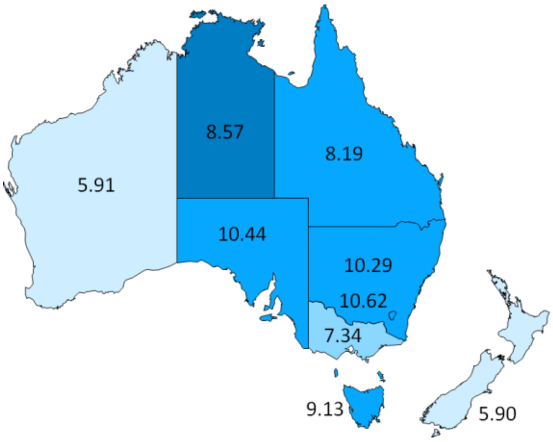


Figure 9 Available Beds per 100,000 population



Data from 207 units (177 AU, 30 NZ).

Figure 10 Physical Adult Beds per 100,000 Adult population

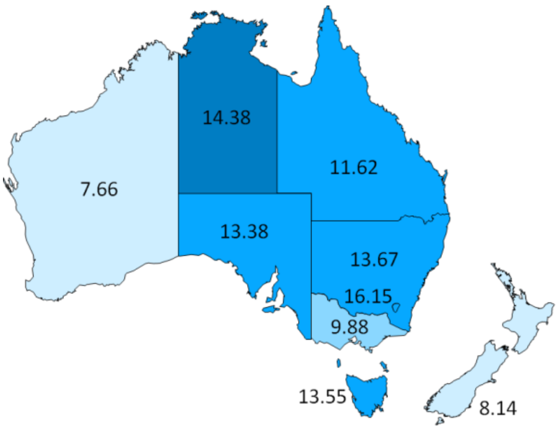
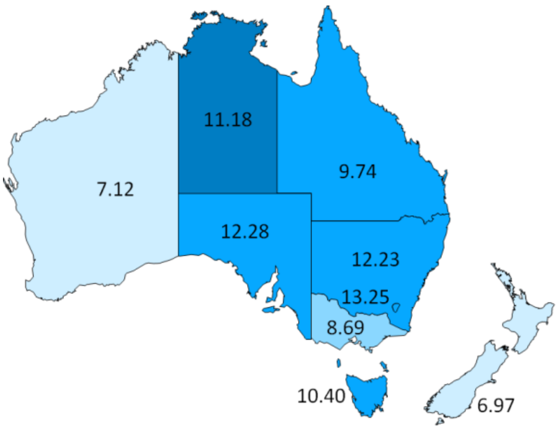


Figure 11 Available Adult Beds per 100,000 Adult population



Data from 198 units (169 AU, 29 NZ).

Intensive Care Bed Stock *continued*

2013/14 Distribution of Public ICU Beds

Figure 12 Physical Public Beds per 100,000 population

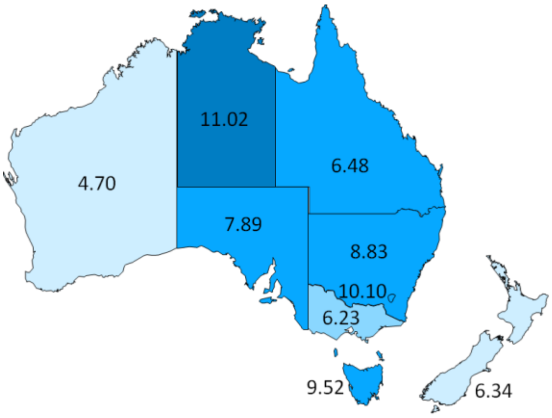
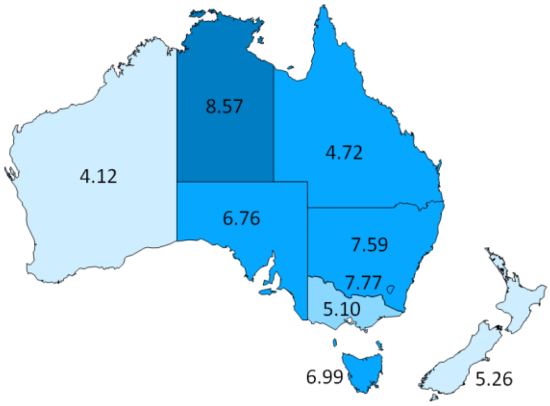


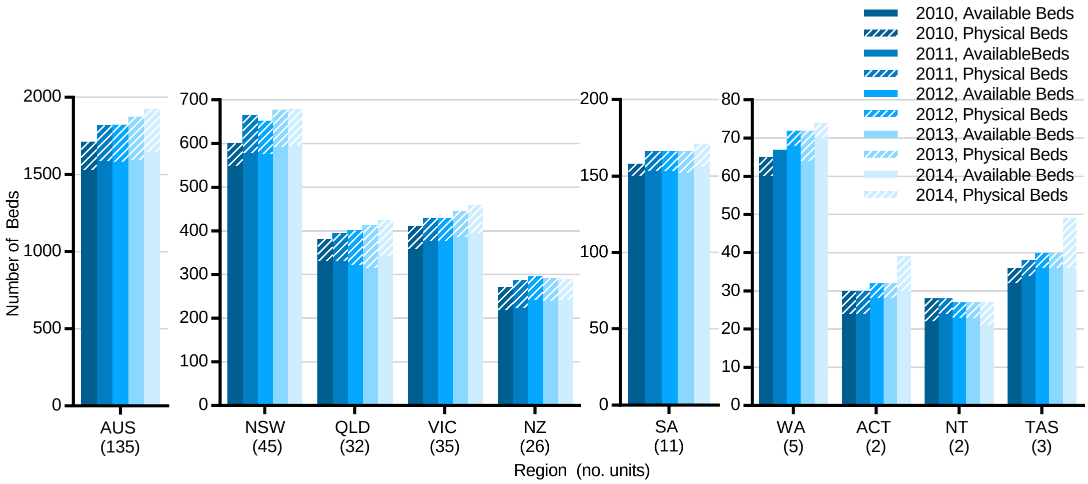
Figure 13 Available Public Beds per 100,000 population



Data from 141 units (116 AU, 25 NZ).

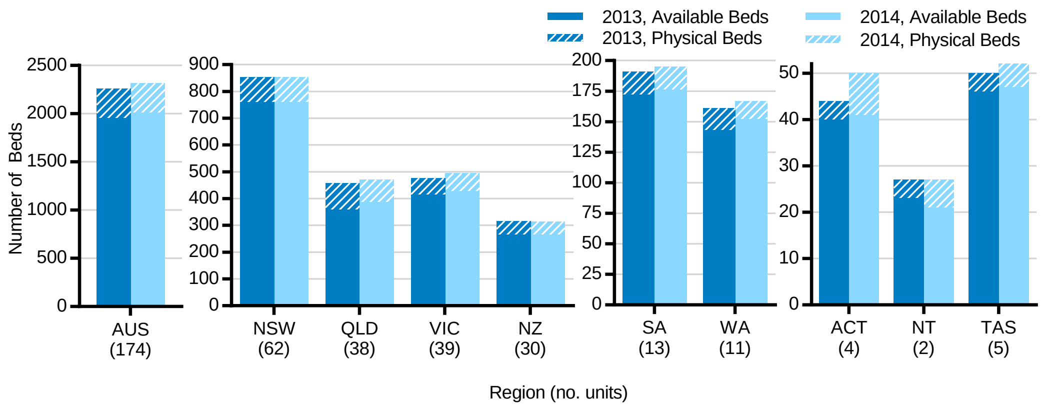
Trends in ICU Bed Stock

Figure 14 ICU Bed Stock between 2009/10 and 2013/14



Consistently contributing units and follow-up with non-contributing sites over 5 years (adult and paediatric). Data from 161 sites (135 AU, 26 NZ).

Figure 15 ICU Bed Stock between 2012/13 and 2013/14

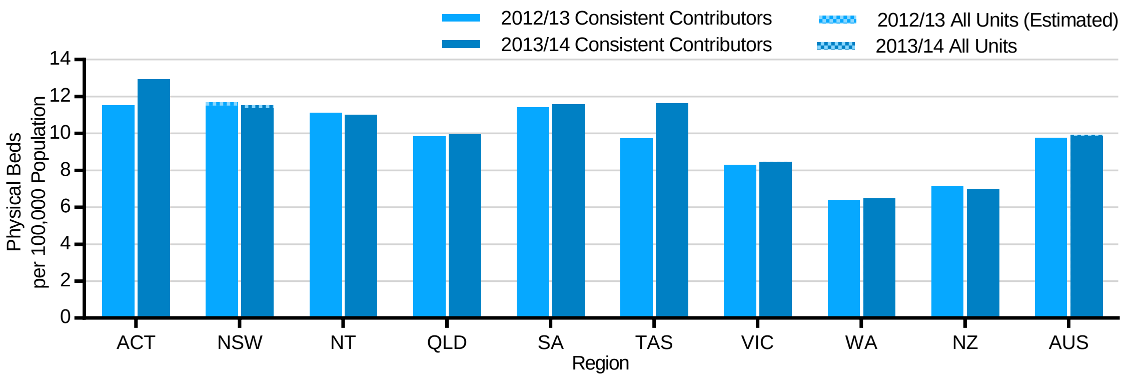


Consistently contributing units and follow-up with non-contributing sites over 2 years (adult and paediatric). Data from 204 sites (174 AU, 30 NZ).

Intensive Care Bed Stock *continued*

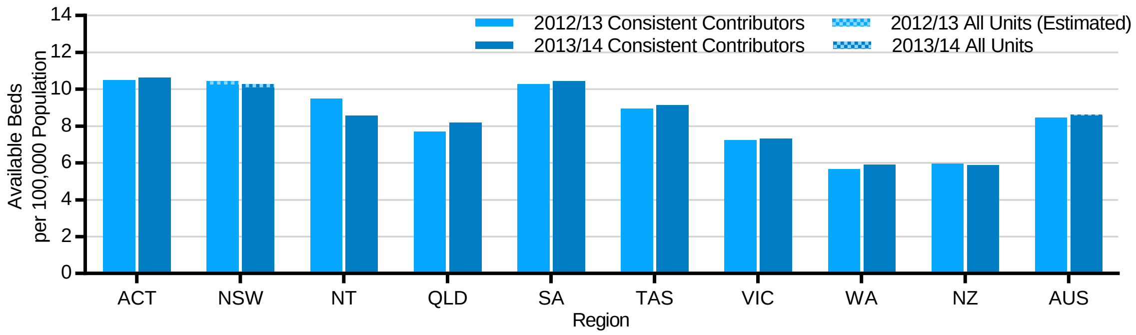
Change in Total ICU Bed Stock by Region

Figure 16 Physical Beds per 100,000 population in 2012/13 and 2013/14



Consistently contributing units and follow-up with non-contributing sites over 2 years (adult and paediatric). Data from 207 sites (177 AU, 30 NZ), 204 consistent contributors and 3 sites estimated.

Figure 17 Available Beds per 100,000 population in 2012/13 and 2013/14



Consistently contributing units and follow-up with non-contributing sites over 2 years (adult and paediatric). Data from 207 sites (177 AU, 30 NZ), 204 consistent contributors and 3 sites estimated.

Change in Total ICU Bed Stock by Unit

Figure 18 Changes in Physical Beds between 2012/13 and 2013/14

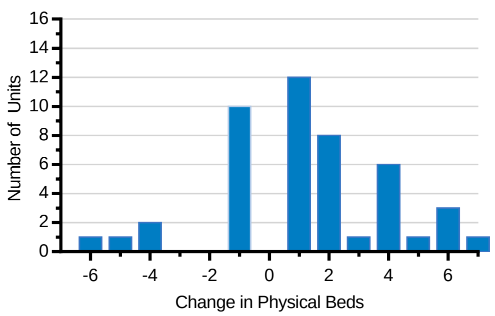
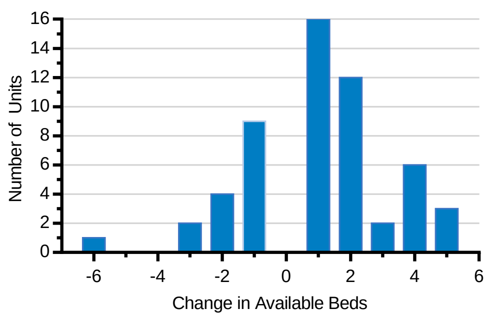


Figure 19 Changes in Available Beds between 2012/13 and 2013/14



Consistently contributing units and follow-up with non-contributing sites over 2 years (adult and paediatric). Data from 204 sites, units with no change excluded from graph.

ICU Activity

The CCR survey collects data relating to adult and paediatric patient admissions to an ICU, including admissions, bed days, readmissions, admission source, discharge destination, and patient ventilation.

Admissions and Discharge

Emergency Admission

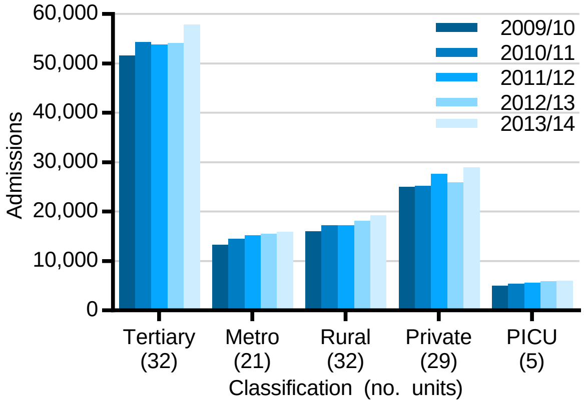
An unplanned admission or an admission of a patient to the ICU for urgent care or treatment.

Elective Admission

A planned admission, an admission to the ICU that could be postponed for 8 hours without adverse effect. A postponed elective admission can subsequently become an emergency admission.

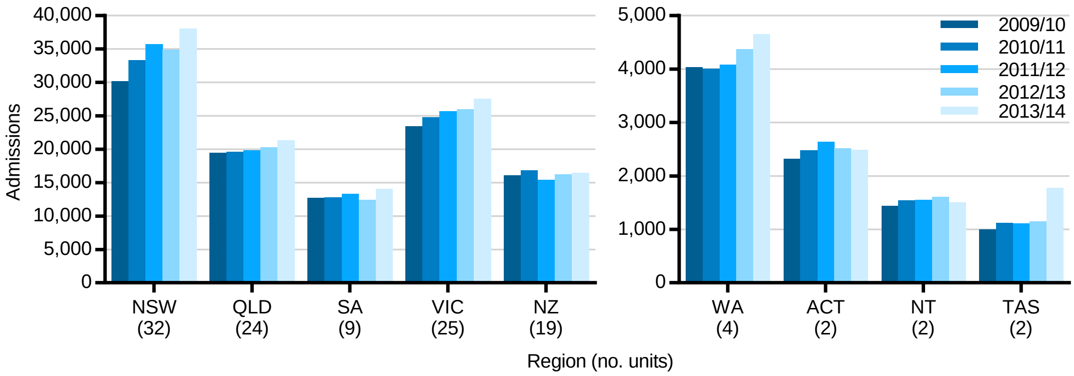
Five year trend in ICU Admissions

Figure 20 Admissions between 2009/10 and 2013/14, by Classification



Consistently contributing units only. Data from 119 sites.

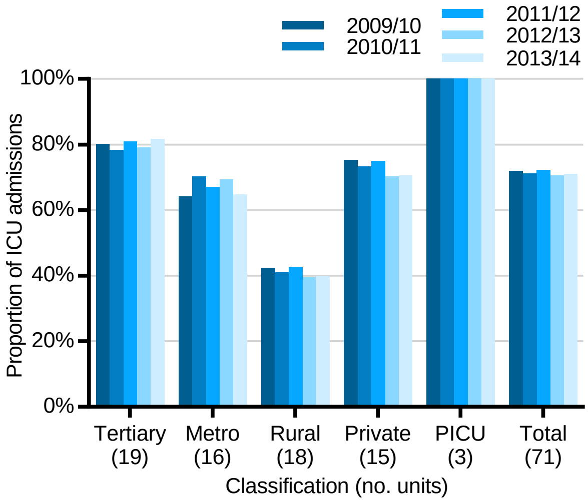
Figure 21 Admissions between 2009/10 and 2013/14, by Region



Consistently contributing units only. Data from 119 sites.

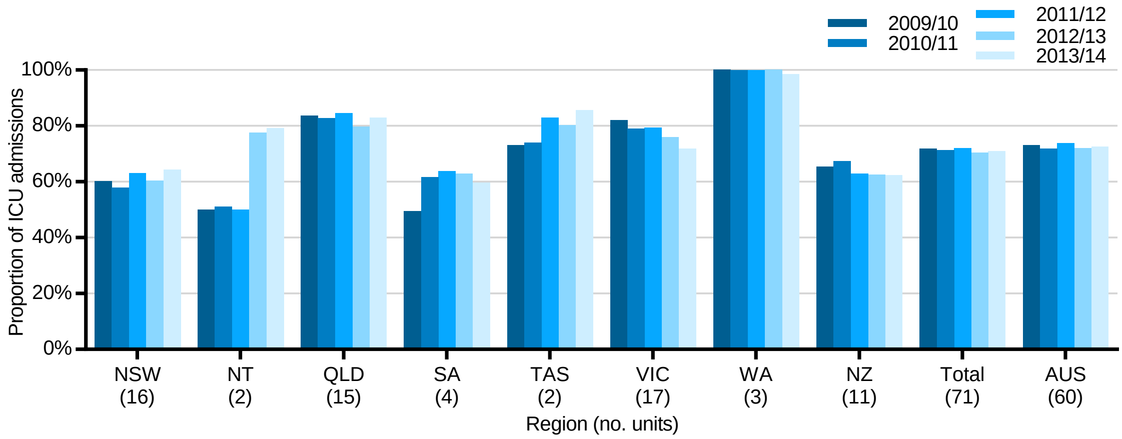
ICU Activity *continued*

Figure 22 Proportion ICU (vs HDU) Admissions between 2009/10 and 2013/14, by Classification



Consistently contributing units only. Data from 71 sites.

Figure 23 Proportion ICU (vs HDU) Admissions between 2009/10 and 2013/14, by Region



Consistently contributing units only. Data from 71 sites.

ICU Activity *continued*

2013/14 ICU Admission Data

Figure 24 Admissions per 100,000 population, by Region in 2013/14

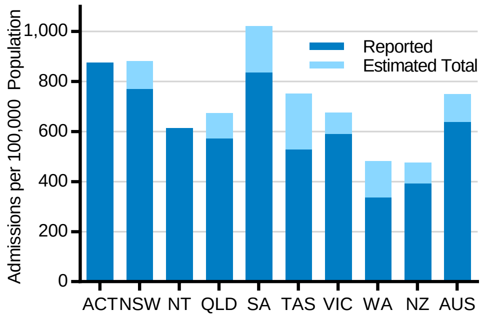
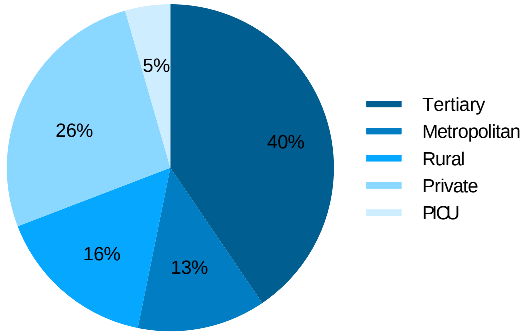


Figure 25 Proportion of Admissions, by Classification in 2013/14



Proportion of Elective and Emergency Admissions

Figure 26 Proportion of Emergency and Elective Admissions, by Classification in 2013/14

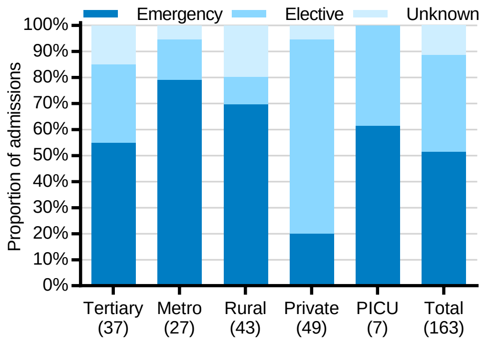
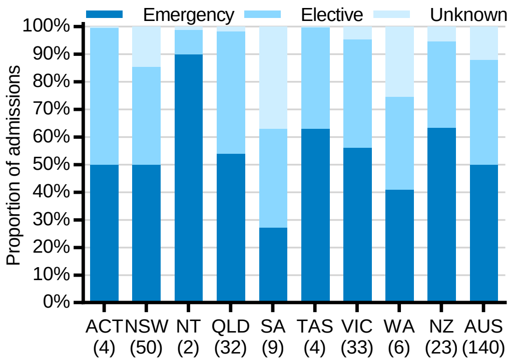


Figure 27 Proportion of Emergency and Elective Admissions, by Region in 2013/14



Proportion of ICU and HDU Admissions

Figure 28 Proportion of ICU and HDU Admissions, by Classification in 2013/14

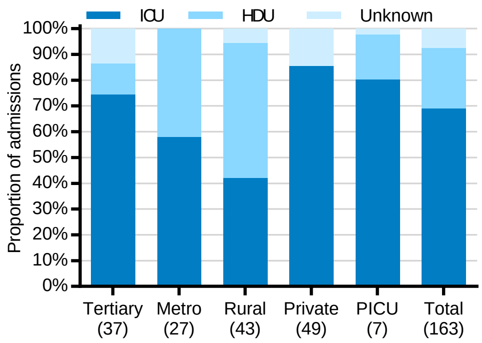
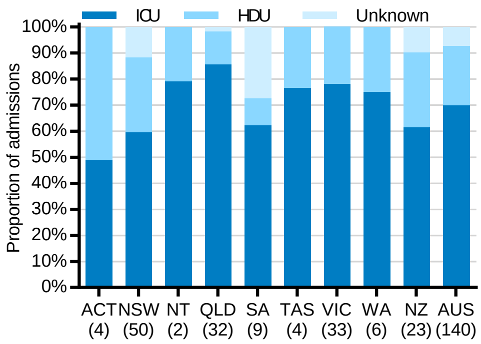


Figure 29 Proportion of ICU and HDU Admissions, by Region in 2013/14



2013/14 contributing units. Data from 163 sites.

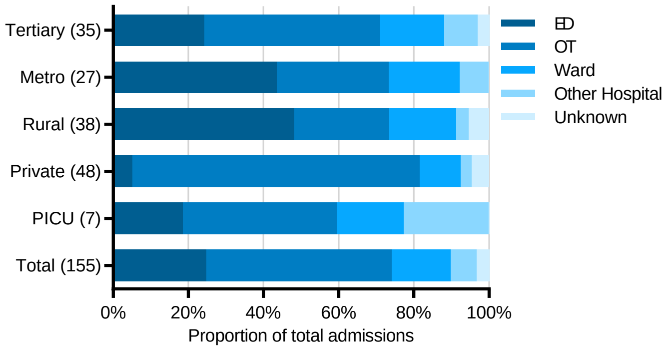
ICU Activity *continued*

Source of Admissions

Source of Admission

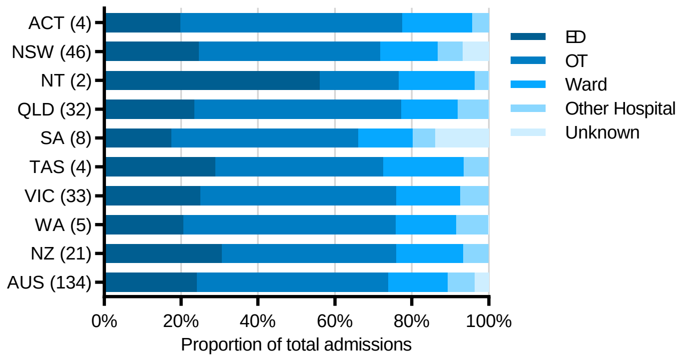
Source of Admission is categorised by those patients admitted from the Emergency Department (ED), the operating theatre (OT), the ward, other hospital or unknown source.

Figure 30 Source of Admission, by Classification in 2013/14



2013/14 contributing units. Data from 155 sites.

Figure 31 Source of Admission, by Region in 2013/14



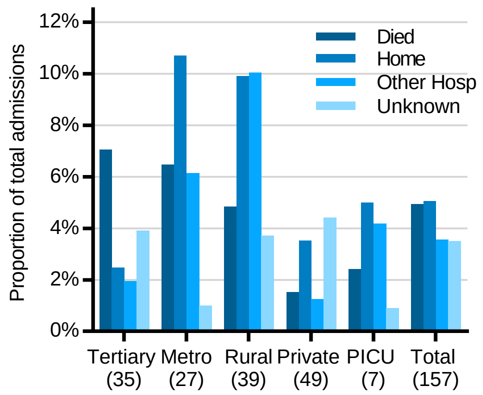
Destination at Discharge

Destination at Discharge

Classified by those patients that died in the ICU, discharged home from the ICU, transferred to another hospital from the ICU or their destination was unknown.

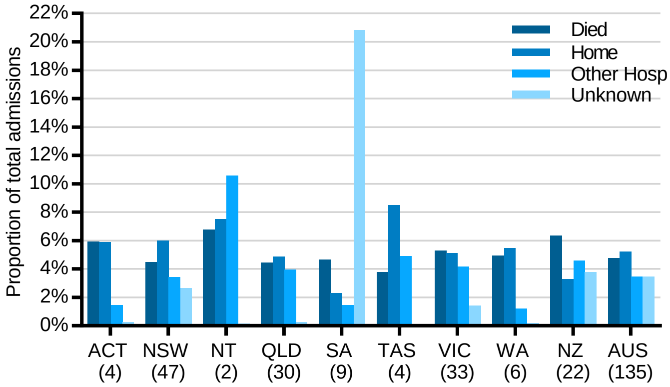
Overall 82.44% of admissions were discharged to the ward and therefore have been excluded from the figures below.

Figure 32 Discharge Destination, by Classification in 2013/14



2013/14 contributing units. Data from 157 sites.

Figure 33 Discharge Destination, by Region in 2013/14



ICU Activity *continued*

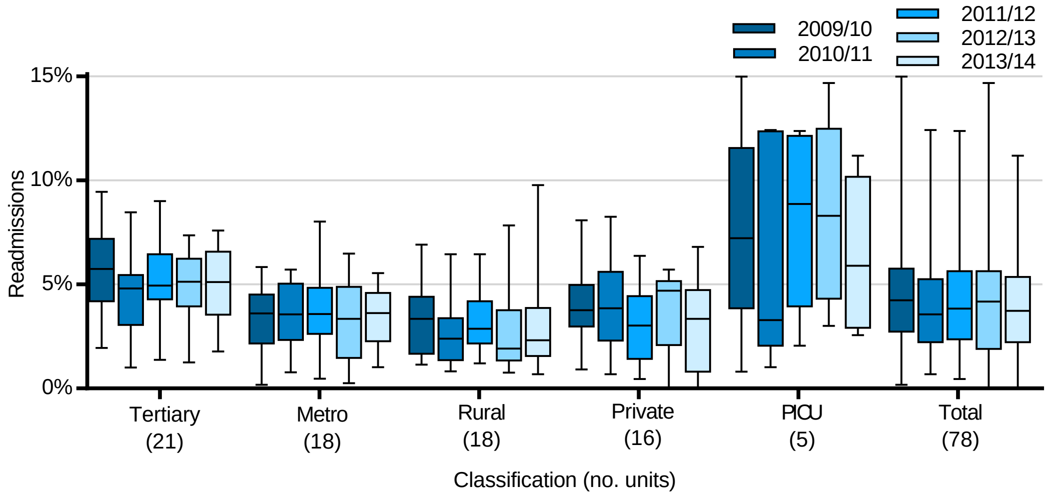
Readmissions

Readmissions
Any second or subsequent admission to ICU/HDU within the same hospital admission, excluding direct transfers to or from ICU/HDU.

Readmissions includes all Readmissions: it is not equivalent to the Australian Council of Healthcare Standards (ACHS) indicator =< 72hrs.

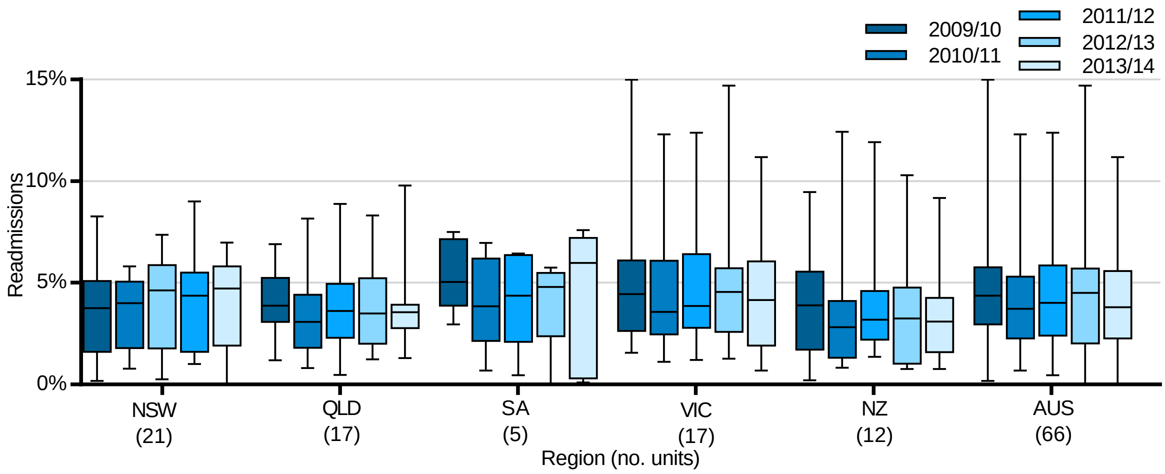
Five year trend in ICU Readmissions

Figure 34 Median and IQR Unit Readmission rates between 2009/10 and 2013/14, by Classification



Consistently contributing units only. Data from 78 sites.

Figure 35 Median and IQR Unit Readmission rates between 2009/10 and 2013/14, by Region



Consistently contributing units only. Data from 78 sites overall, ACT (1), TAS (1), WA (2) + NT (2) excluded from individual section of graph to avoid identification of individual units.

ICU Activity *continued*

2013/14 Readmission Data

In 2013/14 there were 148 sites that submitted readmission data. The overall patient readmission rate was 4.0%.

Figure 36 Median and IQR Unit Readmission rate, by Classification in 2013/14

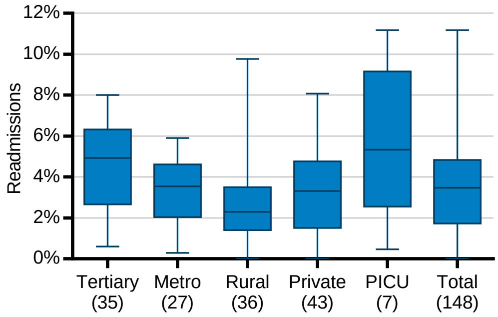
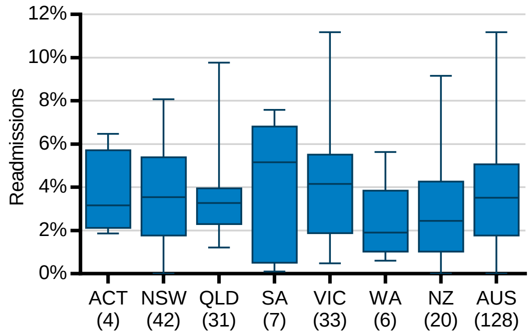


Figure 37 Median and IQR Unit Readmission rate, by Region in 2013/14



2013/14 contributing units. Data from 148 sites, NT (2) + TAS (3) excluded from individual section of graph to avoid identification of individual units.

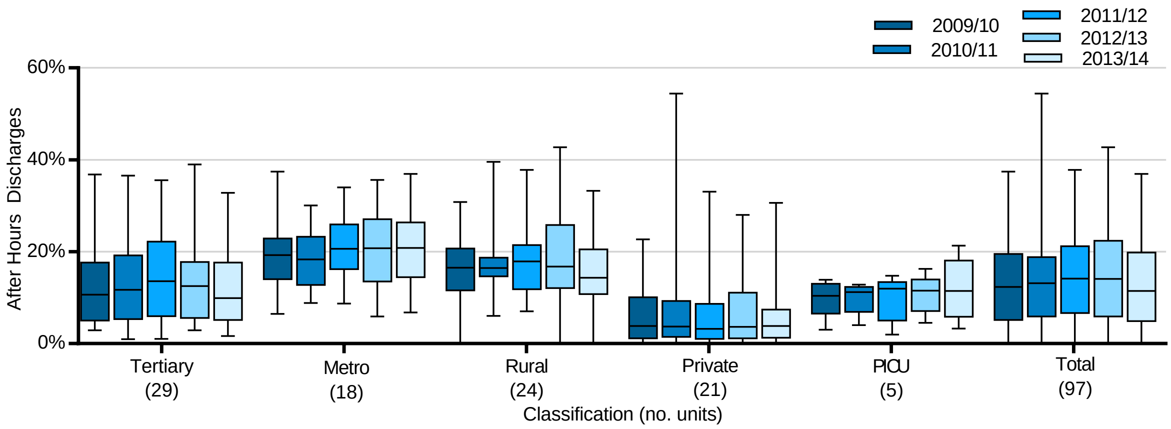
After Hours Discharge

After Hours Discharge

Discharge of patients to a ward between 18:00hrs and 06:00hrs

Five year trend in After Hour Discharge

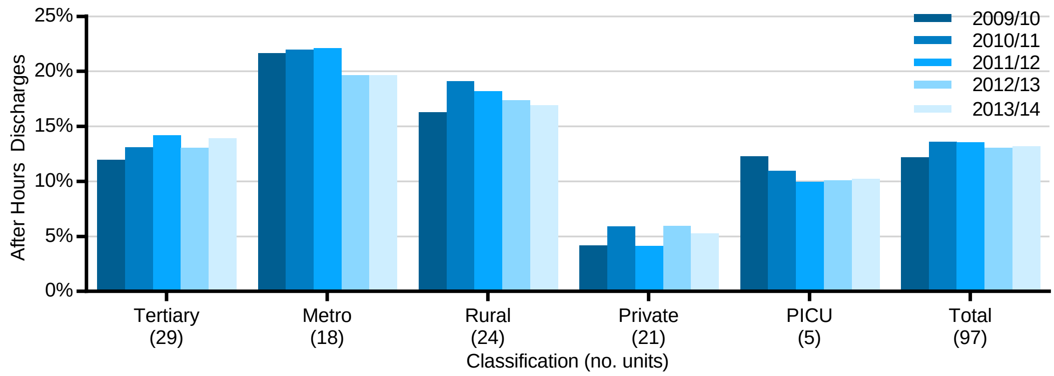
Figure 38 Median and IQR Unit After Hours Discharge rate between 2009/10 and 2013/14, by Classification



Consistently contributing units only. Data from 97 sites.

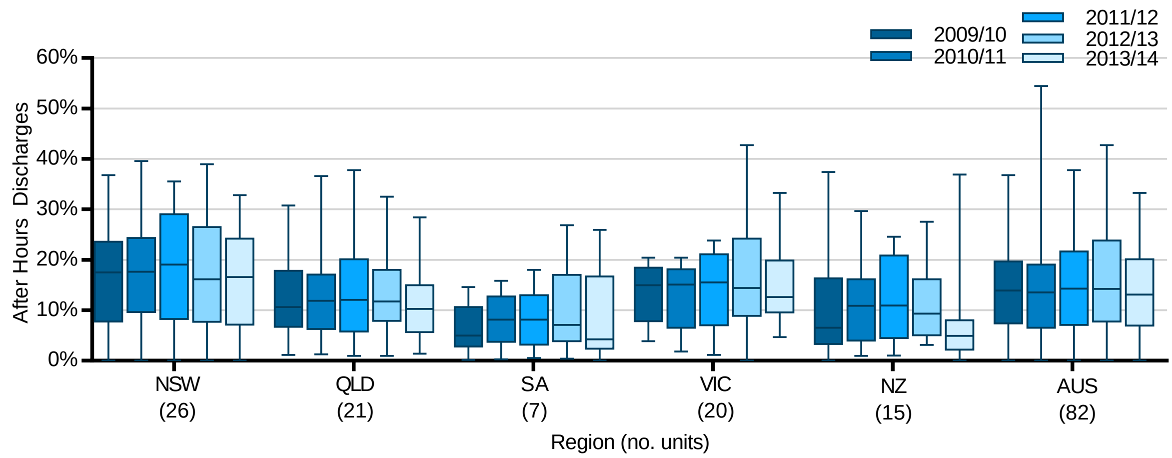
ICU Activity *continued*

Figure 39 Total After Hours Discharge rate between 2009/10 and 2013/14, by Classification



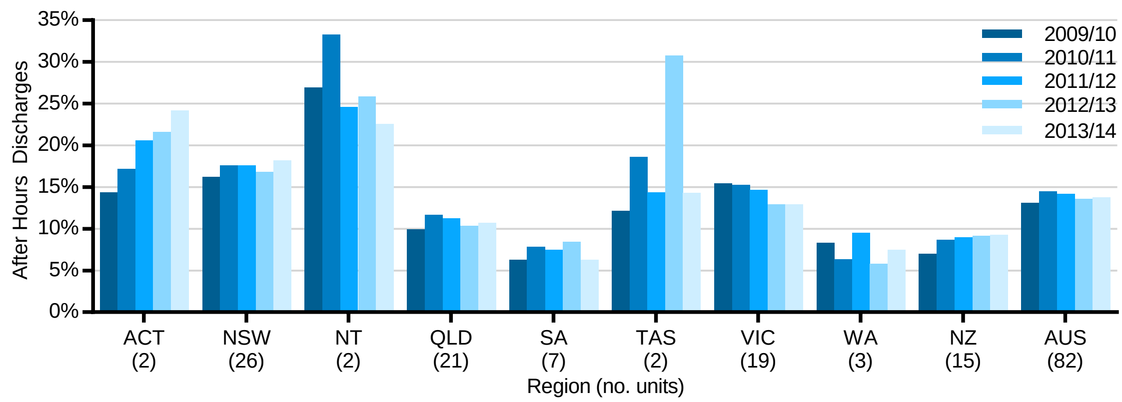
Consistently contributing units only. Data from 97 sites.

Figure 40 Median and IQR Unit After Hours Discharge rate between 2009/10 and 2013/14, by Region



Consistently contributing units only. Data from 97 sites overall, ACT (2), TAS (2), WA (3) + NT (2) excluded from individual section of graph to avoid identification of individual units.

Figure 41 Total After Hours Discharge rate between 2009/10 and 2013/14, by Region



Consistently contributing units only. Data from 97 sites.

ICU Activity *continued*

2013/14 After Hours Discharge Data

Figure 42 Median and IQR Unit After Hours Discharge rate, by Classification in 2013/14

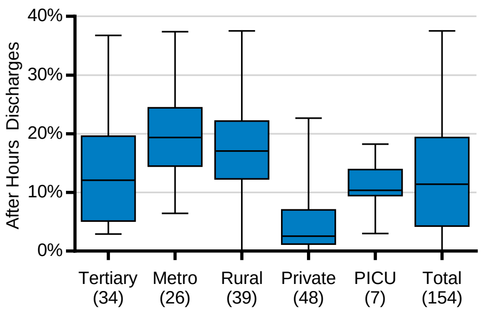
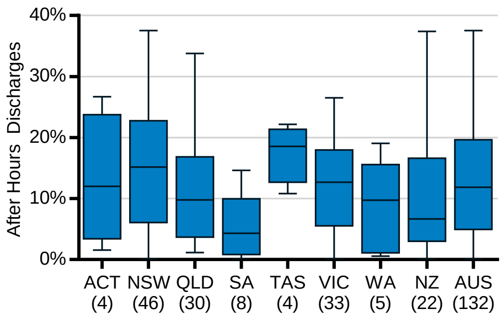


Figure 43 Median and IQR Unit After Hours Discharge rate, by Region in 2013/14



2013/14 contributing units. Data from 154 sites overall, NT (2) excluded from individual section of graph to avoid identification of individual unit.

ICU Activity *continued*

Declined Admissions

Declined Admissions

The CCR Survey collects two variables on declined admissions; declined admissions due to cancelled elective surgery and declined admissions due to inadequate resources.

Cancelled elective surgery rates are calculated as a proportion of elective admissions and refused referral rates as a proportion of emergency admissions. The two data point are combined to calculate an overall declined admission rate as a proportion of total admissions.

Five year trend in Combined Declined Admissions

Figure 44 Declined Admissions in Australia over 5 years

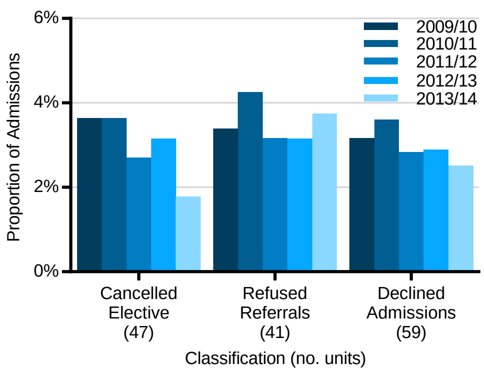
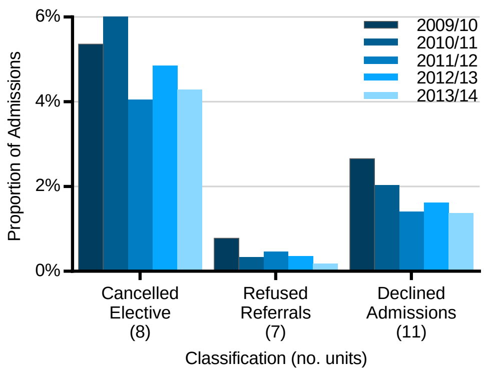
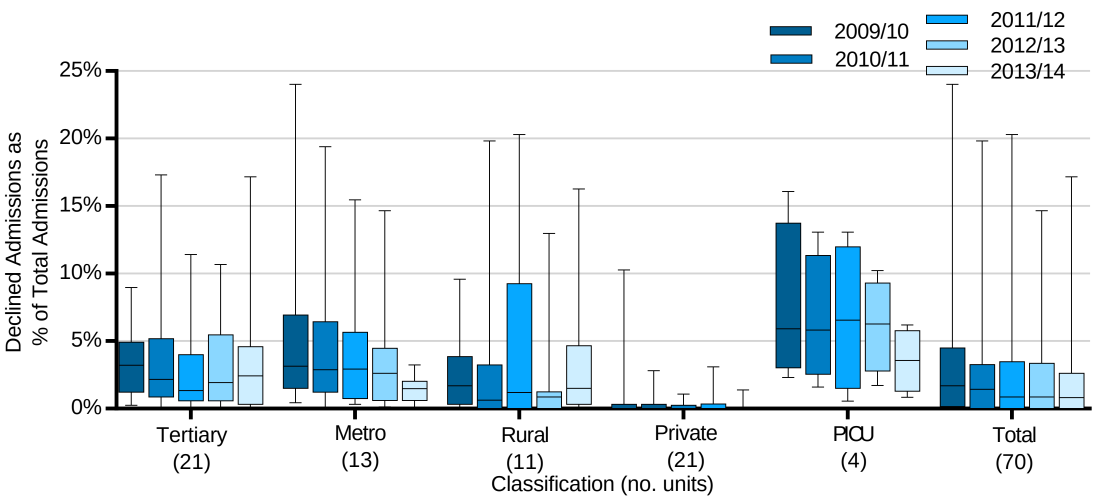


Figure 45 Declined Admissions in New Zealand over 5 years



Consistently contributing units only. Number of sites for each group in brackets.

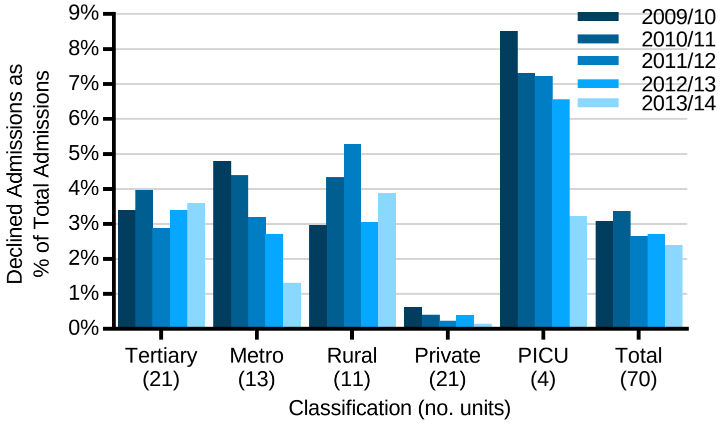
Figure 46 Median and IQR Combined Declined Admission rate over 5 years, by Classification (IQR)



Consistently contributing units only. Data from 70 sites.

ICU Activity *continued*

Figure 47 Total Combined Declined Admission rate over 5 years, by Classification



Consistently contributing units only. Data from 70 sites.

2013/14 Combined Declined Admissions

Figure 48 Median and IQR Combined Declined Admission rate, by Classification in 2013/14

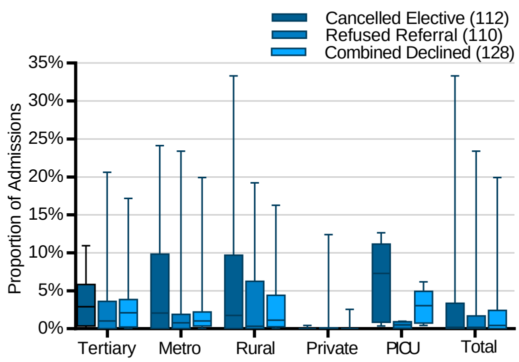
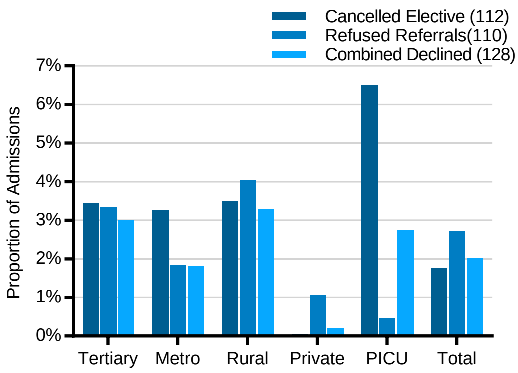
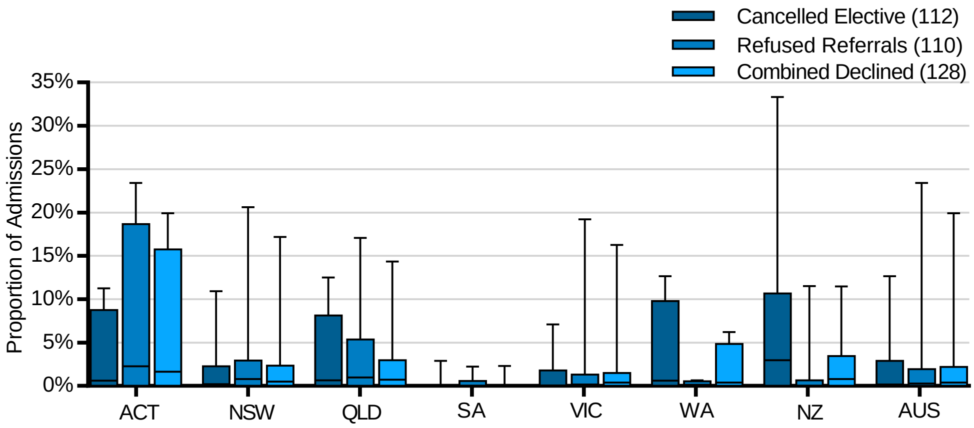


Figure 49 Total Combined Declined Admission rate, by Classification in 2013/14



2013/14 contributing units. Number of sites in brackets.

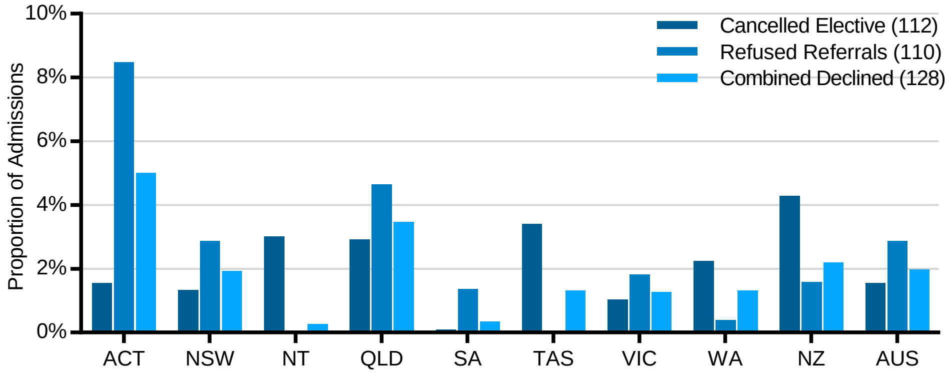
Figure 50 Median and IQR Combined Declined Admission rate, by Region in 2013/14



2013/14 contributing units. Number of sites in brackets, TAS (3) + NT (2) excluded from individual section of graph to avoid identification of individual units.

ICU Activity *continued*

Figure 51 Total Combined Declined Admission rate, by Region in 2013/14



2013/14 contributing units. Number of sites in brackets.

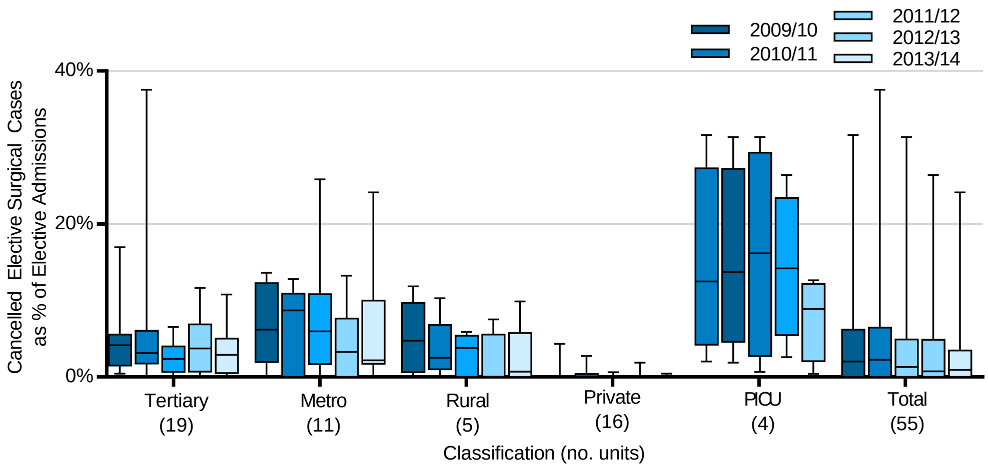
Cancelled Elective Surgery

Cancelled Elective Surgery

Cancelled Elective Surgical cases are planned admissions to ICU following surgery that are cancelled due to inadequate ICU resources. Cancelled Elective Surgery rates are calculated as a proportion of elective admissions.

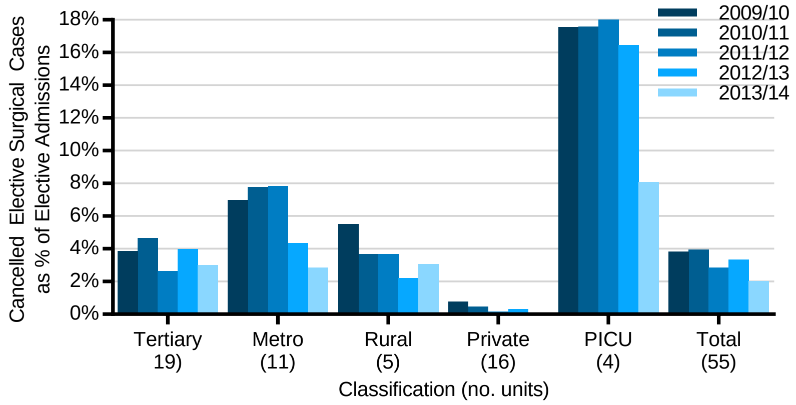
Five year trend in rates of Cancelled Elective Surgery

Figure 52 Median and IQR Cancelled Elective Surgery rate over 5 years, by Classification (IQR)



Consistently contributing units only. Data from 55 sites.

Figure 53 Total Cancelled Elective Surgery rate over 5 years, by Classification



Consistently contributing units only. Data from 55 sites.

ICU Activity *continued*

2013/14 Cancelled Elective Surgery Data

Figure 54 Median and IQR Cancelled Elective Surgery rate, by Classification in 2013/14

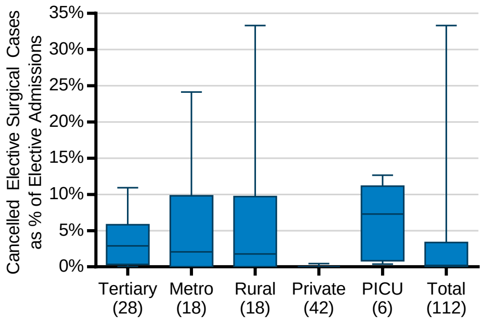
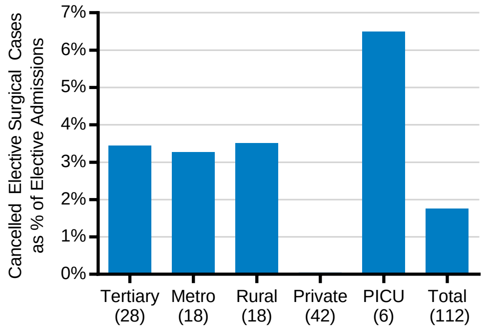


Figure 55 Total Cancelled Elective Surgery rate, by Classification in 2013/14



2013/14 contributing units. Data from 112 sites

Figure 56 Median and IQR Cancelled Elective Surgery rate, by Region in 2013/14

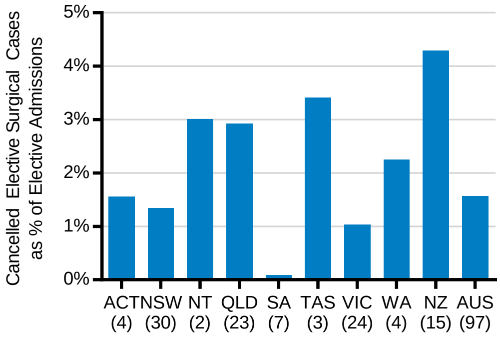
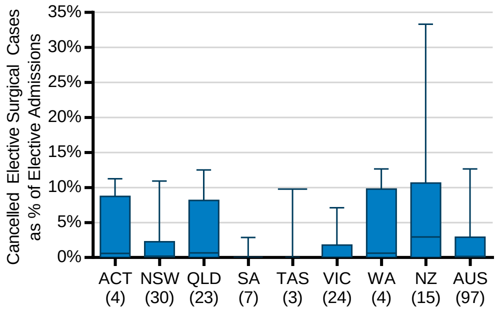


Figure 57 Total Cancelled Elective Surgery rate, by Region in 2013/14



2013/14 contributing units. Data from 112 sites, NT (2) excluded from individual section of graph to avoid identification of individual units.

ICU Activity *continued*

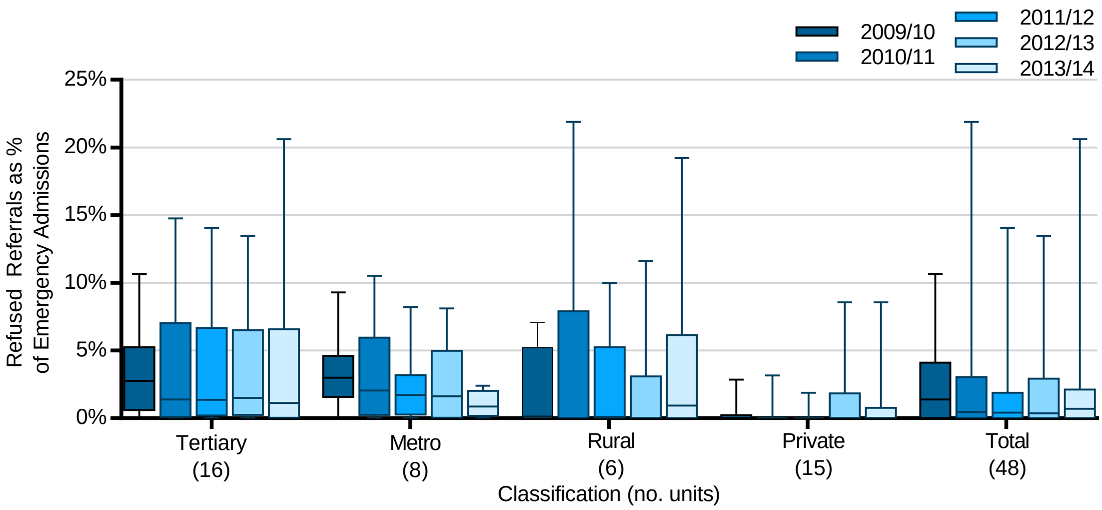
Refused Referrals

Refused Referrals

Refused Referrals are admissions to the ICU that are refused due to inadequate resources. Refused Referrals are calculated as a proportion of emergency admissions.

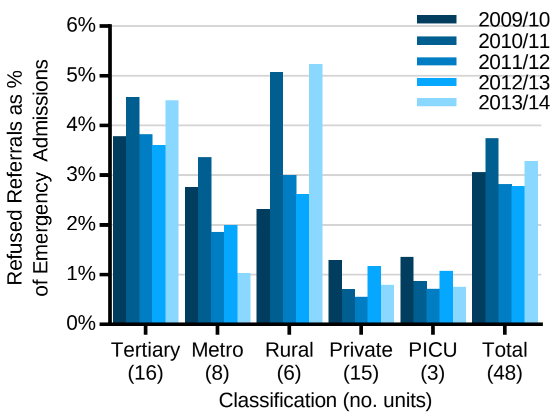
Five year trend in rates of Refused Referrals of emergency admissions

Figure 58 Median and IQR Refused Referral Rate over 5 years, by Classification in 2013/14



Consistently contributing units only. Data from 48 sites overall, PICU (3) excluded from individual section of graph to avoid identification of individual units.

Figure 59 Total Refused Referral Rate over 5 years, by Classification



Consistently contributing units only. Data from 48 sites.

ICU Activity *continued*

2013/14 Rates of Refused Referral for emergency admissions

Figure 60 **Median and IQR Refused Referral rate, by Classification in 2013/14**

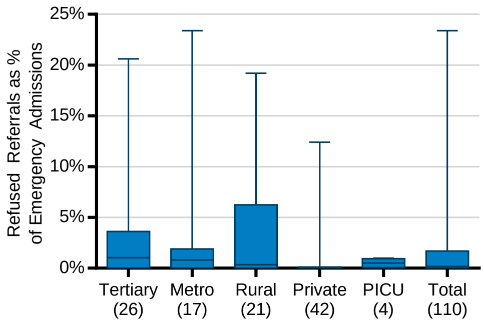
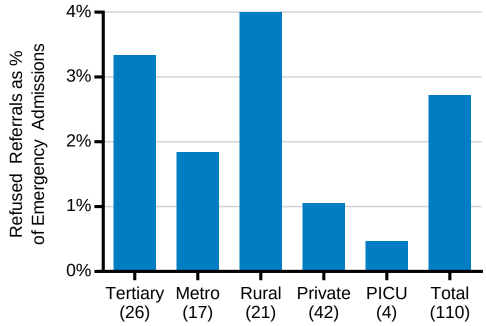


Figure 61 **Total Refused Referral Rate, by Classification in 2013/14**



2013/14 contributing units. Data from 110 sites.

Figure 62 **Median and IQR Refused Referral rate, by Region in 2013/14**

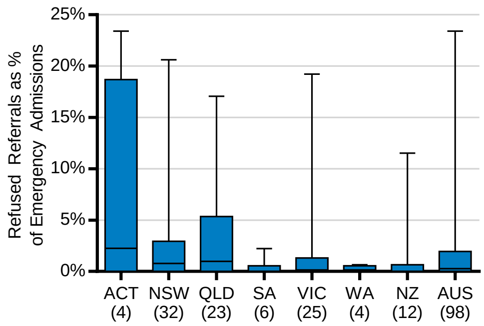
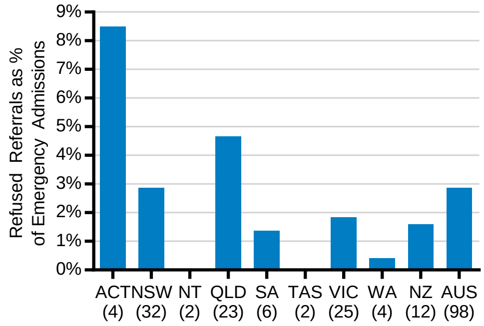


Figure 63 **Total Refused Referral Rate, by Region in 2013/14**



2013/14 contributing units. Data from 110 sites overall, NT (2) + TAS (2) excluded from individual section of graph to avoid identification of individual units.

ICU Activity *continued*

Occupancy and Patient Bed Days

Patient Bed Days

The total number of days for patients who are admitted to the ICU/HDU for an episode of care. Calculated as the difference between separation date and admission date. Same day patients are allocated a length of stay of one day.

Occupancy Rate

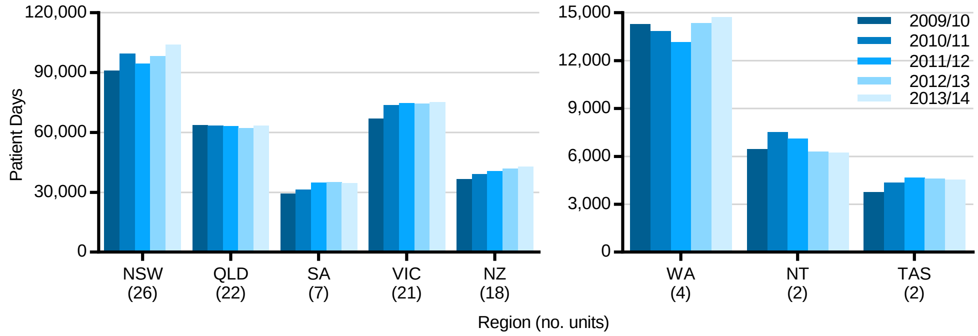
Calculated by the number of bed days divided by the number of available beds multiplied by 365 days

N.B. Occupancy rates calculated for same-day beds could exceed 100%.

Five year trend in Patient Bed Days

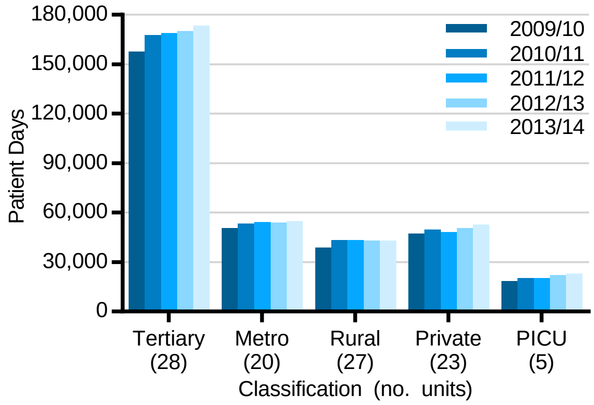
The estimated total bed days per 100,000 population (bed days/population) is calculated on the proportion of available beds reported.

Figure 64 Bed Days per 100,000 population between 2009/10 and 2013/14, by Region



Consistently contributing units. Data from 103 sites, ACT (1) excluded from individual section of graph to avoid identification of individual units.

Figure 65 Bed Days per 100,000 population between 2009/10 and 2013/14, by Classification

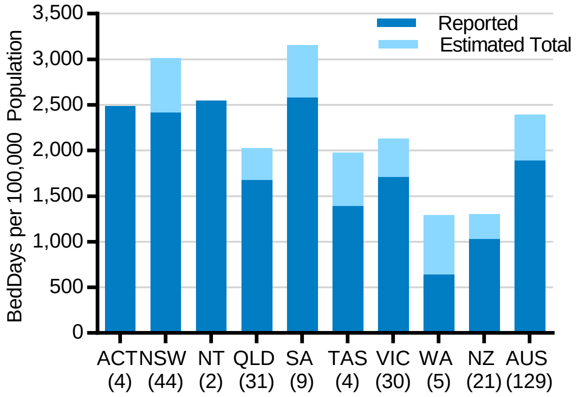


Consistently contributing units. Data from 103 sites.

ICU Activity *continued*

2013/14 Patient Bed Days

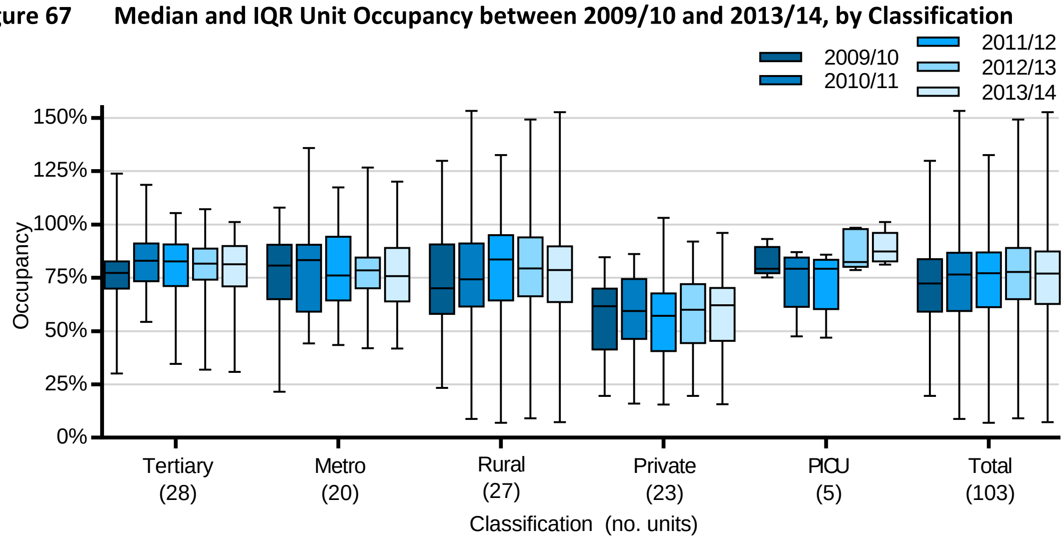
Figure 66 Bed Days per 100,000 population, by Region in 2013/14



2013/14 contributing units. Data from 150 sites.

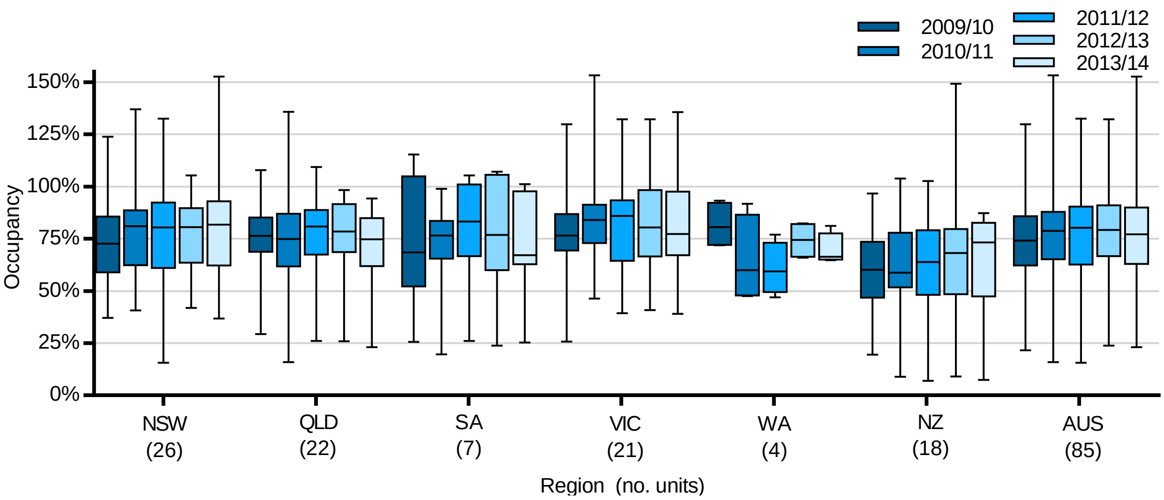
Five year trend in ICU Occupancy

Figure 67 Median and IQR Unit Occupancy between 2009/10 and 2013/14, by Classification



Consistently contributing units. Data from 103 sites.

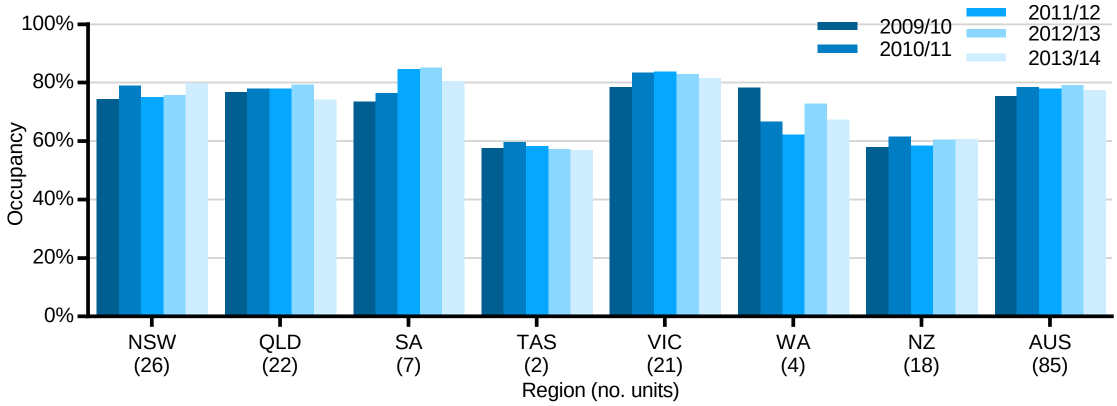
Figure 68 Median and IQR Unit Occupancy between 2009/10 and 2013/14, by Region



Consistently contributing units. Data from 103 sites, ACT (1), NT (2) + TAS (2) excluded from individual section of graph to avoid identification of individual units.

ICU Activity *continued*

Figure 69 Total Occupancy between 2009/10 and 2013/14, by Region



Consistently contributing units. Data from 103 sites, ACT (1) + NT (2) excluded from individual section of graph to avoid identification of individual units.

2013/14 Occupancy Data

Figure 70 Median and IQR Unit Occupancy, by Classification in 2013/14

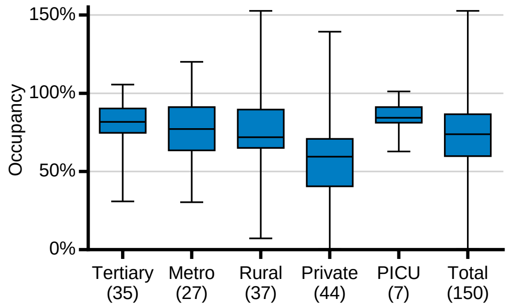
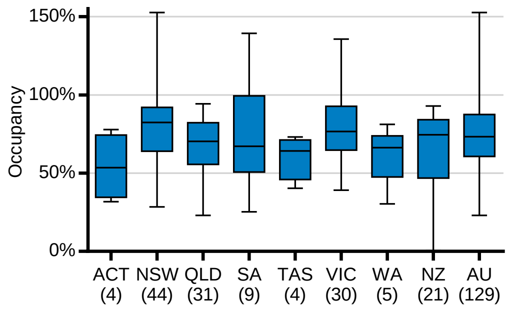
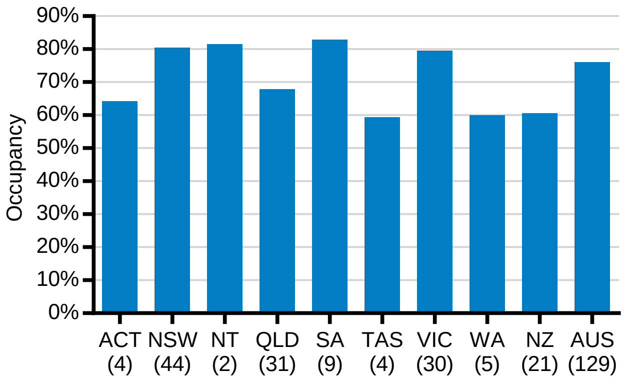


Figure 71 Median and IQR Unit Occupancy, by Region in 2013/14



2013/14 contributing units. Data from 150 sites, NT (2) excluded from individual section of graph to avoid identification of individual units.

Figure 72 Total Occupancy, by Region in 2013/14



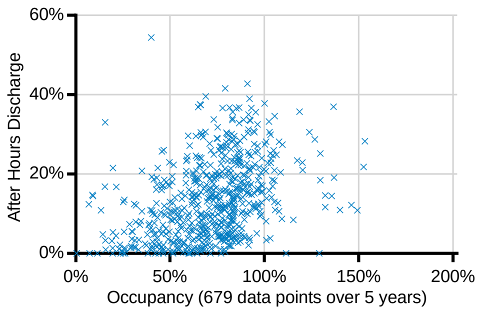
2013/14 contributing units. Data from 150 sites.

ICU Activity *continued*

After Hours Discharge and Occupancy

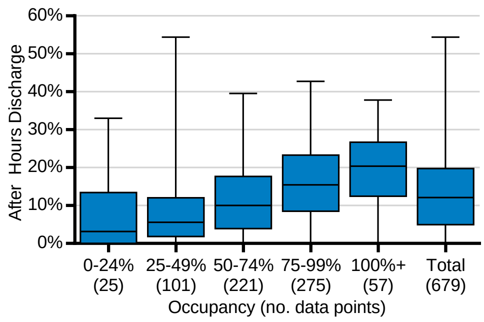
After Hours Discharge rates have been compared to Occupancy Rates for the previous CCR surveys over the last five years (Figure 70 and 71, 679 data points). Figure 71 shows data grouped by Occupancy Rates. Higher occupancy within a unit correlates with a higher rate of After Hours Discharge.

Figure 73 Scatter Plot of Occupancy vs After Hours Discharge



679 data points over five years.

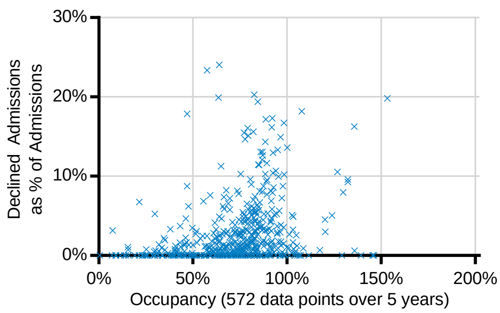
Figure 74 Box Plot of Occupancy vs After Hours Discharge



Declined Admission and Occupancy

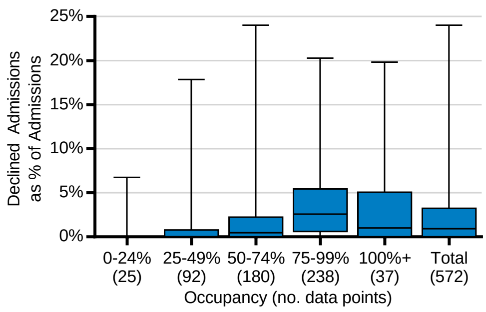
Rates of Declined Admissions have been compared to Occupancy Rates for the previous CCR Surveys over the last four years (Figure 72, 572 data points). Figure 73 shows data grouped by Occupancy Rates. Higher occupancy within a unit correlates with a rate of Declined Admissions.

Figure 75 Scatter Plot of Occupancy vs Declined Admissions



572 data points over five years.

Figure 76 Box Plot of Occupancy vs Declined Admissions



Ventilation

Invasive and Non-Invasive Ventilation

Rates of Ventilation

Rates of ventilation are calculated as the number of ventilated patients as a proportion of all admissions

Invasive Ventilation

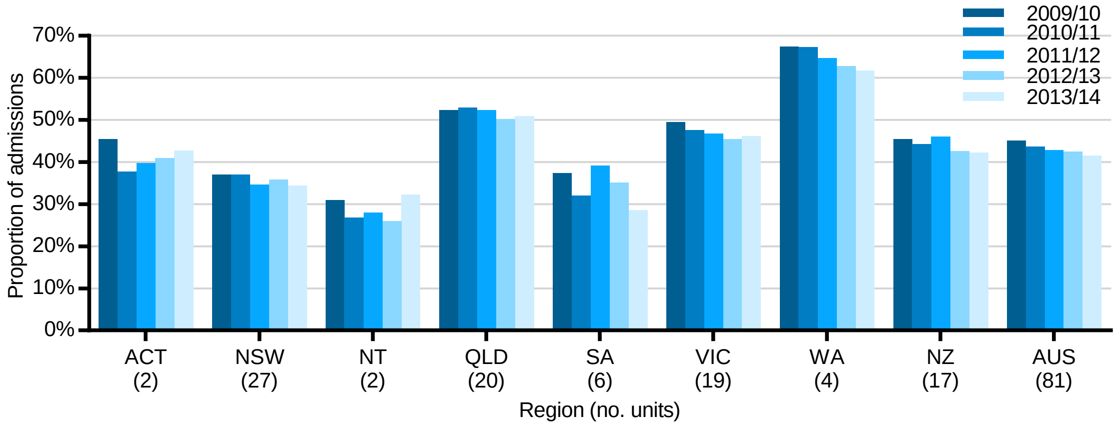
Mechanical ventilator support via oral/nasal intubation or tracheostomy tube

Non-Invasive Ventilation

Ventilatory support such as CPAP/BiPAP, administered via facial or nasal mask or nasal cannulae

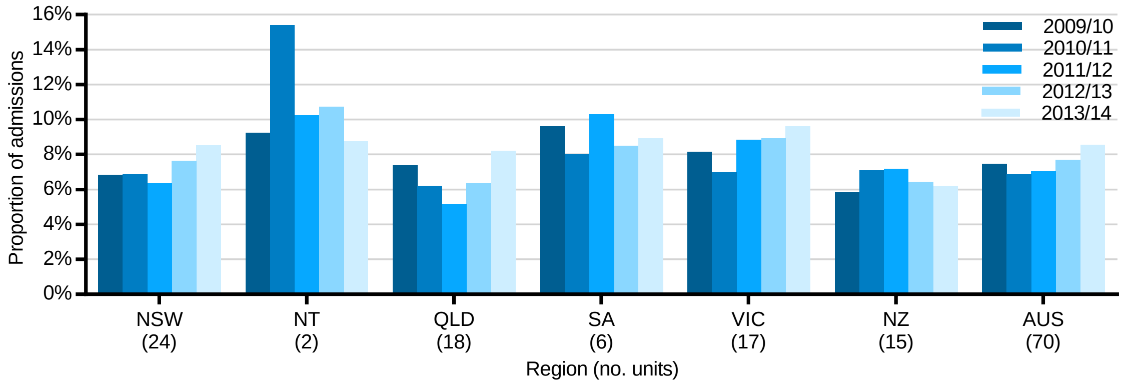
Five year trend for Invasive and Non-Invasive Ventilation

Figure 77 Total rate of Invasive Ventilation between 2009/10 and 2013/14, by Region



Consistently contributing units. Data from 98 sites, TAS (1) excluded from individual section of graph to avoid identification of individual units.

Figure 78 Total rate of Non-Invasive Ventilation (only) between 2009/10 and 2013/14, by Region



Consistently contributing units. Data from 85 sites, ACT (1), TAS (1) + WA (1) excluded from individual section of graph to avoid identification of individual units.

Ventilation *continued*

Figure 79 Total rate of Invasive Ventilation between 2009/10 and 2013/14, by Classification

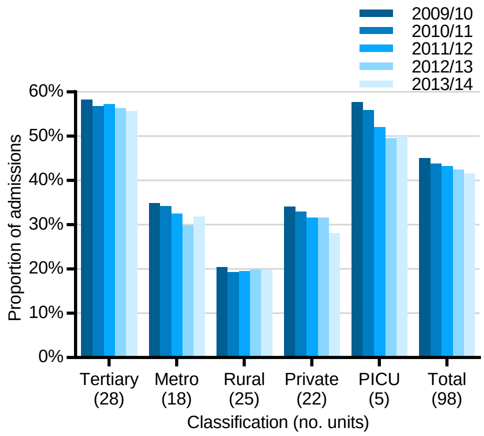
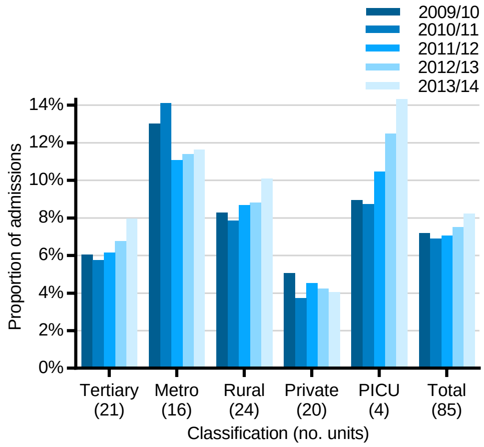


Figure 80 Total rate of Non-Invasive Ventilation between 2009/10 and 2013/14, by Classification



Consistently contributing units. Data from 98 sites.

Figure 81 Duration of Invasive Ventilation between 2009/10 and 2013/14, by Classification

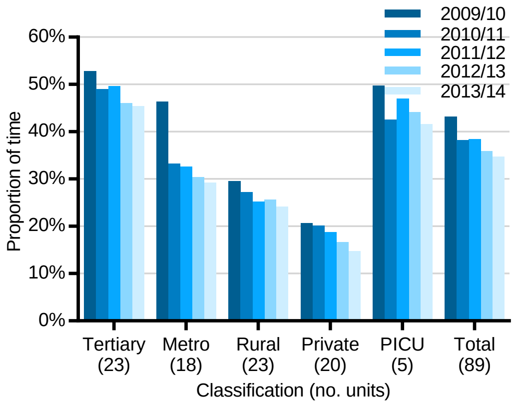
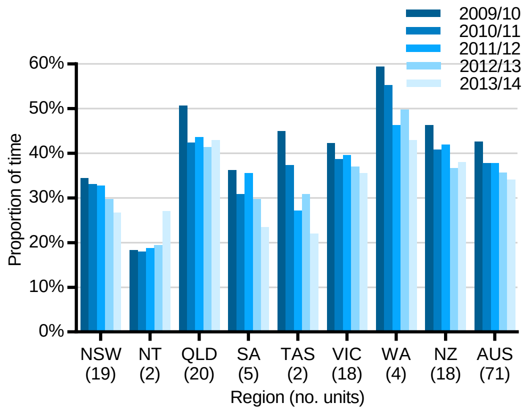


Figure 82 Duration of Invasive Ventilation between 2009/10 and 2013/14, by Region



Consistently contributing units. Data from 89 sites, ACT (1) excluded from individual section of graph to avoid identification of individual units

2013/14 Ventilation Data

Figure 83 Ventilation Rate, by Classification in 2013/14

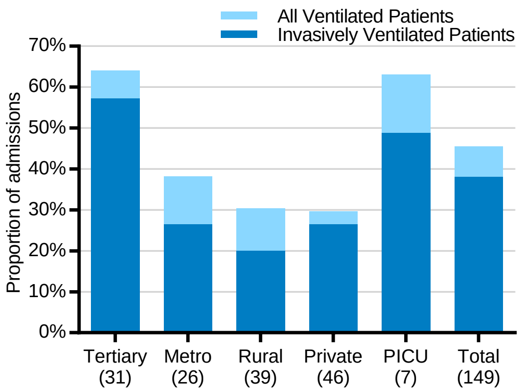
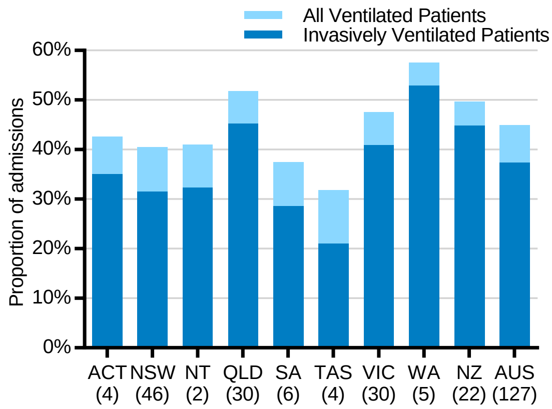


Figure 84 Ventilation Rate, by Region in 2013/14



2013/14 contributing units. Data from 149 sites.

Paediatric Intensive Care

Paediatric Beds

Figure 85 **Physical PICU Beds per 100,000 Paediatric Population in 2013/14**

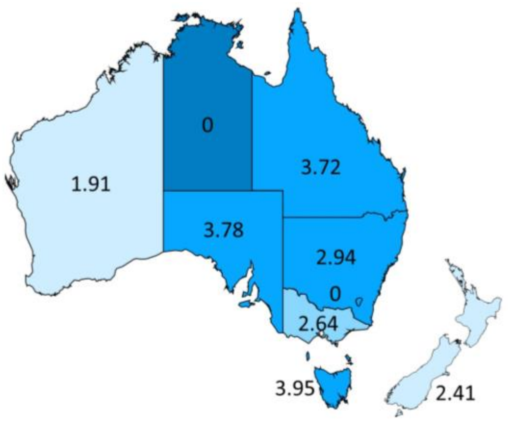
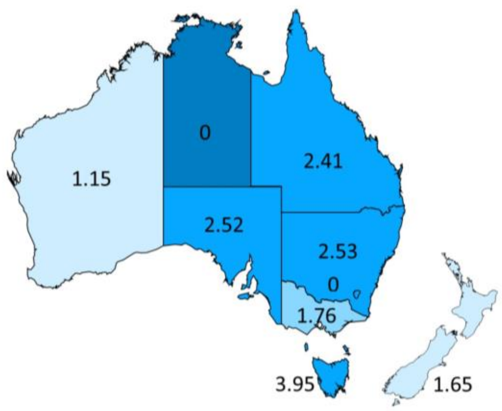


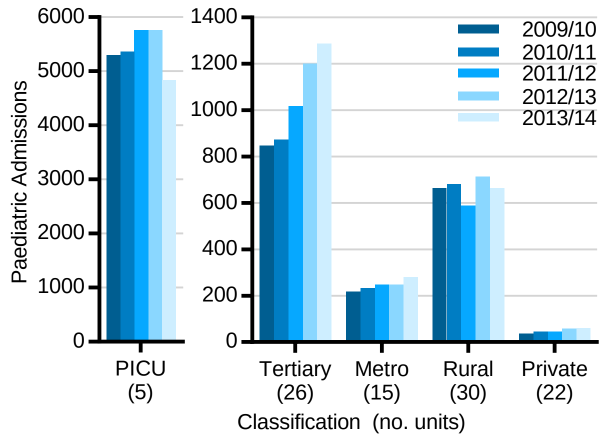
Figure 86 **Available Beds per 100,000 Paediatric Population in 2013/14**



2013/14 contributing units. Data from 9 PICUs. Overall 2.83 physical beds/100,000 paediatric population and 2.05 available beds/100,000 paediatric population.

Five year trend in Paediatric Admissions

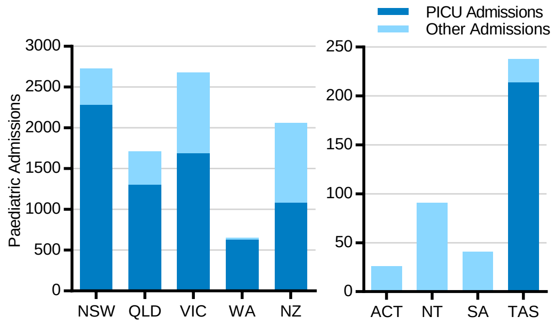
Figure 87 **Paediatric Admissions between 2009/10 and 2013/14, by Classification**



Consistently contributing units. Data from 98 sites.

2013/14 Paediatric Admissions

Figure 88 **Paediatric Admissions, by Region in 2013/14**



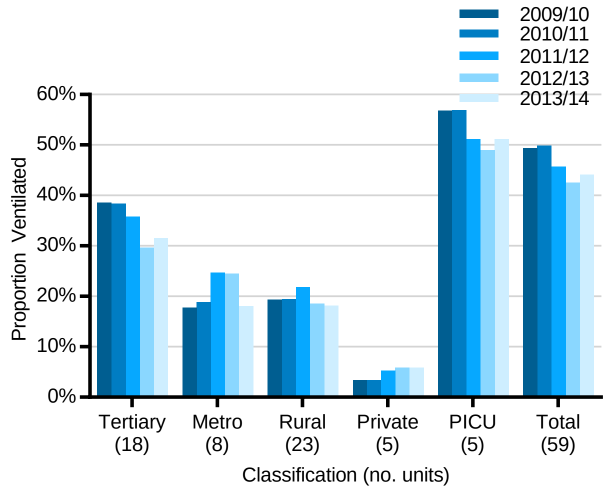
2013/14 contributing units. Data from 6 PICUs and 103 ICUs.

Figure 89 **Paediatric Admissions per 100,000 Paediatric Population, by Region in 2013/14**

Paediatric Intensive Care *continued*

Five year trend for Paediatric Ventilation

Figure 90 Paediatric Ventilation between 2009/10 and 2013/14, by Classification



Consistently contributing units. Data from 59 sites.

2013/14 Paediatric Ventilation Data

Figure 91 Paediatric Ventilation, by Classification in 2013/14

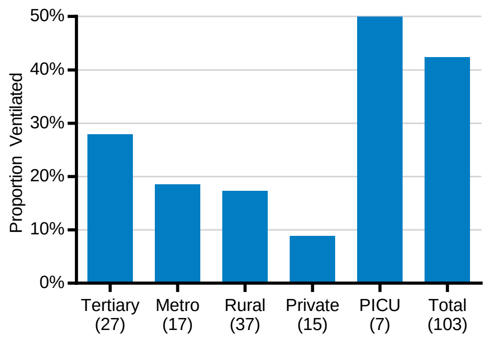
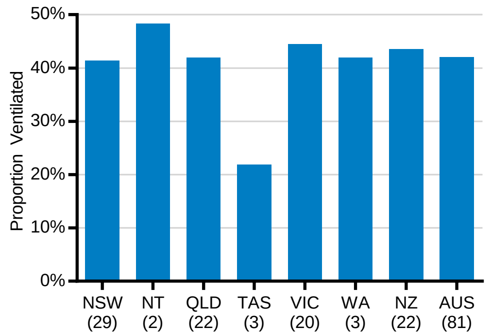


Figure 92 Paediatric Ventilation, by Region in 2013/14



2013/14 contributing units. Data from 103 sites, ACT (1) + SA (1) excluded from individual section of graph to avoid identification of individual units.

Workforce

Senior Medical Staff

Senior Medical Officer (SMO)

Intensive Care Specialists and Non-Intensive Care Specialists

Full Time Equivalent (FTE)

A unit that indicates the workload of an employed person that makes workloads comparable across various contexts.

Five year trend in SMO Staffing

Figure 93 Total SMO FTE between 2009/10 and 2013/14, by Classification

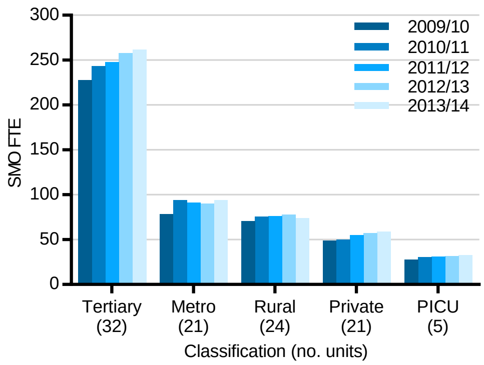
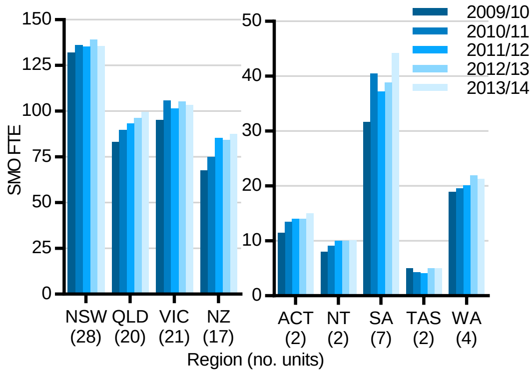
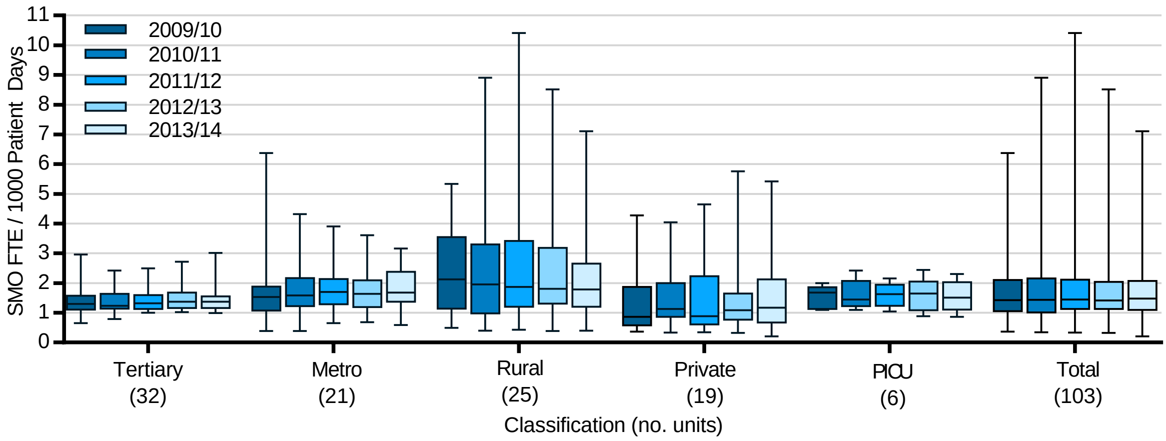


Figure 94 Total SMO FTE between 2009/10 and 2013/14, by Region



Consistently contributing units. Data from 103 sites.

Figure 95 Median and IQR SMO FTE per 1000 Patient Days between 2009/10 and 2013/14, by Classification



Consistently contributing units. Data from 103 sites.

Workforce *continued*

2013/14 SMO Staffing

Figure 96 Total SMO FTE Establishment, by Classification in 2013/14

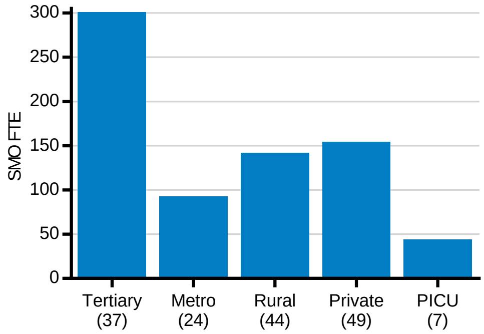
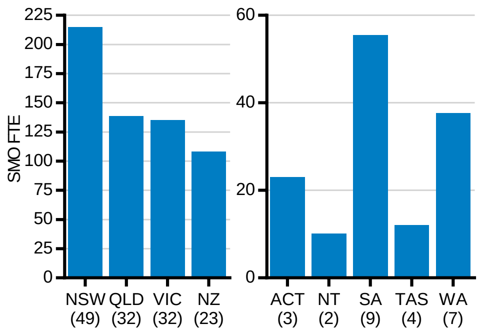


Figure 97 Total SMO FTE Establishment, by Region in 2013/14



2013/14 contributing units. Data from 161 sites.

Figure 98 Median and IQR SMO FTE Establishment per 1000 Patient Days, by Classification in 2013/14

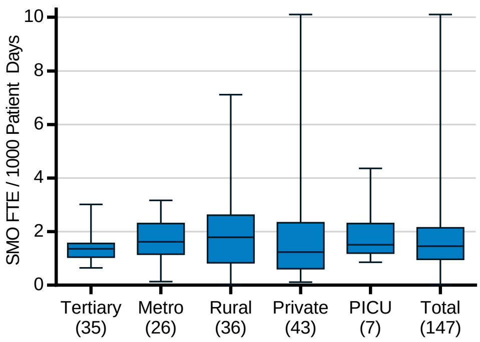
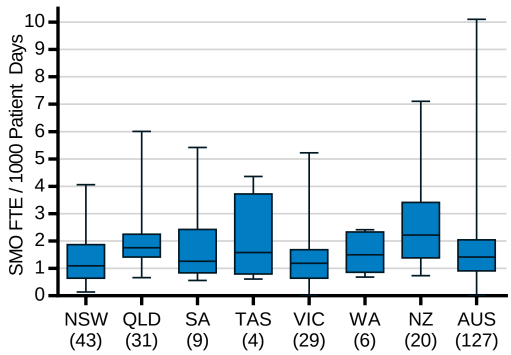


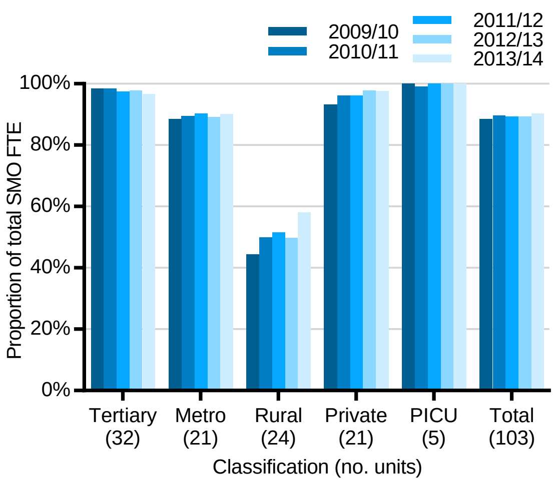
Figure 99 Median and IQR SMO FTE Establishment per 1000 Patient Days, by Region in 2013/14



2013/14 contributing units. Data from 147 sites, ACT (3) + NT (2) excluded from individual section of graph to avoid identification of individual units.

Five trend in Proportion of Intensivists and Vacancies

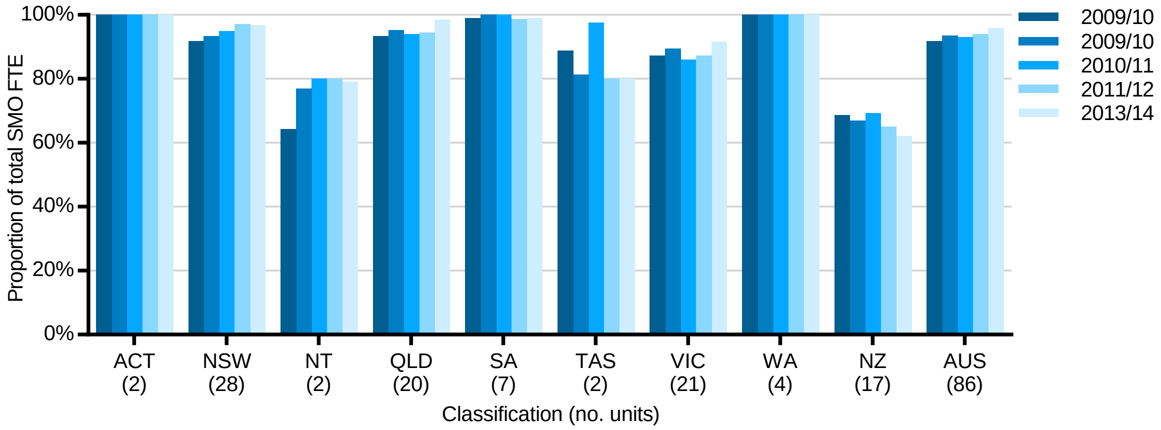
Figure 100 Proportion of SMO FTE that are Intensivists between 2009/10 and 2013/14, by Classification



Consistently contributing units. Data from 103 sites.

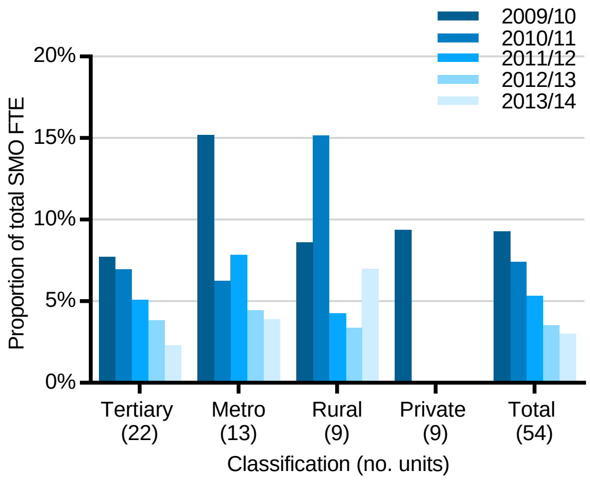
Workforce *continued*

Figure 101 Proportion of SMO FTE that are Intensivists between 2009/10 and 2013/14, by Region



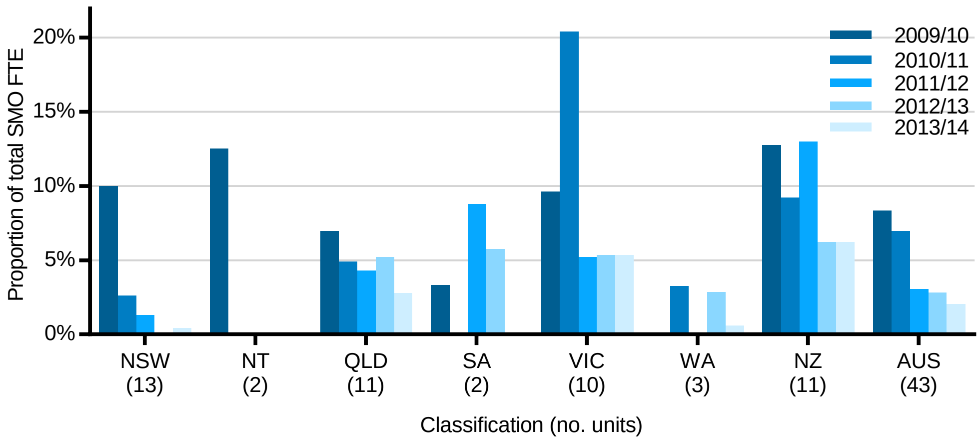
Consistently contributing units. Data from 103 sites.

Figure 102 SMO Vacancies between 2009/10 and 2013/14, by Classification



Consistently contributing units. Data from 54 sites, PICUs (1) excluded from individual section of graph to avoid identification of individual units.

Figure 103 SMO Vacancies between 2009/10 and 2013/14, by Region



Consistently contributing units. Data from 54 sites, ACT (1) + TAS (1) excluded from individual section of graph to avoid identification of individual units.

Workforce continued

2013/14 Proportion of Intensivists and Vacancies

Figure 104 Proportion of SMO FTE that are Intensivists, by Classification in 2013/14

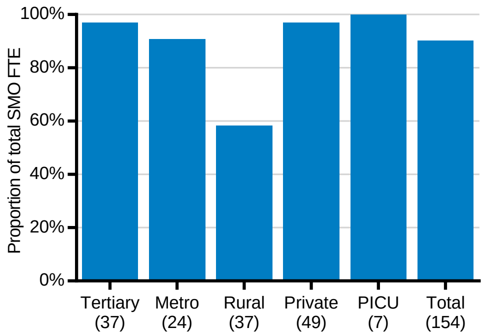
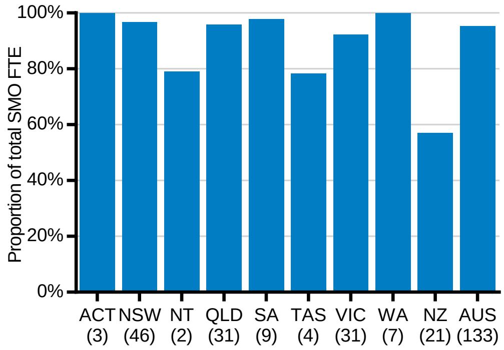


Figure 105 Proportion of SMO FTE that are Intensivists, by Region in 2013/14



2013/14 contributing units. Data from 154 sites.

Figure 106 SMO Vacancy Percentage, by Classification in 2013/14

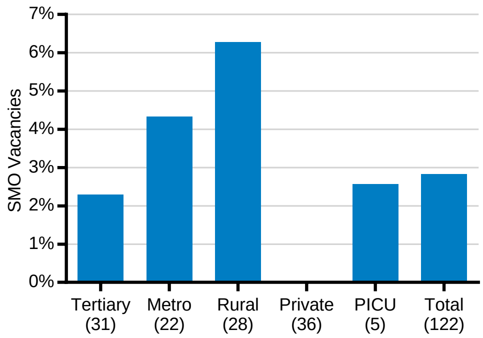
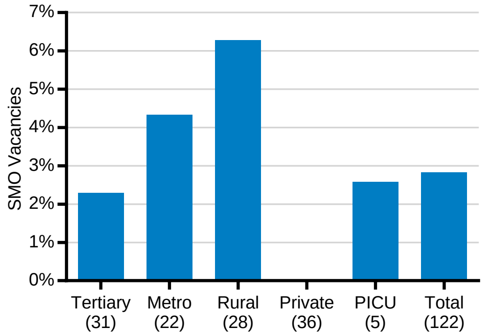


Figure 107 SMO Vacancy Percentage, by Region in 2013/14



2013/14 contributing units. Data from 122 sites.

Figure 108 SMO Vacant Positions (FTE), by Class in 2013/14

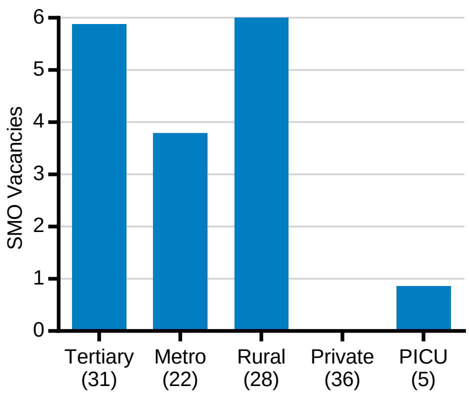
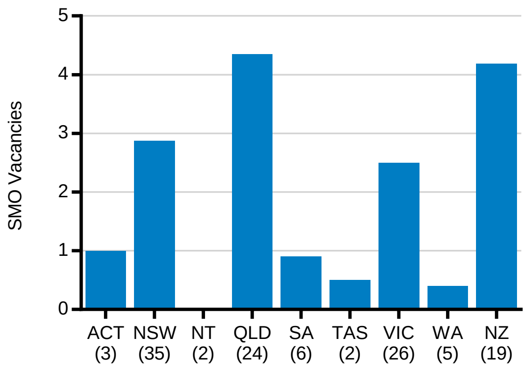


Figure 109 SMO Vacant Positions (FTE), by Region in 2013/14



2013/14 contributing units. Data from 122 sites.

Workforce *continued*

Registrar and Other Medical Staffing

ICU Registrars

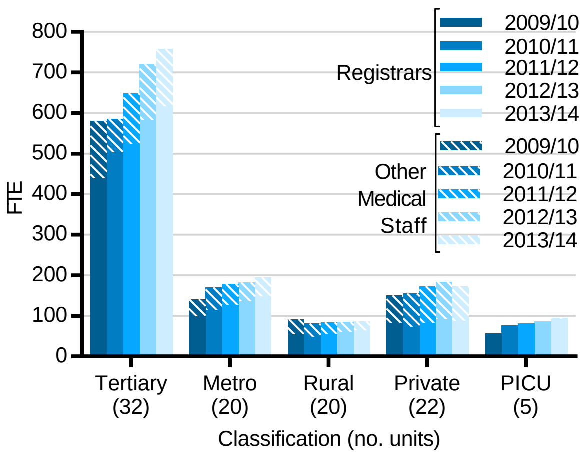
Includes Senior Registrars, registrars in a CICM training program, registrars in a training program other than CICM and registrars not in a training program.

Other Medical Staff

ICU Resident/House Officer dedicated to the ICU and provides "emergency" ward services only.

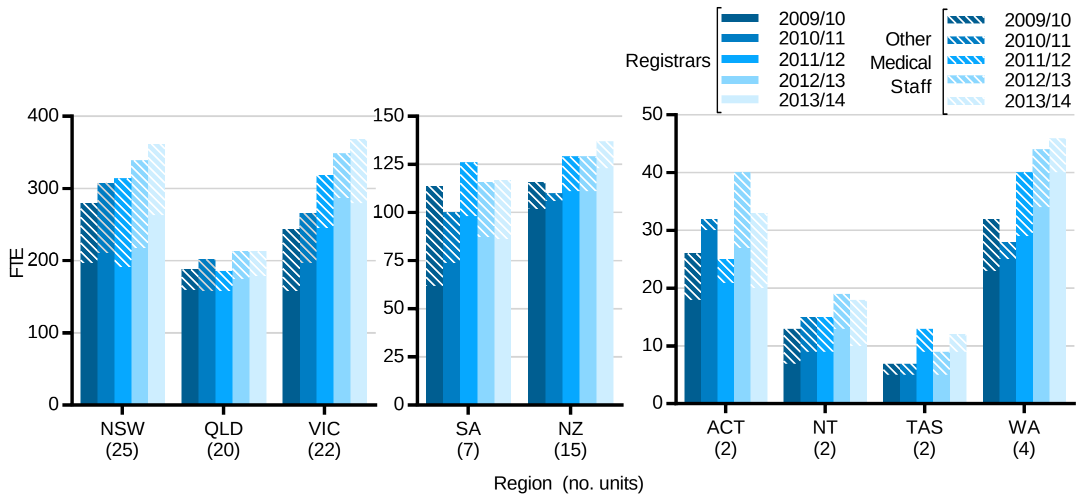
Five year trend in Registrar and Other Medical Staffing

Figure 110 FTE of Registrar and Other Medical Staff between 2009/10 and 2013/14, by Classification



Consistently contributing units. Data from 99 sites.

Figure 111 FTE of Registrar and Other Medical Staff between 2009/10 and 2013/14, by Region



Consistently contributing units. Data from 99 sites.

Workforce *continued*

2013/14 Other Medical Staff

Figure 112 FTE of Registrar and Other Medical Staff, by Classification in 2013/14

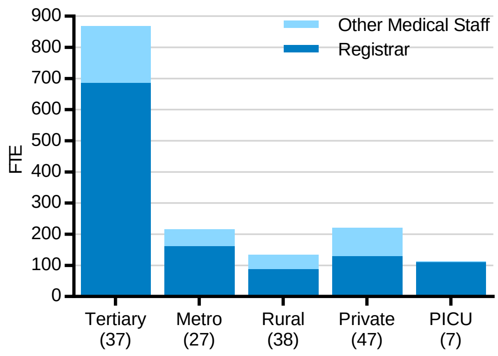
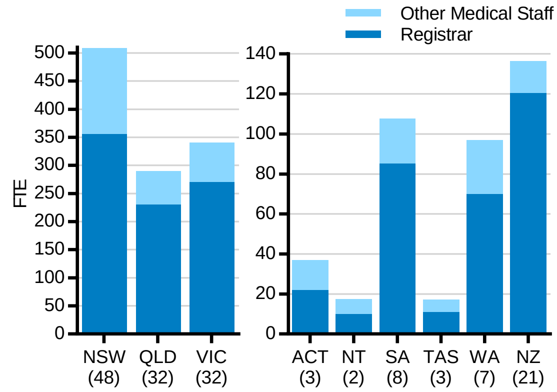


Figure 113 FTE of Registrar and Other Medical Staff, by Region in 2013/14

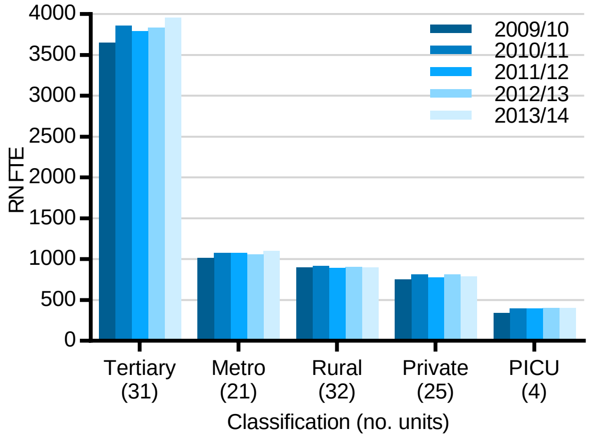


2013/14 contributing units. Data from 156 sites.

ICU Registered Nursing Data

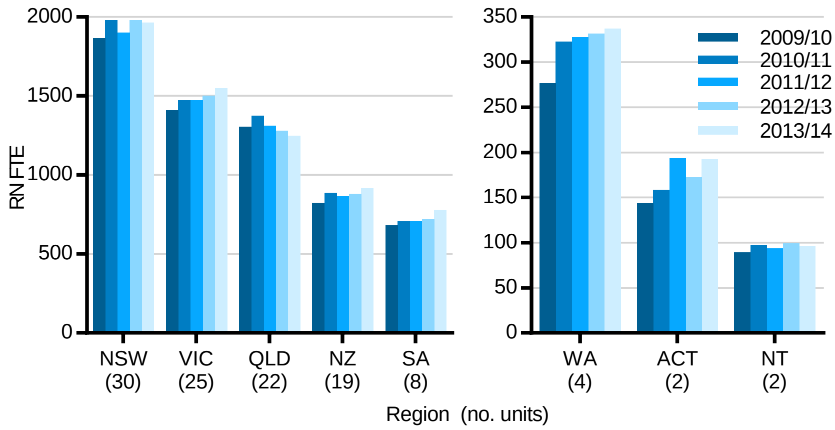
Five year trend in Registered Nursing Staffing

Figure 114 RN FTE between 2009/10 and 2013/14, by Classification



Consistently contributing units. Data from 113 sites.

Figure 115 RN FTE between 2009/10 and 2013/14, by Region



Consistently contributing units. Data from 113 sites, TAS (1) excluded from individual section of graph to avoid identification of individual units.

Workforce *continued*

Figure 116 RN Vacancies between 2009/10 and 2013/14, by Classification

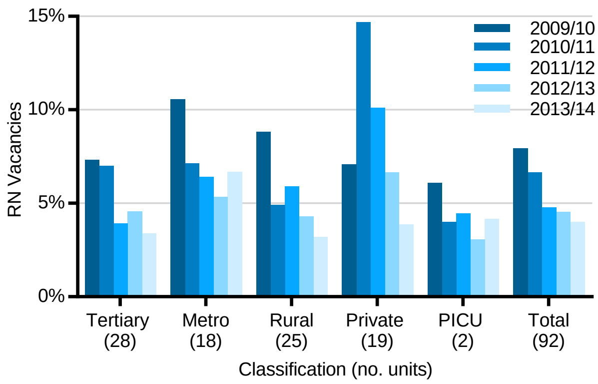
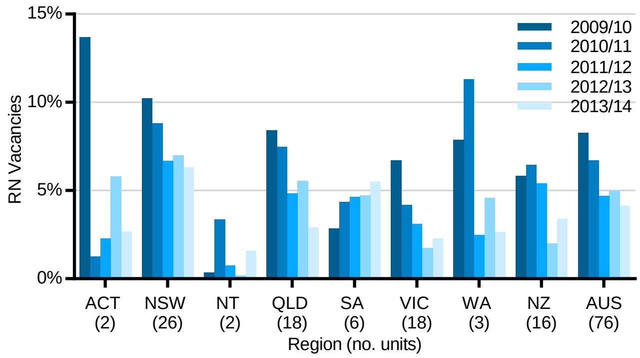
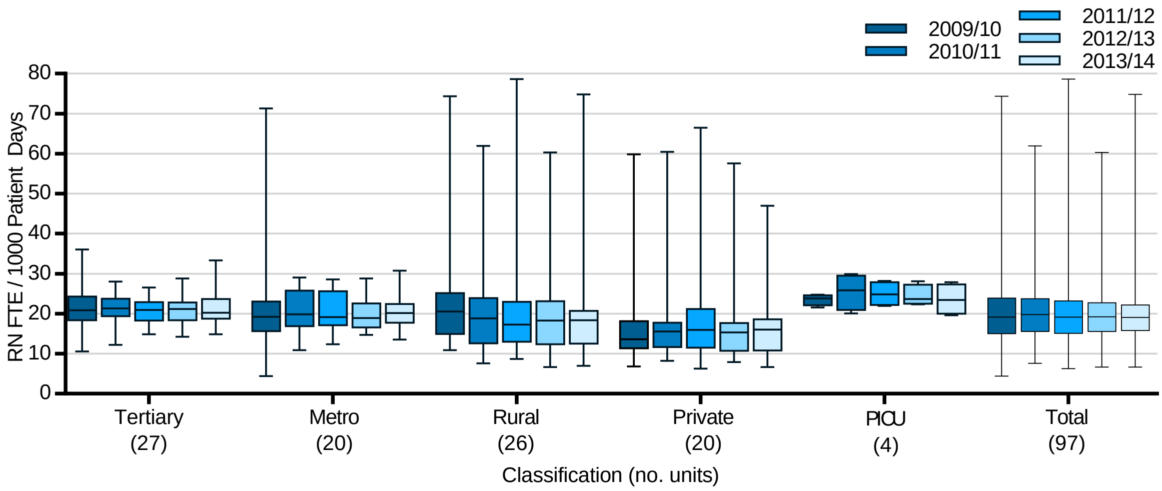


Figure 117 RN Vacancies between 2009/10 and 2013/14, by Region



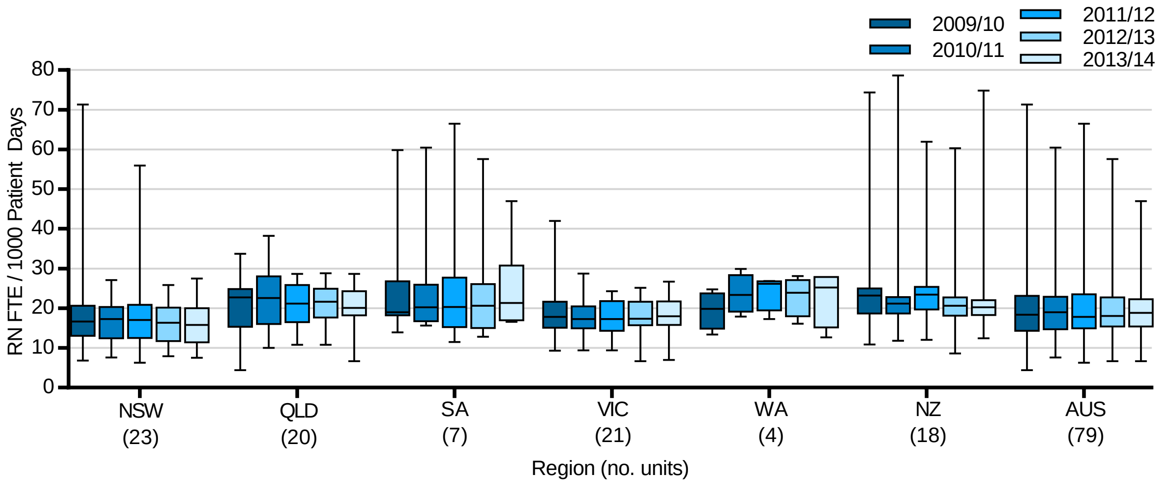
Consistently contributing units. Data from 92 sites, TAS (1) excluded from individual section of graph to avoid identification of individual units.

Figure 118 Median and IQR RN FTE per 1000 Patient Days over 5 years, by Classification



Consistently contributing units. Data from 97 sites.

Figure 119 Median and IQR RN FTE per 1000 Patient Days over 5 years, by Region



Consistently contributing units. Data from 97 sites, ACT (1), TAS (1) and NT (2) excluded from individual section of graph to avoid identification of individual units.

Workforce *continued*

2013/14 ICU Registered Nursing data

Figure 120 Total RN FTE, by Classification in 2013/14

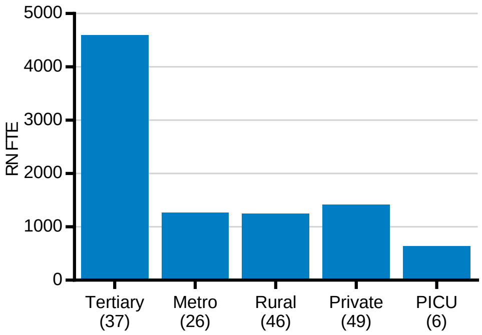
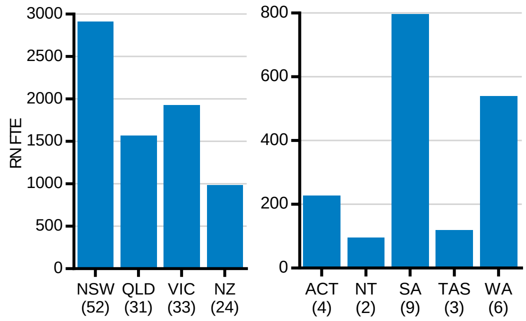


Figure 121 Total RN FTE, by Region in 2013/14



2013/14 contributing units. Data from 164 sites.

Figure 122 Median and IQR RN FTE per 1000 Patient Days, by Classification in 2013/14

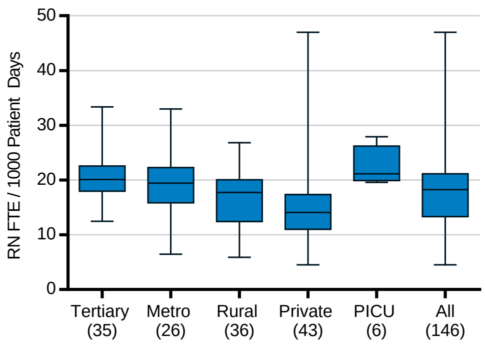
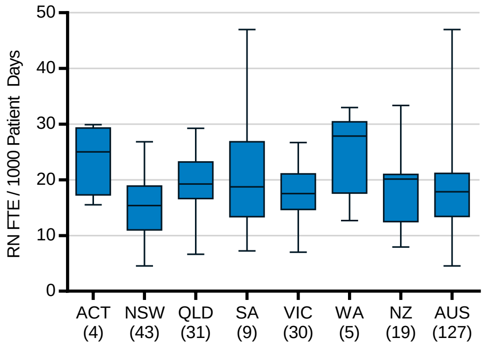
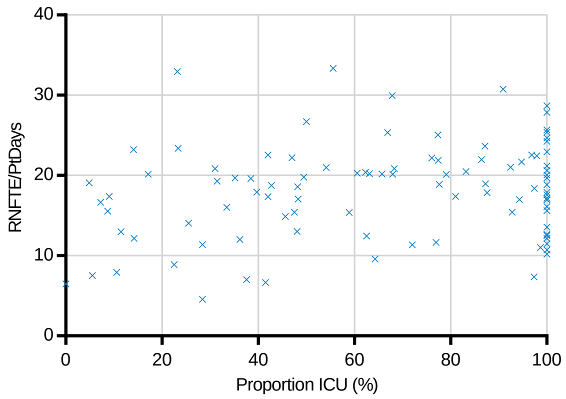


Figure 123 Median and IQR RN FTE per 1000 Patient Days, by Region in 2013/14



2013/14 contributing units. Data from 146 sites, NT (2) excluded from individual section of graph to avoid identification of individual units.

Figure 124 RN FTE per 1000 Patient Days vs Proportion of Admissions ICU (vs HDU) in 2013/14



2013/14 contributing units. Data from 106 sites.

Workforce *continued*

Figure 125 **Percentage of RN with Critical Care Qualification, by Classification in 2013/14**

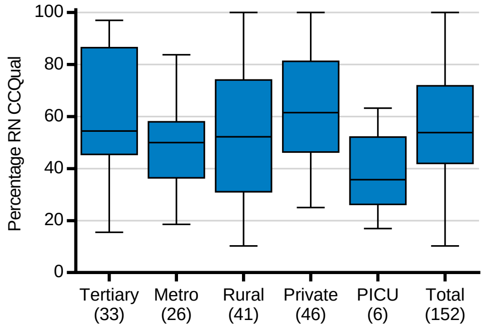
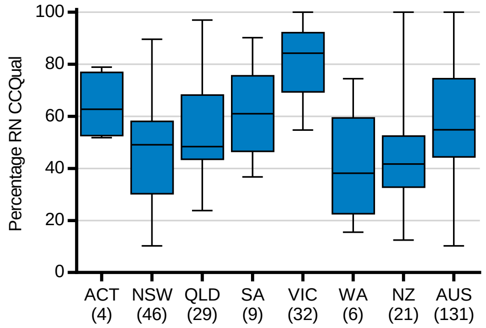
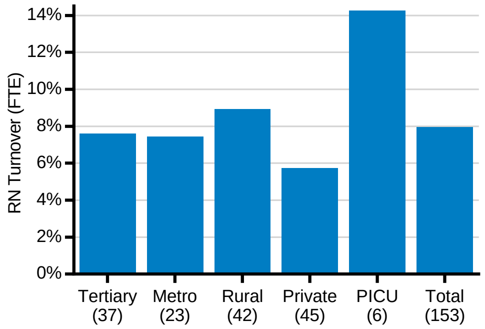


Figure 126 **Percentage of RN with Critical Care Qualification, by Region in 2013/14**



2013/14 contributing units. Data from 152 sites, NT (2) + TAS (3) excluded from individual section of graph to avoid identification of individual units.

Figure 127 **RN Turnover, by Classification in 2013/14**



2013/14 contributing units. Data from 153 sites.

Figure 128 **RN Turnover, by Region in 2013/14**

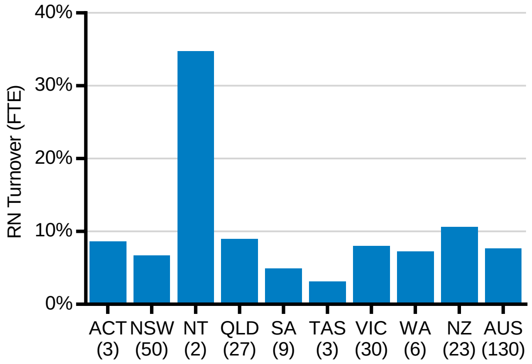
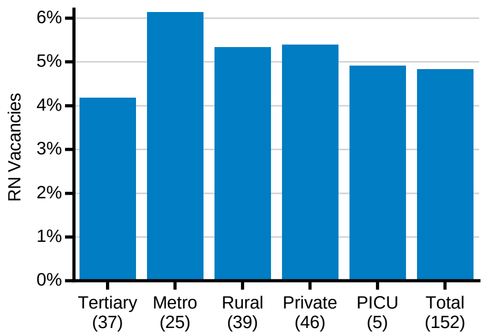
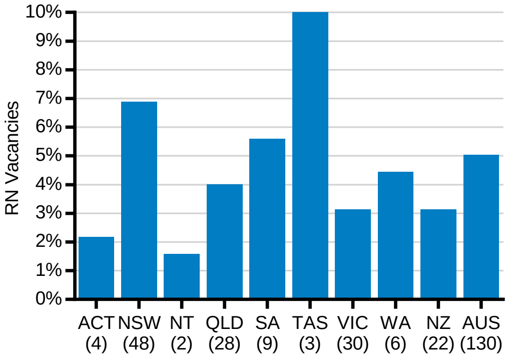


Figure 129 **RN Vacancy Percentage, by Classification in 2013/14**



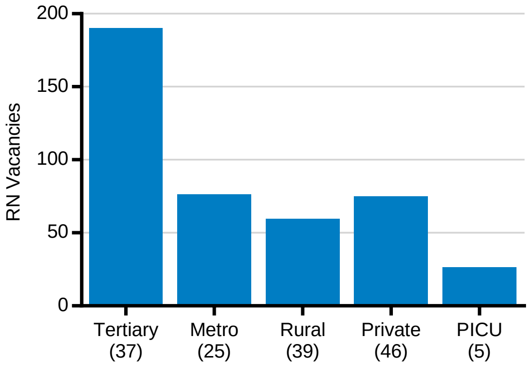
2013/14 contributing units. Data from 152 sites.

Figure 130 **RN Vacancy Percentage, by Region in 2013/14**



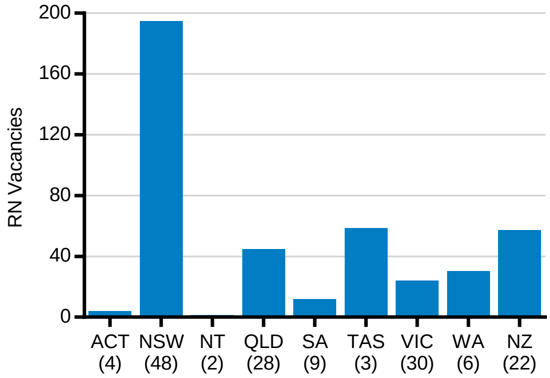
Workforce *continued*

Figure 131 RN Vacant Positions, by Classification in 2013/14



2013/14 contributing units. Data from 152 sites.

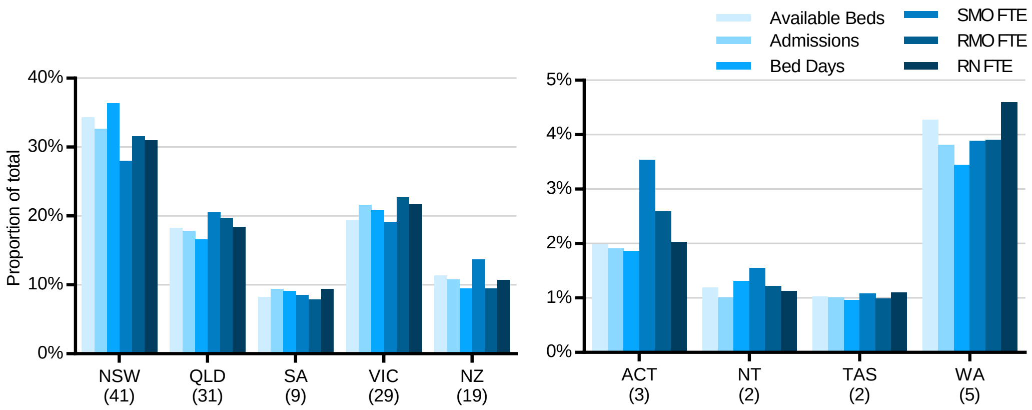
Figure 132 RN Vacant Positions, by Region in 2013/14



Distribution of ICU Staffing Resources

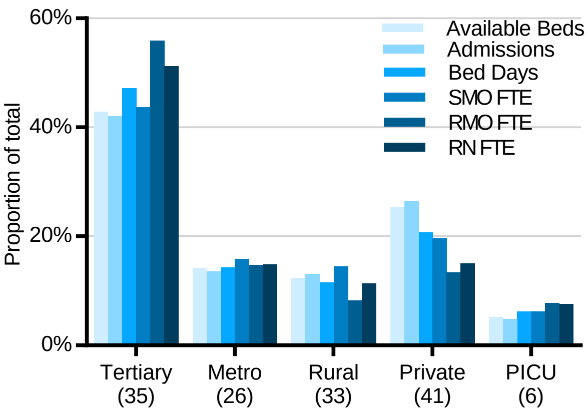
Figures 133 and 134 below compare the proportion of Staffing Resources by hospital classification and region as presented as the proportion of the total for that resource.

Figure 133 Distribution of Staffing Resources, by Region in 2013/14



2013/14 contributing units. Data from 141 sites.

Figure 134 Distribution of Staffing Resources, by Classification in 2013/14



2013/14 contributing units. Data from 141 sites.

Appendix 1 - CCR Survey Methodology

Survey Instrument

The online survey was sent to 205 ICU units in Australia and New Zealand in October 2014, the survey was due for submission in November 2014, however the return of surveys was accepted until January 2015. Follow up of unsubmitted surveys was by email and telephone.

Data Quality

The survey is reliant on self-reporting by staff members at the contributing units. To assist with this process, supporting documents were provided to assist contributors in understanding key terms and to provide the framework for determining ICU levels. Where applicable, CCR endeavours to follow definitions listed in the National Health Data Dictionary.

Submitted data was checked and any identified issues or discrepancies, both within each survey and relating to answers provided in previous surveys, confirmed with the survey contact nominated by units. Not all questions were answered by all units, and despite follow-up of missing data, questions remain unanswered for various reasons. To account for this, the number of contributing units is indicated in each section below.

Data Analysis

The online survey tool enters data into a Microsoft SQL server database. Data extraction and analysis was undertaken with Microsoft SQL server, Microsoft Excel and Graphpad Prism.

Presentation of Data

Data is presented in tables and various types of graphs. Data presented is for the 2013/14 financial year (1 July 2013 to 30 June 2014), unless otherwise stated. Box and whisker plots represent the range, interquartile range and median, unless specifically indicated otherwise. Effort has been taken to avoid identifying individual units. Where units could be identified; measures have been taken to prevent this, such as removal of range from box and whisker plots or combining a group with small numbers into another.

Data Items

Extensive data relating to the resources and activity of ICUs in Australia and New Zealand is collected by the CCR survey, however to ensure only the most relevant information is presented, not all data items are presented in this report. The data not presented here includes data on Safety and Quality, Clinical Indicators and Medical Emergency Teams (MET), and is available upon request from ANZICS CORE (http://www.anzics.com.au/Pages/Information-Requests.aspx).

Comparison Groups

This report separates ICUs into two types of comparison groups; region and classification. The location of ICUs in Australia and New Zealand is separated into nine regions; eight states and territories in Australia, and New Zealand as one region. ICUs are classified as one of five hospital classifications; Tertiary, Metropolitan (Metro), Rural/Regional (Rural), Private and PICU. Classification is determined by a number of factors, including geographical location and patient case mix. Effort is taken to align classifications across all ANZICS CORE registries.

Information on the level and type of ICU was also collected in the survey, but not used as a comparison for the purpose of this report.

Appendix 1 - CCR Survey Methodology *continued*

ICU Beds

For the purposes of the CCR Survey, beds are categorised as general ICU, other ICU and High Dependency Unit (HDU). Coronary Care Unit (CCU) beds were collected and explicitly excluded.

Physical and Available Beds can be described in any category of bed, however ventilator beds can only be described in general ICU and other ICU categories. For the purpose of this report, beds are reported as physical and available, and not broken down by category.

ICU Activity

The CCR Survey collects data relating to Adult and Paediatric patient admissions to an ICU, including admissions, bed days, readmissions, admission source, discharge destination, patient ventilation and activity indicators. Definitions of these activities are detailed in the respective sections of this report.

Intensive Care Workforce

Data is collected on medical and nursing staff within ICUs and reported in the workforce section. Extensive data is collected profiling the nursing staff in units, however for the purposes of this report only Registered Nurse (RN) staffing is included.

Changes over time

In addition to reporting on the 2013/14 financial year, this report makes comparisons against previous survey years. As different units submitted surveys each year, the time series analysis includes only data from units that consistently submitted a survey in all the years in question. This was done to prevent differences in the combination of units masking any trends in changed resources of activity over time. The number of units included in each time series analysis is indicated in each section.

Population

For analysis of data in relation to population, estimated population data at the end of each financial year was obtained from the Australian Bureau of Statistics and Statistics New Zealand. Population was 23,490,736 for Australia and 4,509,900 for New Zealand.

Sources:
http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3101.0Main+Features1Jun%202014?OpenDocument
http://www.stats.govt.nz/browse_for_stats/population/estimates_and_projections/NationalPopulationEstimates_HOTPAt30Jun14.aspx

Appendix 2 – Tables

ICU Bed Stock

Table 1 2013/14 Physical and Available Beds, by Region

Region	Population	No. Units	Physical Beds	Available Beds	Available as % of Physical	Physical Beds/100,000 Population	Available Beds/100,000 Population
ACT	385,996	4	50	41	82.0%	12.95	10.62
NSW	7,518,472	65	867	774	89.3%	11.53	10.29
NT	245,079	2	27	21	77.8%	11.02	8.57
QLD	4,722,447	38	470	387	82.3%	9.95	8.19
SA	1,685,714	13	195	176	90.3%	11.57	10.44
TAS	514,762	5	60	47	78.3%	11.66	9.13
VIC	5,841,667	39	495	429	86.7%	8.47	7.34
WA	2,573,389	11	167	152	91.0%	6.49	5.91
NZ	4,509,900	30	315	266	84.4%	6.98	5.90
Total	28,000,636	207	2646	2293	86.7%	9.45	8.19
AUS Total	23,490,736	177	2331	2027	87.0%	9.92	8.63

2013/14 contributing units and follow-up with non-contributors. Data from 207 sites.

Table 2 2013/14 Public and Private Beds, by Region

	Public			Private			Proportion Public			Public Beds per 100,000 Population	
Region	No. Units	Physical Beds	Available Beds	No. Units	Physical Beds	Available Beds	No. Units	Physical Beds	Available Beds	Physical Beds	Available Beds
ACT	2	39	30	2	11	11	2	78.0%	73.2%	10.10	7.77
NSW	47	664	571	18	203	203	47	76.6%	73.8%	8.83	7.59
NT	2	27	21				2	100%	100%	11.02	8.57
QLD	22	306	223	16	164	164	22	65.1%	57.6%	6.48	4.72
SA	7	133	114	6	62	62	7	68.2%	64.8%	7.89	6.76
TAS	4	49	36	1	11	11	4	81.7%	76.6%	9.52	6.99
VIC	25	364	298	14	131	131	25	73.5%	69.5%	6.23	5.10
WA	7	121	106	4	46	46	7	72.5%	69.7%	4.70	4.12
NZ	25	286	237	5	29	29	25	90.8%	89.1%	6.34	5.26
Total	141	1989	1636	66	657	657	141	75.2%	71.3%	7.10	5.84
AUS Total	116	1703	1399	61	628	628	116	73.1%	69.0%	7.25	5.96

2013/14 contributing units and follow-up with non-contributors. Data from 207 sites.

Table 3 2013/14 Physical Beds, by Classification and Region

Hospital Classification	No. Units	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	NZ	Total
Tertiary	39	31	354		141	88	24	169	76	149	1032
Metropolitan	37	8	118	18	63	21	14	88	35	37	402
Rural / Regional	56		148	9	65	12	7	77		78	396
Private	66	11	203		164	62	11	131	46	29	657
PICU	9		44		37	12	4	30	10	22	159
Total	207	50	867	27	470	195	60	495	167	315	2646

2013/14 contributing units and follow-up with non-contributors. Data from 207 sites.

Appendix 2 – Tables *continued*

Table 4 2013/14 Available Beds by Hospital Classification and Region

Hospital Classification	No. Units	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	NZ	Total
Tertiary	39	22	280		109	77	14	138	73	120	833
Metropolitan	37	8	113	12	47	17	11	71	27	32	338
Rural / Regional	56		140	9	43	12	7	69		70	350
Private	66	11	203		164	62	11	131	46	29	657
PICU	9		38		24	8	4	20	6	15	115
Total	207	41	774	21	387	176	47	429	152	266	2293

2013/14 contributing units and follow-up with non-contributors. Data from 207 sites.

Table 5 Physical Beds between 2009/10 and 2013/14

Region	No. Units	2009/10	2010/11	2011/12	2012/13	2013/14
ACT	2	30	30	32	32	39
NSW	45	601	665	653	678	679
NT	2	28	28	27	27	27
QLD	34	392	406	413	426	439
SA	11	158	166	166	166	171
TAS	3	36	38	40	40	49
VIC	36	418	438	438	456	475
WA	5	65	67	72	72	74
NZ	26	272	287	296	292	290
Total	164	2000	2125	2137	2189	2243
AUS Total	138	1728	1838	1841	1897	1953

Consistently contributing units. Data from 164 sites.

Table 6 Available Beds between 2009/10 and 2013/2014

Region	No. Units	2009/10	2010/11	2011/12	2012/13	2013/2014
ACT	2	24	24	28	28	30
NSW	45	550	578	576	591	595
NT	2	22	24	23	23	21
QLD	34	340	342	334	329	357
SA	11	150	153	153	152	156
TAS	3	32	34	36	36	36
VIC	36	365	384	385	395	409
WA	5	60	67	68	64	70
NZ	26	218	224	242	240	241
Total	164	1761	1830	1845	1858	1915
AUS Total	138	1543	1606	1603	1618	1674

Consistently contributing units. Data from 164 sites.

Appendix 2– Tables continued

Admissions

Table 7 Number of Admissions in 2013/14, by Classification

Hospital Classification	No. Units	Total Admissions	Emergency Admissions	Elective Admissions	Undivided Admissions
Tertiary	37	67,777	37,213	20,369	10,195
Metropolitan	27	21,248	16,780	3,329	1,139
Rural / Regional	43	26,738	18,605	2,824	5,309
PICU	49	44,107	8,829	32,888	2,390
Private	7	7,483	4,594	2,889	0
Total	163	167,353	86,021	62,299	19,033

2013/14 contributing units. Data from 163 sites.

Table 8 Number of Admissions in 2013/14, by Region

Region	No. Units	Total Admissions	Emergency Admissions	Elective Admissions	Undivided Admissions
ACT	4	3,380	1,685	1,680	15
NSW	50	57,861	28,847	20,519	8,495
NT	2	1,507	1,355	133	19
QLD	32	26,988	14,541	11,948	499
SA	9	14,089	3,817	5,040	5,232
TAS	4	2,716	1,714	993	9
VIC	33	34,484	19,341	13,550	1,593
WA	6	8,665	3,543	2,925	2,197
NZ	23	17,663	11,178	5,511	974
Total	163	167,353	86,021	62,299	19,033
AUS Total	140	149,690	74,843	56,788	18,059

2013/14 contributing units. Data from 163 sites.

Table 9 Admissions/100,000 Population in 2013/14

Region	No. Units	Population	Reported Admissions / Population	% Beds Represented	Estimated Total Admissions / Population
ACT	4	385,996	875.66	100.0%	875.66
NSW	50	7,518,472	769.58	87.2%	882.46
NT	2	245,079	614.90	100.0%	614.90
QLD	32	4,722,447	571.48	84.8%	674.28
SA	9	1,685,714	835.79	81.8%	1021.52
TAS	4	514,762	527.62	70.2%	751.46
VIC	33	5,841,667	590.31	87.4%	675.54
WA	6	2,573,389	336.72	69.7%	482.84
NZ	23	4,509,900	391.65	82.3%	475.70
Total	163	7,083,289	597.68	84.7%	705.76
AUS Total	140	23,490,736	637.23	85.0%	749.73

2013/14 contributing units. Data from 163 sites.

Appendix 2– Tables *continued*

Bed Days

Table 10 Total Bed Days in 2013/14, by Classification

Hospital Classification	Total Bed Days		Emergency and Elective Bed Days			
	No. Units	Total Bed Days	No. Units	Emergency Bed Days	Elective	% Emergency Bed Days
Tertiary	35	224,696	29	130,786	41,418	76.0%
Metropolitan	27	72,294	21	48,155	7,247	86.9%
Rural / Regional	37	59,944	29	40,509	6,023	87.1%
PICU	44	100,955	31	18,298	52,791	25.7%
Private	7	30,509	7	21,218	9,291	69.6%
Total	150	488,399	117	258,969	116,771	68.9%

2013/14 contributing units. Data from 150 sites.

Table 11 Total Bed Days in 2013/14, by Region

Region	Total Bed Days		Emergency and Elective Bed Days			
	No. Units	Total Bed Days	No. Units	Emergency Bed Days	Elective	% Emergency Bed Days
ACT	4	9,599	3	5,776	3,031	65.6%
NSW	44	181,709	31	79,310	39,704	66.6%
NT	2	6,240	2	5,816	425	93.2%
QLD	31	79,161	24	46,435	19,265	70.7%
SA	9	43,496	7	14,002	12,987	51.9%
TAS	4	7,150	4	5,244	1,906	73.3%
VIC	30	99,888	24	60,092	25,188	70.5%
WA	5	16,415	5	10,454	5,961	63.7%
NZ	21	46,398	17	31,841	9,962	76.2%
Total	150	490,058	117	258,969	118,430	68.6%
AUS Total	129	443,659	100	227,128	108,468	67.7%

2013/14 contributing units. Data from 150 sites.

Paediatric Admissions and Beds

Table 12 2013/14 Paediatric Intensive Care, by Region

Region	PICU Beds		Total Paediatric Admissions (PICU admissions)	Paed Admissions/100,000 Paed Population
	Physical	Available		
ACT			26	34.00
NSW	44	38	2,728 (2,279)	181.97
NT			91	158.91
QLD	37	24	1,714 (1,304)	172.22
SA	12	8	41	12.91
TAS*	4	4	238 (214)	234.85
VIC	30	20	2,678 (1,685)	235.48
WA	10	6	650 (627)	124.27
NZ	22	15	2,061 (1,078)	226.16
Total	159	115	10,227 (7,187)	182.00
AUS Total	137	100	8,166 (6,109)	173.45

2013/14 contributing units. Data from 7 PICUs, 103 ICUs. *PICU Beds/Admissions in combined NICU/PICU

Appendix 3 – Contributing sites

Hospital	Region	Hospital Classification
Concord Hospital (Sydney)	NSW	Tertiary
John Hunter Hospital	NSW	Tertiary
Liverpool Hospital	NSW	Tertiary
Nepean Hospital	NSW	Tertiary
Prince of Wales Hospital (Sydney)	NSW	Tertiary
Royal North Shore Hospital	NSW	Tertiary
Royal Prince Alfred Hospital	NSW	Tertiary
St George Hospital (Sydney)	NSW	Tertiary
St George Hospital (Sydney) ICU2	NSW	Tertiary
St Vincent's Hospital (Sydney)	NSW	Tertiary
Westmead Hospital	NSW	Tertiary
Wollongong Hospital	NSW	Tertiary
Bankstown-Lidcombe Hospital	NSW	Metropolitan
Calvary Mater Newcastle	NSW	Metropolitan
Campbelltown Hospital	NSW	Metropolitan
Canterbury Hospital	NSW	Metropolitan
Gosford Hospital	NSW	Metropolitan
Hornsby Ku-ring-gai Hospital	NSW	Metropolitan
Manly Hospital & Community Health	NSW	Metropolitan
Sutherland Hospital & Community Health Services	NSW	Metropolitan
Armidale Rural Referral Hospital	NSW	Rural / Regional
Bathurst Base Hospital	NSW	Rural / Regional
Bowral Hospital	NSW	Rural / Regional
Dubbo Base Hospital	NSW	Rural / Regional
Goulburn Base Hospital	NSW	Rural / Regional
Griffith Base Hospital	NSW	Rural / Regional
Lismore Base Hospital	NSW	Rural / Regional
Maitland Hospital	NSW	Rural / Regional
Manning Rural Referral Hospital	NSW	Rural / Regional
Orange Health Service	NSW	Rural / Regional
Shoalhaven Hospital	NSW	Rural / Regional
Tamworth Base Hospital	NSW	Rural / Regional
Tweed Heads District Hospital	NSW	Rural / Regional
Wagga Wagga Base Hospital & District Health	NSW	Rural / Regional
Wyong Hospital	NSW	Rural / Regional
Calvary Health Care Riverina (Wagga)	NSW	Private
Dalcross Adventist Hospital (Sydney)	NSW	Private
Figtree Private Hospital	NSW	Private
Gosford Private Hospital	NSW	Private
Lake Macquarie Private Hospital	NSW	Private
Macquarie University Private Hospital	NSW	Private
Mater Private Hospital (Sydney)	NSW	Private
Newcastle Private Hospital	NSW	Private
North Shore Private Hospital	NSW	Private
Norwest Private Hospital	NSW	Private

Appendix 3 – Contributing sites *continued*

Hospital Name	Region	Hospital Classification
Prince of Wales Private Hospital (Sydney)	NSW	Private
St Vincent's Private Hospital (Sydney)	NSW	Private
Strathfield Private Hospital	NSW	Private
Sydney Adventist Hospital	NSW	Private
Westmead Private Hospital	NSW	Private
Sydney Children's Hospital	NSW	PICU
The Children's Hospital at Westmead	NSW	PICU

Hospital	Region	Hospital Classification
Gold Coast University Hospital	QLD	Tertiary
Mater Adults Hospital (Brisbane)	QLD	Tertiary
Princess Alexandra Hospital	QLD	Tertiary
Royal Brisbane and Women's Hospital	QLD	Tertiary
The Prince Charles Hospital	QLD	Tertiary
The Townsville Hospital	QLD	Tertiary
Caboolture Hospital	QLD	Metropolitan
Ipswich Hospital	QLD	Metropolitan
Logan Hospital	QLD	Metropolitan
Nambour General Hospital	QLD	Rural / Regional
Queen Elizabeth II Jubilee Hospital	QLD	Metropolitan
Redcliffe Hospital	QLD	Metropolitan
Robina Hospital	QLD	Metropolitan
Bundaberg Base Hospital	QLD	Rural / Regional
Cairns Base Hospital	QLD	Rural / Regional
Hervey Bay Hospital	QLD	Rural / Regional
Mackay Base Hospital	QLD	Rural / Regional
Mount Isa Hospital	QLD	Rural / Regional
Rockhampton Hospital	QLD	Rural / Regional
Toowoomba Hospital	QLD	Rural / Regional
Allamanda Private Hospital	QLD	Private
Brisbane Private Hospital	QLD	Private
Holy Spirit Northside Hospital	QLD	Private
John Flynn Private Hospital	QLD	Private
Mater Private Hospital (Brisbane)	QLD	Private
Noosa Hospital	QLD	Private
St Andrew's Hospital Toowoomba	QLD	Private
St Andrew's War Memorial Hospital	QLD	Private
Sunshine Coast University Private Hospital	QLD	Private
The Sunshine Coast Private Hospital	QLD	Private
The Wesley Hospital	QLD	Private
Mater Children's Hospital (Brisbane)	QLD	PICU

Hospital Name	Region	Hospital Classification
Flinders Medical Centre	SA	Tertiary
Royal Adelaide Hospital	SA	Tertiary
The Queen Elizabeth (Adelaide)	SA	Tertiary

Appendix 3 – Contributing sites *continued*

Hospital Name	Region	Hospital Classification
Lyell McEwin Hospital	SA	Metropolitan
Ashford Community Hospital	SA	Private
Calvary Wakefield Hospital (Adelaide)	SA	Private
Flinders Private Hospital	SA	Private
St Andrew's Hospital (Adelaide)	SA	Private
The Memorial Hospital (Adelaide)	SA	Private

Hospital Name	Region	Hospital Classification
Launceston General Hospital	TAS	Metropolitan
North West Regional Hospital (Burnie)	TAS	Rural / Regional
Calvary Hospital (Lenah Valley)	TAS	Private
Royal Hobart Hospital NICU/PICU	TAS	PICU

Hospital Name	Region	Hospital Classification
Royal Darwin Hospital	NT	Metropolitan
Alice Springs Hospital	NT	Rural / Regional

Hospital Name	Region	Hospital Classification
Alfred Hospital	VIC	Tertiary
Austin Hospital	VIC	Tertiary
Geelong Hospital	VIC	Tertiary
Monash Medical Centre-Clayton Campus	VIC	Tertiary
Royal Melbourne Hospital	VIC	Tertiary
St Vincent's Hospital (Melbourne)	VIC	Tertiary
Dandenong Hospital	VIC	Metropolitan
Frankston Hospital	VIC	Metropolitan
Maroondah Hospital	VIC	Metropolitan
Albury Base Hospital	VIC	Rural / Regional
Ballarat Health Services	VIC	Rural / Regional
Bendigo Health Care Group	VIC	Rural / Regional
Central Gippsland Health Service	VIC	Rural / Regional
Goulburn Valley Health	VIC	Rural / Regional
Latrobe Regional Hospital	VIC	Rural / Regional
Mildura Base Hospital	VIC	Rural / Regional
Northeast Health Wangaratta	VIC	Rural / Regional
South West Healthcare (Warrnambool)	VIC	Rural / Regional
Western District Health Service (Hamilton)	VIC	Rural / Regional
Wimmera Health Care Group (Horsham)	VIC	Rural / Regional
Cabrini Hospital	VIC	Private
Epworth Eastern Private Hospital	VIC	Private
Epworth Freemasons Hospital	VIC	Private
Epworth Hospital (Richmond)	VIC	Private
John Fawkner Hospital	VIC	Private
Knox Private Hospital	VIC	Private
Melbourne Private Hospital	VIC	Private
Peninsula Private Hospital	VIC	Private

Appendix 3 – Contributing sites *continued*

Hospital Name	Region	Hospital Classification
St John of God Hospital (Bendigo)	VIC	Private
St John Of God Hospital (Geelong)	VIC	Private
St Vincent's Mercy Private (Melbourne)	VIC	Private
Warringal Private Hospital	VIC	Private
Royal Children's Hospital (Melbourne)	VIC	PICU

Hospital Name	Region	Hospital Classification
Canberra Hospital	ACT	Tertiary
Calvary Hospital (Canberra)	ACT	Metropolitan
Calvary John James Hospital	ACT	Private
National Capital Private Hospital	ACT	Private

Hospital Name	Region	Hospital Classification
Fremantle Hospital	WA	Tertiary
Royal Perth Hospital	WA	Tertiary
Sir Charles Gairdner Hospital	WA	Tertiary
Joondalup Health Campus	WA	Metropolitan
Mount Hospital	WA	Private
Princess Margaret Hospital for Children	WA	PICU

Hospital Name	Region	Hospital Classification
Auckland City Hospital CV ICU	NZ	Tertiary
Christchurch Hospital	NZ	Tertiary
Dunedin Hospital	NZ	Tertiary
Middlemore Hospital	NZ	Tertiary
Waikato Hospital	NZ	Tertiary
Wellington Hospital	NZ	Tertiary
North Shore Hospital	NZ	Metropolitan
Tauranga Hospital	NZ	Metropolitan
Timaru Hospital	NZ	Metropolitan
Whangarei Area Hospital, Northland Health Ltd	NZ	Metropolitan
Greymouth Hospital	NZ	Rural / Regional
Hawkes Bay Hospital	NZ	Rural / Regional
Hutt Hospital	NZ	Rural / Regional
Nelson Hospital	NZ	Rural / Regional
Palmerston North Hospital	NZ	Rural / Regional
Southland Hospital	NZ	Rural / Regional
Taranaki Health	NZ	Rural / Regional
Wairau Hospital	NZ	Rural / Regional
Wanganui Hospital	NZ	Rural / Regional
Whakatane Hospital	NZ	Rural / Regional
Southern Cross Hospital (Hamilton)	NZ	Private
Wakefield Hospital (NZ)	NZ	Private
Starship Children's Hospital	NZ	PICU

**Nepean Private Hospital, Rotorua Hospital, St John of God Hospital (Subiaco) and Peter McCallum Hospital submitted a survey in 2013/14 however have not been included in the analysis.*

Appendix 4 - Abbreviations

ACHS	Australian Council on Healthcare Standards
ACT	Australian Capital Territory
Admissions/Population	Admissions per 100,000 population
ANZICS	Australian and New Zealand Intensive Care Society
ANZPIC	Australian and New Zealand Paediatric Intensive Care Registry
APD	Adult Patient Database
ARCCCR	ANZICS Research Centre for Critical Care Resources
AUS	Australia
CCR	Critical Care Resources
CCU	Coronary Care Unit
CICM	College of Intensive Care Medicine
CLABSI	Central Line Associated Blood Stream Infection
CORE	Centre for Outcome and Resource Evaluation
ED	Emergency Department
FTE	Full Time Equivalent
HDU	High Dependency Unit
Hosp	Hospital
ICU	Intensive Care Unit
MET	Medical Emergency Team
Metro	Metropolitan
NICU	Neonatal Intensive Care Unit
NSW	New South Wales
NT	Northern Territory
NZ	New Zealand
OT	Operating Theatre
PICU	Paediatric Intensive Care Unit
QLD	Queensland
RN	Registered Nurse
Rural	Rural / Regional
SA	South Australia
SMO	Senior Medical Officer
SQL	Structured Query Language
TAS	Tasmania
VIC	Victoria
WA	Western Australia

Appendix 5 - Glossary

Available Bed	A bed with advanced life support capability that is fully staffed and funded.
Bed Days	A bed-day is a day during which a person occupies a bed in which the patient stays overnight in a hospital.
BedDays/Population	Bed Days per 100,000 population.
Beds/Population	Beds per 100,000 population.
Elective Admission	A planned admission. An admission to the ICU that could be postponed for 8 hours without adverse effect. A postponed elective admission can subsequently become an emergency admission.
Emergency Admission	An unplanned admission. An admission of a patient to the ICU for urgent care or treatment.
Exit Block	Delay in the discharge of a patient of 6 hours or more.
Full Time Equivalent	A unit that indicates the workload of an employed person (or student) in a way that makes workloads comparable across various contexts.
Intensivist	A medical practitioner who has been specifically trained in intensive care medicine. Intensive care specialists are formally certified in intensive care by completing the training requirements of the CICM.
Interquartile Range	The range between the first and third quartile (25%-75%) when values are listed in ascending order.
Invasive Ventilation	Mechanical ventilator support via oral/nasal intubation of tracheostomy tube.
Percentage Occupancy	Patient Bed Days divided by the total number of Available Beds multiplied by the number of days for the given period.
Median	The middle value when values are listed in ascending order.
Non-Invasive Ventilation	Ventilatory support such as CPAP/BiPAP, administered via facial or nasal mask or nasal cannulae.
Physical Bed	A single patient care location fully configured to ICU standards. It is an actual bed, not a bed space.
Undivided Admission	Admissions that have not been classed as elective or emergency, or ICU or HDU, but have been reported to CCR.
Ventilator Bed	A physical ICU bed plus ventilator.