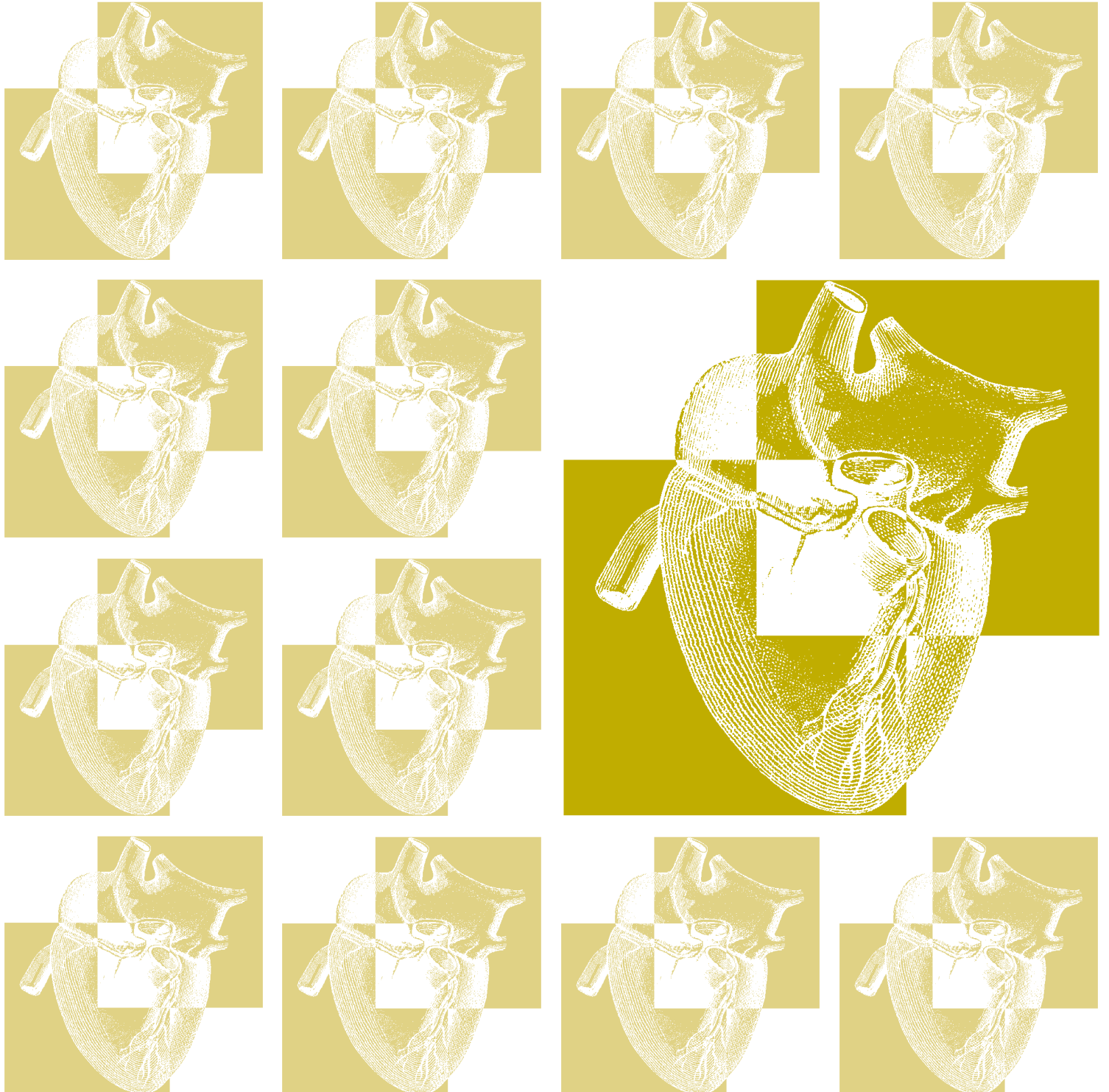


Cardiac surgery in Victorian public hospitals 2005-06

Report to the public



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2005–06**

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and Thoracic Surgeons Database Project Steering Committee

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Foreword

Fourth Annual Report of the Australasian Society of Cardiac and Thoracic Surgeons Database

This report of the Database covers the period from 1st July 2005 to 30th June 2006. Again, it presents a record and analysis of all cardiac surgical procedures performed in the participating units.

As previously, an evaluation of the results of surgeons and units revealed that the accustomed high standards of performance continue.

This data is presented in the format of the previous four reports. In addition, it is now possible to review five years' data. This reveals some trends, which are described in ensuing pages.

Once again, I would like to thank the members of the steering committee, their data managers and the staff of the Baker Heart Research Institute, for their perceptive and persisting contribution.

This database project is pleased to appreciatively acknowledge the Victorian Department of Human Services, for its encouragement, guidance and funding, which initiated and has assured the continuance of this important and pioneering project.

Gil Shardey
Chairman
Steering Committee

Introduction

The Australasian Society of Cardiac and Thoracic Surgeons (ASCTS), together with the Victorian Department of Human Services have developed a program to collect data in reference to, and report on, cardiac (heart) surgery in Victorian hospitals. This is the fifth report of the program. It describes the data from surgery performed in between 1 July 2005 and 30 June 2006 at the six specialist cardiac surgery units that exist within Victorian public hospitals. The hospitals are:

- Austin Hospital
- Geelong Hospital
- Monash Medical Centre – Clayton
- Royal Melbourne Hospital
- St Vincent’s Hospital – Melbourne
- The Alfred Hospital

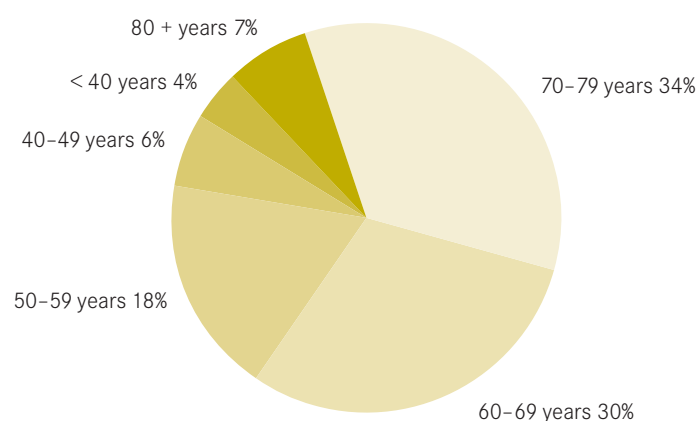
This report provides an overview of the patients who underwent surgery, the types of surgery performed, complications, and other details relating to risk and the outcomes of surgery.

Who received cardiac surgery?

Two thousand seven hundred and ninety-five people underwent cardiac surgery in Victorian public hospitals over the 12 months period from July 2005 to June 2006. Overall, the demographic data in this period is similar to that of the four previous years.

More than four out of five of these patients were aged between 50 and 80 years (as shown in the pie chart below). The average age was 65, and nearly three quarters of the patients (73%) were male.

Figure 1: Age distribution of patients having cardiac surgery in Victorian public hospitals



A number of factors influence the risk of heart disease and surgical complications. Of the people undergoing cardiac surgery, one in eight were current smokers, almost one in three had diabetes, three out of every four had high blood pressure at a level requiring treatment, one in six had had previous heart intervention, and half of those had a previous angioplasty.

The number of patients being admitted to hospital on the day of their operation (rather than a day or two prior) has increased in the past years. Over half the patients were admitted on the day of surgery in 2005–06 compared to just under 50% in the previous years. The percentages are displayed below.

	2002–03	2003–04	2004–05	2005–06
Total number of cases	2,994	3,051	2,735	2,795*
Risk factors	Per cent	Per cent	Per cent	Per cent
Current smoker	11	13	14	13
Diabetes	29	28	29	29
Hypertension (high blood pressure)	70	72	71	71
Cerebrovascular disease (eg. stroke)	12	12	12	12
Peripheral vascular disease	12	13	12	13
Cardiac history				
Previous cardiac intervention	18	18	18	19
This included:				
Previous CABG	5	4	4	4
Previous valve	2	2	2	2
Previous PTCA/stent	9	9	9	11
Previous heart attack/myocardial infarction (MI)	43	46	43	43
This included:				
MI less than 21 days before surgery	15	18	19	19
Congestive heart failure	31	31	30	32
Admission				
Admitted on the day of surgery	45	45	47	52

*2,795 represents the number of patients operated on during the financial year. Five patients had additional operations done and died within 30 days of the first operation. These additional operations are not included in mortality analyses as they are supplementary to the initial surgery.

PTCA = Percutaneous transluminal coronary angioplasty. PTCA involves the use of a balloon tipped catheter to dilate (widen) narrowed arteries. Some of these procedures also involve placing a stent. Stents are wire mesh tubes used to prop open arteries after PTCA.

What operations were done?

The main operations were:

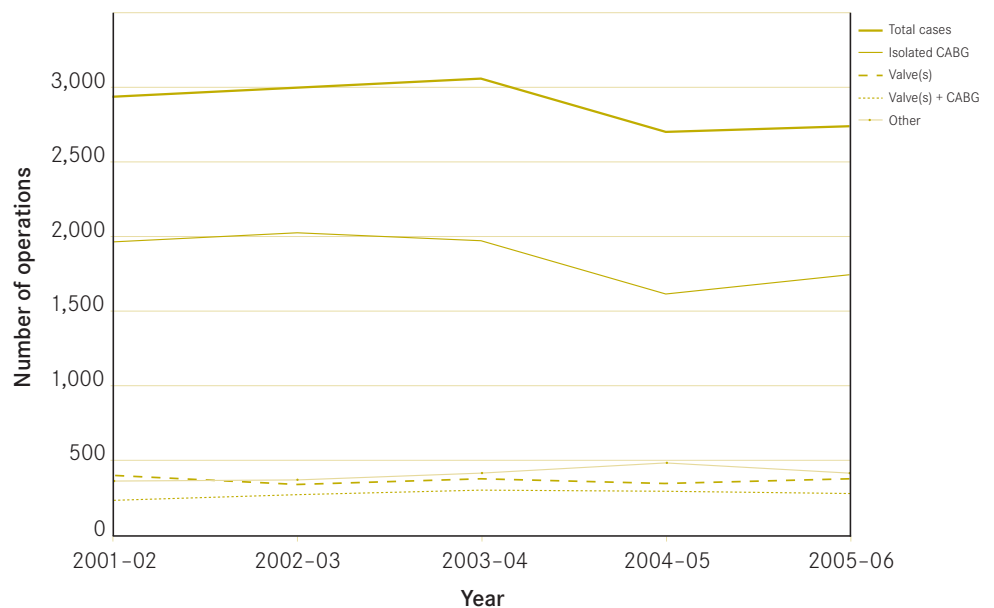
- isolated coronary artery bypass graft surgery – 63 per cent of procedures
- isolated heart valve repair or replacement – 13 per cent
- a combination of these two procedures – 10 per cent

The remaining 14 per cent were less common heart operations.

Coronary artery bypass graft surgery (CABG) is a surgical procedure in which new pathways are created around blocked or narrowed arteries to allow blood to reach the heart muscle again.

A heart valve operation is performed on a valve that is too narrow to allow sufficient blood to flow through the valve opening or on a valve that cannot close tightly enough to prevent blood from flowing in the wrong direction in the heart. Where a valve cannot be repaired, it can be replaced with a substitute valve.

Figure 2: Total cardiac operations in the six Victorian hospitals (2001-06)



How successful was surgery?

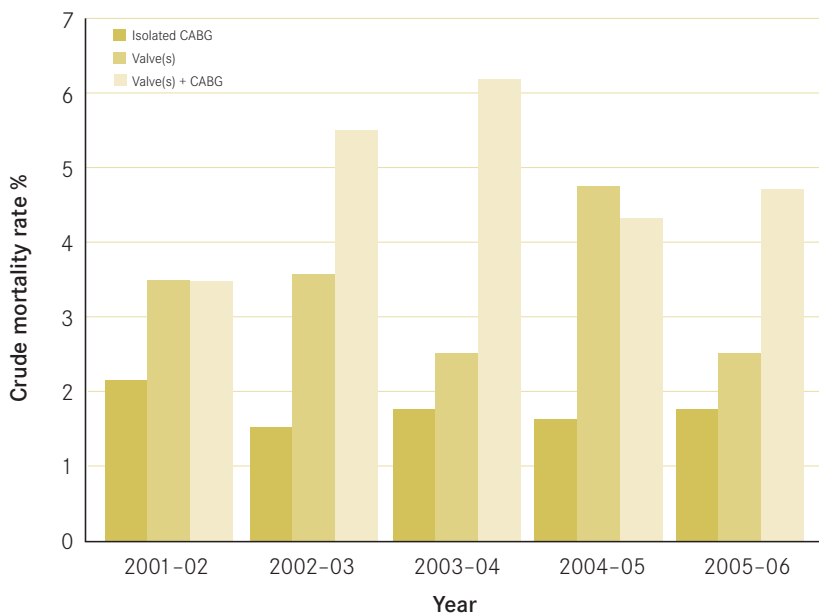
The data collected show that cardiac surgery in Victorian hospitals is very safe by world standards. One measure of success (or lack of it) in the short term is the number of complications and deaths that occur. In both these areas, the Victorian figures were comparable or in some cases lower than those from the United States of America and the United Kingdom.

It must be remembered that people undergoing these operations have a serious heart condition, and their poor health places them at greater risk of complications than people in good health. Older age increases the risk.

Mortality rates following cardiac surgery

The mortality rates (that is, the rate of death associated with the surgery) quoted here cover deaths that occurred within 30 days of surgery. In the patients undergoing isolated CABG surgery, there was about one death for every fifty-six patients in the 30 days after surgery for the year 2005–06. Therefore the mortality rate for isolated CABG surgery is 1.8 per cent; for isolated valve surgery it was 2 per cent; and for the combination of coronary artery bypass graft and valve surgery it was around 4.4 per cent. The overall mortality for isolated coronary artery bypass graft or combination procedure of valve and coronary artery bypass graft has remained unchanged. These mortality rates are illustrated in Figure 3.

Figure 3: Crude mortality rate for different cardiac operations



Factors affecting outcomes of coronary artery bypass graft

The hospitals were required to provide more detailed information on CABG procedures, so the remainder of the report focuses on patients undergoing isolated CABG surgery.

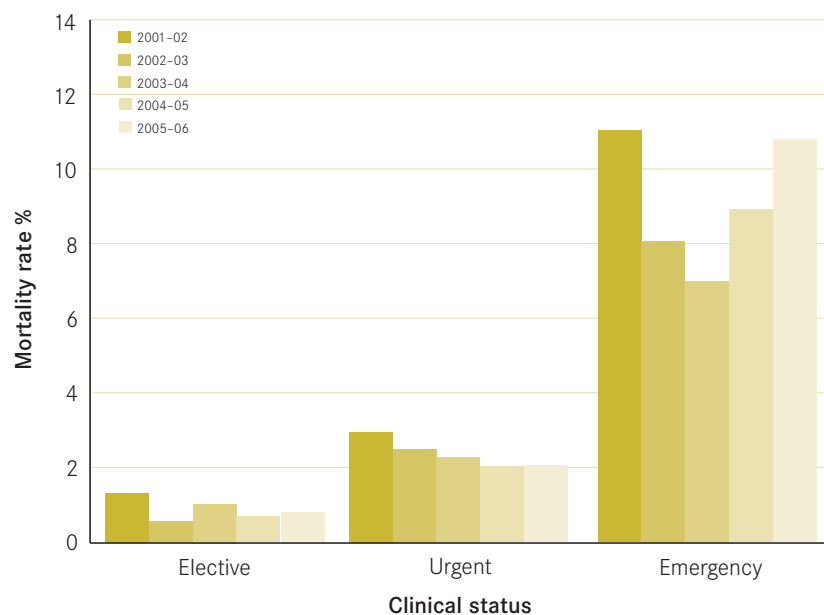
1 Urgency

In general, the more urgent the surgery the higher the risk. This is demonstrated in Figure 4. Ideally, the heart condition will be diagnosed and surgery planned and undertaken before an emergency arises, but this is not always possible. In relation to the people presenting at Victorian public hospitals for cardiac surgery:

- Just over 50% were admitted as an elective patient;
- about 40% were operated on as urgent cases;
- around 5.9% were operated on as an emergency (as soon as possible on the same day as presenting at the hospital).

A very small number of patients were operated on as 'salvage' procedures, that is, an urgent attempt to save the patient's life when a life-threatening event had already occurred.

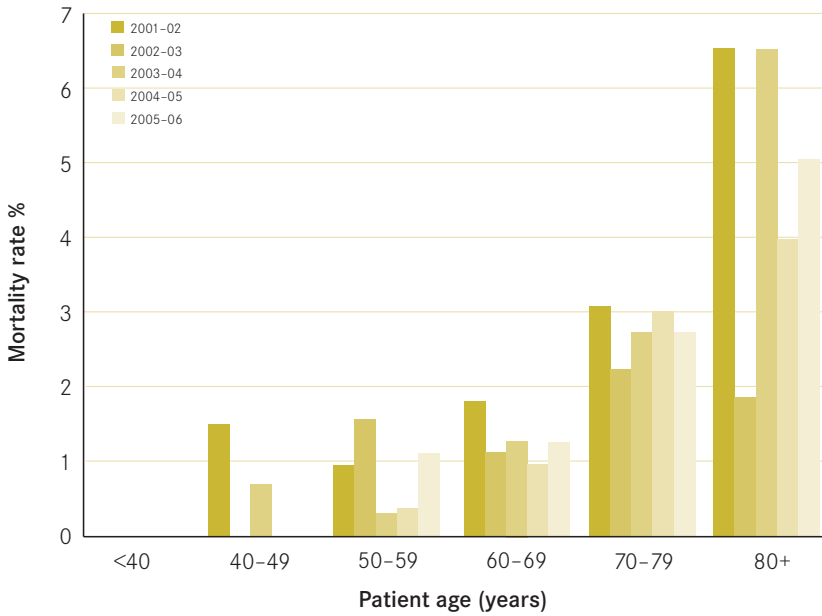
Figure 4: Mortality rate for isolated CABG, in relation to the urgency of surgery



2 Age

Older patients are at greater risk of complications and death. Figure 5 shows the mortality rates for people undergoing isolated CABG surgery as an elective procedure. There is a clear increase in mortality rates with increasing age. Even so, for people over 80 years the death rate was as low as 5 per cent - that is 1 in 20 people in the 2005-06 period.

Figure 5: Mortality rate for elective isolated CABG, in relation to patient age



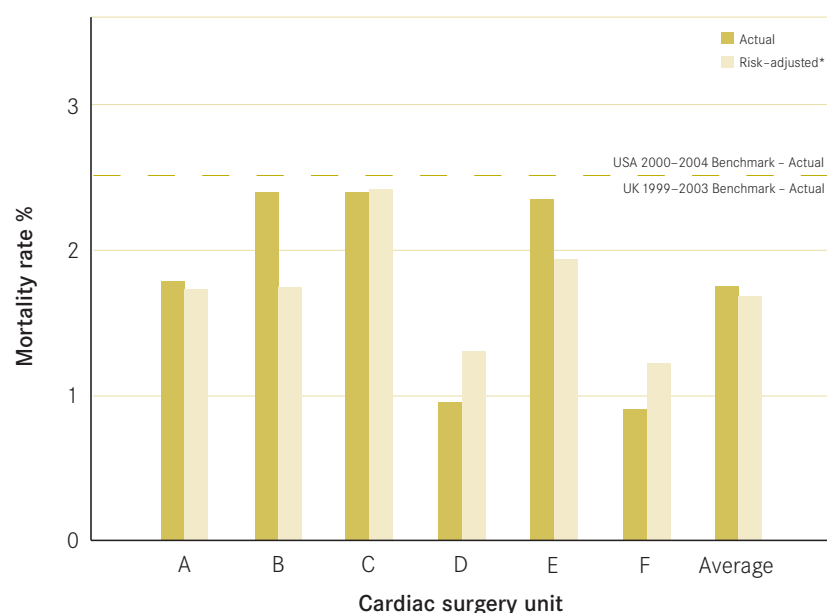
Do figures differ among hospitals?

As discussed above, over the 30 days following isolated CABG surgery, the average mortality rate in Victorian public hospitals is below that reported by the United Kingdom (UK) and the United States of America (USA).

In 2005–06 five of the Victorian cardiac surgery units had a mortality rate below the rate for the USA, and either at or below the rate for the UK. Though there are variations between the figures for the different units, the differences are very small and within the range of variation that might be expected. In statistical terms, the differences are not significant (that can be due purely to chance), as the outcome for all hospitals fell within 3 standard deviations of the mean.

Figure 6 includes data from the period 2001–06 for both ‘actual mortality’ and ‘risk-adjusted mortality’. The degree of risk associated with having the operation varies widely for patients who undergo cardiac surgery. As shown previously, older patients and those undergoing emergency procedures are more likely to have a poor outcome than younger patients having planned operations. There are a large number of other factors that can also increase a patient’s individual risk. Different hospitals vary in terms of the type of patients that they care for, and the types of procedures that are performed. This can be due to the location of the hospital, or the specific services the hospital provides. The hospital that has the sickest patients might be expected to have the highest mortality rate. It is therefore unfair to compare hospitals based on the total number of deaths. Risk-adjusted mortality is calculated by taking into account the individual risk of each patient having surgery so that a fair comparison can be made between hospitals.

Figure 6: Mortality rate within 30 days following isolated CABG surgery (2001-06)

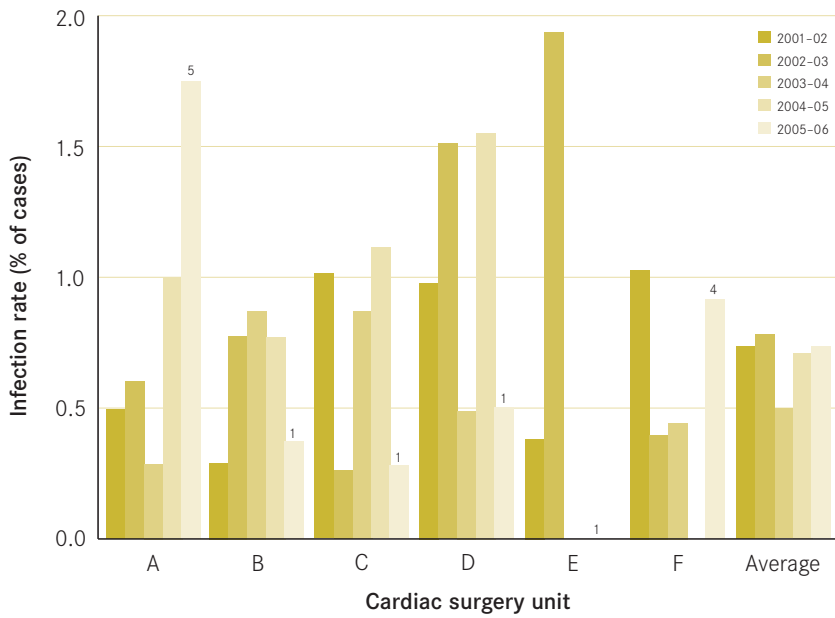


*Risk-adjusted using the AusScore Model

Complications of surgery

Deep sternal infection is a rare but serious complication of coronary artery bypass graft surgery. The average for Victorian cardiac surgery units is 0.7 per cent. This means that during 2005-06 between zero and five patients were affected at each hospital with a total number of 12 patients.

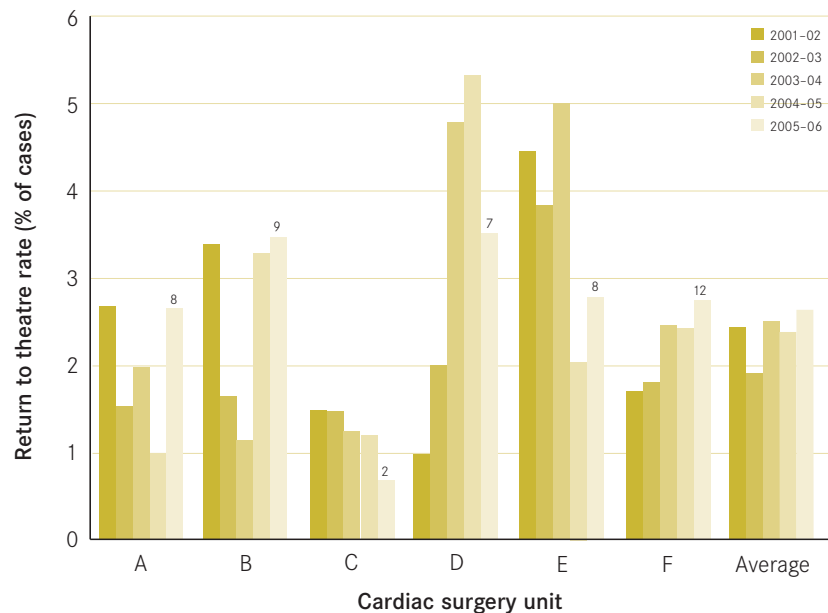
Figure 7: Deep sternal infections within 30 days following isolated CABG surgery.



Another complication that can occur is bleeding (post-operative haemorrhage) which requires the patient to return to the operating theatre. This complication is not as serious as deep sternal infection, but is more common. Nevertheless, the number of patients affected during 2005-06 was low (46 out of just over 1800 patients undergoing isolated CABG, which is an average of just 2.6 per cent).

All units had very low rates of both complications and there were no significant differences in complication rates between cardiac surgery units.

Figure 8: Return to theatre for bleeding within 30 days following isolated CABG surgery



Length of stay and mechanical ventilation

Immediately following cardiac surgery, most patients need 'mechanical ventilation' – that is, equipment to support and assist their breathing. The length of time a patient needs this depends on the extent and complexity of the cardiac surgery undertaken, the patient's age and the presence of obesity or pre-existing respiratory disease.

Patients will usually spend a period of time in the intensive care unit (ICU) following their procedure. The length of time a patient spends in the intensive care unit also depends on their condition. The most common reason for an extended period in intensive care unit is the need for a longer than usual period of time on mechanical ventilation.

During 2005-06 the average ventilation time following a CABG procedure was 10 hours while the average length of stay in ICU was 23 hours. These times are consistent with previous years.

Figure 9: Median time (in hours) on mechanical ventilation after isolated CABG

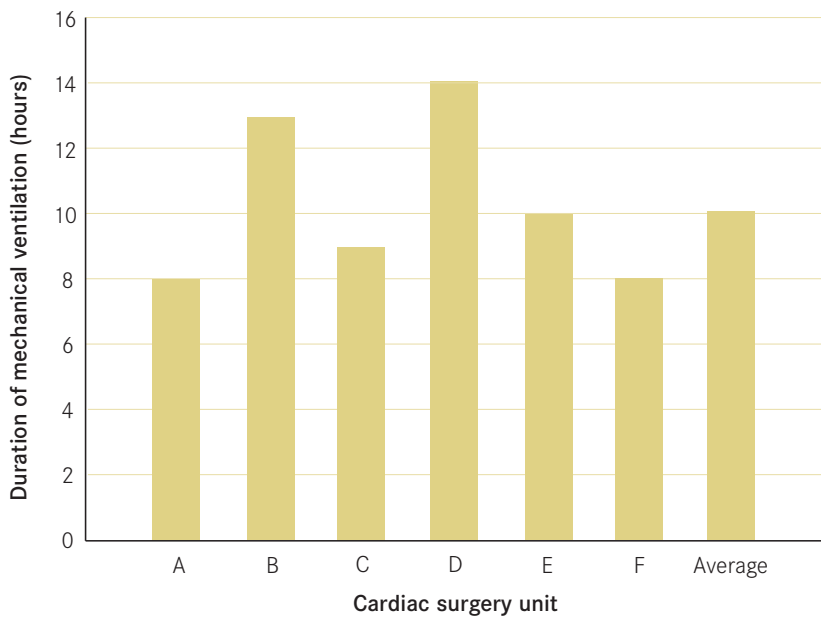
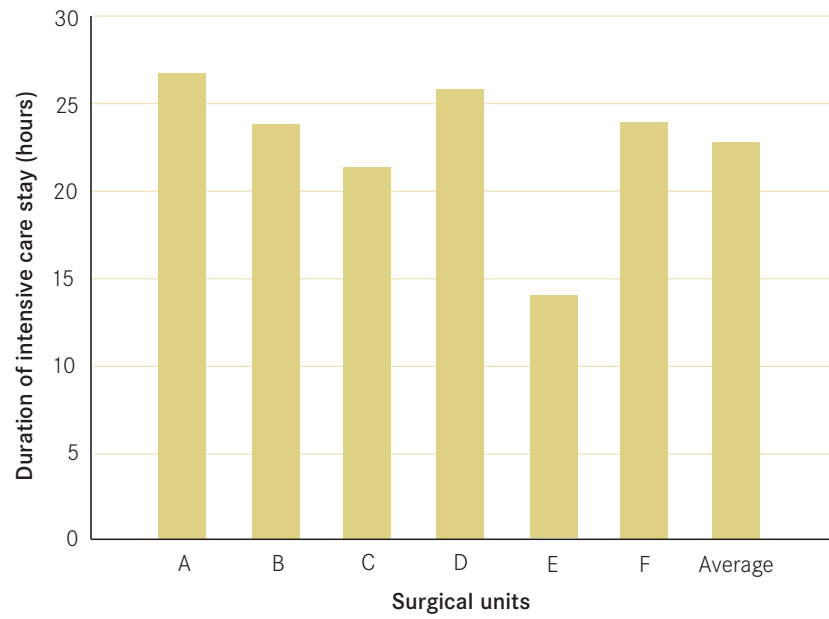


Figure 10: Median time (in hours) in the ICU after isolated CABG

Summary

Over the last five years, cardiac surgery in all of Victoria's public hospitals remains consistent and is as safe, or safer, than in hospitals overseas. There are no significant differences for any of the outcomes between hospitals, or from year to year. It is expected that the continued monitoring of cardiac surgery in Victoria will maintain this high standard and possibly result in further improvements in the quality and outcome of care in Victorian patients undergoing cardiac surgery operations in the public hospital system.

