

Key messages

Cardiology services



Prepared for the Auditor General for Scotland
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Auditor General for Scotland

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Key messages

Background

1. Coronary heart disease (CHD) is a preventable disease which killed over 8,000 people in Scotland in 2010 (around 15 per cent of all deaths).^{1,2} It is the second highest cause of death in Scotland after cancer. Deaths from all types of heart disease, such as heart attack, angina and heart failure, have reduced by around 40 per cent over the last ten years.³ Rates of heart disease in Scotland are the highest in Western Europe and are higher for men, some ethnic groups and people living in deprived areas. An estimated 3.3 per cent of the population has CHD (over 182,000 people).⁴

2. Cardiology is a large hospital specialty that treats people with heart disease.⁵ It is an area of high activity and spending. In 2009/10, there were 39,000 discharges from Cardiology wards, 10,300 day cases and 120,900 outpatient appointments.⁶ However, most patients with heart disease are not admitted to a Cardiology ward and there were a total of 90,800 inpatient discharges for patients with heart disease from wards, including General Medicine and Geriatric Medicine.⁷

3. Reported spending on hospital Cardiology services has been steadily increasing over recent years, from around £80 million in 2002/03 to around £146 million in 2010/11. This represents around a 50 per cent increase in real terms.⁸ However, spending on Cardiology is an under-

estimate as not all relevant costs are recorded under the Cardiology specialty. Some NHS boards include some or all of their costs under General Medicine. In addition, Cardiology staff are involved in caring for patients treated in other wards and this is not included in Cardiology costs.

Our audit

4. We looked at how effectively the NHS in Scotland manages Cardiology services, how much is spent and whether patients across Scotland have the same access to services. We also assessed whether there is scope to improve the efficiency of Cardiology services by comparing activity across Scotland and identifying areas of good practice where efficiencies have been made. It is however difficult to assess value for money across all aspects of Cardiology services as NHS boards have different ways of providing services and because of inconsistencies in how NHS boards record activity and costs.

5. Our report focuses on Cardiology services provided in hospitals including those provided by the Golden Jubilee National Hospital.⁹ In addition to Cardiology activity we looked at all hospital activity for heart disease patients being looked after in other wards. We did not look in detail at the work of other services that provide a lot of care for patients with heart disease, such as Cardiac Surgery, General Medicine and the

Scottish Ambulance Service, but we examined some issues to do with how hospital Cardiology services work with these services. We also looked at some examples of activity and prevention work that take place in the community, mostly through GPs and their teams.

6. During the audit we:

- analysed available information on Cardiology activity and costs
- interviewed staff at three NHS boards (Fife, Greater Glasgow and Clyde, and Highland), the Golden Jubilee National Hospital, Information Services Division (ISD) Scotland, National Procurement, the Scottish Ambulance Service, the Scottish Cardiology Society and the Scottish Government¹⁰
- carried out patient focus groups (a separate report is available on our website).

7. We have tried to minimise the use of technical terms but [Exhibit 1 in the main report](#) provides a summary of some of the main terms and a Glossary is included in [Appendix 1 in the main report](#).

8. Healthcare Improvement Scotland carried out a review of NHS boards' performance against its clinical standards for heart disease and published local reports for NHS boards and an overview report in September 2011.^{11,12} This was the

1 CHD is caused by narrowing of the coronary artery which means there is not enough circulation to heart muscle and surrounding tissue and can lead to a heart attack, angina or sudden death. Heart disease is a more general term that includes all heart disease, so in addition to CHD, it includes conditions such as heart failure, abnormal heart rhythms, and congenital and hereditary heart disease.

2 *Registration data*, National Records of Scotland, 2011.

3 *Age-sex standardised rates from Heart Disease Table MC1*, ISD Scotland, November 2011.

4 *Heart Disease Table PV1*, ISD Scotland, February 2011.

5 A hospital specialty covers a specific area of activity such as Dermatology and General Medicine. NHS staff working in specialties have specialist knowledge of the clinical area and usually work in a ward or outpatient clinic dedicated to that specialty.

6 ISD Scotland measures activity in hospital wards by inpatient discharges which is the point that marks the end of stay in a ward. A day case is when a patient goes into hospital for treatment and leaves on the same day.

7 *Number of discharges (Episodes) to specialty SMR01 and Outpatient and A&E summary SMR00*, ISD Scotland, December 2010

8 Cost data for Cardiology as a separate specialty are only available from 2002/03. These include costs for paediatric Cardiology services and Coronary Care Units (CCU) which treat people with serious heart conditions who need special care, for example people who have had a heart attack.

9 The Golden Jubilee National Hospital is part of the NHS National Waiting Times Centre.

10 ISD Scotland and National Procurement are part of NHS National Services Scotland.

11 *Heart disease improvement programme: National Overview – Take Heart*, Healthcare Improvement Scotland, September 2011.

12 *Heart disease improvement programme: Summary Local Reports – NHS Scotland*, Healthcare Improvement Scotland, September 2011

first large-scale review to measure performance against clinical standards and national guidelines for heart disease in Scotland. We have made use of these findings in our report.

Key messages

1 More people in Scotland are surviving heart disease with death rates falling by around 40 per cent over the last decade. Waiting times for the two main Cardiology procedures have also gone down.

9. Over the last decade, the NHS in Scotland has made a number of improvements for heart disease patients. Death rates from all heart disease have fallen by around 40 per cent over the last 11 years (from 216.8 to 129 deaths per 100,000 population) and deaths from heart attack have fallen by almost 50 per cent (from 104.7 to 55.7 deaths per 100,000 population) (Exhibit 1). Death rates are higher for men, people aged 75 and over and people living in the most deprived areas.¹³

10. Rates of new cases of CHD have also been decreasing over the past decade, falling by almost a third over the period 2000/01 to 2009/10.¹⁴ Over the same period, the rates of heart attacks decreased by 45 per cent (7,326 to 4,577 heart attacks).¹⁵ The percentage of people who are still alive 30 days after emergency admission to hospital improved between 2000/01 and 2009/10, from 83.1 to 89 per cent for patients who had a heart attack, and from 82.4 to 85.5 per cent for patients with heart failure.¹⁶ (See paragraphs 24 to 30 in the main report.)

Exhibit 1

Death rates for all heart disease per 100,000 population, Scotland, 2000–10

Death rates for all heart disease in Scotland have been steadily decreasing over the last ten years.



Source: Table MC1: Trends in mortality 2000–10, Registrar General for Scotland, Death Records, ISD Scotland, November 2011

11. The Scottish Government set a national target for patients with heart disease that they should wait no longer than 16 weeks for treatment from the time they are referred to a rapid access chest pain clinic (RACPC), or after they have been seen in an outpatient clinic by a heart specialist who has recommended treatment. However, due to a lack of systems to capture information on the patient's overall wait, waiting times are instead reported for four groups of cardiac tests and treatments which cover both Cardiology and Cardiac Surgery (angiography, revascularisation, valve surgery and all other cardiac treatment).

12. Waiting times for the four groups of cardiac tests and treatments have reduced. For example, for the two targets most relevant to Cardiology:

- angiography (an X-ray of the arteries of the heart) – nine out of ten patients were waiting up to four weeks in 2010/11 compared to 15 weeks in 2002/03 (the number of people seen reduced by a quarter over this time to 6,900)
- revascularisation (treatment to widen a narrowed artery using a catheter or surgery) – nine out of ten patients were waiting up to eight weeks in 2010/11 compared to 35 weeks in 2002/03 (the number of people seen increased by over 50 per cent to 3,200)^{17, 18, 19}

¹³ Table MC1: Trends in mortality 2000–2010, Registrar General for Scotland, Death Records, ISD Scotland, November 2011.

¹⁴ Heart Disease Table IC1, ISD Scotland, February 2011

¹⁵ Heart Disease Table MC1, ISD Scotland, November 2011.

¹⁶ Heart Disease Table S1, ISD Scotland, November 2011.

¹⁷ From 1 January 2008, the Scottish Government introduced new guidance for waiting times. Previously patients who were unavailable for treatment for medical or social reasons, such as having another medical condition which needs to be treated first or being on holiday, were removed from the waiting list and could lose their guarantee of a maximum waiting time. The new system introduces the concept of a waiting time clock to calculate the time that patients wait and excludes periods when the patient is unavailable for treatment for medical or social reasons.

¹⁸ Data for the quarter ending 31 March 2011 exclude NHS Grampian due to technical difficulties in implementing a new patient management system.

¹⁹ Audit Scotland analysis of waiting times data provided by ISD Scotland, June 2011.

13. All NHS boards met quarterly waiting times targets for cardiac procedures for the quarter ending 30 September 2011.²⁰ NHS boards were also working towards meeting the new target that came into place at the end of 2011 that requires patients to be treated within 18 weeks from the time they are referred by their GP. This new 18-week referral to treatment target replaces the four cardiac targets. It is too early to comment on performance against this target as data are still being collected. (See paragraphs 33 to 37 in the main report.)

2 More could be done to ensure all patients get the services they need, including those who may benefit from cardiac rehabilitation, those at risk of stroke, heart failure patients and people who have had a severe heart attack.

14. Cardiac rehabilitation is recommended for patients who have had treatment for a heart condition and has been shown to help patients recover.²¹ The Healthcare Improvement Scotland review found that after a heart attack, 79 per cent of patients were referred to cardiac rehabilitation programmes (60 per cent of patients completed the programme). However, it is not clear if patients with other heart conditions who would benefit from cardiac rehabilitation following hospital treatment are being referred to these programmes to the same extent. This includes patients with conditions such as heart failure and those who have had an angioplasty. ISD Scotland is continuing to audit cardiac rehabilitation and looking at ways to improve information

on all patients being referred. The Scottish Government has also committed to work with British Heart Foundation (BHF) and Chest Heart and Stroke Scotland (CHSS) to try to identify ways to improve access for patients and information on all patients being referred.

15. Some people with heart disease are also at risk of stroke. Blood-thinning medication, such as warfarin, should be prescribed to patients with heart disease at high risk of stroke as a prevention measure. But the Healthcare Improvement Scotland review found that this was not done for almost half of patients. It also found that around a third of patients at low risk of stroke were inappropriately being prescribed warfarin which puts them at risk of complications unnecessarily.

16. Heart failure is a life-limiting condition and people can live with disabling symptoms for a number of years. Healthcare Improvement Scotland's review indicated that heart failure patients are not always receiving appropriate care:

- low numbers of patients are receiving recommended tests, however most patients are receiving evidence-based drug treatments
- the level of implantation of cardiac resynchronisation therapy (CRT) devices (a type of pacemaker recommended for some heart failure patients) of around seven per million population is low compared to other European countries and is significantly lower than in England

- few patients are on a palliative care register (two per cent).²² (See paragraphs 42 to 46 in the main report.)

17. There are a number of Cardiology treatments for patients who have had a heart attack. These need to be provided within a short timescale for patients with a severe heart attack.²³ Over the last five years, the NHS has gradually introduced services for patients with a heart attack in six regional centres across Scotland (Lothian, Golden Jubilee, Grampian, Lanarkshire, Tayside and Highland).²⁴ However, due to the geography of Scotland and the way services are currently provided across Scotland, it is not possible for all patients with a severe heart attack to receive the most effective treatment within the required 90 minutes from diagnosis because they live too far away from the nearest regional centre. This mainly affects patients in NHS Dumfries and Galloway, the island boards and some parts of Highland and other remote and rural parts of Scotland.

18. The Scottish Government is reviewing the current model. It is considering whether the target times for the most effective treatment should be extended taking into account more recent evidence that suggests the time from diagnosis to treatment could be extended to 120 minutes. This would potentially allow most heart attack patients in Scotland to receive the most effective treatment. (See paragraphs 47 to 52 and Exhibit 7 in the main report.)

20 Only two patients waited longer than the local target for angiography. *Inpatient, Day case and Outpatient stage of treatment waiting times – Monthly & quarterly data to 30 September 2011*, ISD Scotland, November 2011.

21 SIGN 57 *Cardiac Rehabilitation: A national clinical guideline*, Scottish Intercollegiate Guidelines Network, January 2002.

22 The Audit Scotland report *Review of palliative care services in Scotland*, published in August 2008, highlighted the importance of palliative care for people with all types of life-limiting conditions and that services were primarily cancer-focused. It recommended that processes should be in place within the NHS to ensure that all patients with life-limiting conditions receive appropriate palliative care.

23 We are using the term severe heart attack to describe what is known clinically as STEMI (ST segment elevation myocardial infarction) and less severe heart attack to describe NSTEMI (non-ST segment elevation myocardial infarction). STEMI is where blood flow to the heart has been interrupted and NSTEMI is where there is a partial blockage in a coronary artery but some blood is still able to flow to the heart muscle.

24 *Better heart disease and stroke care action plan*, Scottish Government, June 2009.

3 Rates of heart disease in Scotland are the highest in Western Europe and are higher for men, some ethnic groups and people in deprived areas. Comprehensive evidence is not yet available on the impact of measures in Scotland that aim to prevent heart disease, such as health checks for high-risk patients but there are plans to evaluate their impact. This evidence would help inform the Scottish Government and NHS boards' priorities for spending on preventative services.

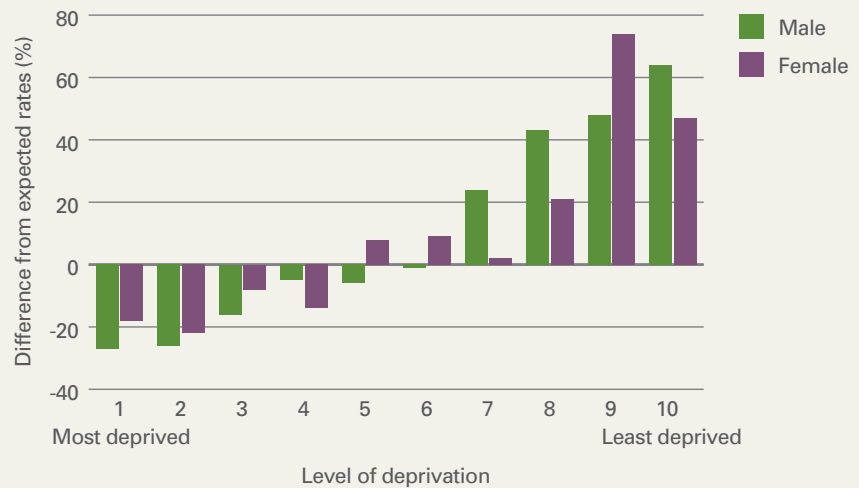
19. ISD Scotland has examined rates of revascularisation (treatment to widen a narrowed artery) and compared these against the rates that would be expected when age, sex and level of disease (using CHD death rates) are taken into account. Its analysis shows that fewer of these treatments are being carried out for people in more deprived areas – from over 20 per cent less treatments than would be expected in the most deprived areas to over 60 per cent more treatments than would be expected in the least deprived areas (**Exhibit 2**). This was first highlighted in a national report published by the Scottish Executive in 2001, and implies a lower level of access to these treatments for people in more deprived areas.²⁵ NHS boards should monitor access to procedures by different groups of the population to help ensure that all patients have appropriate and timely treatment. (See paragraphs 55 and 56 in the main report.)

20. A number of factors increase the risk of heart disease, including smoking, family history of heart disease, diabetes, ethnic background, high blood pressure, high blood cholesterol, age, physical inactivity and being overweight.²⁶ Many of these risk factors can be controlled or reduced to either prevent heart

Exhibit 2

Observed versus expected revascularisation (angioplasty and coronary artery bypass graft surgery) rates by deprivation category in Scotland, 2008/09

There are fewer procedures being carried out for people in more deprived areas.



Note: Deprivation categories are based on the Scottish Index of Multiple Deprivation (SIMD). Data are plotted from the highest level of deprivation (SIMD 1) to lowest levels of deprivation (SIMD 10). A negative percentage difference represents lower levels of procedure being carried out than would be expected based on the age, sex and level of disease in each category of deprivation.

Source: Table DC2, Mortality adjusted ratios for CABG and Angioplasties, SMR01, ISD and National Records of Scotland

disease occurring or prevent existing heart disease becoming worse.

21. In 2010/11, all NHS boards exceeded their individual targets of increasing the number of cardiovascular health checks in the most deprived areas in Scotland where rates of heart disease and deaths are highest (Keep Well programme). It is not clear yet what the overall impact of these checks has been on the rates of heart disease, hospital admissions and deaths, although death rates have reduced in the 15 per cent most deprived areas and the gap between the national average and the most deprived areas has narrowed slightly. In November 2011, the Scottish Government announced that £35 million will be spent over

the following three years on rolling out the Keep Well programme to all 40-64 year olds living in deprived communities.²⁷ NHS Health Scotland has commissioned an evaluation of the impact of the programme on outcomes during 2012 to 2015.

22. There have been improvements in outcomes for heart disease patients but rates of disease and deaths are still higher in the most deprived areas of Scotland and higher in Scotland compared to many other European countries. More evidence is required on measures aimed at preventing heart disease to help the Scottish Government, NHS boards and other partners make decisions on where to target and prioritise spending. (See paragraphs 57 to 65 in the main report.)

²⁵ Coronary heart disease/stroke taskforce report, Scottish Executive, 2001.

²⁶ Keep your heart healthy, British Heart Foundation, December 2007.

²⁷ <http://www.scotland.gov.uk/News/Releases/2011/11/04165309>

4 There is scope to make efficiency savings of at least £4.4 million in a number of areas such as using less expensive tests, reducing length of stay, increasing day case rates and making savings in prescribing and procurement. In outpatients, there is scope to improve referral processes, reduce demand and increase the number of available appointments. These efficiency savings are a conservative estimate as we have not been able to calculate savings in a number of areas due to limitations in the data.

23. The number of people having Cardiology treatments is increasing, particularly for older people. People are also living longer with heart conditions. Increases in demand and developments in treatments will put increasing pressure on Cardiology services at a time of reducing resources across the public sector. It is important for NHS boards to assess value for money and identify scope for improving efficiency. This needs to be supported by reliable information on cost and activity. (See paragraphs 66 to 67 in the main report.)

24. There are a number of standard tests for diagnosis of heart disease using different types of scanners to produce images of the heart structure and arteries and flow of blood to the heart. A more invasive test can also be used to provide more detailed images of the arteries in the heart which involves inserting a catheter into the artery. It should not necessarily be used as the first test for patients presenting with chest pain for example, as less invasive and less expensive tests can be used to rule out heart disease in many patients.

25. There is some variation in the types of diagnostic tests provided locally by NHS boards and there is evidence that boards that do not provide some or all of these less expensive and non-invasive tests have higher rates of the more invasive test. NHS boards should review the range of tests for patients with heart disease provided locally and explore potential efficiencies to be made by providing more non-invasive tests when appropriate. We have identified that efficiency savings of £0.5 to £0.8 million could be made across Scotland. (See paragraphs 68 to 72 and Exhibit 9 in the main report.)

26. From data provided by ISD Scotland it has not been possible to get detailed information on how long patients are staying on different wards as part of their overall hospital stay. Instead we have looked at total length of stay in hospital across all wards for a number of heart conditions and procedures and this varies by NHS board.²⁸ If NHS boards can address variation in length of stay this would mean more patients could be treated using the same resources. There is scope to save an additional 4,700 days in hospital if the mainland NHS boards with a longer median length of stay for heart failure, heart attack, angina and atrial fibrillation (the conditions that account for the majority of days) can reduce their average length of stay to the national average. This equates to a potential efficiency saving of around £1.5 million a year. (See paragraphs 73 to 81 and Exhibits 10, 11 and 12 in the main report.)

27. There is scope for some boards to carry out additional procedures as day cases if they are able to perform at the same rate as the national average. Our analysis shows that for

angiography, an additional five per cent of cases (483) could be carried out as day cases if NHS Lothian and Tayside were able to increase to the national average of 80 per cent. However, there are inconsistencies in how NHS boards record these data which affect the accuracy and comparability of day case activity across Scotland. Issues with data recording were even more apparent when we looked at angioplasty activity and we have been unable to include this in the report as these could not be resolved.

28. NHS boards should work with ISD Scotland to ensure that day case activity is being recorded consistently to allow comparison of day case rates across Scotland. NHS boards should also review day case rates for Cardiology procedures and identify if there is scope to increase this. (See paragraphs 82 to 87 and Exhibit 13 in the main report.)

29. Outpatient clinics could be used more efficiently by improving referral processes, increasing capacity, reducing the percentage of patients failing to attend appointments and reducing overall demand for clinics. In 2009/10, 4,151 patients failed to attend a new appointment and 9,443 patients failed to attend a return appointment across all NHS boards. This equates to a cost of £1.6 million to the NHS for wasted Cardiology outpatient consultations, although the return appointment numbers are likely to be an under-estimate which means the cost is likely to be higher.²⁹ We found good practice examples of NHS boards improving efficiency in outpatient clinics across Scotland. (See paragraphs 88 to 93, Exhibits 14 and 15 and Case Study 3 in the main report.)

²⁸ Patients may be treated in a different board to where they stay and the length of stay figures presented here are for the whole hospital stay which may involve transfers between hospitals and boards.

²⁹ The average cost of a Cardiology outpatient appointment is £119 – *R04opX: Specialty Outpatient Summary, Costs Book*, ISD Scotland, November 2010.

30. NHS National Procurement has a number of contracts in place for commonly purchased and important goods and services within the NHS. There are a number of contracts relevant to Cardiology services, including contracts for drugs, stents and pacemakers. There is variation across Scotland in purchasing within the national contracts and there is scope for NHS boards to make further cash savings. NHS National Procurement has achieved annual cash savings of £1.5 million for three drug and equipment contracts related to Cardiology services. We have identified at least a further £0.5 million of cash savings for NHS boards if they made further efficiencies. (See paragraphs 94 to 100 in the main report.)

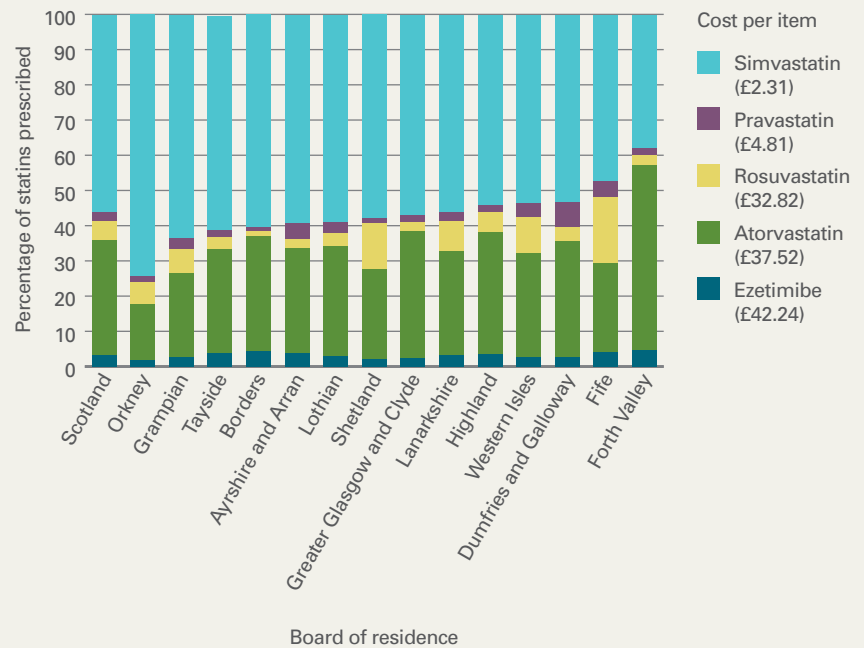
31. The NHS could still improve its prescribing of more cost-effective drugs. Around £70.7 million was spent on statins in 2010/11 and the level of prescribing per population varies by NHS board. We compared statin prescribing against disease rates and population cholesterol levels and could find no link between higher prescribing rates and lower disease rates or cholesterol levels. There are a number of statins available to NHS boards. The two main statins prescribed by boards are:

- simvastatin – a generic drug since 2003 which costs £2.31 per item and accounts for around 55 per cent of all statins prescribed in Scotland
- atorvastatin – due to come off patent in May 2012 and costs £37.52 per item (but cheaper options will become available once the patent expires) and accounts for around 33 per cent of all statins prescribed in Scotland.^{30,31}

Exhibit 3

Percentage of various statins prescribing in the community by NHS board, 2010/11

The percentage of inexpensive statins prescribed by NHS boards varies and this impacts on the cost of statins per 1,000 population.



Note: The percentage of statins prescribed is based on Defined Daily Dose (DDD) for each statin. DDD is defined by the World Health Organisation (WHO) as the assumed average maintenance dose per day for a drug used on its main indications in adults. DDDs are commonly used as a proxy measure of how many patients in the population are taking a particular drug and this allows for some comparison between health boards.

Source: Audit Scotland analysis of ISD Scotland cardiovascular prescribing by statin and Prescribing Health Board, 2010/11

32. Both simvastatin and atorvastatin have comparable outcomes for patients and atorvastatin should only be prescribed in patients with established heart disease when a high dose is required. Patients at risk of a developing heart disease should be started on simvastatin.³² However, variation in prescribing rates affects the overall spend on statins within each NHS board. In mainland boards, the prescribing of the more expensive drug (atorvastatin) ranges from 24 per cent in NHS Grampian to 52 per

cent in NHS Forth Valley. In NHS Fife, a higher percentage of another expensive statin (rosuvastatin) is prescribed – 19 per cent compared to the national average of 5.5 per cent (Exhibit 3). NHS Grampian and Lothian have the lowest cost for statins at around £10,000 per 1,000 population and NHS Forth Valley has the highest cost at over £22,000 per 1,000 population.

30 When a pharmaceutical company first develops a drug it will normally apply for a patent which means that it can only be sold by that company for a certain number of years. Once the patent expires, other companies can sell the drug under their own brand and these are known as generic drugs.

31 Prescription Cost Analysis for financial year 2010/11, ISD Scotland, July 2010.

32 Risk estimation and the prevention of cardiovascular disease, Scottish Intercollegiate Guidelines Network, February 2007.

33. A prescribing group in the West of Scotland looked at improving cost-effectiveness in prescribing and provided recommendations for boards in the West of Scotland in December 2009. The Scottish Government shared this with all boards across Scotland and asked them to review prescribing locally and address any unwarranted variation. However, the prescribing data for 2010/11 shows that there is still considerable variation in prescribing by NHS boards and further scope for making efficiency savings. (See paragraphs 101 to 105 in the main report.)

34. NHS boards hold some information locally on the Cardiology workforce but it is not used or recorded consistently. This makes comparisons between NHS boards, including productivity measures, and regional and national planning of Cardiology services difficult. Exact figures of the number of Cardiology consultants and nurses working in Scotland are not clear. Published figures by ISD Scotland are generated from information entered by NHS boards into the Scottish Workforce Information Standard System (SWISS) and in many instances these do not reflect the same information captured on local NHS board systems. ISD Scotland should work with boards to address these data quality issues. (See paragraphs 111 to 113 in the main report.)

Summary of key recommendations

The Scottish Government and NHS boards should:

- continue to improve the evidence base on the impact and cost effectiveness of measures to help prevent heart disease and use this evidence to identify priorities for spending to help improve outcomes and address inequalities, particularly in deprived areas
- ensure that consistent and accurate activity, workforce, cost and quality information is available and shared nationally to allow NHS boards to monitor their performance, compare services and identify potential improvements in value for money.

NHS boards should:

- work with regional planning groups to ensure their strategic plans to develop and monitor services meet patients' needs and address gaps in services
- implement Healthcare Improvement Scotland's recommendations on improving services for patients with heart failure and ensure that patients at risk of stroke are prescribed appropriate drugs
- examine variation in Cardiology services, including tests provided for heart disease, length of stay, day case rates, prescribing, procurement and outpatients, to ensure services are being provided in the most efficient way and identify scope for improving efficiency
- use the Audit Scotland checklist available on our website to help improve the efficiency and effectiveness of Cardiology services.

Cardiology services

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