

Report of the

Australian and New Zealand

Paediatric Intensive Care Registry

2001 - 2002

Lynda Norton and Anthony Slater

Lynda Norton

Australian and New Zealand Paediatric Intensive Care Registry

Department of Paediatric Critical Care Medicine - Women's and Children's Hospital

Anthony Slater

Department of Paediatric Critical Care Medicine - Women's and Children's Hospital

Department of Paediatrics - The University of Adelaide

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Report of the Australian and New Zealand Paediatric Intensive Care Registry 2001 - 2002

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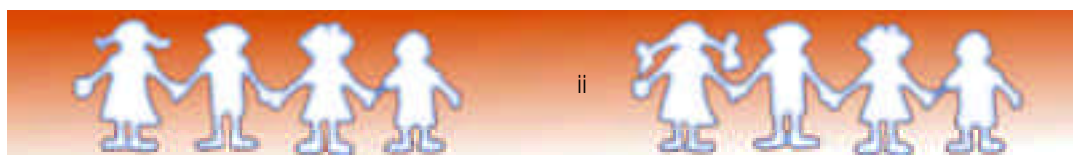
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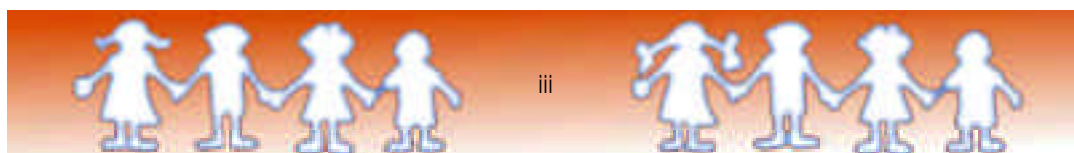
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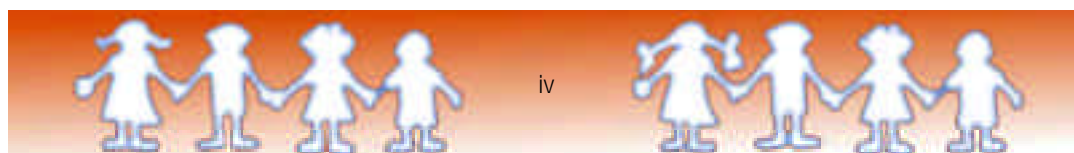
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# Foreword

I am delighted to acknowledge this second Report of the Australian and New Zealand Paediatric Intensive Care Registry for data collected during 2001 and 2002 on behalf of the Paediatric Study Group, and importantly sponsored by the Australian and New Zealand Intensive Care Society. It is the second report in this format covering two years as a “catch up”, with an improved recalibrated model of mortality prediction.

The importance of this and previous Reports lie with the need to proudly benchmark Australian and New Zealand outcomes against internationally recognised standards, to highlight the importance of regionalised Paediatric Intensive Care Services, and to ensure responsibility for outcomes and resource utilisation. Such reports and data collections are now integral to health care management. They are labour intensive to ensure accuracy and relevance, but unfortunately resources are often not supported by administrations. Despite dedicated efforts for these Reports, 2400 patients were excluded from the adjusted mortality analysis due to concerns of data reliability. As such, administrations need to accept the need for additional resources. The revised Joint Faculty of Intensive Care Document IC-3, “Minimum Standards For Intensive Care Units, acknowledges these resources issues, with Level III and Level II Units now required to demonstrate staff who have dedicated time to collect and manage data.

In conclusion, the participating Paediatric Intensive Care Units are to be congratulated for ongoing participation. Tony Slater and Lynda Norton are again to be applauded for their dedication, for meticulousness of their work and for the excellence of the presentation.

Dr Neil T Matthews  
Dean  
Joint Faculty of Intensive Care Medicine  
(ANZCA and RACP)





# 1 Introduction

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## 1.1 History of the Australian and New Zealand Paediatric Intensive Care Registry

The Paediatric Study Group (PSG) of the Australian New Zealand Intensive Care Society (ANZICS) established the Australian and New Zealand Paediatric Intensive Care (ANZPIC) Registry in 1997. The aims of the Registry are:

- To describe paediatric intensive care practices and outcomes in Australia and New Zealand
- To provide contributing units with efficacy and efficiency reports that compare performance in their units against national and international standards
- To facilitate research in paediatric intensive care

The Registry is located at the Women's and Children's Hospital in Adelaide and is managed by the Study Group convenor and a project officer. There are links with other ANZICS projects through the ANZICS Database Management Committee (ADMC).

The Registry complies with the guidelines for Health Registers recommended by the Australian Institute of Health and Welfare (1).

## 1.2 Paediatric Intensive Care - Intensive Care Units that admit children

The Faculty of Intensive Care, Australian and New Zealand College of Anaesthetists (FICANZCA) defines an Intensive Care Unit (ICU) as a designated ward of a hospital, which is specially staffed and equipped to provide observation, care and treatment to patients with actual or potential life-threatening illnesses, injuries or complications, from which recovery is possible. The ICU provides special expertise and facilities for the support of vital functions and utilises the skills of medical, nursing and other staff trained and experienced in the management of these problems. A Paediatric Intensive Care Unit (PICU) must be capable of providing complex, multisystem life support for an indefinite period, be a tertiary referral

centre for children needing intensive care and have extensive backup laboratory and clinical services facilities to support this tertiary role. It must be capable of providing mechanical ventilation, extracorporeal renal support services and invasive cardiovascular monitoring for an indefinite period to infants and children less than 16 years of age, or care of a similar nature. Also included in the FICANZCA minimum standards are specific recommendations for formal audit and review of activities and outcomes (2).

In Australia seven PICU's exist in the state capitals. The Australian Capital territory (ACT), the Northern Territory (NT) and Tasmania (TAS) do not have designated PICU's. In these regions some children are admitted to Level III Adult ICU's, while other children are transported to specialised PICU's. In Queensland children with cardiac conditions requiring ICU admission are admitted to a combined adult and paediatric cardiac ICU at Prince Charles Hospital. In other Australian states children with cardiac conditions are admitted to specialist PICU's.

In New Zealand the Starship Children's Hospital in Auckland is the tertiary referral centre for paediatrics. There is one specialist PICU at the Starship Children's Hospital. In some regions of New Zealand children are commonly admitted to adult ICU's. Children with cardiac conditions requiring ICU admission are admitted to a combined adult and paediatric cardiac ICU at Greenlane Hospital Auckland. Contact details for the ANZPICRegistry participating units are shown in Appendix 3.





## 2 Data Set

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### 2.1 Participating ICU's

The ANZPIC Registry collects data from all PICU's in Australia and New Zealand (n = 8). These PICU's are located in university-affiliated hospitals. Patients admitted to these units range in age from birth to young adulthood. Participating ICU's which admit primarily adults (n = 5) submit data on patients less than 16 years of age. The number of ICU's submitting data to the Registry increased in 2002. Neonates (< 28 days) are included in the data collection if they have been admitted to a PICU. The Australian and New Zealand Neonatal Network (ANZNN) conducts an ongoing audit for all level III Neonatal Intensive Care Units (NICU's) in Australia and New Zealand. The majority of neonates requiring ICU admission are admitted to NICU's. Criteria for admitting neonates to PICU's vary from unit to unit.

### 2.2 The data set

The minimum data set consists of 38 variables. In 2002 three additional variables were added to the minimum data set. This was in response to the adoption of the revised Paediatric Index of Mortality (PIM2) mortality prediction model. These variables and their definitions are listed in Appendix 1.

Information collected includes demographic data, diagnosis directly responsible for ICU admission as well as underlying and additional diagnoses. Additionally, physiologic variables measured at the time of first face to face contact between the patient and a doctor from the ICU or a specialist retrieval team, the ICU outcome and the length of stay (LOS) are recorded.

All participating units collect the minimum data set. All variables are routinely measured or recorded in the patients' medical record. No variables are measured specifically for the ANZPIC Registry.

### 2.3 Data collection

Data are collected in the hospitals by either filling out the specific ANZPIC Registry forms or by incorporating the ANZPIC Registry data items into the local clinical information system. Participating hospitals maintain unit specific databases and submit electronic copies of de-identified data to the ANZPIC Registry each quarter.

### 2.4 Data verification

Missing, inconsistent or unusual data are identified and flagged at the time of data submission to the Registry. This initial filtering is performed both automatically, via computer based checks for outliers, and manually by the project officer.

### 2.5 Data validation.

Each hospital contributing to the database undergoes a validation exercise annually. This process involves a number of specific steps:

- (1) Once complete data has been submitted to the Registry, 50 cases are randomly selected for re-extraction. The randomisation process is stratified by the risk of death, predicted by PIM/PIM2, to ensure that the random sample includes patients with a representative range of mortality risk.
- (2) An independent data collector from another PICU physically re-extracts the information from the hospital medical records.
- (3) The principal diagnosis, intensive care outcome and the variables required to calculate PIM / PIM2 are recorded by the independent data collector. The ICU flow charts, progress notes, emergency department and retrieval records are all reviewed to ensure that the physiological values at first ICU medical contact are recorded.
- (4) The re-extracted data is entered into a computer program that simultaneously displays the original data and re-extracted data for each patient, together with the predicted risk of death calculated from both sets of data. This process identifies where errors occur and the impact of the errors.



(5) The Bland Altman technique is used to plot the difference in the risk of death against the average risk of death for the two sets of data (3).

(6) Reports are generated for each hospital summarising the number and type of errors and possible methods of improvement.

## 2.6 Data limitations

Limitations to the data are related to the data collection process, the small population of paediatric patients admitted to ICU's in Australia and New Zealand and the outcome measures used to compare hospitals.

Only three of the participating hospitals have designated data managers. In the other ICUs data is collected by a range of staff, from clinical nurses to senior medical staff. Data collection errors are more common when large numbers of staff from a unit share responsibility for data collection.

Timely data submission remains a major hurdle for some hospitals lacking resources for data collection. This impacts significantly on the ability of the Registry to rapidly report on performance differences between units or within each unit over time.

Three hospitals have integrated clinical information systems that automatically download data to the ANZPIC database. Problems with data validity and accuracy have been detected in one hospital submitting data for 2002. This has resulted in an extensive review of their 2002 data requiring manual data re-collection.

Currently the outcome measures used by the ANZPIC Registry are length of ICU stay and mortality. These measures are easy to collect but only provide a limited measure of efficiency and effectiveness of intensive care. Two Australian units have undertaken research studies of long term outcome of children admitted to PICU (4).

Assessment of long term morbidity and quality of life is labour intensive and is currently not a realistic aim for routine continuous outcome monitoring.



### 3 Demographics

#### 3.1 Population

There were 6,688 children admitted to ICU's participating in the ANZPIC Registry during 2001 and 6,624 children admitted in 2002. The number of admissions recorded by the ANZPIC Registry varies annually with the number of hospitals submitting data.

#### 3.2 Age

There were around 3.9 million children (age < 15 years) in Australia at the last census (5). This is more than double the number of children since 1921. Most of this increase occurred between 1946 and 1964. Over the past three decades the fertility rate in Australia has decreased from 3.4 babies per woman to the current low of 1.7 babies per woman. In New Zealand the fertility rate has fallen from 4.2 to 2.0 babies per woman (6). Since 1990 the proportion of children in the Australian population has decreased by 7 percent

(5). The proportion of children in the New Zealand population has remained steady at 23 percent from 1991 to 2001 (7). As at 30 June 2001 21 percent of Australia's population and 22 percent of New Zealand's population were children (7).

The majority of admissions to ICU in 2001 and 2002 were for children less than 5 yr (63%) with more than half of this group being infants less than 1 yr (35.6% of all admissions) as illustrated in figure 3.2.1.

#### 3.3 Ethnicity

There is no international standard classification of ethnicity. Both the definitions of ethnicity in the Australian Standard Classification of Cultural and Ethnic Groups (ASCCEG) and the New Zealand Standard Classification of Ethnicity (NZSCE) are based on the principle of self assessed identification with an ethnic group (8). In PICU's ethnicity and indigenous status is

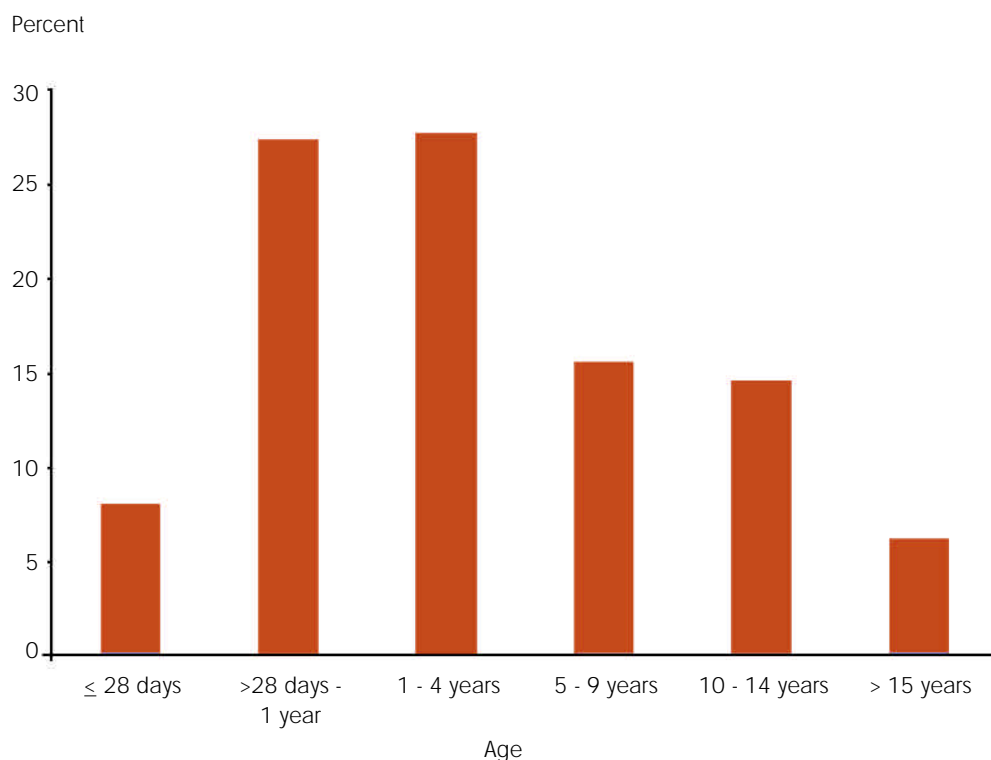


Figure 3.2.1: Proportion of patients admitted to ANZPICRegistry ICUs, by age, 2001 and 2002 data have been combined



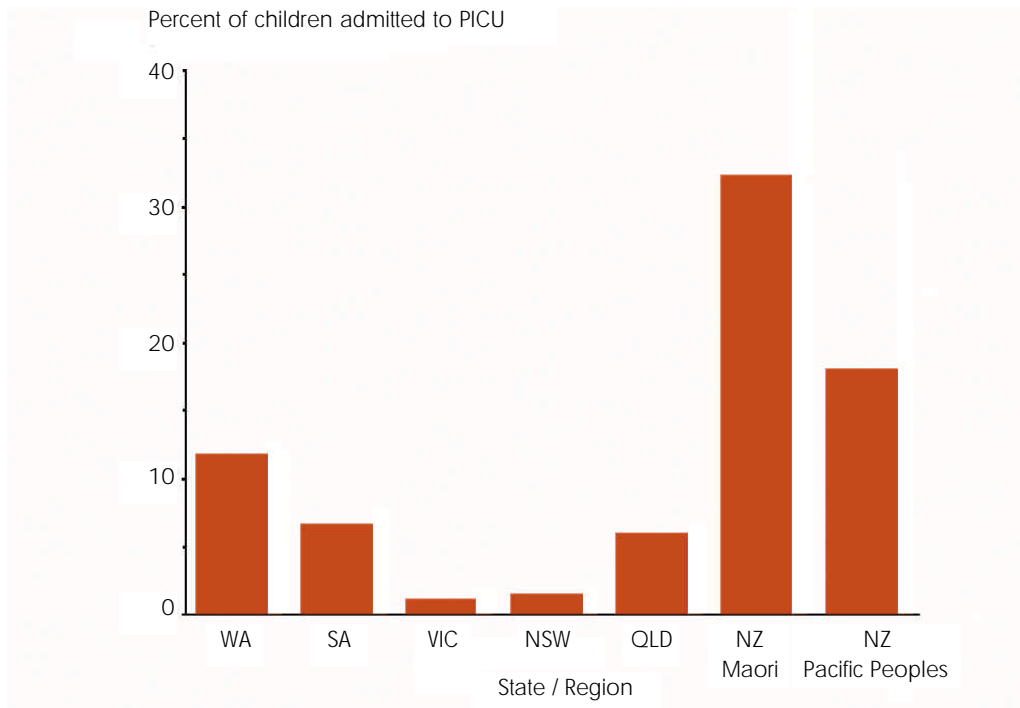


Figure 3.3.1: Indigenous patients as a proportion of the total patient population of each State/Region, 2001 and 2002 data have been combined

most often determined by the parents or next of kin.

The majority of patients admitted to PICUs in Australia were Caucasian (79%). Five percent of patients identified as Asian, four percent as Aboriginal and three percent as Maori or Pacific Peoples. In New Zealand 45 percent of patients identified with the Caucasian ethnic group, 32 percent identified with the Maori ethnic group, 18 percent with the Pacific Peoples ethnic group and two percent with the Asian ethnic group. The percent of patients identifying with a particular indigenous status varied greatly between regions, as shown in figure 3.3.1.

The age structure of the indigenous populations of Australia and New Zealand is considerably younger than that of the total population. In 2001, 46 percent of the Aboriginal and Torres Strait Islander population were aged under 18 years (9), while 37 percent of the

Maori population, were aged under 15 years (7). The age structure in these groups varies significantly from that of other patients. Of the Aboriginal patients admitted to ICU's in the Registry 42 percent were less than 12 months of age compared to 34 percent of Caucasian patients. This follows the trend from previous years. Similarly, in New Zealand 53 percent of Maori patients were less than 12 months of age compared with 35 percent of Caucasian patients.



## 4 Admission Characteristics

### 4.1 Admission Source

Patients were admitted to intensive care from the operating theatre (40% of admissions), as direct admissions (24%), from hospital wards (19%) and from the emergency department (16%). Twenty four percent of children were admitted directly to ICU from outside the hospital. Of these direct admissions 50 percent came from other hospital emergency departments and 20.7 percent came from other hospital ICU's.

Fifty eight percent of ICU admissions were unplanned. There is significant variation in the proportion of planned admissions among the hospitals (figure 4.1.1). This is associated with the number of post surgical admissions to an ICU. For example, 95% of all admissions to Prince Charles Hospital, Brisbane were planned. This was related to the ICU receiving predominantly cardiac surgical patients.

### 4.2 Admission diagnosis

Data collectors code the principal reason a patient is

admitted to intensive care. This may not be the same diagnosis for which the patient was admitted to hospital. The underlying diagnosis that contributed to the patient's intensive care admission as well as up to five additional diagnoses are also recorded.

Diagnostic codes were developed by the PSG (Appendix 2). There are 319 principal diagnosis codes grouped by operative status and physiological system. In addition, there are 58 codes used to identify the aetiological factors of injury mechanism and causative organism for infection.

In 2001 and 2002 post operative diagnoses were the most frequently selected of the diagnostic groups (36%). Cardiac surgery accounted for nearly half the post operative admissions (47%). The most common principal reason for admission to ICU was seizures (table 4.2.1). As in previous years other leading diagnoses were bronchiolitis and head trauma.

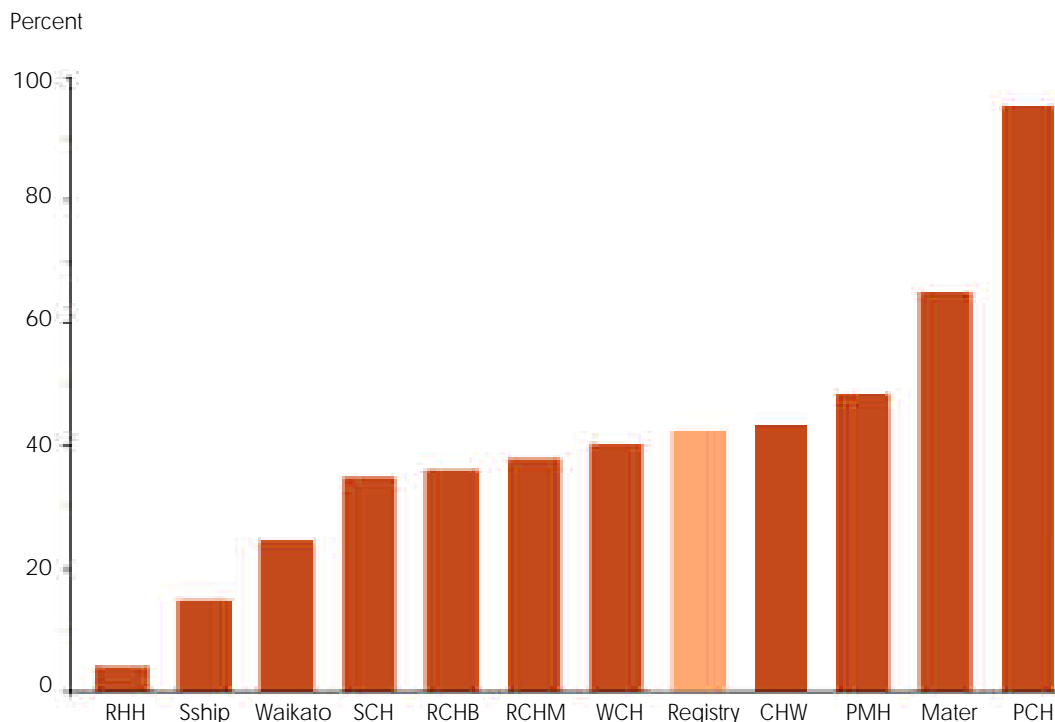


Figure 4.1.1: Planned admissions as a percent of total admissions, 2001 and 2002 data have been combined



Table 4.2.1: Top ten principal reasons for admission to ICU, 2001 and 2002 data have been combined

Principal admission diagnosis	Number	%
Seizures	623	4.9
Bronchiolitis	618	4.9
ICU procedure	594	4.7
Head trauma	535	4.2
Asthma	511	4.1
Pneumonia	348	2.8
VSD repair	346	2.7
Respiratory failure	271	2.1
Diabetic ketoacidosis	236	1.9
Spinal instrumentation	233	1.8

### 4.3 Admission numbers

The number of patients admitted to individual ICUs has remained relatively constant since 1997. This is illustrated in figure 4.3.1. The proportion of children ventilated during their ICU admission varies between hospitals. In 2001 and 2002 the proportion of children ventilated range from 19 to 89 percent. As in past years Prince Charles Hospital recorded the highest proportion of ventilated admissions, this reflects the

cardiac surgery caseload of that unit. For the remaining units the percentage of ventilated admissions was higher in larger units, see table 4.3.1. The admission of a greater proportion of children not requiring ventilation to smaller units is generally considered appropriate and usually reflects efficient delivery of high intensity nursing care in smaller hospitals.

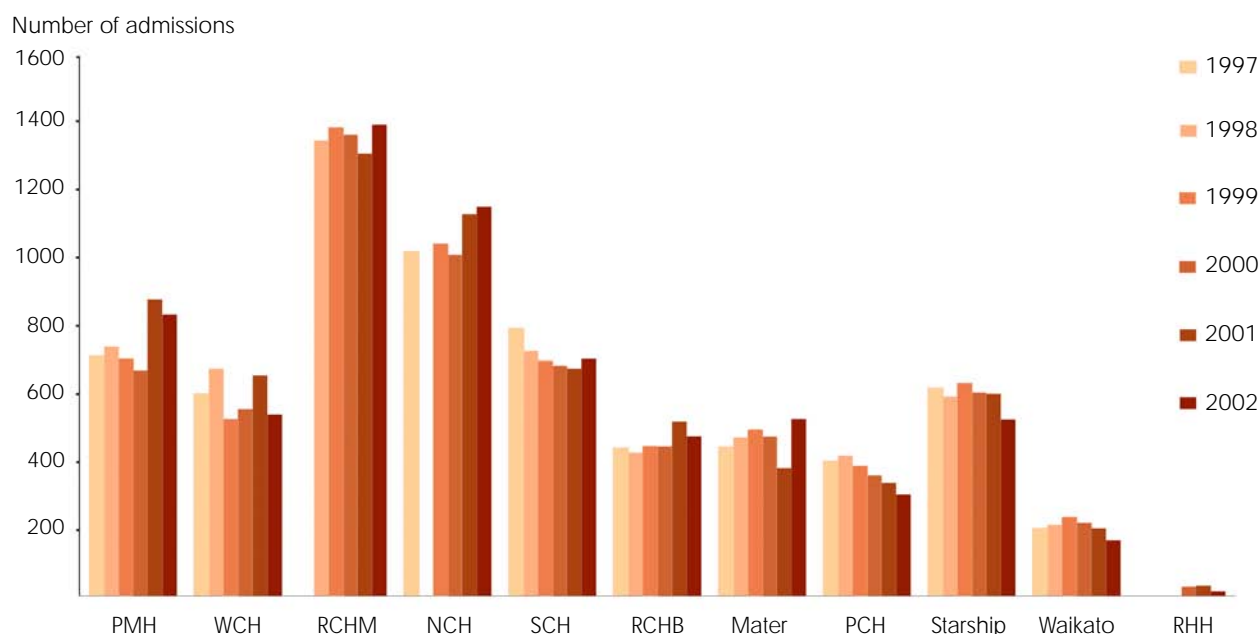


Figure 4.3.1: Number of patients admitted to ICUs participating in the ANZPICRegistry, 1997 - 2002

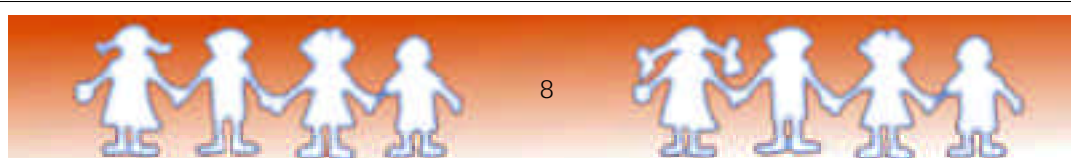
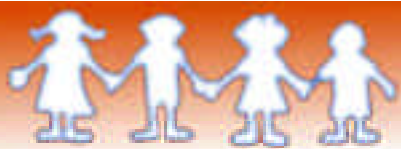


Table 4.3.1: Number of admissions and ventilated patients by unit, 1997 – 2002

Hospital	1997	1998	1999	2000	2001	2002
<b>Children's Hospital at Westmead</b>						
admissions	1015	n/a	1037	1004	1124	1148
ventilated	601		577	564	592	568
%	59		56	56	53	50
<b>Mater Misericordiae Children's Hospital</b>						
admissions	441	469	492	489	379	523
ventilated	153	169	192	175	165	164
%	35	36	39	36	44	31
<b>Prince Charles Hospital</b>						
admissions	400	416	386	357	336	302
ventilated	346	371	337	311	299	257
%	87	89	87	87	89	85
<b>Princess Margaret Hospital</b>						
admissions	708	735	700	665	874	829
ventilated	195	179	185	210	189	270
%	28	24	26	32	22	33
<b>Royal Children's Hospital - Brisbane</b>						
admissions	438	425	444	442	516	473
ventilated	164	169	194	176	179	188
%	37	40	44	40	35	40
<b>Royal Children's Hospital - Melbourne</b>						
admissions	n/a	1341	1379	1358	1303	1388
ventilated		879	885	822	824	882
%		66	64	61	63	64
<b>Royal Hobart Hospital</b>						
admissions	n/a	n/a	n/a	30	33	17
ventilated				17	16	7
%				57	49	41
<b>Starship Children's Hospital</b>						
admissions	615	590	629	601	598	522
ventilated	269	244	291	303	320	305
%	44	41	46	50	54	58
<b>Sydney Children's Hospital</b>						
admissions	789	722	693	680	671	699
ventilated	454	363	342	366	336	353
%	58	50	49	54	50	51
<b>Waikato Hospital</b>						
admissions	202	212	235	218	202	167
ventilated	63	60	52	52	38	44
%	31	28	22	24	19	26
<b>Women's and Children's Hospital</b>						
admissions	598	672	523	552	652	537
ventilated	216	255	211	202	215	180
%	36	38	40	37	33	33

n/a = not available





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## 5 Length of stay

### 5.1 Median LOS

Length of stay (LOS) in intensive care is frequently used as a measure of efficiency of intensive care services. In this report LOS was determined using the exact LOS, this involved calculating the difference between discharge date and time and admission date and time in hours and dividing by 24.

Median LOS was used as a measure of central tendency to determine the 'typical' LOS. The median LOS for all patients admitted between 1997 and 2002 is shown in figure 5.1.1 below. While the LOS over time has remained relatively unchanged, LOS varies for specific groups of patients, as shown in table 5.1.1. Comparison between ICUs showed significant variation in the median LOS when all patients were used and when both intubated and non-intubated patients were analysed. The median LOS for individual ICU's in 2001 and 2002 are shown in figures 5.1.2 – 5.1.4.

Figure 5.1.2 illustrates the range between hospitals in median LOS (0.8 – 1.9 days) in 2001 and 2002. Every hospital showed an increase in the median LOS from 2001 to 2002. Figure 5.1.3 illustrates the range between hospitals in median LOS for intubated patients. Figure 5.1.4 illustrates the range between hospitals in median LOS for non-intubated patients.

Admission practices among hospitals varied such that some hospitals had primarily planned post-operative patients with relatively short LOS. Other hospitals had larger proportions of emergency admissions with extended LOS. The practise of admitting short stay patients (<4 hours) for procedures performed in ICU also skewed LOS for a small number of hospitals. In other hospitals these ICU procedures were performed outside of ICU and short stay patients didn't contribute significantly to the total patient numbers.

Significant differences in LOS for intubated patients may result from different ventilation practices between

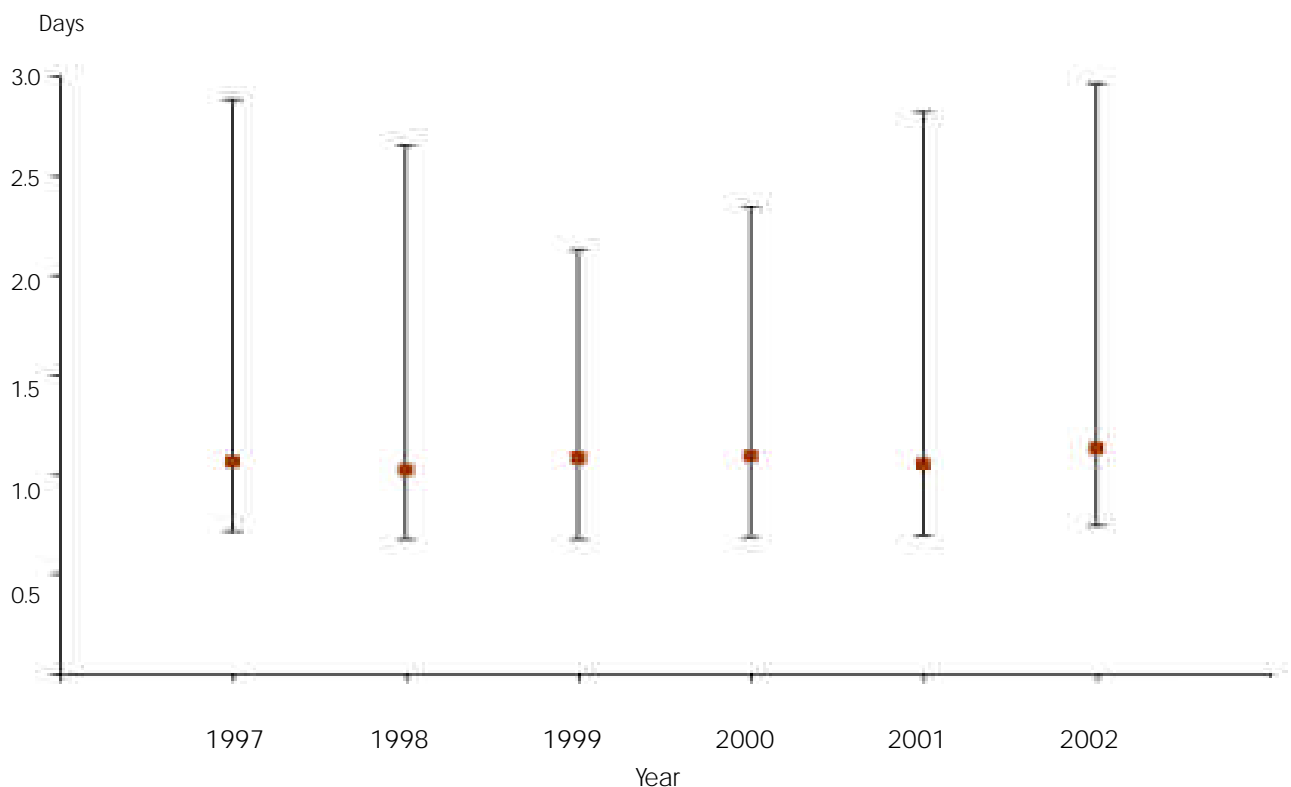


Figure 5.1.1: Median length of stay with interquartile ranges for all admissions in the ANZPICRegistry, 1997 - 2002



Table 5.1.1: Median LOS by admission type and intubation status, 2001 and 2002

	Number	Median	Mean	Interquartile range
<b>2001</b>				
All patients	6688	1.05	3.01	0.69 - 2.82
Planned admissions	2602	0.97	2.25	0.73 - 2.00
Emergency admissions	4086	1.31	3.49	0.66 - 3.41
Intubated patients	3163	2.09	4.95	0.97 - 5.00
Non intubated patients	3525	0.81	1.27	0.48 - 1.33
<b>2002</b>				
All patients	6603	1.14	3.20	0.74 - 2.96
Planned admissions	2985	1.00	2.75	0.75 - 2.10
Emergency admissions	3617	1.49	3.59	0.72 - 3.65
Intubated patients	3249	2.22	5.05	1.01 - 5.17
Non intubated patients	3354	0.86	1.42	0.52 - 1.46

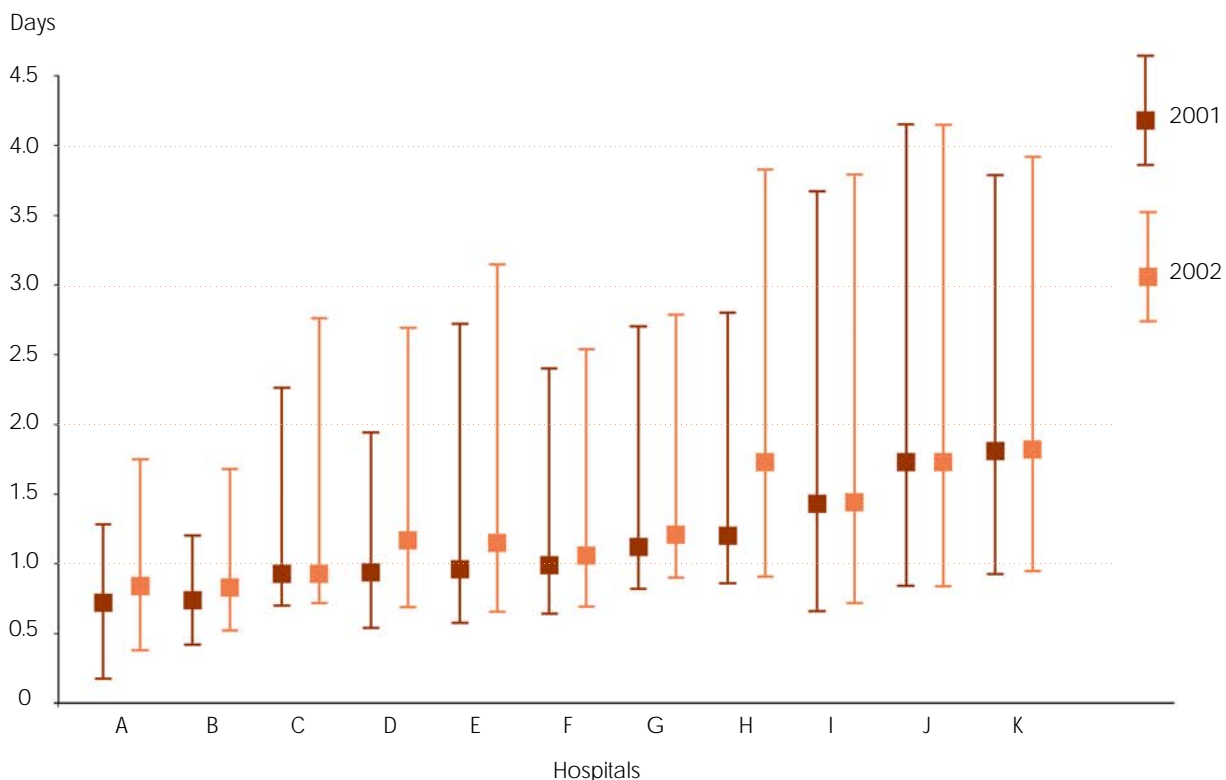


Figure 5.1.2: Median length of stay for all patients in each hospital in 2001 and 2002. The 25th and 75th percentile are shown.

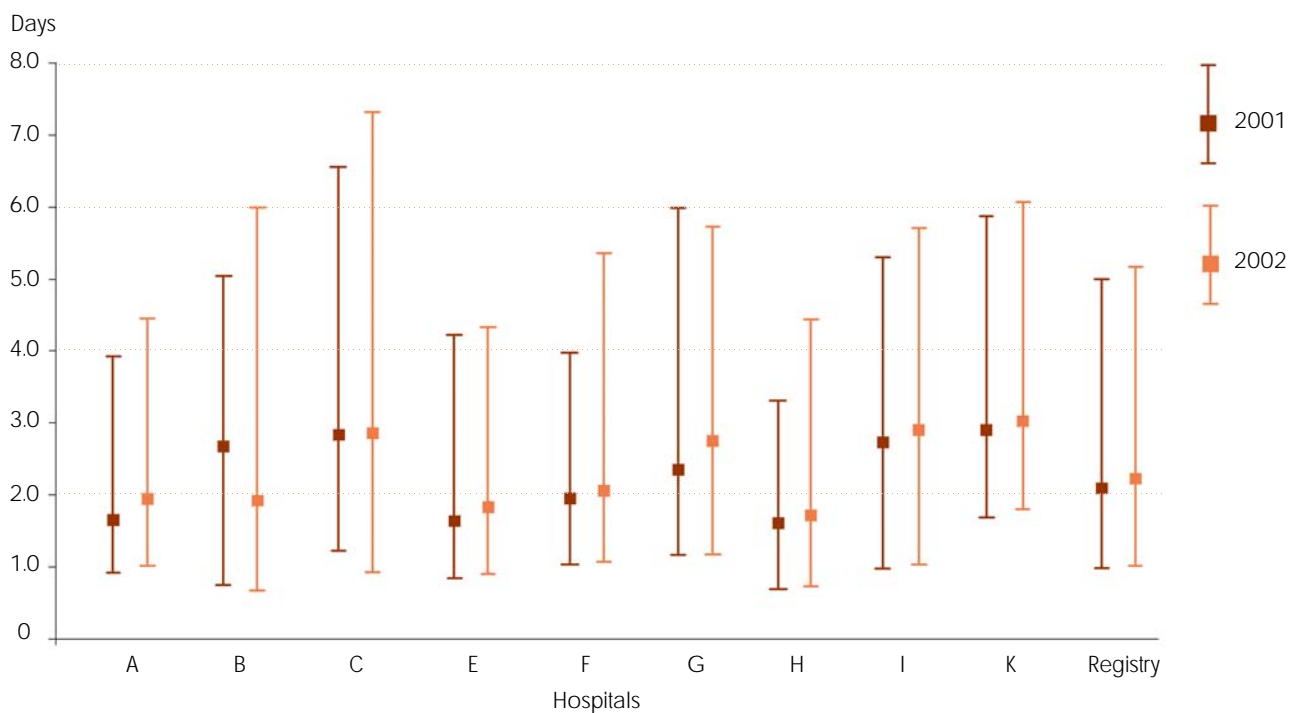


Figure 5.1.3: Median length of stay for intubated patients in each hospital in 2001 and 2002. The 25th and 75th percentile are shown.

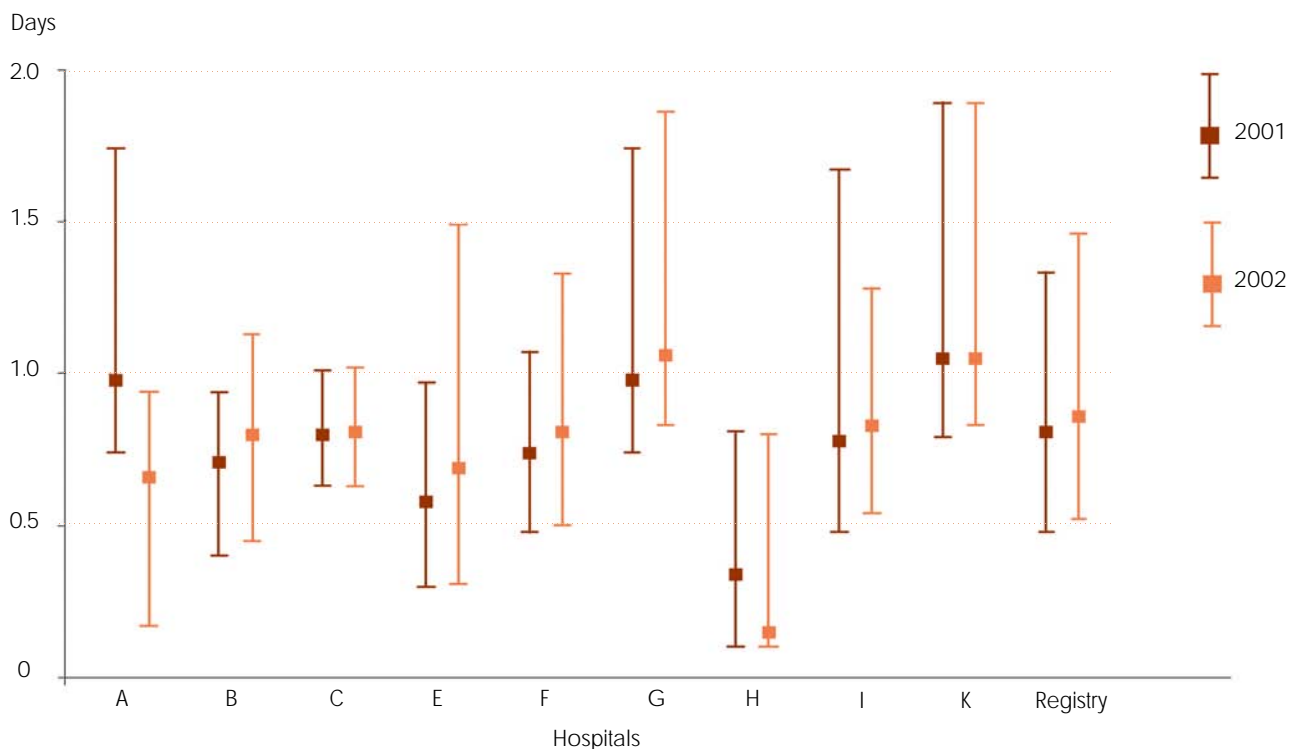


Figure 5.1.4: Median length of stay for non-intubated patients in each hospital in 2001 and 2002. The 25th and 75th percentile are shown.

Table 5.2.1: Bed days occupied by long stay patients in 2001 and 2002

	Number	%	Bed days	%
2001 patients	6688	100	20,139	100
LOS > 28 days	65	1.0	3899	19.4
2002 patients	6624	100	18,876	100
LOS >28 days	63	1.0	3948	20.9

hospitals or from different patient mix. Some PICU's had a high proportion of intubated patients who were post-operative admissions intubated for less than 24 hours. Hospitals with longer LOS for intubated patients had a higher proportion of intubated patients that were emergency admissions.

## 5.2 Occupied bed days

There were 20,139 occupied bed days (OBD) in 2001 and 18,876 OBDs in 2002. Patients with lengthy stays in ICU utilise significant resources. One percent of patients stayed longer than 28 days in both 2001 and 2002. This group utilised 19 to 20 percent of bed days (Table 5.2.1). The percent of patients who stayed over 28 days ranged from zero in one cardio-thoracic ICU to 2 percent of admissions.

Table 5.2.2 illustrates the reasons for admission of patients staying > 28 days. Diseases associated with a

requirement for long term respiratory support feature prominently.

There are many factors that influence length of stay including factors within and outside the ICU. For example, smaller hospitals often concentrate nursing resources in the ICU. After ICU admission many children require high dependency nursing and observation. Some hospitals have developed dedicated high dependency units or step down units. Other hospitals have high dependency nursing capabilities in specialist units such as cardiac or oncology units. While other hospitals provide this care within the ICU. For these hospitals this practice is more efficient than duplicating high dependency resources in other areas of the hospital. It is very important that external factors influencing length of stay are considered before conclusions are drawn from data comparing length of stay among units.

Table 5.2.2: Admission diagnoses for long stay patients (> 28 days), 2001 and 2002 data have been combined

Diagnosis	Bed days	Number of patients
Other respiratory disorders	2335	43
Cardiac disease	1457	28
Injury	608	10
Tracheo & / or bronchomalacia	605	4
Neuromuscular disorders	578	13
Sepsis	511	7
General surgery	492	5
Gastrointestinal disorders	356	7
Central hypoventilation	336	2
Neurosurgery	335	2
Syndrome or malformation	292	3



## 6 Mortality

### 6.1 Mortality rates

Mortality rates are one of the most widely used measures of health or ill health in a population. Between 1980 and 2000 mortality rates for infants, children and adolescents declined. This can be attributed to a range of public health activities, for example, the reduction in sudden infant death syndrome (SIDS) deaths through public education campaigns and the decline in injuries following the introduction of legislation regarding pool fencing, helmet use for cyclists, and car restraints. Mortality rates in PICUs are low compared to mortality rates in adult ICUs (4% vs 7 to 21% - personal communication Carol George, ANZICS Adult Patient Database).

The major causes of death amongst infants aged less than 1 year were attributable to congenital anomalies, complications of low birth-weight and SIDS (10). In children aged between 1 and 14 years injury and poisoning were the leading causes of death. The main cause of death from injury were motor vehicle, bicycle

and pedestrian accidents and drowning (5). Other major causes of death were neoplasms and congenital anomalies. In adolescents aged 15 – 19 years, deaths from suicide and motor vehicle accidents were most common (10).

Between 1997 and 2002 the number of children that died in participating ICU's remained relatively constant (Figure 6.1.1). Figure 6.1.2 shows the crude mortality rate for each unit in 2001 and 2002. Mortality rates for males (4.8%) admitted to ICU have remained consistently higher than mortality rates for females (4%).

Infant mortality is commonly used as an indicator of the health status of children and as a means of comparing the health of different populations. In this report infant deaths have been divided into those occurring in the neonatal period (within the first 28 days of life) and those occurring on or after the 28th day but in the first year of life. Neonates had the highest age specific mortality (6.3%) followed by children aged 10 to 14 years (4.6%) (Table 6.1.1).

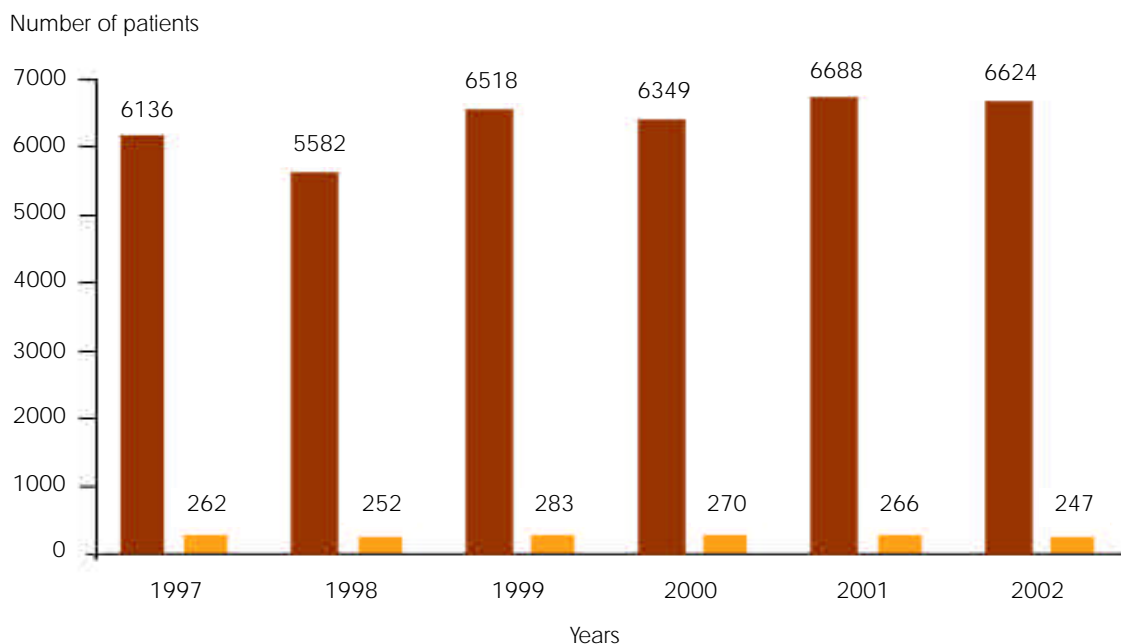
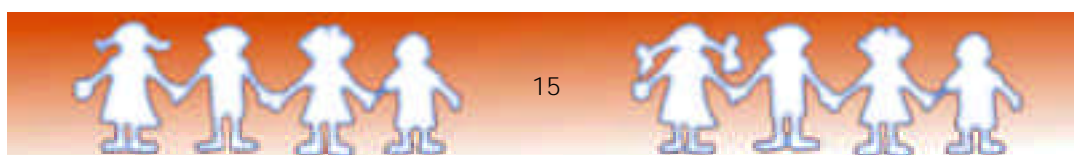


Figure 6.1.1: Admissions and deaths in ANZPICRegistry intensive care units, 1997 - 2002



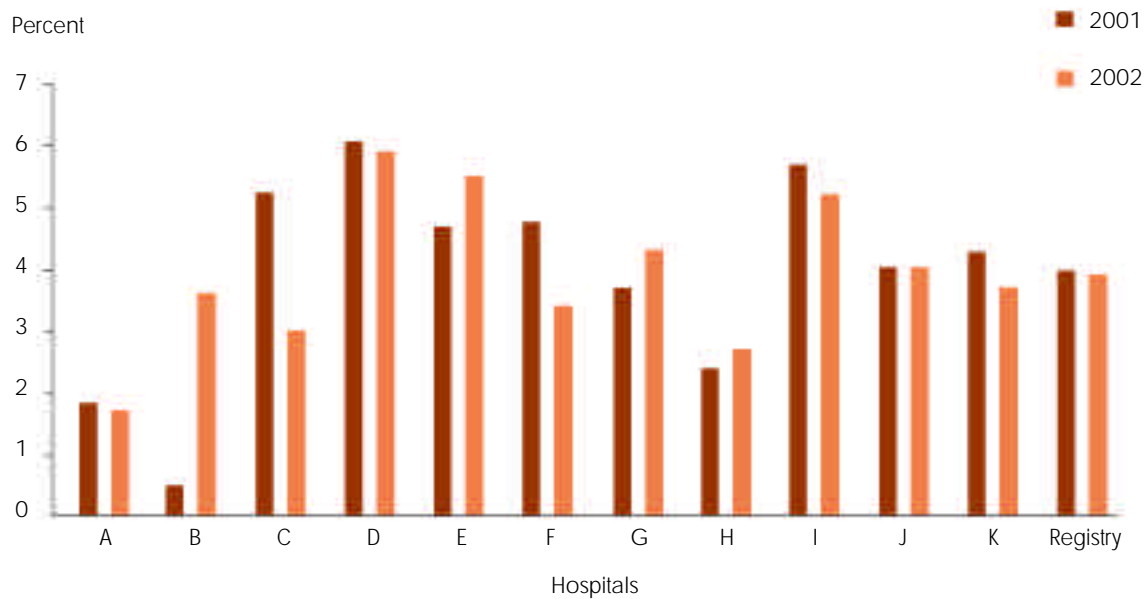


Figure 6.1.2: Mortality rate for 11 participating ICU's and the combined Registry data, 2001 and 2002

## 6.2 Diagnosis specific mortality

Based on the ANZPIC Registry diagnosis codes the PICU admission diagnoses associated with the highest mortality rate were in-hospital and out-of-hospital cardiac arrest, hypoplastic left heart syndrome and immersion. Head trauma consistently contributes the largest number of deaths annually.

patient's who did not survive ICU between 2001 and 2002 as well as the diagnosis specific mortality rate.

Note the ANZPIC Registry diagnosis codes are used to record the principal reason for a patient's admission to the PICU, this may not necessarily reflect the reason for the patient's admission to hospital. For example, a patient admitted to ICU with septic shock may have been admitted to hospital with leukemia.

Table 6.2.1 shows the top ten admission diagnoses for

Table 6.1.1: Mortality by age, 2001 and 2002 data have been combined

Age	Number	Deaths	Age Specific Mortality (95%CI)
Neonates	1025	65	6.3 (5.0 - 8.0)
>28 days - 1 year	3458	117	3.4 (2.8 - 4.0)
1 - 4 years	3494	121	3.5 (2.9 - 4.1)
5 - 9 years	1971	80	4.1 (3.3 - 5.0)
10 - 14 years	1850	85	4.6 (3.7 - 5.6)
> 15 years	794	27	3.4 (2.3 - 4.9)



Table 6.2.1: Mortality by principal diagnosis, 2001 and 2002 data have been combined

Principal admission diagnosis	Number of deaths	Diagnosis Specific Mortality (95%CI)
Head trauma	65	12.1 (9.6 - 15.2)
Cardiac arrest out of hospital	34	77.3 (63.0 - 87.2)
Pneumonia or pneumonitis	28	8.0 (5.6 - 11.4)
Septic shock	28	15.1 (10.6 - 20.9)
Respiratory failure	26	9.6 (6.6 - 13.7)
Sepsis	19	9.2 (6.0 - 14.0)
Immersion	14	18.7 (11.5 - 28.9)
Intracranial haemorrhage	14	28.6 (17.8 - 42.4)
Respiratory arrest in hospital	14	24.1 (15.0 - 36.5)
Meningitis	10	4.8 (2.6 - 8.7)

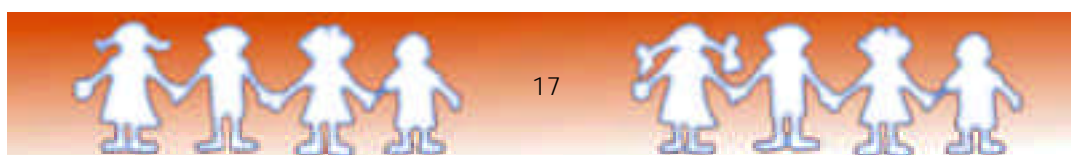
### 6.3 Paediatric Index of Mortality (PIM2)

The Paediatric Index of Mortality (PIM) is a logistic regression model used to standardise ICU mortality rates (11). It was derived and validated in PICU's in Australia and Britain between 1988 and 1995. The model has recently been re-calibrated using a more recent patient population (12). Based on the mix of patients and the degree of disturbance to physiology at the time of admission, the model can be used to calculate the expected mortality in participating ICU's. The expected mortality can then be compared to the observed mortality. The observed and predicted mortality for 2001 and 2002 are shown in figures 6.3.1 and 6.3.2.

In 2001 the variables used to calculate PIM were collected by ANZPIC Registry hospitals. There were 324.3 deaths predicted by PIM and 266 deaths observed giving a Standardised Mortality Rate (SMR) for the population of 0.82 (0.73 – 0.91). In 2002 the variables used to calculate PIM2 were collected by ANZPIC Registry hospitals. At the time of this report PIM2 data was not available for 2,406 admissions, these were excluded from the PIM2 analysis. There were 187.1 deaths predicted by PIM2 and 168 deaths

observed giving a SMR for the population of 0.90 (0.78 - 1.01). There were 79 deaths in the excluded group.

The SMR (with 95% confidence intervals) for contributing hospitals in 2001 and 2002 are illustrated in figures 6.3.3 and 6.3.4. In 2001 the SMR's ranged from 0.2 to 1.2. In 2002 SMR's ranged from 0.6 to 1.2. The confidence intervals are wide for hospitals with a small number of deaths. The lower confidence limit for the units with a SMR greater than 1.0 overlapped the 95% confidence intervals of the population overall.



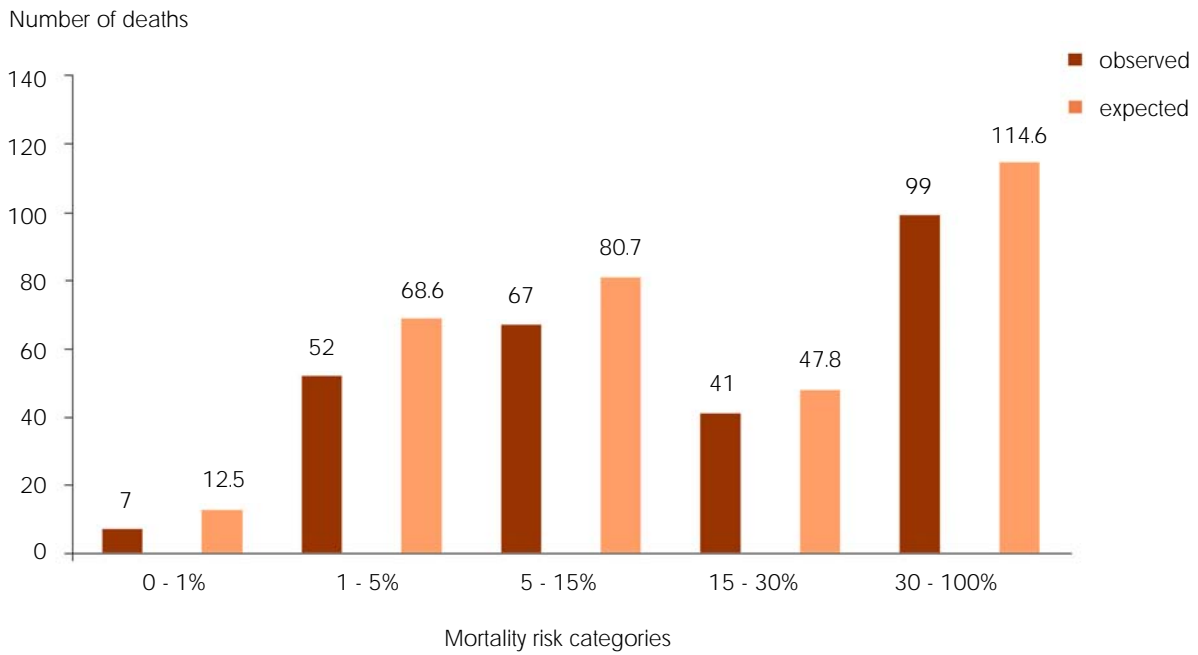


Figure 6.3.1: Observed vs expected number of deaths predicted by PIM, by mortality risk category in 2001

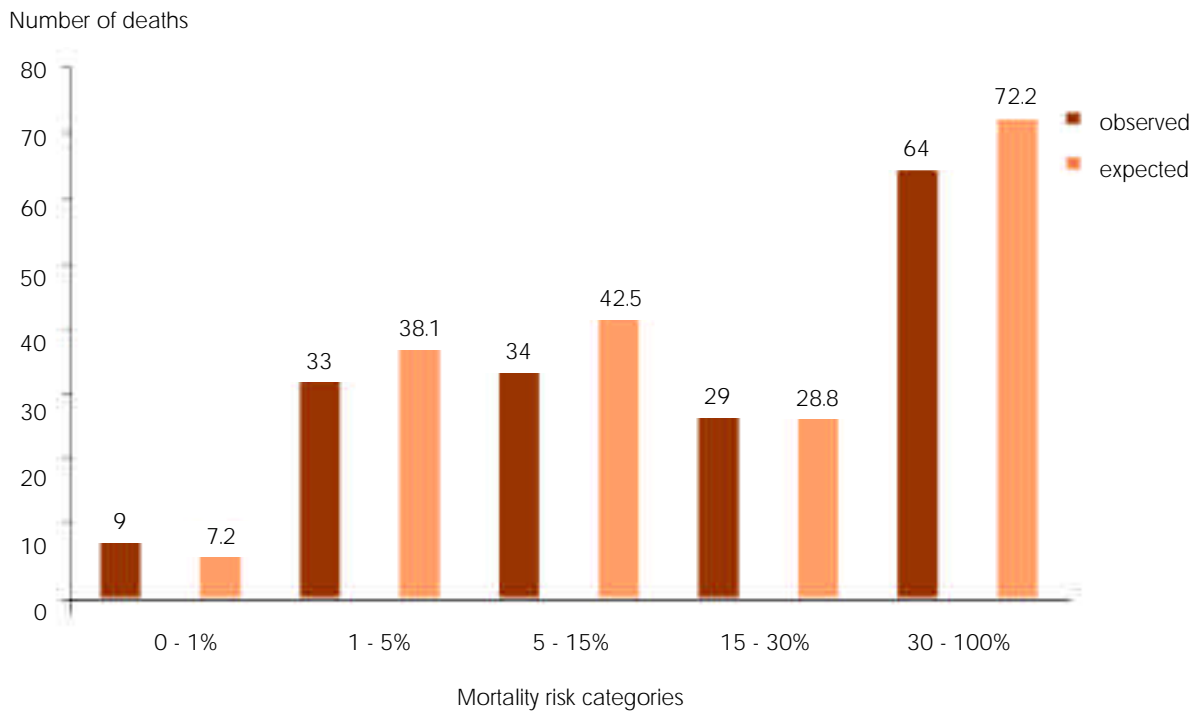
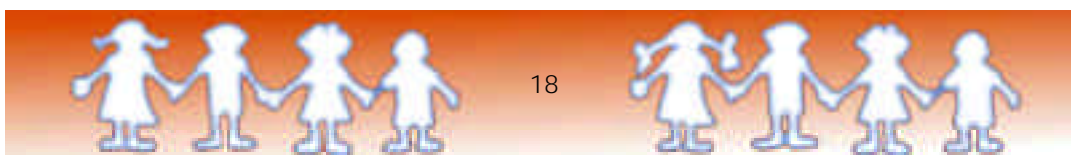


Figure 6.3.2: Observed vs expected number of deaths predicted by PIM2, by mortality risk category in 2002



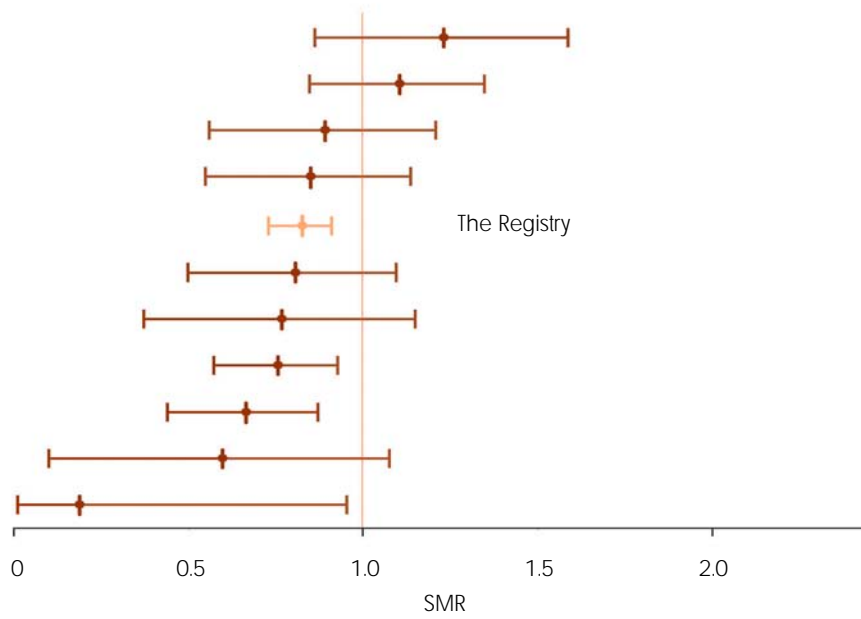


Figure 6.3.3: Standardised mortality rate with 95% confidence intervals, using PIM, for all patients submitted to the Registry and each participating unit in 2001

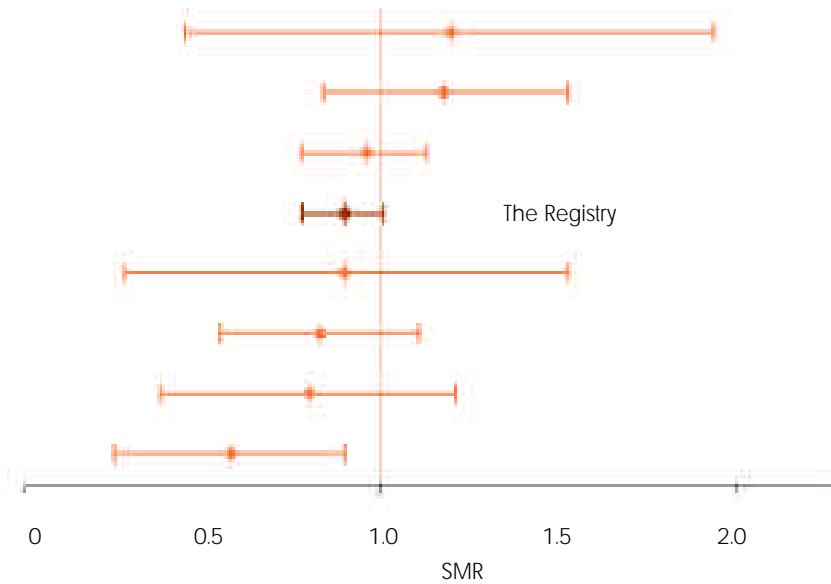


Figure 6.3.4: Standardised mortality rate with 95% confidence intervals, using PIM2, for all patients submitted to the Registry and each participating unit in 2002



## Changes to the PIM variables in 2002

Revision of the PIM algorithm during 2001 has resulted in a revised model (PIM2). Details of the revision have been published in the journal Intensive Care Medicine (12). Additional variables have been added to the algorithm and these have been highlighted below with an asterisk.

## Date of birth

Date of birth of the patient.

dd/mm/yyyy

## Sex

Sex of the patient

M male

F female

## Ethnicity

Ethnic origin of the patient, as identified by the patient or next of kin.

- 1 Caucasian - of Caucasoid heritage (includes European, Russian, Middle Eastern and Arabic)
- 2 Aboriginal - of Aboriginal or Torres Strait Islander (TI) descent, who identifies as an Aboriginal or TI and is accepted as such by the community with which the patient is associated
- 3 Maori - determined by patient/ next of kin self identification
- 4 Pacific Peoples - patient whose ethnic background originates from the countries of Pacific Oceania, excluding Maori
- 5 Asian - patient whose ethnic background originates from the countries of Asia, South East Asia and Indian subcontinent

## Weight

The weight of the patient on admission.

Measured in kilograms.

## Post Code

Post code of patient's home address.

## Hospital admission source

Patient's location prior to admission to hospital.

- 1 home / scene - admitted from home or the scene of an injury
- 2 other hospital - emergency department - patient transferred from the emergency department of another hospital
- 3 other hospital - OT/recovery - patient transferred from the operating theatre or recovery room of another hospital

- 4 other hospital - ICU/NICU - patient transferred from the intensive care unit or the neonatal intensive care unit of another hospital
- 5 other hospital - ward - patient transferred from any other inpatient area of another hospital
- 6 inborn - patient was born at this hospital

## Retrieval

Describes the mechanism whereby a patient is transported to the hospital by a specialist paediatric ICU transport team or equivalent.

- 0 no
- 1 yes

## ICU admission source

Patient's location immediately prior to admission to the ICU.

- 1 OT/recovery - patient admitted to ICU from the operating theatre or recovery room
- 2 Emergency department - patient admitted to ICU from the emergency department
- 3 Ward - patient admitted to ICU from any other inpatient area
- 4 Other ICU/NICU same hospital - patient admitted to ICU from another ICU or NICU within the same hospital
- 5 Direct ICU admission - patient admitted directly to ICU, for example following a retrieval

## Previous ICU admission during this hospital admission

Has the patient been previously admitted to intensive care during this episode of care.

- 0 no
- 1 yes - readmitted within 48 hours of previous ICU discharge
- 2 yes - readmitted after 48 hours of previous discharge

## ICU admission date and time

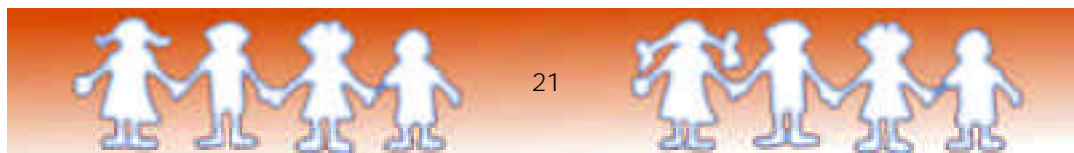
The date and time on which the patient commenced an episode of ICU care.

dd/mm/yyyy: hh/mm

## ICU discharge date and time

The date and time on which the patient completes an episode of ICU care.

dd/mm/yyyy: hh/mm



## Minimum data set variables

### Principal ICUdiagnosis

The reason most directly responsible for the patients admission to ICU. Use the ANZPICRegistry diagnoses codes (Appendix 2). For patients admitted primarily for recovery after a procedure, use a post procedural diagnosis for the principal diagnosis. Do not use injury mechanism or infection codes for the principal diagnosis.

- 0 non-elective - all other admissions
- 1 elective - include admission after elective surgery, for an ICU procedure (for example, central line insertion), for diagnostic monitoring or review of a home ventilation patient

### \* Recovery from surgery

Includes a radiology procedure or cardiac catheter. Do not include patients admitted from the operating theatre where recovery from surgery is not the main reason for ICUadmission (for example, a patient with a head injury who is admitted from theatre after insertion of an ICP monitor, in this patient the main reason for ICUadmission is the head injury)

### Principal underlying diagnosis

The underlying diagnosis which has contributed to the need for admission to ICU. For example, an ex-premature infant with bronchiolitis will have a principal ICUdiagnosis of bronchiolitis with an underlying diagnosis of prematurity.

- 0 no
- 1 yes

\* Admitted following cardiac bypass  
Also code as recovery from surgery

### Associated diagnoses

The presence of any other conditions in addition to that listed as the principal diagnosis. For patients having an operative procedure during the ICU admission, a post-procedural diagnosis should be listed as an associated diagnosis.

- 0 no
- 1 yes

### Outcome

The patients destination on completion of the ICU episode of care.

- 1 discharged to ward (includes transfer to another hospital ward) or home
- 2 died in ICU
- 3 transferred to another ICU/NICU
- 4 still in ICU

### Systolic Blood Pressure

Measured in mmHg. If not measured within one hour of admission record 999.

### \* Pupillary responses to bright light

Pupillary reactions to bright light are used as an index of brain function. Do not record abnormal findings due to drugs, toxins or local eye injury.

- 0 all other responses, including unknown
- 1 both fixed and > 3mm

### ICU/NICUtransferred to

Name of the hospital to which the patient is transferred.

### Paediatric Index of Mortality Variables

Record the first value of each variable measured at or about the time of first face to face contact between the patient and a doctor from your ICU (or a specialist paediatric retrieval team). Use the first values measured within the period from shortly before first contact to one hour after arrival in your own ICU. The first contact may be in the ICU, the emergency department, another inpatient area of the hospital or in another hospital (for example, on a retrieval). If the variable was not measured record 999.

### PaO<sub>2</sub>

The arterial oxygen tension, in mmHg, as measured in an arterial blood gas sample.

### FiO<sub>2</sub>

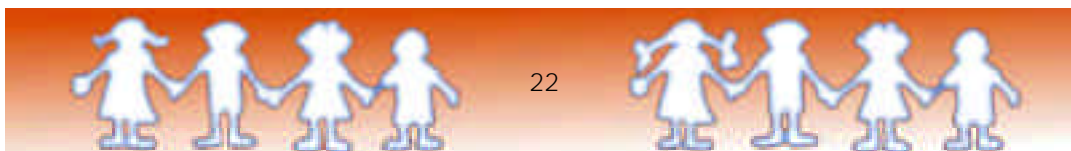
The fraction of inspired oxygen being delivered to the patient via endotracheal tube (ETT) or headbox. Measured at the same time as the PaO<sub>2</sub>.

### Base excess

The base excess measured in arterial or capillary blood, in mmol/l.

### \* Elective

An ICU admission or an operation is considered elective if it could be postponed for more than 6 hours without an adverse effect.



## Minimum data set variables

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**\* PIM2high risk conditions**

Specific conditions associated with increased mortality risk

- 0 none
- 1 cardiac arrest out of hospital - requires either documented absent pulse or the requirement for external cardiac massage (do not include past history of cardiac arrest)
- 11 cardiac arrest in hospital - preceding ICU admission requires either documented absent pulse or the requirement for external cardiac massage (do not include past history of cardiac arrest)
- 2 severe combined immune deficiency - requires the documented diagnosis of SCID
- 3 lymphoma or leukemia after first induction
- 4 spontaneous cerebral haemorrhage - haemorrhage must be spontaneous (for example, from an aneurysm or AVM) (do not include traumatic cerebral haemorrhage or intracranial haemorrhage that is not intracerebral)
- 5 cardiomyopathy or myocarditis - requires the documented diagnosis of myocarditis or cardiomyopathy
- 6 hypoplastic left heart syndrome - include only cases where a Norwood procedure, or equivalent, is required to sustain life
- 7 HIV infection - requires the documented diagnosis of HIV
- 8 IQ < 35 (worse than Downs)
- 9 neurodegenerative disorder - requires a history of progressive loss of milestones or a diagnosis where this will inevitably occur
- 10 liver failure - acute or chronic, include patients admitted for recovery following liver transplantation for acute or chronic liver failure

**\* PIM2low risk conditions**

Specific conditions associated with reduced mortality risk

- 0 none
- 1 croup is the main reason for ICU admission
- 2 asthma is the main reason for ICU admission
- 3 bronchiolitis is the main reason for ICU admission
- 4 diabetic keto-acidosis is the main reason for ICU admission

**Mechanical ventilation**

Record whether the patient was mechanically ventilated within the first hour of admission to ICU. Mechanical ventilation refers to both invasive (ETT or tracheostomy) and non-invasive (nasopharyngeal airway, mask or nasal

prongs) methods of augmenting work of breathing. Using conventional mechanical ventilation (CMV), continuous positive airway pressure (CPAP), biphasic positive airway pressure (BiPAP) or negative pressure ventilation (NPV).

- 0 no
- 1 yes

**Intubation commenced date and time**  
The date and time on which the patient was intubated. Intubation refers to ETT or tracheostomy. Two separate episodes of intubation can be recorded. dd/mm/yyyy:hh/mm

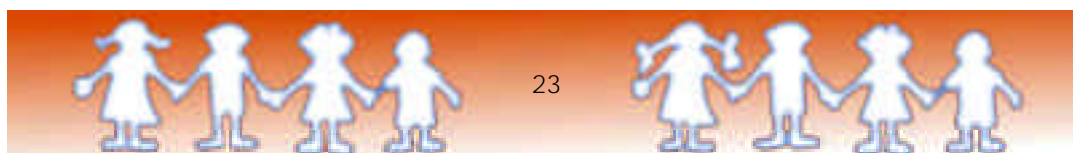
**Intubation ceased date and time**  
The date and time on which the patient was extubated, or discharged, if the patient has a tracheostomy. Two separate episodes of extubation can be recorded. dd/mm/yyyy: hh/mm

**Intubation additional hours**  
If more than 2 episodes of intubation occur during a patients ICU admission further episodes are recorded as additional hours of intubation. Alternatively the total number of intubation hours for all episodes can be calculated and recorded in this field.

**Respiratory support commenced date and time**  
The date and time on which the patient commenced respiratory support. Respiratory support refers to CMV, CPAP, BiPAP or NPV. Two separate episodes of intubation can be recorded. dd/mm/yyyy:hh/mm

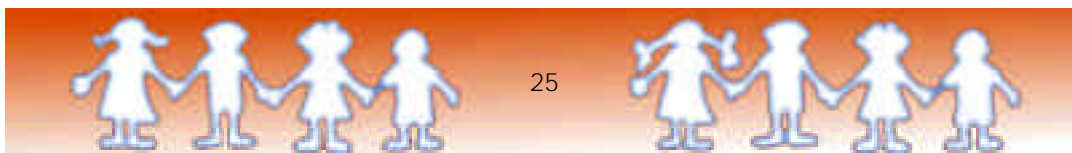
**Respiratory support ceased date and time**  
The date and time on which the patient ceased respiratory support. Two separate episodes of respiratory support can be recorded. dd/mm/yyyy: hh/mm

**Respiratory support additional hours**  
If more than 2 episodes of respiratory support occur during a patients ICU admission further episodes are recorded as additional hours of respiratory support. Alternatively the total number of respiratory support hours for all episodes can be calculated and recorded in this field.





<b>INJURY</b>	<b>NEUROLOGICAL</b>	<b>RENAL</b>
100 Injury - Other	300 Neurological – Other	500 Renal - Other
101 Anaphylaxis	301 Botulism	501 Haemolytic Uraemic Syndrome
102 Burns	302 Brain Abscess	502 Nephrotic and/or Nephritic Syndrome
103 Carbon Monoxide Poisoning	303 Brain AV Malformation	505 Previous Renal Transplant
104 Drug Toxicity - Iatrogenic	304 Brain Death	503 Renal Failure - Acute
105 Electrocutation	305 Brain Infarction or Stroke	504 Renal Failure - Chronic
106 Envenomation	306 Brain Tumour	506 Urinary Tract Infection
107 Hanging or Strangulation	324 Cerebral Aneurysm	
108 Hyperthermia	307 CSF Shunt Malfunction or Infection	<b>GASTROINTESTINAL</b>
109 Hypothermia	308 Encephallitis	600 Gastrointestinal – Other
110 Immersion (Near Drowning)	309 Encephalopathy, Acute – Hypoxic Ischaemic	620 Biliary Atresia
111 Ingestion	310 Encephalopathy, Acute – Other	601 Bowel Obstruction
112 Smoke Inhalation	311 Encephalopathy, Chronic Degenerative (eg Leigh's Syndrome)	621 Bowel Perforation
113 Trauma - Other	312 Encephalopathy, Chronic Static (eg Cerebral Palsy)	602 Colitis
114 Trauma - Abdominal	313 Guillain Barre Syndrome	603 Gastroenteritis
115 Trauma - Chest	314 Hydrocephalus	604 Gastrointestinal Haemorrhage
116 Trauma - Facial	315 Intracranial Haemorrhage – Spontaneous	605 Gastroschisis or Exomphalos
117 Trauma - Head	316 Intracranial Hypertension (Raised ICP)	606 Hepatitis
118 Trauma - Skeletal	317 Meningitis	622 Hirschsprung's Disease
119 Trauma - Spinal	318 Meningomyelocele or Spina Bifida	607 Intussusception
<b>INJURY MECHANISM *</b>	325 Muscular Dystrophy	608 Liver Disorder – Other
* DO NOT USE FOR PRINCIPAL DIAGNOSIS*	326 Myasthenia Gravis	609 Liver Failure – Acute
150 Injury Mechanism – Other	327 Myopathy	610 Liver Failure – Chronic
162 Crush Injury	320 Neuropathy	611 Necrotising Enterocolitis
151 Cyclist	321 Seizures	623 Neonatal Jaundice
152 Fall	322 Spinal Cord Lesion	612 Oesophageal Atresia
153 Farm Equipment	327 Tetanus	624 Oesophageal Foreign Body
154 Firearm Injury	323 Venous Sinus Thrombosis	613 Pancreatitis
161 Motor Bike Rider / Passenger		614 Peritonitis
155 MVA – Passenger	<b>RESPIRATORY</b>	625 Portal Hypertension
156 MVA – Pedestrian	<b>UPPER AIRWAY</b>	626 Previous Liver Transplant
157 Non Accidental Injury	400 Upper Airway – Other	615 Pyloric Stenosis
158 Self Injury	401 Choanal Atresia or Stenosis	616 Short Gut Syndrome
159 Sports Injury	402 Epiglottitis	617 Ulcer – Duodenal
160 Slab Injury	403 Foreign Body – Inhaled	618 Ulcer – Gastric or Gastritis
	404 Laryngotracheobronchitis (Croup)	619 Varices – Oesophageal or Gastric
<b>CARDIOVASCULAR</b>	405 Obstructive Sleep Apnoea	627 Volvulus
<b>CONGENITAL</b>	406 Pierre Robin Syndrome	
200 Cardiovascular - Congenital - Other	407 Retropharyngeal Abscess	<b>INFECTION *</b>
201 Absent Pulmonary Valve	413 Subglottic Haemangioma	* DO NOT USE FOR PRINCIPAL
202 Anomalous Coronary Artery	408 Subglottic Stenosis	<b>DIAGNOSIS*</b>
203 Aortic Insufficiency	409 Tracheitis	700 Infection – Other
204 Aortic Stenosis	410 Upper Airway Obstruction – Other	701 Adenovirus
224 AP Window	411 Upper Respiratory Infection – Other	702 Bacterium – Other
205 ASD	412 Vocal Cord Paresis	703 Bacterium – Gram Negative - Other
225 AV Malformation		704 Bacterium – Gram Positive - Other
206 AVSD (AV Canal)	<b>LOWER AIRWAY</b>	705 Candida
207 Coarctation	430 Lower Airway – Other	706 Clostridium
208 Cortriatriatum	431 Asthma	707 CMV
226 Double Outlet Right Ventricle	432 Bronchiolitis	708 EBV
209 Ebstein's Anomaly	433 Chronic Lung Disease (Includes BPD)	730 E Coli
210 Hypoplastic Left Heart Syndrome	434 Malacia - Trachea and/or Bronchi	709 Enterovirus
211 Interrupted or Hypoplastic Aortic Arch	435 Mediastinal Mass	710 Fungus – Other
227 LV Outflow Obstruction	436 Stenosis - Trachea and/or Bronchi	711 Haemophilus Influenzae Type b
212 Mitral Insufficiency	437 Tracheo-oesophageal Fistula	712 Hepatitis – Viral
213 Mitral Stenosis	438 Vascular Ring	713 Herpes Simplex Virus
214 PDA		714 HIV
215 Pulmonary Atresia or Stenosis	<b>OTHER</b>	715 Influenza Virus
228 Pulmonary Insufficiency	450 Respiratory – Other	731 Klebsiella
229 RV Outflow Obstruction	451 Air Leak Syndrome	716 Legionella
216 Single Ventricle	452 Apnoea – Central	732 Malaria
217 TAPVD	453 ARDS	735 Measles Virus
218 Tetralogy of Fallot	454 Aspiration	717 Meningococcus
219 Transposition of Great Arteries (dTGA)	455 Chylothorax	718 Mycoplasma
220 Tricuspid Atresia or Stenosis	456 Congenital Diaphragmatic Hernia	719 Parainfluenzae Virus
221 Tricuspid Insufficiency	457 Congenital Lung Anomaly	720 Pertussis
222 Truncus Arteriosus	458 Cystic Fibrosis	721 Pneumococcus
223 VSD	459 Empyema	722 Pneumocystis Carinii
<b>AQUIRED</b>	460 Hyaline Membrane Disease	733 Pseudomonas
250 Cardiovascular – Acquired – Other	461 Hypoventilation – Central	723 Rotavirus
251 Cardiac Failure	469 Lower Respiratory Infection – Other	724 RSV
252 Cardiac Tumour	462 Lung Abscess	725 Salmonella
253 Cardiomyopathy	463 Meconium Aspiration Syndrome	726 Staphylococcus
254 Dysrhythmia – Supraventricular	470 Pertussis Syndrome	734 Streptococcus Group B
255 Dysrhythmia – Ventricular	464 Pleural Effusion	727 Streptococcus – Other
256 Endocarditis	465 Pneumonia or Pneumonitis	728 Varicella
257 Hypertension – Pulmonary	471 Previous Lung Transplant	729 Virus – Other
258 Hypertension – Systemic	466 Pulmonary Hypoplasia	799 No Organism Identified
259 Kawasaki's Disease	467 Pulmonary Oedema	
260 Pericardial Effusion or Tamponade	468 Respiratory Failure	
263 Previous Heart Lung Transplant	472 Transient Tachypnoea of the Newborn	
264 Previous Heart Transplant		
261 Vascular Thrombosis		
262 Vasculitis		



# ANZPICRegistry Diagnostic Codes

## MISCELLANEOUS

800 Miscellaneous – Other  
 801 Acute Life Threatening Event (Near Miss SIDS)  
 802 Cardiac Arrest - In Hospital  
 803 Cardiac Arrest – Out of Hospital  
 804 Chromosomal Anomaly  
 805 Coagulopathy  
 839 Craniostylosis  
 806 Dehydration  
 807 Dermatological Disorder  
 808 Diabetes Insipidus  
 809 Diabetes Mellitus with Ketoacidosis  
 810 Diabetes Mellitus without Ketoacidosis  
 811 Electrolyte Disorder  
 812 Endocrine Disorder  
 813 Gas Gangrene  
 847 Haematological Disorder  
 814 Home Ventilation Patient  
 815 Hypoglycaemia  
 816 ICU Diagnostic Monitoring - Elective  
 817 ICU Procedure (eg CVC Insertion)  
 818 Immunodeficiency - Congenital  
 819 Immunosuppression - Acquired  
 820 Inborn Error of Metabolism  
 821 Leukaemia or Lymphoma  
 822 Necrotising Fasciitis  
 840 Neonate – Hydrops Fetalis  
 841 Neonate – Infant of Diabetic Mother  
 842 Neonate – IUGR  
 823 Neutropenia  
 848 Organ Donor  
 824 Pancytopenia  
 825 Phaeochromocytoma  
 826 Prematurity  
 843 Previous Bone Marrow Transplant  
 827 Respiratory Arrest - In Hospital  
 828 Respiratory Arrest - Out of Hospital  
 844 Scoliosis  
 829 Sepsis  
 830 Shock – Cardiogenic  
 831 Shock – Hypovolaemic  
 832 Shock – Septic  
 833 SIRS  
 834 Solid Neoplasm – Malignant (not Lymphoma)  
 835 Solid Neoplasm – Non Malignant  
 836 Syndrome or Malformation (not Chromosomal)  
 837 Toxic Shock Syndrome  
 838 Transplant - Bone Marrow  
 845 Tumor Lysis Syndrome  
 846 Wound Infection

## ICU PROCEDURES / THERAPIES\*

\* DO NOT USE FOR PRINCIPAL DIAGNOSIS  
 901 Cardioversion / Defibrillation  
 902 Dialysis - Haemo (intermittent)  
 903 Dialysis - Peritoneal  
 904 ECMO  
 905 Haemofiltration (eg CVWH, CWHD)  
 906 High Frequency Oscillation  
 909 Inhaled Nitric oxide  
 907 Plasma Filtration  
 908 Ventricular Assist Device

## POST PROCEDURAL DIAGNOSES

### MISCELLANEOUS / ANAESTHETIC

1100 Post Procedure - Other  
 1101 Anaesthetic Complication  
 1106 Cardiac Catheter – Balloon Septostomy  
 1102 Cardiac Catheter – Diagnostic  
 1107 Cardiac Catheter – Interventional  
 1103 Ex-prem, Post GA  
 1104 Invasive Radiology Procedure  
 1105 Massive Intraop Transfn (> 1 blood vol)

### CARDIAC SURGERY

**CLOSED**  
 1200 Cardiac Surgery Closed – Other  
 1201 Coarctation Repair  
 1202 PA Band  
 1203 Pacemaker Insertion or Revision  
 1204 PDA Ligation  
 1205 Systemic-Pulmonary Shunt  
 1206 Valvotomy – Closed

### OPEN

1230 Cardiac Surgery Open – Other  
 1231 Aortic Arch Reconstruction  
 1232 Arterial Switch  
 1233 ASD Repair  
 1234 AVSD Repair (AV Canal)  
 1235 Cardiac Tumour Resection  
 1236 Cavo-Pulmonary Shunt  
 1252 Conduit Repair or Replacement  
 1253 Coronary Artery Repair  
 1237 Fontan  
 1238 LV Outflow Reconstruction  
 1254 MAPCAs Surgery  
 1239 Norwood - Stage I  
 1240 PA Plasty or Repair  
 1241 RV Outflow Reconstruction  
 1242 Senning  
 1243 TAPVD Repair  
 1244 Tetralogy of Fallot Repair  
 1245 Transplant – Heart  
 1246 Transplant – Heart Lung  
 1247 Transplant – Lung  
 1248 Truncus Repair  
 1249 Valve Repair or Replacement  
 1250 Valvotomy – Open  
 1251 VSD Repair

### NEUROSURGERY

1300 Neurosurgery – Other  
 1301 Craniotomy – Anterior Fossa  
 1302 Craniotomy – Posterior Fossa  
 1303 CSF Shunt Insertion or Revision  
 1304 Decompression - Cranial  
 1305 Decompression - Spinal Cord  
 1306 Hemispherectomy or Lobectomy  
 1307 ICP Monitor or Vent. Drain Insertion  
 1308 Intracranial Haematoma Evacuation

### THORACIC SURGERY

1400 Thoracic Surgery - Other  
 1401 Diaphragm Plication  
 1402 Diaphragm Repair  
 1403 Lung Biopsy  
 1404 Lung Decortication  
 1405 Oesophageal Atresia Repair  
 1406 Pneumonectomy or Lobectomy  
 1407 Thoracic Tumour Resection  
 1408 Tracheo-oesophageal Fistula Repair  
 1409 Tracheopexy

### ENT SURGERY

1500 ENT - Other  
 1501 Adenoidectomy and/or Tonsillectomy  
 1502 Choanal Atresia Repair  
 1503 Cricoid Split  
 1504 Laryngeal Reconstruction  
 1505 Laryngobronchoscopy  
 1506 Tracheostomy

### ABDOMINAL / GENERAL SURGERY

1600 General Surgery – Other  
 1601 Abdominal Tumour Resection  
 1602 Appendectomy  
 1603 Bladder Extrophy Repair  
 1604 Burns Surgery  
 1605 Fundoplication  
 1606 Gastroschisis or Exomphalos Repair  
 1607 GI Endoscopy and/or Sclerotherapy  
 1608 Intussusception Repair  
 1609 Kasai  
 1610 Laparotomy  
 1615 Laparotomy – Bowel Obstruction  
 1616 Laparotomy – Bowel Perforation  
 1617 Laparotomy – GI Haemorrhage  
 1618 Laparotomy – Necrotising Enterocolitis  
 1619 Laparotomy – Peritonitis  
 1620 Laparotomy – Trauma  
 1611 Transplant – Kidney  
 1612 Transplant – Liver  
 1613 Transplant - Small Bowel  
 1614 Urogenital Surgery – Other

### CRANIOFACIAL SURGERY

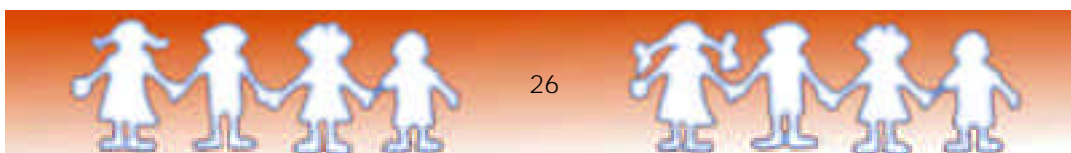
1700 Craniofacial Surgery – Other  
 1706 Cleft Palate Repair  
 1701 Cranial Vault Reshaping  
 1702 Dental Surgery  
 1703 Facial Cleft Repair  
 1704 Mandibular Mobilisation  
 1705 Midface Mobilisation

### ORTHOPAEDIC SURGERY

1800 Orthopaedic Surgery - Other  
 1801 Fracture Fixation  
 1802 Spinal Instrumentation

## Instructions for using the ANZPIC registry diagnostic codes

1. Code the reason most directly responsible for ICU admission as the Principal Diagnosis.
2. Code up to 5 Associated Diagnoses.
3. For patients admitted primarily for recovery after a procedure, use a Post Procedural Diagnosis for Principal Diagnosis.
4. For patients having an operative procedure during the admission code the Post Procedural Diagnosis as an Associated Diagnosis.
5. Do not use Injury Mechanism or Infection codes for the Principal Diagnosis (eg for RSV bronchiolitis code bronchiolitis as the Principal Diagnosis and RSV as an Associated Diagnosis).
6. If new information (eg a test result) becomes available during the admission that allows more accurate coding, amend the original codes but ensure that the Principal Diagnosis still indicates the reason most directly responsible for ICU admission.



## Appendix 3 ANZPIC Registry participating units and contact details

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### Australian Capital Territory

The Canberra Hospital  
POBox 11  
Woden, ACT, 2606  
p: +61 2 6244 3423

Director  
Imogen Mitchell (imogen.mitchell@act.gov.au)

Data Manager  
Joy Whiting (joy.whiting@act.gov.au)

### New South Wales

Sydney Children's Hospital  
High St  
Randwick, NSW, 2031  
p: +61 2 9382 1919

Director  
Barry Duffy (b.duffy@unsw.edu.au)

Consultants  
Ion Alexander (i.alexander@unsw.edu.au)  
John Awad (j.awad@unsw.edu.au)  
Andrew Numa (a.numa@unsw.edu.au)  
Gary Williams (g.williams@unsw.edu.au)

Data manager  
Janelle Young (youngja@sesahs.nsw.gov.au)

The Children's Hospital at Westmead  
Locked Bag 4001  
Westmead, NSW, 2145  
p: +61 2 9845 1171

Director  
Tony O'Connell (tonyo@chw.edu.au)

Consultants  
Robin Choong (robinc@chw.edu.au)  
Jonathon Gillis (jong@chw.edu.au)  
Stephen Jacobi (stephej2@chw.edu.au)  
David Schell (davids1@chw.edu.au)  
Barry Wilkins (barryw2@chw.edu.au)

Tamworth Base Hospital  
POBox 83  
Tamworth NSW, 2340  
p: +61 2 6761 9542

Director  
Phil Hungerford (phungerford@doh.health.nsw.gov.au)

Data manager  
Tim Constable (tconstable@doh.health.nsw.gov.au)

### Queensland

Mater Misericordiae Children's Hospital  
Private Bag  
South Brisbane, QLD, 4101  
p: +61 7 3840 8269

Director  
Bruce Lister (blister@mater.org.au)

Consultants  
Phil Sargent (psargent@mater.org.au)  
Andreas Schibler (andreas\_schibler@mater.org.au)

Prince Charles Hospital  
Rode Rd  
Chermside, QLD, 4032  
p: +61 7 3350 8672

Director  
Nikolaus Haas (nikolaus\_haas@health.qld.gov.au)

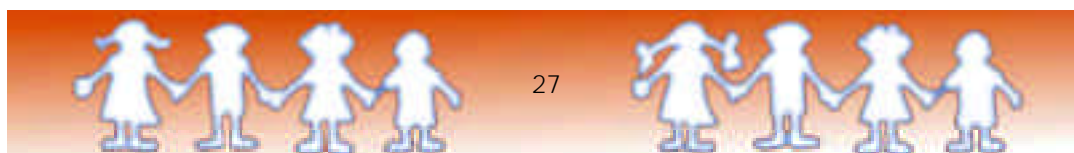
Consultants  
Robert Justo (robert\_justo@health.qld.gov.au)

Data manager  
Janelle Johnson (janelle\_johnson@health.qld.gov.au)

Royal Children's Hospital, Brisbane  
Herston Rd  
Herston, QLD, 4029  
p: +61 7 3636 7957

Director  
Greg Delbridge (greg\_delbridge@health.qld.gov.au)

Consultants  
Julie McEniery (julie\_mcenery@health.qld.gov.au)  
Mark Coulthard (mark\_coulthard@health.qld.gov.au)



# ANZPIC Registry participating units and contact details

---

## South Australia

Women's and Children's Hospital  
72 King William Rd  
North Adelaide, SA, 5006  
p: +61 8 8161 6265

Director  
Steve Keeley (keeleys@wch.sa.gov.au)

Consultants  
Neil Matthews (matthewsn@wch.sa.gov.au)  
Tony Slater (slatera@wch.sa.gov.au)  
Michael Yung (yungm@wch.sa.gov.au)

## Tasmania

Royal Hobart Hospital  
POBox 1061L  
Hobart, Tasmania, 7001  
p: +61 3 6222 8212

Director  
Tony Bell (anthony.bell@dchs.tas.gov.au)

Launceston General Hospital  
Charles St  
Launceston, Tasmania, 7250  
p: +61 3 6222 8212

Director  
Scott Parkes (scott.parkes@dhhs.tas.gov.au)

## Victoria

Royal Children's Hospital, Melbourne  
Flemington Rd  
Parkville, Victoria, 3052  
p: +61 3 9345 5224

Director  
Frank Shann (frank.shann@rch.org.au)

Consultants  
Warwick Butt (warwick.butt@rch.org.au)  
Robert Henning (robert.henning@rch.org.au)  
James Tibballs (james.tibballs@rch.org.au)  
Lara Shekerdeman (lara.shekerdeman@rch.org.au)

Data manager  
Anna Taylor (anna.taylor@rch.org.au)

## Western Australia

Princess Margaret Children's Hospital  
POBox D184  
Perth, WA, 6840  
p: +61 8 9340 8447

Director  
Alan Duncan (alan.duncan@health.wa.gov.au)

Consultants  
Geoff Knight (geoff.knight@health.wa.gov.au)  
Simon Erickson (simon.erickson@health.wa.gov.au)

## New Zealand

Starship Children's Hospital  
Private Bag 92024  
Auckland, NZ  
p: +64 9 9307 4903

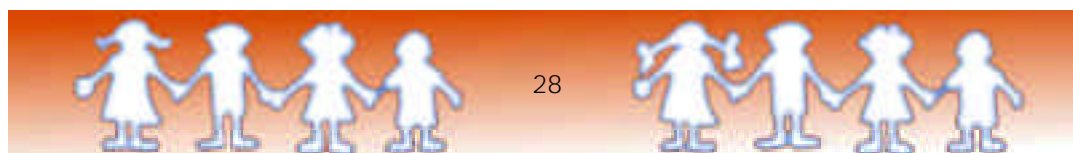
Director  
John Beca (JohnBeca@adhb.govt.nz)

Consultants  
Liz Segedin (lizes@adhb.govt.nz)  
David Buckley (davidb@adhb.govt.nz)

Waikato Hospital  
Private Bag 3200  
Hamilton, NZ

Director  
John Torrance (torrancj@hwl.co.nz)  
p: 021 382 625 (5625)

Consultants  
Nick Barnes (barnesn@waikatodhb.govt.nz)  
p: 021 382 628 (6970)  
Grant Howard (howardg@waikatodhb.govt.nz)  
p: 021 523 029 (6670)  
Rob Frengley (frengler@waikatodhb.govt.nz)  
p: 021 644 233 (6537)



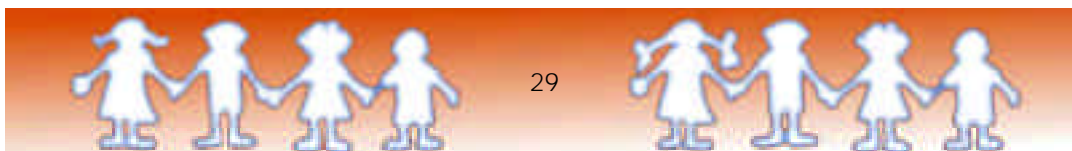
## ANZPIC Registry participating units and contact details

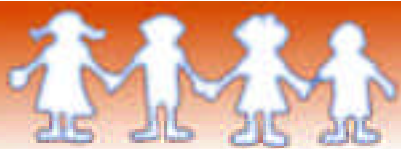
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### ANZPICRegistry

Women's and Children's Hospital  
72 King William Rd  
North Adelaide, SA, 5006  
p: +61 8 8161 6736

Project Manager  
Lynda Norton (anzpic@mail.wch.sa.gov.au)





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