

**Cardiac surgery in Victorian public hospitals
2004–05**

Report to the public

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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 2004 to 30th June 2005. 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 two reports. In addition, it is now possible to review four years' data. This reveals some trends, which are described in ensuing pages.

During the past year, the Database dataset and definitions were extensively reviewed and revised by the committee. They were applied in this reporting period. This necessitated an upgrade of the reporting software.

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

This database project is pleased to appreciatively acknowledge the Department of Health Services Victoria, 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 fourth report of the program. It describes the data from surgery performed in between 1 July 2004 and 30 June 2005 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

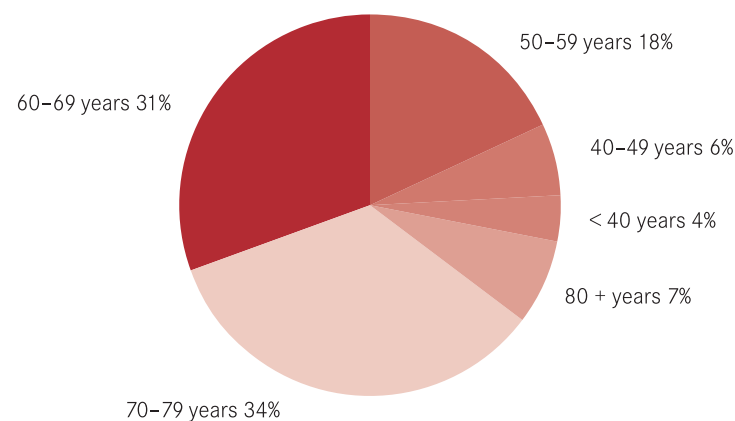
This report provides an overview of the patients who underwent surgery, the types of surgery performed, complications, and other details relating to risk and the outcomes of surgery.

Who received cardiac surgery?

Two thousand seven hundred and thirty five people underwent cardiac surgery in Victorian public hospitals over the 12 months period from July 2004 to June 2005. This represents an approximate 10 per cent reduction over the average of the previous three years. Overall, the demographic data in this period is similar to that of the three 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 (72 per cent) were male.

Figure 1: Age distribution of patients having cardiac surgery in Victorian public hospitals (2004–05)



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 three years. Over half the patients were admitted on the day of surgery in 2002-03, 2003-04 and 2004-05 compared to slightly more than a third in 2001-02. The percentages are displayed below.

	2001-02	2002-03	2003-04	2004-05
Total number of cases	2,931	2,994	3,051	2,735*
Risk factors	Per cent	Per cent	Per cent	Per cent
Current smoker	12	11	13	14
Diabetes	27	29	28	29
Hypertension (high blood pressure)	66	70	72	71
Cerebrovascular disease (eg. stroke)	11	12	12	12
Peripheral vascular disease	12	12	13	12
Cardiac history				
Previous cardiac intervention	17	18	18	18
Including:				
Previous coronary artery bypass graft surgery	5	5	4	4
Previous valve	2	2	2	2
Previous PTCA/stent	9	9	9	9
Previous heart attack/Myocardial infarction (MI)	42	43	46	43
Including:				
MI less than 21 days before surgery	13	15	18	19
Previous congestive heart failure	28	31	31	30
Admission				
Admitted on the day of surgery	40	51	51	54

*2735 represents the number of procedures conducted during 2004-05. Six additional procedures were conducted on patients who died within 30 days of the first operation. These additional procedures are not included in mortality analyses as they are supplementary to the initial procedure.

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– 60 per cent of procedures
- isolated heart valve repair or replacement– 12 per cent
- a combination of these two procedures – 11 per cent.

The remaining 17 per cent were 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?

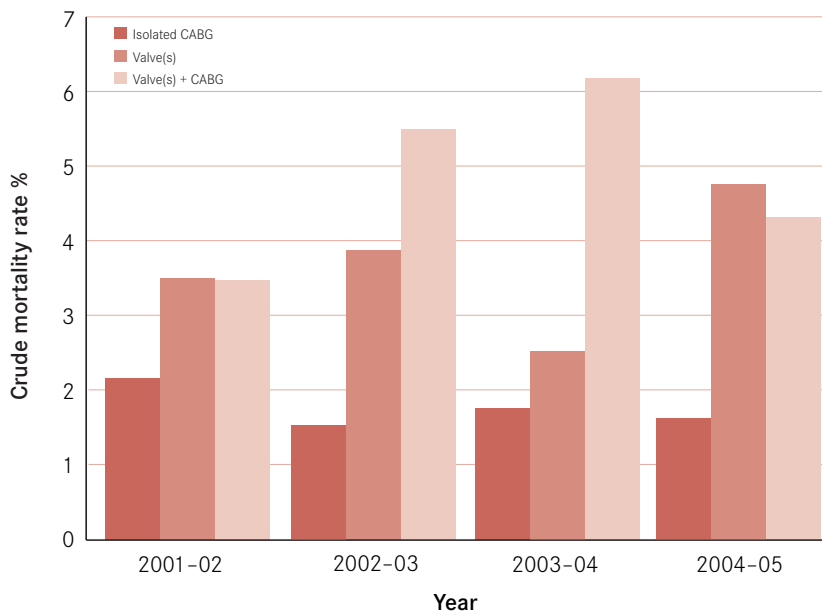
The data collected show that cardiac surgery in Victorian hospitals is very safe by world standards. One measure of success (or lack of it) in the short term is the number of complications and deaths that occur. In both these areas, the Victorian figures were comparable or in some cases lower than those 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 sixty-three patients in the 30 days after surgery for the year 2004–05. Therefore the mortality rate for isolated CABG surgery is 1.6 per cent; for isolated valve surgery it was 4.9 per cent; and for the combination of coronary artery bypass graft and valve surgery it was around 4.3 per cent. The overall mortality for isolated coronary artery bypass graft or combination procedure of valve and coronary artery bypass graft has remained unchanged. The mortality rate for isolated valve surgery has increased slightly, reflecting the increasing age of these patients. These mortality rates are illustrated in Figure 2.

Figure 2: 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 coronary artery bypass graft procedures, so the remainder of the report focuses on patients undergoing isolated CABG surgery.

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:

- one in two was admitted as an elective patient;
- about 40 per cent were operated on as urgent cases;
- around one in twenty five 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 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 3: The urgency of surgery for patients undergoing isolated CABG surgery

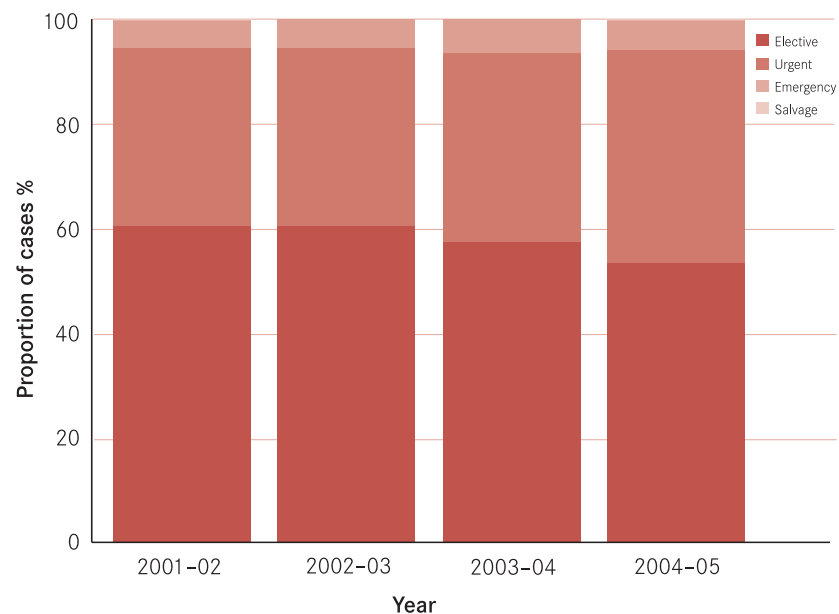
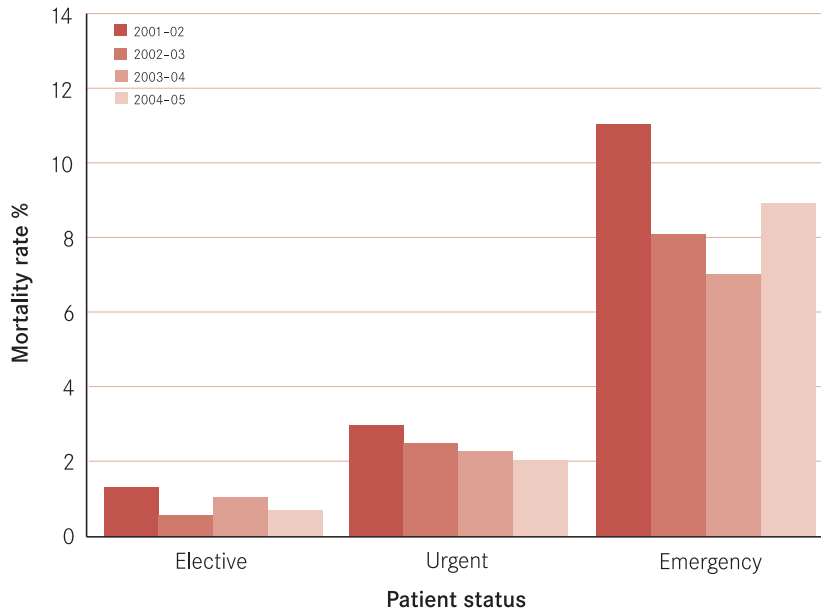


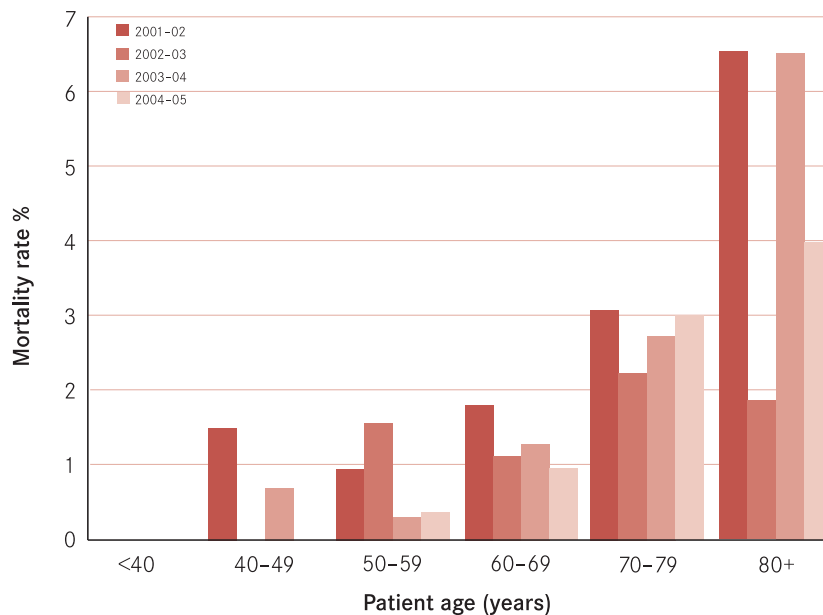
Figure 4: Mortality rate for isolated CABG, in relation to the urgency of surgery



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 4 per cent - that is 1 in 25 people in the 2004-05 period.

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

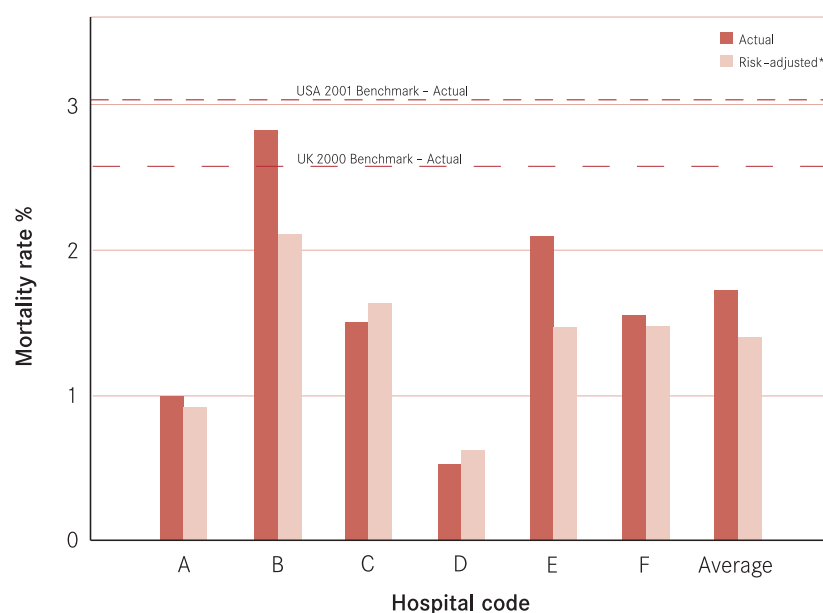


Do figures differ among hospitals?

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 States of America and United Kingdom. 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. 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 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 isolated CABG surgery (2004-05)

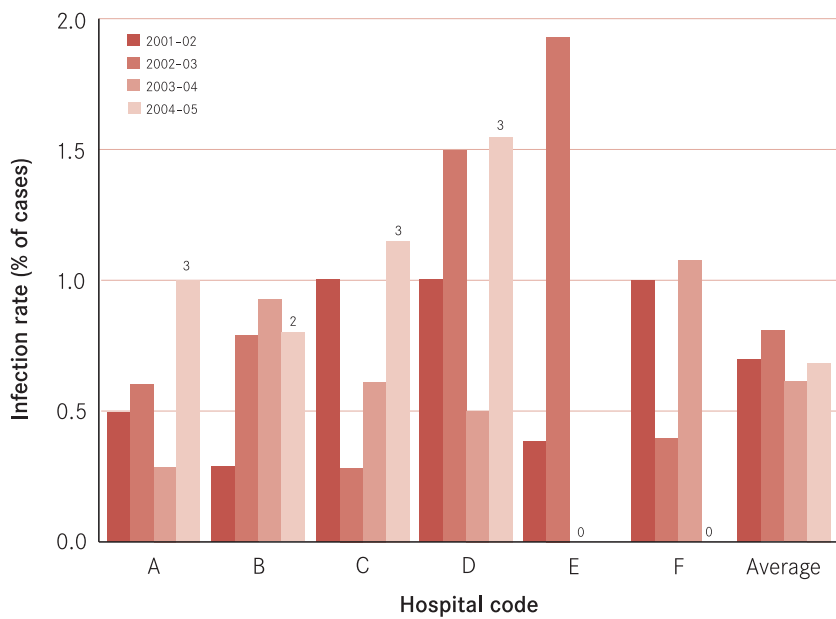


*Risk-adjusted using the Aus-score Model

Complications of surgery

Deep sternal infection is a serious but rare complication of coronary artery bypass graft surgery. The average for Victorian cardiac surgery units is 0.7 per cent. This means that during 2004-05 between zero and three patients were affected at each hospital with a total number of 11 patients.

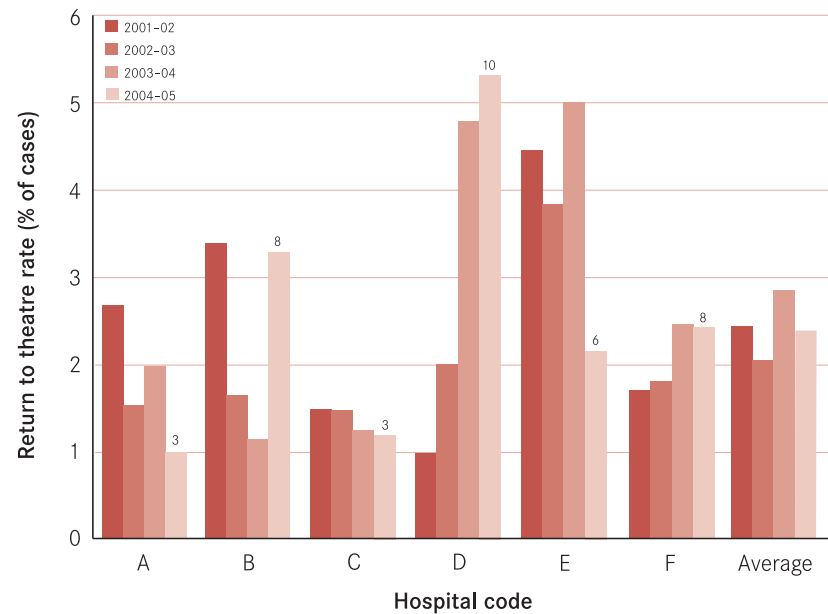
Figure 7: Deep sternal infections within 30 days following isolated CABG surgery.



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 2004-05 was low (38 out of just over 1500 patients undergoing isolated CABG, which is an average of just 2.3 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 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.

Figure 9: Median time (in hours) on mechanical ventilation after CABG (2004-05)

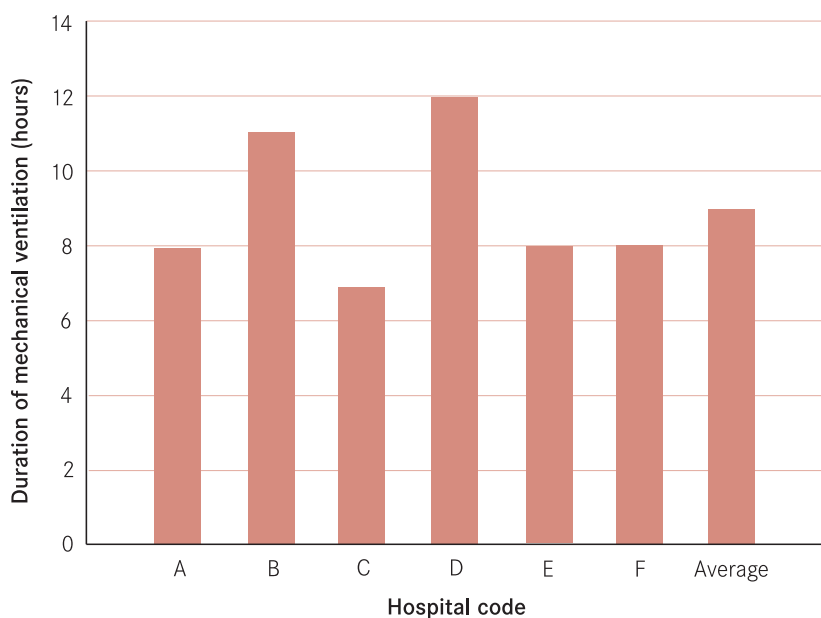
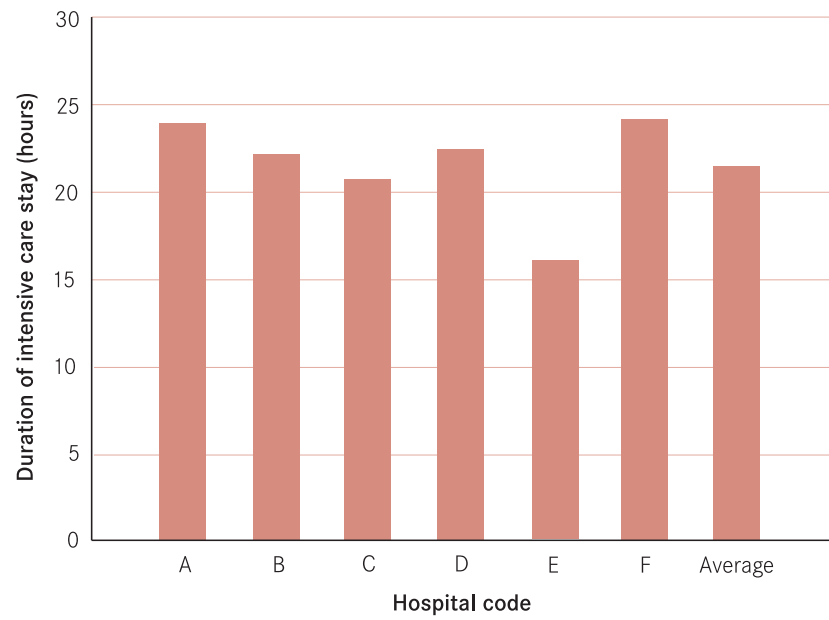


Figure 10: Median time (in hours) in the intensive care unit after isolated CABG (2004-05)



Summary

Over the last four 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.

