

Intensive care for adults in Victorian public hospitals 2003–04

Report to the public

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Prepared by

Victorian Intensive Care Data Review Committee

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Invited foreword from the Chairman, Victorian Branch, Australian and New Zealand Intensive Care Society


The Victorian Intensive Care Data Review Committee (VICDRC) has for the third year provided us with a comprehensive annual report detailing the activities and results of patient care within Victorian Intensive Care Units during 2003-04.

Within this report, individual hospitals are identified for the first time and their casemix and outcomes are clearly presented. Notably, the number of participating hospitals has increased and the data presented includes almost 90% of all patient episodes in Victorian Intensive Care Units. These data provide strong support for our confidence in the continuing high standard of Intensive Care in Victoria, comparable with other Australian States and Territories, and exceeding international benchmarks.

Notably, in this report the VICDRC has increased its focus on safety and quality of intensive care services as illustrated by the recognition of outcomes that have fallen outside expectations and accordingly has provided a consideration of potential contributing reasons and areas for future analysis.

Finally, this report serves as a marker of the significant efforts of the many people involved, including the members of the Data Review Committee under the chairmanship of Dr Peter Stow and more recently Dr John Santamaria, the ANZICS Database Management Committee, and the many doctors, nurses and other team members who have collected and collated their intensive care units' data—all of whom deserve recognition. Additionally, the Victorian Department of Human Services continues to support the activities of the VICDRC, which has directly contributed to the quality of this annual report.

We should encourage all stakeholders to maintain their commitment to these excellent results and congratulate all those who have contributed to this valuable report.



**David Ernest
Chairman**

Victorian Branch, Australian and New Zealand Intensive Care Society

Contents

Introduction	4
Summary	5
Victoria's public ICUs	6
Patients	7
What are the most common diagnoses in ICU?	9
How long was the stay in ICU?	10
Ventilation (artificial breathing)	12
Source of admission to ICU	13
Mortality rates in ICU	13
ICU admissions from operating theatre or recovery room	17
ICU admissions from emergency departments	19
ICU admissions from general wards	21
Admissions to tertiary ICUs	23
Admissions to metropolitan ICUs	24
Admissions to regional ICUs	25
Readmission to intensive care	26
Time of discharge from intensive care	26
In conclusion	28

List of figures

Figure 1: Proportion of ICU admissions that are elective	7
Figure 2: Mean age of patients at time of ICU admission by financial year	8
Figure 3: Percentage of admissions in each different age group for all Victorian public hospital admissions to ICU	8
Figure 4: Number of admissions to ICU ('episodes') by length of stay for all Victorian public hospital ICUs	10
Figure 5: Average stay in ICU for each classification of ICU (2002-03 and 2003-04)	11
Figure 6: Median length of stay in ICU for each hospital	11
Figure 7: Length of ventilation time for patients in all Victorian public hospital ICUs	12
Figure 8: Mortality rate by source of ICU admission for the 18 ICUs reporting to the APD	13
Figure 9: Mortality rate by age group	14
Figure 10: SMR by source of ICU admission (2002-03 and 2003-04)	15
Figure 11: SMR for each public hospital ICU	16
Figure 12: SMR (with 95% confidence interval) for top ten diagnoses for patients admitted to ICU from operating theatre or recovery room	18
Figure 13: SMR (with 95% confidence interval) for the top ten diagnoses for patients admitted to ICU from emergency departments	20
Figure 14: SMR (with 95% confidence interval) for the top ten diagnoses for patients admitted to ICU from general wards in the same hospital	22

List of tables

Table 1:	Top ten reasons for people being admitted to ICU	9
Table 2:	Top ten diagnoses for patients admitted to ICUs from operating theatres or recovery rooms	17
Table 3:	Top ten diagnoses for patients admitted to ICU from emergency departments	19
Table 4:	Top ten diagnoses for patients admitted to ICU from general wards in the same hospital	21
Table 5:	Top ten diagnoses for patients admitted to tertiary ICUs	23
Table 6:	Top ten diagnoses for patients admitted to metropolitan ICUs	24
Table 7:	Top ten diagnoses for patients admitted to regional ICUs	25
Table 8:	Rates of nocturnal discharge from ICU, and readmission to ICU	27

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Ms Carol George, Project Manager, Adult Patient Database extracted data from the ANZICS Adult Patient Database (APD).

Tracey Higlett, Research Manager, ANZICS Research Centre for Critical Care Resources (ARCCCR), compiled all data from the ANZICS Research Centre for Critical Care Resources.

The ANZICS Database Management Committee is funded by grants from States and Territories according to the terms of AHMAC Out of Session Paper No 233.

Introduction

This report summarises information on the quality and outcomes of care for adults in intensive care units (ICUs) within Victorian public hospitals over the 12 months from July 2003 to June 2004. It summarises the third annual report to hospitals issued by the Victorian Intensive Care Data Review Committee (VICDRC). The VICDRC was established in February 2002 by the Australian and New Zealand Intensive Care Society (ANZICS) and the Victorian Department of Human Services.

ANZICS has been compiling Victorian data in the Adult Patient Database (APD) since 1992. Data collection in Victorian ICUs is voluntary, however the number of units contributing data to the APD has continued to increase for the period 1999–2004. For the first annual report in 2001–02, 13 hospitals contributed data. For this report, 18 of Victoria's 23 public hospital ICUs have contributed data. These hospitals are:

- Six tertiary hospitals (hospitals providing super-specialist care):
 - Geelong Hospital
 - Royal Melbourne Hospital
 - St Vincent's Hospital - Melbourne
 - The Alfred Hospital
 - Austin Hospital
 - Monash Medical Centre-Clayton
- Seven metropolitan hospitals:
 - Box Hill Hospital
 - Dandenong Hospital
 - Frankston Hospital
 - Maroondah hospital
 - The Northern Hospital
 - Peter MacCallum Cancer Institute
 - Western Hospital-Footscray
- Five regional hospitals:
 - Ballarat Base Hospital
 - The Bendigo Hospital
 - Goulburn Valley Health-Shepparton
 - Latrobe Regional Hospital-Traralgon
 - Northeast Health Wangaratta.

The remaining five institutions with ICUs did not contribute. They are:

- Central Gippsland Health Service-Sale
- Mildura Base Hospital
- Southwest Healthcare-Warrnambool
- Hamilton Base Hospital
- Wimmera Health Care Group-Horsham

The non-contributing units accounted for 11 per cent of all ICU admissions during 2003-04 according to the data submitted to the Department of Human Services through the Victorian Admitted Episodes Dataset (VAED).

Summary

- Victorian public hospital ICUs provide high quality care, which compares favourably with other Australian ICUs and benchmarks from the United States and the United Kingdom.
- For the year July 2003 to June 2004, the hospital death rate for patients whose time in hospital included an ICU admission was 13.4 per cent.
- The standardised mortality (death) rate was lower than might be expected when measured against the outcomes of international best practice.
- The standardised mortality (death) rate for patients receiving ICU treatment also tended to be lower than that seen in other Australian states and territories.
- Overall, the standard of care, as measured by length of stay and the results of care, should be regarded as excellent.
- The number of submissions to the APD has increased in both years since the first report.

Victoria's Public ICUs*

Number of beds

Approximately three quarters (168) of Victoria's ICU beds are equipped to treat patients requiring ventilation (artificial breathing). Of the 18 units that submitted a full year of data to the APD, 16 treat more than 350 patients each year.

Medical and nursing staff

Across all of Victoria's adult ICUs during 2002–03, there were 54.6 full time equivalent (FTE) specialist doctors (in addition to hospital registrars and resident medical officers). This amounts to:

- One FTE specialist for every 4.09 Victorian ICU beds, compared with one FTE specialists for every 4.62 ICU beds across Australia
- 1.22 FTE specialists for every 100,000 Victorians, compared with 1.39 FTE specialists for every 100,000 people across Australia.

Of these specialist doctors, 90 per cent were specialists in intensive care and the remainder had other related specialist qualifications.

There were 1,500 registered nurses (1061 FTE) employed in Victorian adult public ICUs during 2002–03. This is an increase of 86 nurses or 39 FTE. Seventy-seven per cent of these held a qualification in critical care.

**Source: Higlett T. Anderson T & Hart G.K. (2004) Review of intensive care resources and activity 2002/2003. ANZICS, Melbourne.*

Patients

Numbers

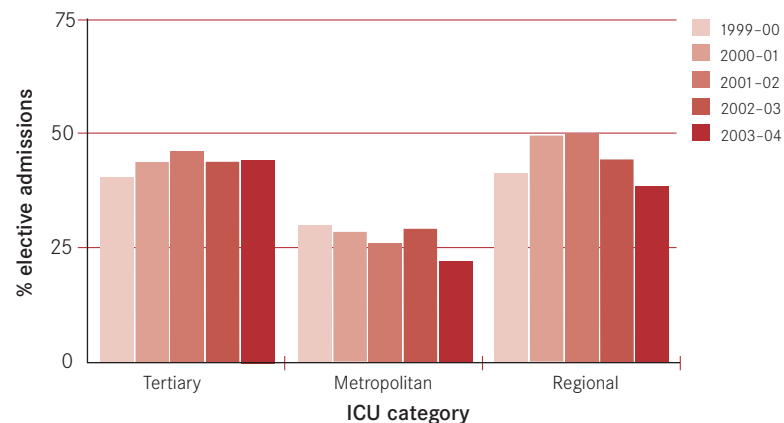
For 2003-04, the APD received data on 16,088 admissions to ICUs in Victorian public hospitals. This includes some repeat admissions for patients returning to ICU during their hospital stay.

Based on comparison to the Victorian Admitted Episodes Dataset (VAED) these data from the 18 public hospitals contributing to the APD represent around 89 per cent of all admissions to Victoria's adult public hospital ICUs.

Elective versus emergency admission

Around 40 per cent of admissions to ICUs are elective (that is, pre-planned) and usually for patients who are having complicated surgery and are expected to require post-operative support and observation. Tertiary and regional ICUs tend to have a higher proportion of elective admissions, while metropolitan ICUs have a higher proportion of emergency admissions. The high proportion of elective admissions to tertiary units is associated with planned procedures such as heart surgery.

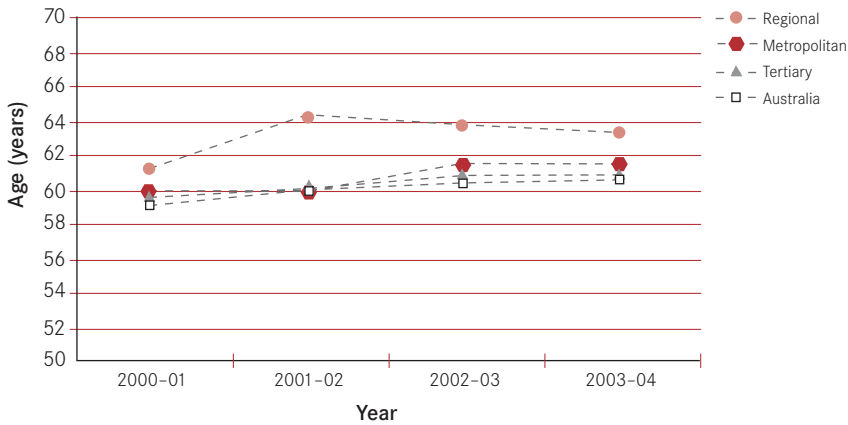
Figure 1: Proportion of ICU admissions that are elective



Age

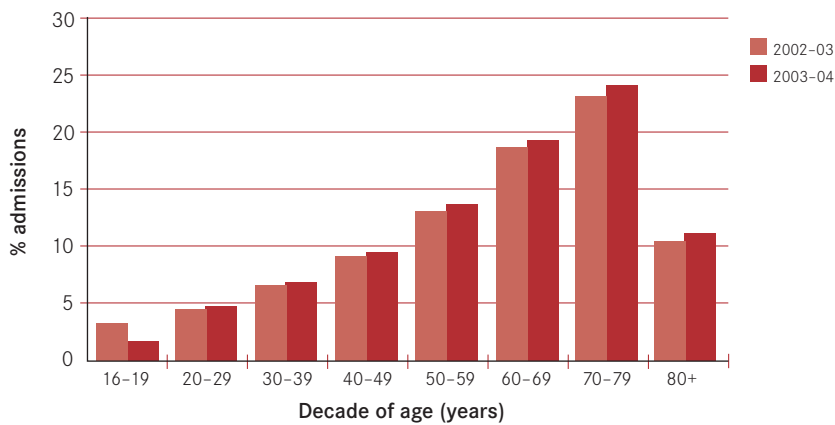
Over the four years the APD has been collecting data, there has been a gradual increase in the median age of patients treated in metropolitan and tertiary categories of public hospital ICU. However, this was not the case for regional ICUs in 2003-04 where a slight reduction in median age occurred for the second year running. National Australian data are provided as a benchmark.

Figure 2: Mean age of patients at time of ICU admission by financial year



Across all Victorian public hospitals during the year July 2003 to June 2004, there were 18,013 admissions of patients aged older than 16 years that included a stay in an intensive care unit (Source: VAED). Almost four in ten (39.7 per cent) of these admissions involved patients aged 69 years or older and more than one in ten (12.8 per cent) involved patients aged 80 years or older.

Figure 3: Percentage of admissions in each different age group for all Victorian public hospital admissions to ICU



What are the most common diagnoses in ICU?

Coronary artery bypass surgery is the most common diagnosis for patients in an ICU in Victoria, as shown in Table 1. Tracheostomy is a very common reason for being admitted to ICU; however, the patients with a tracheostomy can be suffering from a range of clinical diagnoses that might not in themselves have been sufficient to require a stay in ICU. On the other hand, all patients undergoing coronary artery surgery are admitted to ICU after their surgery.

Table 1: Top ten reasons for people being admitted to ICU

Diagnosis	Percentage of total
Coronary artery bypass graft surgery	10.9
Tracheostomy	9.7
Major bowel surgery	7.4
Acute myocardial infarction (heart attack)	3.9
Heart valve surgery	3.8
Poisoning/overdose	3.8
Arrhythmia (irregular heart rhythm)	2.7
Unstable angina	2.1
Major vascular surgery	2.1
Emphysema	1.7

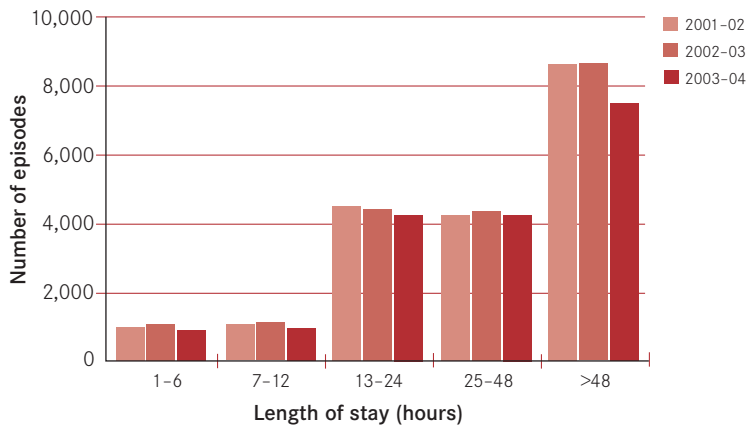
How long was the stay in ICU?

Figures for all Victorian ICUs show that during 2003-04:

- about one-third of people (34 per cent) stayed in ICU for up to 24 hours
- one-quarter (25 per cent) stayed for one to two days
- just under one-half (42 per cent) stayed for longer than two days.

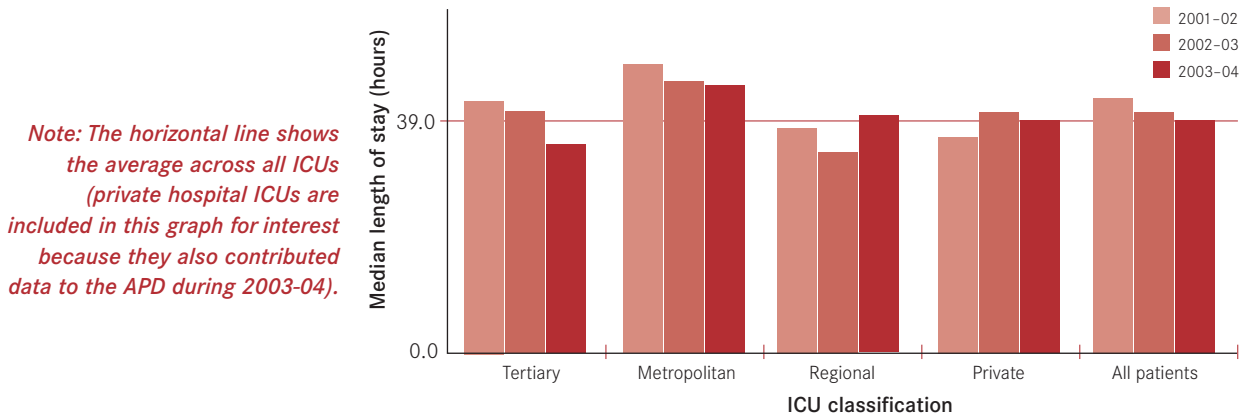
The average length of stay for all Victorian ICUs is 66.25 hours (2.76 days); however, a patient might stay in ICU for many weeks.

Figure 4: Number of admissions to ICU ('episodes') by length of stay for all Victorian public hospital ICUs



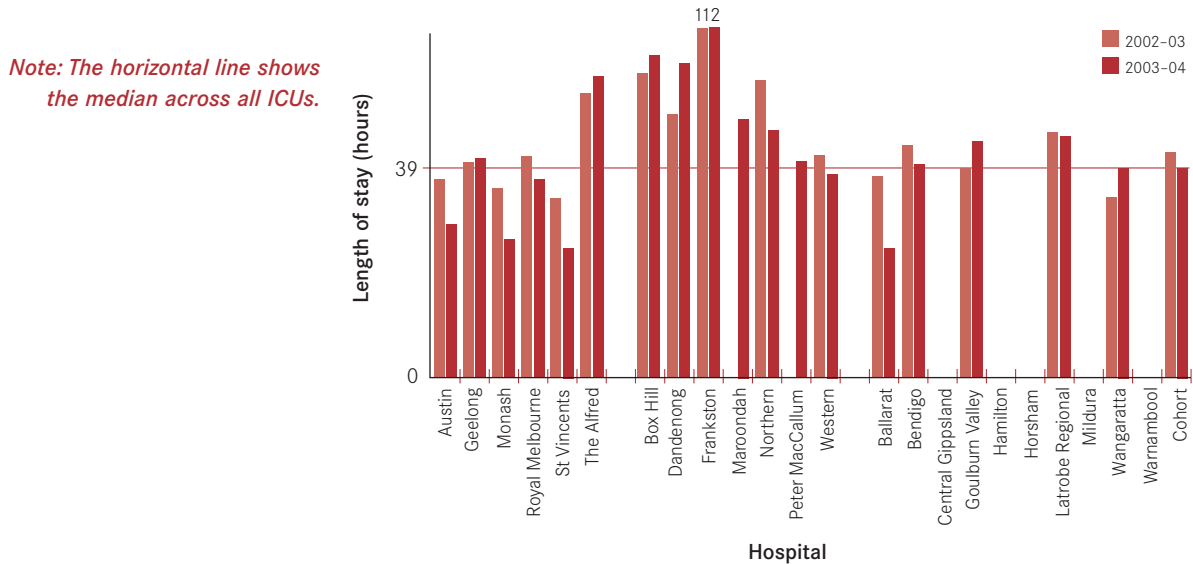
The average length of stay varied between the categories of ICU. Once again the average length of stay was significantly longer in metropolitan ICUs than in other ICUs. This is probably due to the higher proportion of emergency cases reported by metropolitan hospitals. The following graphs show length of stay for each classification of ICU and for the individual ICUs.

Figure 5: Average stay in ICU for each classification of ICU



The longer length of stay of patients in metropolitan units is likely to be associated with the higher proportion of emergency admissions. Planned/elective admissions usually have shorter stays in ICUs.

Figure 6: Median length of stay in ICU for each hospital

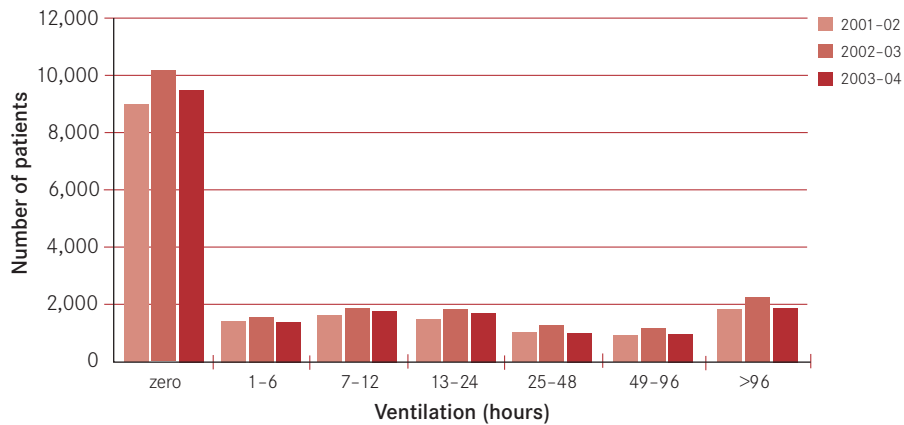


Frankston Hospital reported a much more extended length of stay than would be expected. This has been shown to be related to incomplete data submission. The Alfred Hospital has a longer length of stay when compared with peer hospitals. This is associated with the conditions suffered by the patients who are cared for in this unit.

Ventilation (artificial breathing support)

Just under half (48 per cent) of the patients admitted to a Victorian ICU required ventilation (artificial breathing), and of the patients who were ventilated, over half (56 per cent) needed it for 24 hours or less. This is a small decrease in both number of ventilated patients and duration of ventilation. Those types of breathing support that do not involve the insertion of a tube into the airway are not included in the information relating to 'ventilation hours'.

Figure 7: Length of ventilation time for patients in all Victorian public hospital ICUs



Source of admission to ICU

Patients come to ICU from a range of sources. During 2003–04, 50 per cent of all ICU admissions reported to the APD were from the operating theatre or recovery room, 26 per cent were from the emergency department and 17 per cent came directly from a general ward of the hospital. A small number of patients was also admitted from the wards or ICUs of other hospitals. These proportions are unchanged from 2002–03.

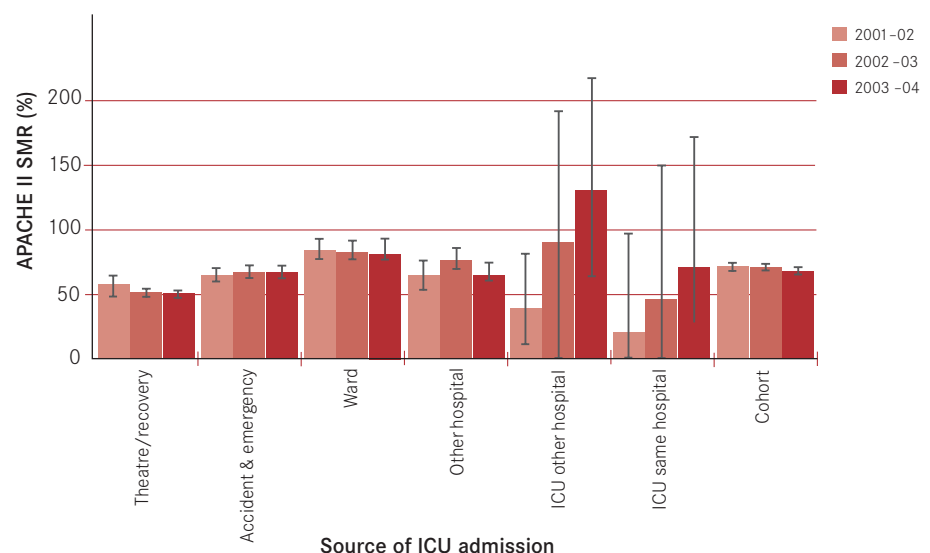
Mortality rates in intensive care

Because people admitted to intensive care are very sick, it is to be expected that not all will recover. However, mortality rates (death rates) provide one measure of the effectiveness of the care delivered in and of the performance of ICUs.

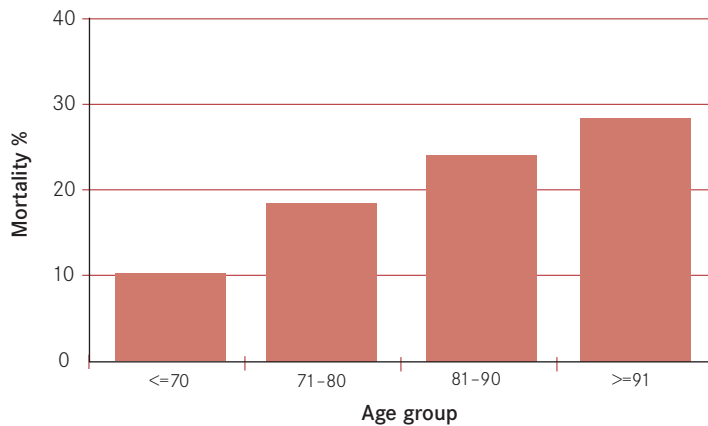
The overall mortality rate of Victorian intensive care patients was 13.4 per cent (including deaths in intensive care or while the patient is still in the hospital after leaving intensive care). This means that more than 86 per cent of patients admitted to Victorian ICUs survived their ICU admission and subsequent hospital stay. The mortality rate for 2002–03 was 15.2 per cent.

Mortality rates differed based on the source of admission to ICU. Patients admitted from another hospital had the highest mortality rate (30.9 per cent), while those admitted from the operating theatre or recovery room had the lowest mortality rate (8 per cent).

Figure 8: Mortality rate by source of ICU admission for the ICUs reporting to the APD



Among patients aged over 80 years, mortality was twice as high as for people aged 70 years or less. Nevertheless, around seven in every ten patients aged 91 years or older survived their ICU admission and subsequent hospital stay. These figures are comparable to 2002–03. The apparently large change in mortality rates for the ‘ICU other hospital’ and ‘ICU same hospital’ categories is due to the small numbers of patients in these categories.

Figure 9: Mortality rate by age group

The Standardised Mortality Ratio

Standardised mortality ratios (SMRs) provide a method of comparing the outcomes of care (death versus survival) across different and often widely varying groups of patients. People who are admitted to intensive care range from those who require monitoring for a short time to those who require prolonged and complex care for severe life-threatening illness or injuries. The likelihood of surviving a stay in an ICU and hospital therefore varies considerably across the range of patients. In addition, the mix of patients varies greatly between ICUs at different hospitals.

This means that the raw mortality rates (that is, the actual numbers of deaths) are not a reliable way of comparing different ICUs or different patient groups. These rates can be expected to be highest in hospitals that treat the most difficult cases. The SMR takes these factors into account and provides a reliable way of comparing mortality between hospitals or different patient groups.

The SMR presents the number of deaths that occur as a percentage of the number of deaths that might be expected, given best practice treatment and taking into account the severity of the particular patients' conditions. 'Expected deaths' therefore reflects outcomes that have been achieved internationally across hospitals seen to be delivering best practice treatment. An SMR below 100 per cent represents a lower than expected mortality rate.

SMRs in Victorian ICUs

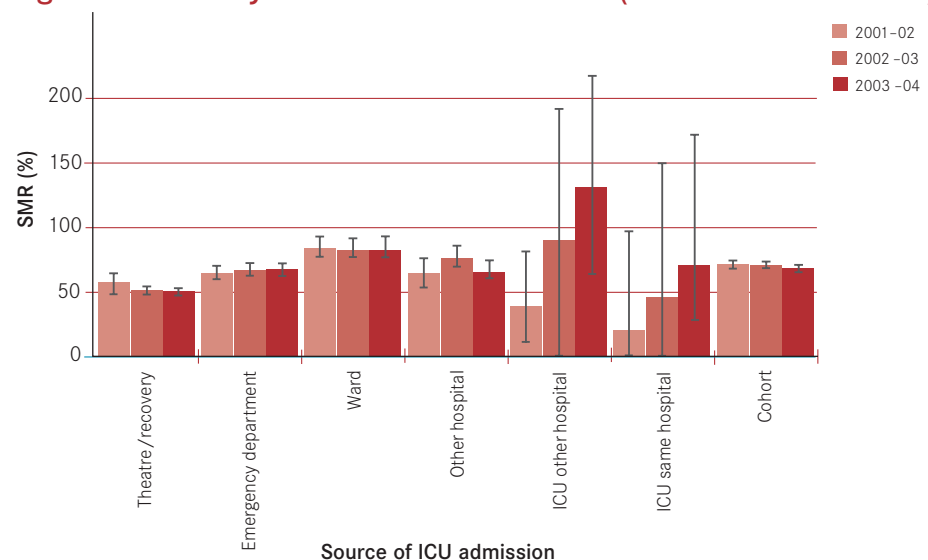
SMRs showed that across the 18 Victorian ICUs reporting data to the APD, patients admitted from wards within the same hospital were at higher risk than those from operating theatre/recovery room, emergency department or other hospitals. Patients admitted from the operating theatre or recovery room were at lower than average risk, possibly reflecting a relatively high proportion of elective (rather than emergency) cases admitted to intensive care from these sources.

Importantly, while SMRs differed across the Victorian ICUs, with the exception of Frankston hospital, all had an average SMR that was lower than the proportion of expected deaths: that is, below 100 per cent. Overall, the SMRs for Victorian ICUs compared favourably with those seen internationally (in the United States of America and United Kingdom) and, in general, were better than elsewhere in Australasia.

Ninety-five per cent confidence interval

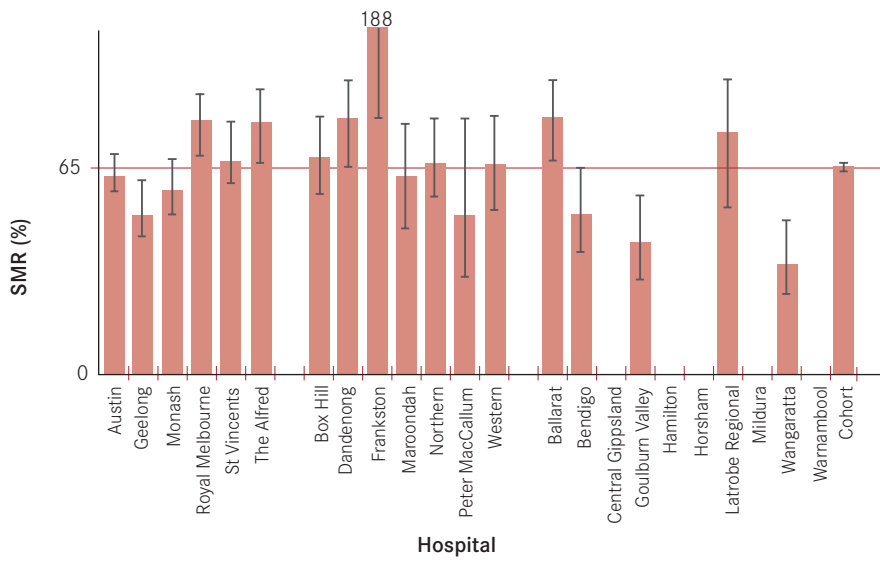
The following bar charts show SMRs for a number of different groups of ICU patients. These bar charts show the 95 per cent confidence interval around each SMR; that is, the range in which we would expect a result to fall (19 times out of 20) if we were to repeat the study. In other words, the 95 per cent confidence interval is used to show the range over which the 'true' result almost certainly falls. If the 95 per cent confidence intervals for two results do not overlap, it is likely there is a 'true' difference between the results.

Figure 10: SMR by source of ICU admission (2002-03 and 2003-04)



Note: The vertical black line on each bar shows the 95 per cent confidence interval.

Figure 11: SMR for each public hospital ICU



Note: The vertical black line on each bar shows the 95 per cent confidence interval.

ICU admissions from operating theatre or recovery room

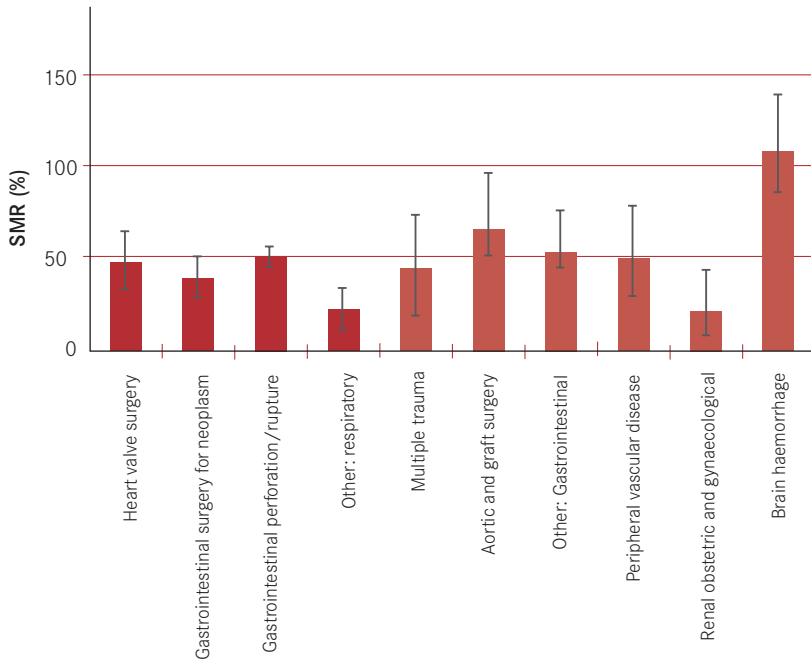
ICU admissions from the operating theatre or recovery room again accounted for the largest group of ICU admissions reported to the APD (50 per cent). The top ten clinical reasons for these admissions during 2003-04, and the mortality rates, are shown in Table 2. Figure 12 shows the SMR for these admission diagnoses. All compare favourably with the 'predicted' rate of 100 per cent. Eight of the conditions listed in the top ten are the same as in the 2002-03 report although the order of the conditions in the table has altered slightly. The two additions to the top ten conditions are 'Aortic and graft surgery' and 'Renal, obstetric and gynaecological'.

Table 2: Top ten diagnoses for patients admitted to ICUs from operating theatres or recovery rooms

Diagnosis	Admissions (per cent)	Mortality (per cent)
Heart valve surgery	9.0	4.0
Gastrointestinal surgery for cancer	8.4	6.8
Gastrointestinal perforation/obstruction	7.3	17.3
Other: respiratory	7.0	2.9
Multiple trauma	6.8	3.0
Aortic and graft surgery	6.7	9.5
Other gastrointestinal causes	6.2	10.1
Peripheral vascular disease	3.7	7.8
Renal, obstetric and gynaecological	2.3	3.9
Surgery for bleeding in or around the brain	2.2	33.3

Note: The most common reason for admission from operating theatres is, in fact, coronary artery grafts; however, it is not included in this table or the SMR calculations because it is not an SMR diagnostic category. The associated mortality rate is 2.2 per cent.

Figure 12: SMR (with 95% confidence interval) for top ten diagnoses for patients admitted to ICU from operating theatre or recovery room



ICU admissions from emergency departments

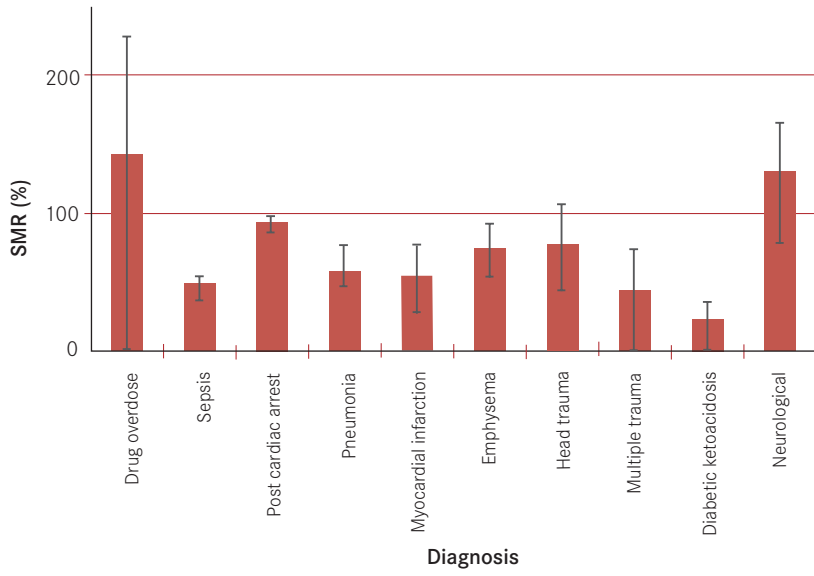
ICU admissions from emergency departments accounted for 26 per cent of all ICU admissions. This is consistent with this source's proportion of total ICU admissions from 2002-03. Respiratory diagnoses (infection, emphysema and asthma) accounted for a high percentage of admissions. Self-administered drug overdose was again the most common admission diagnosis, accounting for 10 per cent of overall admissions. This is particularly the case in non-tertiary hospitals as shown in Table 6 (admission to metropolitan ICUs). Cardiac arrest (heart attack) continues to be associated with the lowest survival rate (39 per cent).

The top ten reasons for these admissions during 2003-04, and the mortality rates, are shown in Figure 13. The bar chart shows the SMR for these diagnoses. The most common diagnostic category was self-poisoning/overdose. The SMR of 140 for that diagnosis is significantly lower than in 2002-03 (255) with confidence intervals that include 100. However, the crude mortality rate for this group of patients was only 1.9 per cent. The unexpectedly high SMR might be related to issues with data collection and as with all the data produced by the APD, validation is important and will form part of the future work of the VICDRC. With this possible exception, all SMRs compare favourably with international experience.

Table 3: Top ten diagnoses for patients admitted to ICU from emergency departments

Diagnosis	Admissions (per cent of total)	Mortality (per cent)
Self-administered drug overdose	10.2	1.9
Sepsis (any cause)	7.0	20.9
Post cardiac arrest (only)	6.6	60.5
Pneumonia	6.1	21.2
Myocardial infarction (heart attack)	5.2	12.4
Emphysema	5.0	21.2
Head trauma	4.7	10.6
Multiple trauma	4.3	2.3
Diabetic ketoacidosis	4.2	1.2
Neurologic causes including stroke	3.5	21.7

Figure 13: SMR (with 95% confidence interval) for the top ten diagnoses for patients admitted to ICU from emergency departments



ICU admissions from general wards

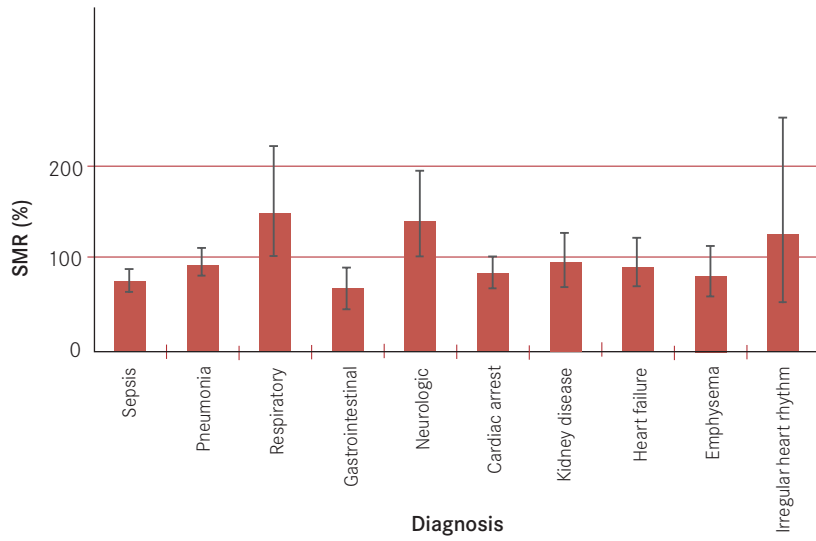
Admissions from the general wards of the same hospital accounted for 17 per cent of ICU admissions. This proportion is unchanged from 2002–03. Of these cases, 25 per cent involved a cardiac or respiratory diagnosis. The top ten reasons for these admissions during 2003–04, and the mortality rates, are shown in Table 4 and Figure 14. The bar chart shows the SMR for these diagnoses. Eight of the top ten diagnoses remain unchanged ('neurologic' and 'kidney disease' were added), although the order of the top ten has altered slightly.

Admissions from the general wards usually involve serious illness and the mortality rates were high in this group. Further, these admissions were also associated with high SMRs, with some falling above 100 per cent (that is, above international benchmarks). In particular, these SMRs suggest the need to look at earlier intervention and management of patients with severe cardiac and respiratory disease.

Table 4: Top ten diagnoses for patients admitted to ICU from general wards in the same hospital

Diagnosis	Admissions (per cent of total)	Mortality (per cent)
Sepsis (any cause)	9.7	37.7
Pneumonia	6.5	27.6
Other: Respiratory	5.5	18.3
Other: Gastrointestinal	5.0	26.9
Neurologic	4.7	27.1
Post cardiac arrest (only)	4.1	61.7
Kidney disease	3.6	25.7
Heart failure	3.6	27.1
Emphysema	3.2	29.5
Irregular heart rhythm	3.1	14.8

Figure 14: SMR (with 95% confidence interval) for the top ten diagnoses for patients admitted to ICU from general wards in the same hospital



Admissions to tertiary ICUs

Admissions to the six tertiary (that is, super-specialist) ICUs reporting to the APD accounted for more than half (61 per cent) of all the ICU admissions reported. In 2002-03 this figure was 64 per cent. The slight reduction in proportion of admissions is related to the addition of data from two non-tertiary units (Peter MacCallum Cancer Institute and Maroondah Hospital).

The top ten reasons for admission to a tertiary ICU are shown in Table 5. The most common reason was cardiac surgery, which (due to the way the SMR categories are organised), is included in the group 'other: undefined' and in the group 'heart valve surgery'. This year all causes of trauma (head trauma alone, multiple trauma, head and multiple trauma together) have been grouped to reflect all trauma admissions. Trauma admissions make up the second largest diagnostic group in tertiary ICUs. This group of patients are largely concentrated in two ICUs, The Alfred and Royal Melbourne, which are the designated Major Trauma Services for adults in Victoria.

Table 5: Top ten diagnoses for patients admitted to tertiary ICUs

Diagnosis	Admissions (per cent of total)
Other: undefined	23.4
Multiple trauma	8.9
Heart valve surgery	7.6
Other: respiratory	5.4
Sepsis (any cause)	5.1
Other: gastrointestinal	4.2
Other: cardiovascular	3.9
Peripheral vascular disease	3.5
Gastrointestinal surgery for cancer	3.5
Cardiac arrest	2.9

Admissions to metropolitan ICUs

Admissions to metropolitan ICUs accounted for 20 per cent of public hospital ICU admissions reported to the APD. The addition of data contributions from Peter MacCallum Cancer Institute and Maroondah Hospital means that the proportion of admissions reported by metropolitan hospitals has increased from 17 per cent in 2002-03. The top ten reasons for admission are shown in Table 6.

The majority of metropolitan admissions are associated with emergency rather than elective diagnoses. Elective admissions account for only 22 per cent of admissions to metropolitan units compared to 44 percent in tertiary units and 38 percent in regional units. Another difference between metropolitan and the other categories is that there are more people admitted to metropolitan hospitals following self-administered drug overdoses.

Table 6: Top ten diagnoses for patients admitted to metropolitan ICUs

Diagnosis	Admissions (per cent of total)
Other: gastrointestinal	7.5
Gastrointestinal perforation/obstruction	7.6
Gastrointestinal surgery for cancer	7.2
Respiratory infection	7.0
Self-administered drug overdose	6.3
Sepsis (any cause)	5.7
Other: respiratory	5.2
Trauma (all causes)	4.8
Post cardiac arrest	4.6
Emphysema	3.9

Admissions to regional ICUs

Admissions to regional ICUs accounted for one in five (20 per cent) of public hospital ICU admissions. The top ten reasons for admission are shown in Table 7.

This year, all causes of trauma have been grouped under the category 'Multiple trauma'. The number of patients with trauma managed in regional ICUs therefore appears higher than reported in 2002–03. The number of trauma patients managed in regional centres (375) is more than in metropolitan (154) units, but significantly less than in tertiary ICUs (875). Irregular heart rhythm and heart disease remain common diagnoses, again reflecting a case-mix heavily influenced by coronary care admissions.

Table 7: Top ten diagnoses for patients admitted to regional ICUs

Diagnosis	Admissions (per cent of total)
Multiple trauma	12.4
Other: respiratory	7.5
Heart disease	7.1
Other: gastrointestinal	6.5
Irregular heart rhythm	6.2
Gastrointestinal perforation/ obstruction	5.3
Gastrointestinal surgery for cancer	5.3
Other: renal	4.5
Self-administered drug overdose	3.7
Peripheral vascular disease	4.2

Readmission to intensive care

A readmission to ICU occurs when a patient who previously has been a patient of an ICU has a subsequent admission during the same hospital stay. Readmissions can be planned, as occurs for higher level observation after a surgical procedure, or unplanned, as occurs when a patient's condition deteriorates. The reporting of readmission rates is important because readmission is often associated with poorer outcomes for patients.

Readmission rates vary between 1 per cent and 8 per cent across hospitals. Those figures reported as approaching zero are thought to be due to under-reporting or to the allocation of a new admission number for each presentation to ICU.

Table 8 shows the percentage of readmissions for each hospital that reported readmission rates.

Time of discharge from intensive care

As noted in 2002-03, discharge from intensive care to a general ward during the night might result in poorer patient outcome. Nocturnal discharges are at times unavoidable such as where an urgent or highly unstable patient has to be accommodated. Nine per cent of all discharges from contributing units occurred between 10.00 pm and 7.00 am. Fourteen hospitals reported discharging 10 per cent or less of their patients from intensive care after hours, while the remaining hospitals discharged between 10 and 21 per cent of their ICU patients between these hours.

The impact of nocturnal discharges on the outcome of patients is an area that is currently being investigated by the VICDRC.

Table 8: Rates of nocturnal discharge from ICU and readmission to ICU

Hospital	Nocturnal discharges (percentage of total)	Readmissions (percentage of total)
Tertiary hospitals		
Austin Hospital	13.9	8.2
Geelong Hospital	4.6	6.2
Monash Medical Centre - Clayton	8.6	5.6
Royal Melbourne Hospital	4.4	6.3
St Vincent's Hospital - Melbourne	5.0	5.2
The Alfred	20.5	7.4
Metropolitan hospitals		
Box Hill Hospital	6.1	5.0
Dandenong Hospital	10.2	3.6
Frankston Hospital*	20.8	2.4
Maroondah	4.9	2.8
The Northern Hospital	7.5	5.7
Peter MacCallum Cancer Institute	6.5	4.5
Western	9.3	6.2
Regional hospitals		
Ballarat Base Hospital	4.4	4.0
The Bendigo Hospital	7.1	4.3
Goulburn Valley Health - Shepparton	12.4	3.5
Northeast Health Wangaratta	4.5	1.6
Latrobe Regional Hospital - Traralgon	4.4	2.1
Hamilton Base Hospital	N/A	N/A
Wimmera Health Care Group - Horsham	N/A	N/A
Mildura Base Hospital	N/A	N/A
Central Gippsland Health Service - Sale	N/A	N/A
Southwest Healthcare - Warrnambool	N/A	N/A

* The figures for Frankston are not suitable for comparison as a result of incomplete reporting.

In conclusion

The standard of intensive care in Victoria remains high when judged by international standards and when compared with other Australian States and Territories. This occurs in the context of high demand for available resources. The future strategy for the Victorian Intensive Care Data Review Committee will involve continued review and commentary on unit level reports. The Committee will continue to broaden its role to include not only data review, but also to drive other developments in data collection in Victorian ICUs including:

- Review of illness severity scoring systems
- Use of early warning systems such as cumulative sum analysis (CUSUM)
- Instant data access through a web portal
- Data validation
- Further development of the strategy for management of outlier performance

With the availability of an increasingly complete dataset, all of the above activities will become more valuable and useful.

