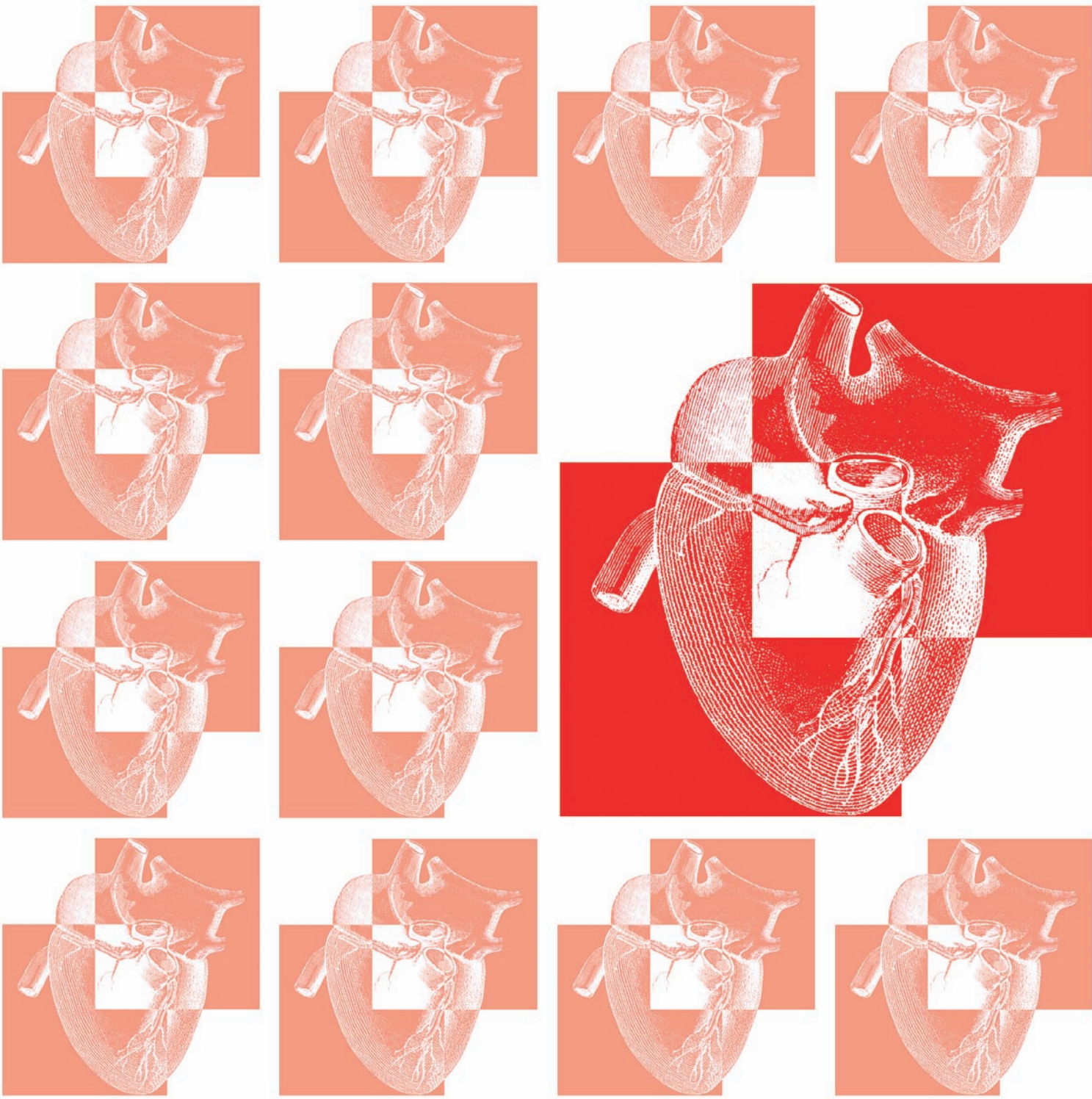


Cardiac surgery in Victorian public hospitals 2003–04

Report to the public



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2003–04**

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on behalf of the Australian Society of Cardiac
and Thoracic Surgeons Database Project Steering Committee

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Introduction

The Australasian Society of Cardiac and Thoracic Surgeons and the Victorian Department of Human Services have developed a program to collect data and to report on cardiac (heart) surgery in Victorian hospitals. This is the third report of the program. It describes the data from surgery performed between 1 July 2003 and 30 June 2004 at the six specialist cardiac surgery units in Victorian public hospitals. The hospitals are:

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

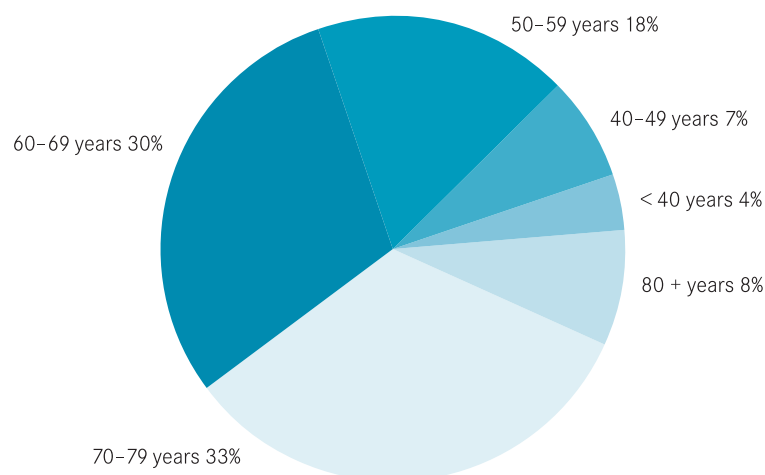
This report provides an overview of the patients who underwent surgery, the types of surgery performed, complications, and other details relating to risk and the outcomes of surgery.

Who received cardiac surgery?

More than 3,000 people underwent cardiac surgery in Victorian public hospitals during the 12 months from July 2003 to June 2004. Overall, the demographic data in this period are similar to those of the two 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 years, and nearly three quarters of the patients (73 per cent) were male.

Figure 1: Age distribution of patients having cardiac surgery in Victorian public hospitals during 2003–04



A number of factors place people at higher than average risk of heart disease and surgical complications. Of the people undergoing cardiac surgery in 2003–04, 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 two years. Nearly half the patients were admitted on the day of surgery in 2002–03 and 2003–04 compared with slightly more than a third in 2001–02. The percentages are shown below.

	2001–02	2002–03	2003–04
Total number of cases	2,931*	2,994**	3,051
Risk factors	Per cent	Per cent	Per cent
Current smoker	12	11	13
Diabetes	27	29	28
Hypertension (high blood pressure)	66	70	72
Cerebrovascular disease (eg. stroke)	11	12	12
Peripheral vascular disease	12	12	13
Cardiac history			
Previous cardiac intervention	17	18	18
Including:			
Previous coronary artery bypass graft surgery	5	5	4
Previous valve	2	2	2
Previous PTCA/stent	9	9	9
Previous heart attack/Myocardial infarction (MI)	42	43	46
Including:			
MI less than 21 days before surgery	13	15	18
Previous congestive heart failure	28	31	31
Admission			
Admitted on the day of surgery	40	51	51

*This data set is for the financial year 1 July 2001 to 30 June 2002. Any discrepancies between the data presented in this report and the Annual Report 2001–02 arise from the initial report including data from 1 July 2001 to 1 August 2002.

**In the current report, all cases are listed in the total number. In previous reports, those cases with missing procedure type, status of procedure and gender were not listed.

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:

- coronary artery bypass graft surgery alone: 65 per cent of procedures
- heart valve repair or replacement alone: 12 per cent of procedures
- a combination of these two procedures: 10 per cent of procedures.

The remaining 13 per cent of procedures comprised less common heart operations.

A coronary artery bypass graft 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.

How successful was surgery?

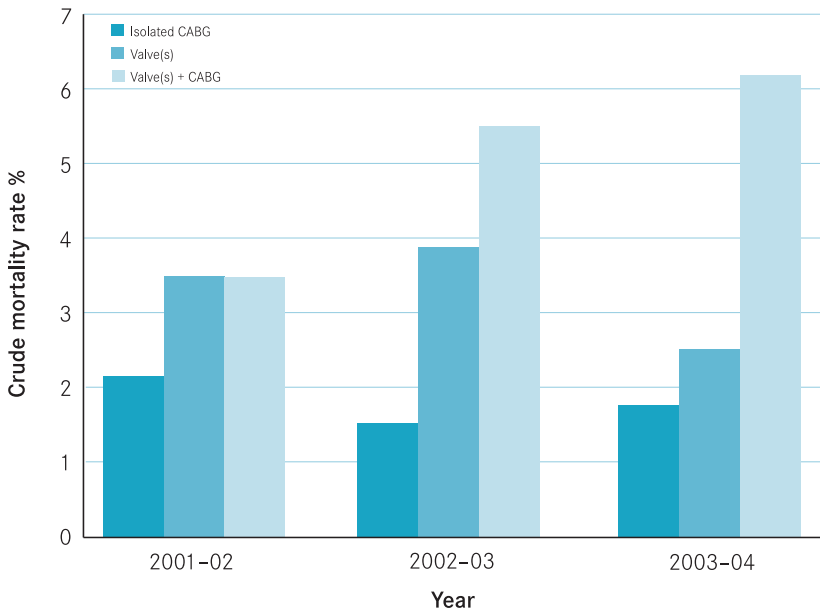
The data collected show that cardiac surgery in Victorian hospitals is very safe by world standards. One measure of success (or lack of it) in the short term is the number of complications and deaths that occur. In both these areas, the Victorian figures were comparable to, or in some cases lower than,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

The mortality rates (that is, the rates of death associated with the surgery) quoted here cover deaths that occurred in the 30 days after surgery. In the Victorian hospitals among patients undergoing coronary artery bypass graft alone, there was about one death for every 56 patients in the 30 days after surgery for the year 2003–04. Therefore the mortality rate for coronary artery bypass graft surgery alone is 1.8 per cent; for valve surgery alone it was 2.5 per cent; and for the combination of coronary artery bypass graft and valve surgery it was around 6 per cent. The overall mortality for isolated coronary artery bypass graft or valve surgery has remained unchanged. The combination procedure of valve and coronary artery bypass graft surgery shows an increasing trend, reflecting the increasing age of these patients. These mortality rates are illustrated in Figure 2.

Figure 2: Crude mortality rate for different cardiac operations in the six Victorian public hospitals



Factors affecting outcomes of coronary artery bypass graft (CABG) surgery

The hospitals were required to provide more detailed information on coronary artery bypass graft procedures, so the remainder of the report focuses on patients undergoing coronary artery bypass graft alone.

1 Urgency

The more urgent the surgery, generally the higher the risk. 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, Figure 3 illustrates that:

- about 60 per cent were admitted as elective patients
- nearly one-third were operated on as urgent cases
- around one in 25 was operated on as an emergency (as soon as possible on the same day as presenting at the hospital)
- a very small number of patients' operations were 'salvage' procedures; that is, an urgent attempt to save the patient's life when a life-threatening event had already occurred.

Figure 3: The urgency of surgery for patients undergoing CABG alone

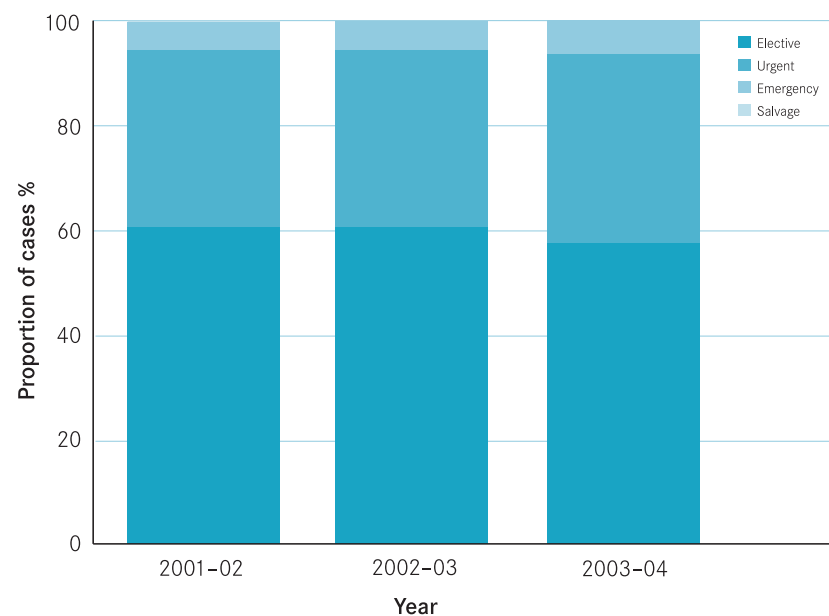
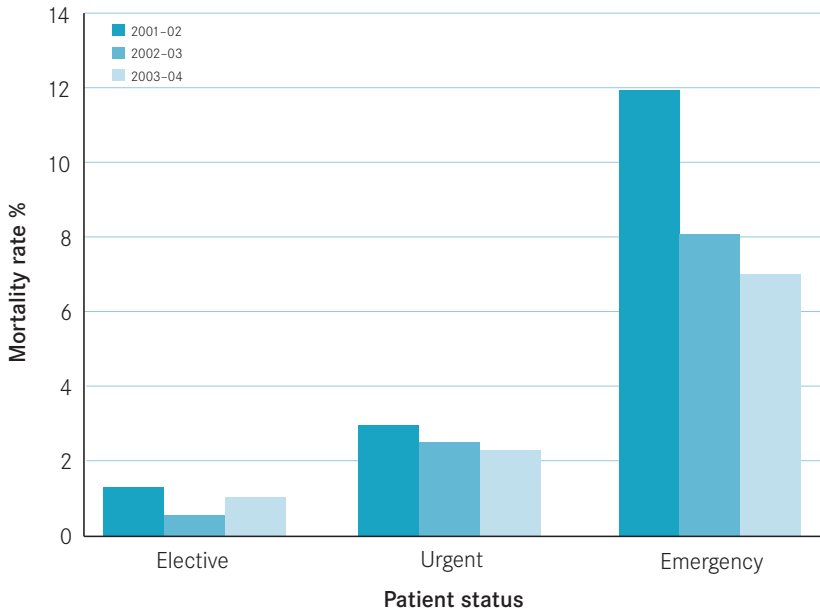


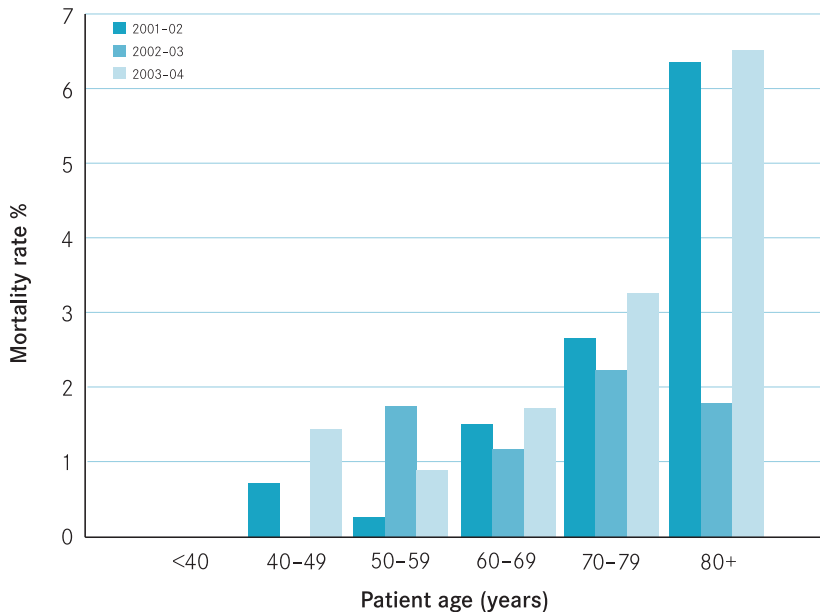
Figure 4: Mortality rate for CABG alone, in relation to the urgency of surgery



2 Age

Older patients are at greater risk of complications and death. Figure 5 shows the mortality rates for people undergoing coronary artery bypass graft alone as an elective procedure. There is a clear increase in rates with increasing age. Even so, for people over 80 years, the death rate was as low as 5 per cent—that is, one in 20 people in the 2003–04 period.

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

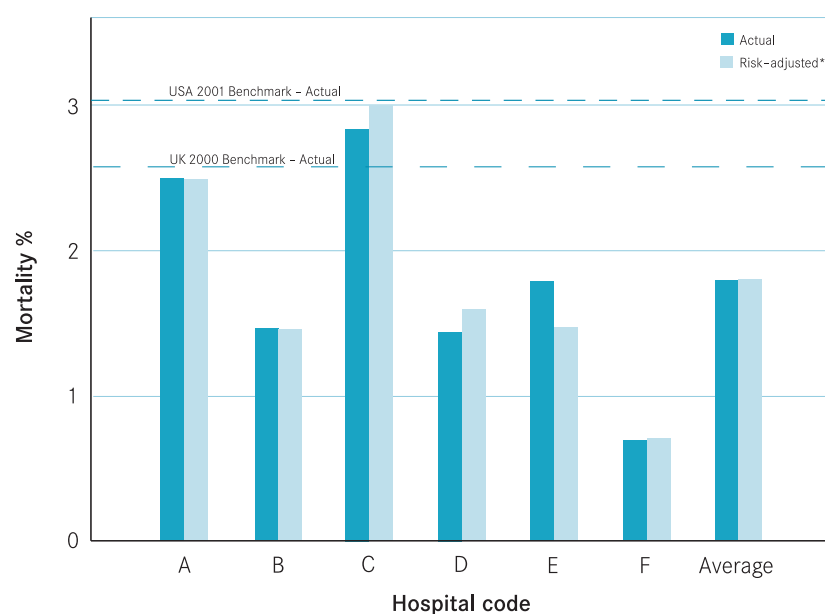


Do figures differ among hospitals?

As discussed, over the 30 days following coronary artery bypass graft alone, the average mortality rate in Victorian public hospitals is below that reported by the United Kingdom and the United States of America. All Victorian cardiac surgery units had a mortality rate below the rate for the United States of America and either at or below the rate for the United Kingdom. Although there are variations among 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 is, can be due purely to chance) because all hospitals fell within three standard deviations of the mean.

Figure 6 includes 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 previously shown, older patients and those undergoing emergency procedures are more likely to have a poor outcome than younger patients having planned operations. There are many other factors that can increase a patient’s individual risk. Hospitals vary in the type of patients they care for and the types of procedures they perform. This can be a result of either the hospital’s location or the specific services it 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 CABG alone for the six Victorian public hospital cardiac surgery units during 2003–04

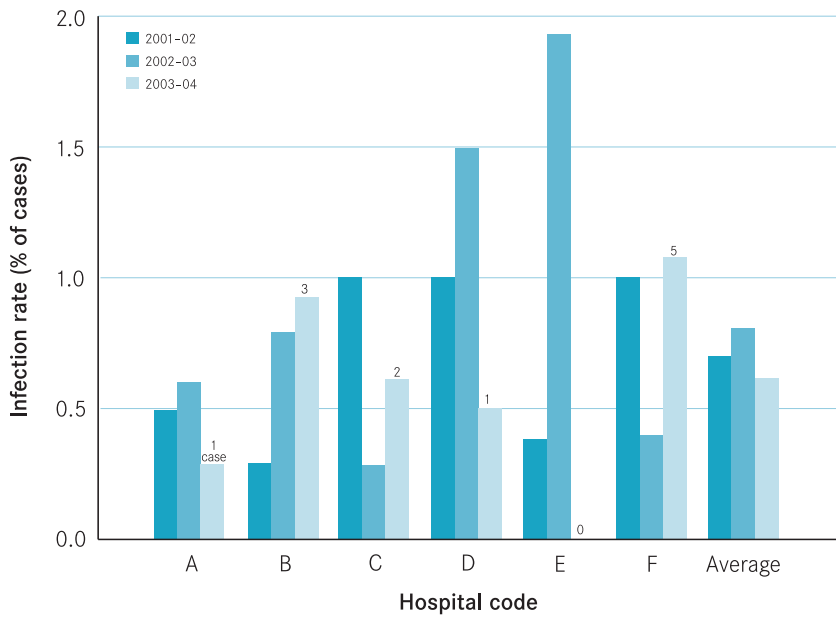


*Risk-adjusted using the Euroscore Model

Complications of surgery

Deep sternal infection is a serious but rare complication of coronary artery bypass graft surgery. The average annual incidence for Victorian cardiac surgery units is 0.6 per cent. This means that during 2003–04 between zero and five patients were affected at each hospital, and a total number of 12 patients overall.

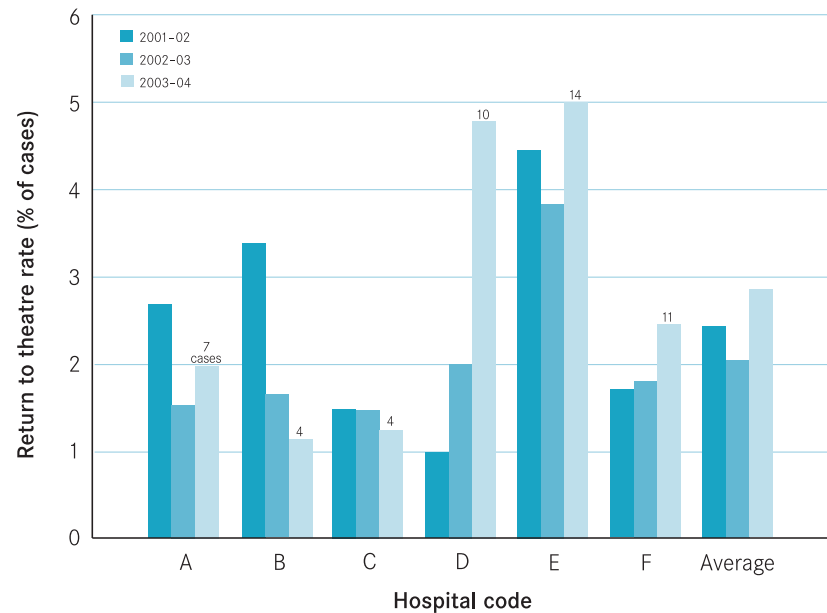
Figure 7: Deep sternal infections within 30 days following CABG, for the six Victorian public hospital cardiac surgery units



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 and is more common. Nevertheless, the number of patients affected during 2003-04 was low (50 out of just under 2,000 patients undergoing coronary artery bypass graft alone, which is an average of 2.5 per cent).

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

Figure 8: Return to theatre for bleeding within 30 days following CABG alone for the six Victorian public hospital cardiac surgery units



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 after 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 the intensive care unit is the need for a longer than usual period of time on mechanical ventilation.

Figure 9: Median time (in hours) on mechanical ventilation after CABG alone, 2003–04

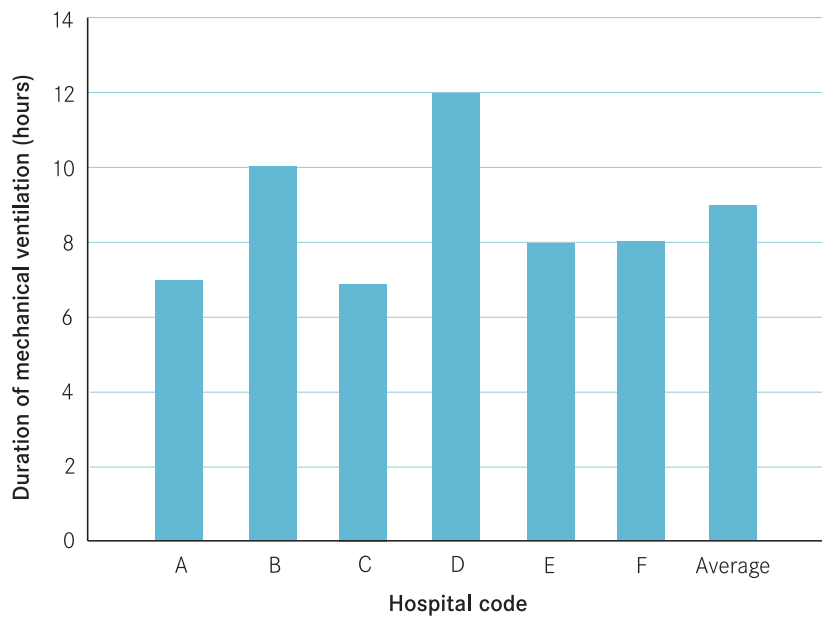
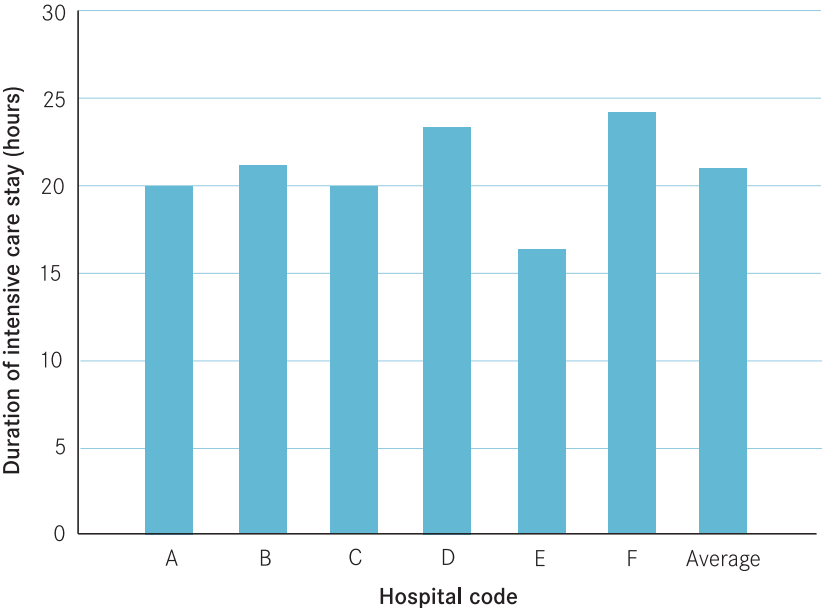


Figure 10: Median time (in hours) in the intensive care unit after CABG alone, 2003-04



Summary

Over the past three years, cardiac surgery in all of Victoria's public hospitals has remained consistent and as safe or safer than it is in overseas hospitals. There are no significant differences in any of the outcomes among 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 for Victorian patients undergoing cardiac surgery in the public hospital system.

