

# Prescribing in general practice in Scotland



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# Auditor General for Scotland

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# Contents

## Summary Page 2

---

Background

About the audit  
Page 3

---

Key messages

Key recommendations  
Page 4

---

## Part 1. Trends in general practice prescribing Page 5

---

Key messages

The quantity of drugs prescribed has increased while real-terms spending has fallen  
Page 6

---

Trends in spending are similar to the rest of the UK

Spending on drugs is lower in the UK than in the rest of Europe  
Page 7

---

## Part 2. Spending and potential savings Page 9

---

Key messages

Good information is available to support effective prescribing

Patterns of prescribing vary among NHS boards  
Page 10

---

Prescribing advisers have supported better quality and cost-effective prescribing  
Page 11

---

Generic prescribing and NHS board-led initiatives have helped manage spending on statins  
Page 14

---

The NHS could potentially save up to £26 million a year without affecting patient care  
Page 16

---

It is too early to tell whether the abolition of prescription charges has had an impact on prescribing  
Page 18

---

A growth in the number of older people will lead to increased prescribing but may not lead to increased overall spending

Expiry of drug patents is likely to lead to significant savings in the short term  
Page 19

---

Recommendations  
Page 20

---

## Part 3. Age, deprivation and lifestyle Page 21

---

Key messages

A number of factors affect prescribing, including patient age and deprivation

Older people tend to take more drugs  
Page 22

---

Practices with patients living in deprived areas prescribe significantly more drugs  
Page 23

---

There is a clear link between deprivation and prescribing of particular types of drugs  
Page 24

---

Changes in lifestyle are leading to increased prescribing  
Page 25

---

Recommendations  
Page 26

---

## Appendix 1. Audit methodology Page 27

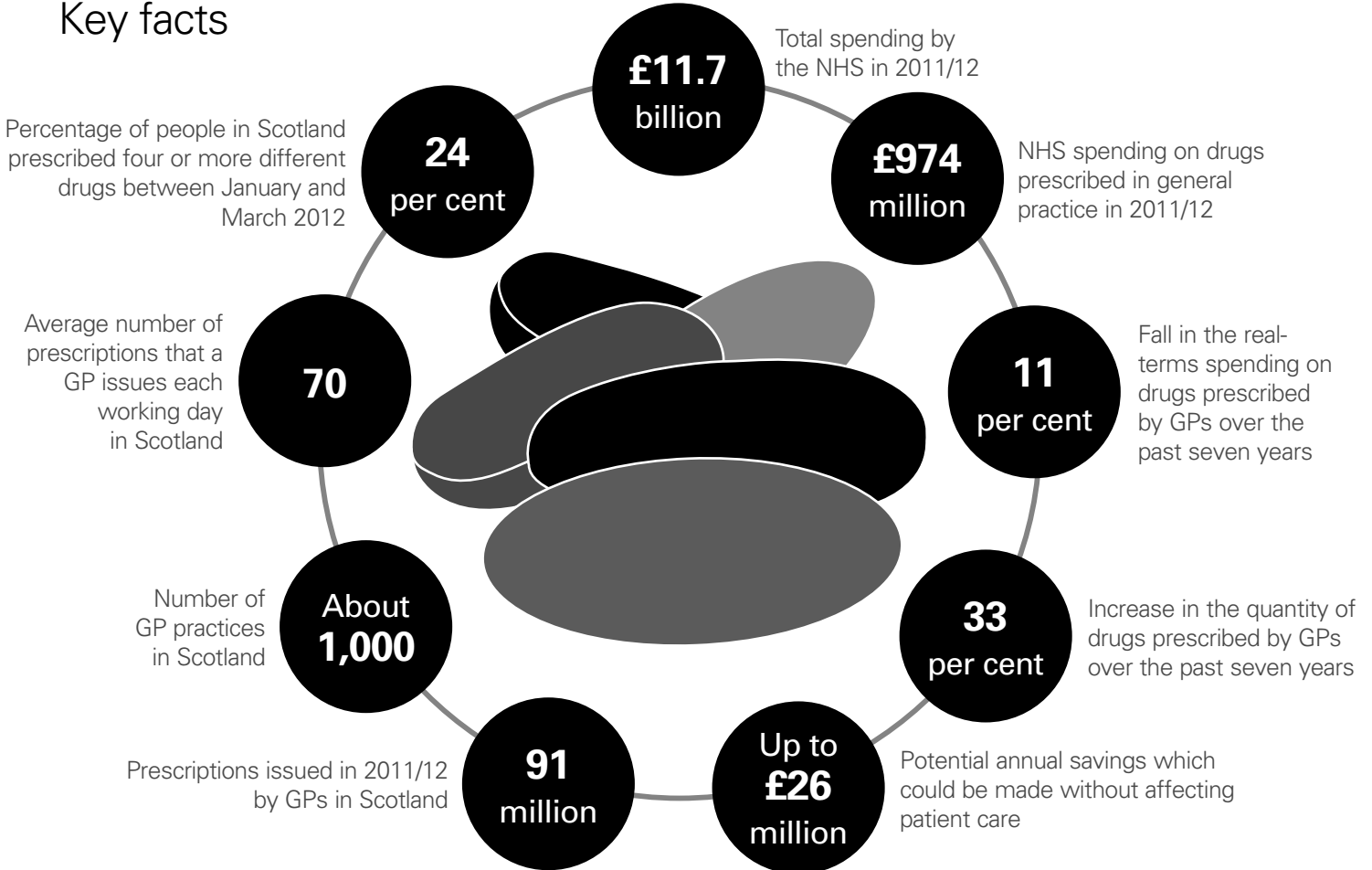
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## Appendix 2. Project advisory group Page 28

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# Summary

## Key facts



The NHS has improved its management of prescribing in general practice.

## Background

**1.** People make most contact with the health service through consultations with their general practitioner (GP). A consultation often leads to a prescription – as a one-off treatment; to help prevent ill health in the future; or to manage a long-term condition and enable people to sustain a good quality of life. Over a three-month period, about 60 per cent of people in Scotland get at least one prescription from their GP. Over 90 per cent of GP prescribing is for drugs, with the remainder including items such as dressings and specialist foods.<sup>1</sup>

**2.** The NHS in Scotland spends almost £1.4 billion per year on drugs, of which almost £1 billion (70 per cent) is spent in general practice.<sup>2</sup> Territorial NHS boards spend about ten per cent of their budgets on GP prescriptions and boards continue to identify this as a significant cost pressure.

**3.** Most GPs in Scotland are independent contractors and are not employed by the NHS. A GP practice's contract with the NHS defines the services that a practice will provide, the standards it should achieve and the payment it will receive. The Quality and Outcomes Framework (QOF) is a voluntary incentive scheme for GPs which uses financial incentives to encourage high quality care. The QOF has had considerable influence on the way GPs work, including their prescribing. For example, it includes targets for managing particular conditions, such as hypertension, which have an effect on prescribing.

**4.** Prescribing is also influenced by clinical guidelines, which contain recommendations for effective clinical practice, including prescribing, based on current evidence. For

example, clinical guidelines help GPs and nurses identify people at risk of heart disease and stroke, provide them with lifestyle advice and make recommendations for GPs to prescribe statins (drugs to lower people's cholesterol level) and other drugs as appropriate.<sup>3</sup> In addition, all NHS boards have an agreed formulary covering GP practices and hospitals that provides guidance on appropriate and cost-effective prescribing.

**5.** The Scottish Government has introduced national therapeutic indicators that provide financial incentives for GPs to improve the quality and cost effectiveness of their prescribing, for example by increasing use of lower cost statins. It has also provided guidance to NHS boards on managing patients who are taking a large number of different drugs, and on making better use of the prescribing advisers' network.

**6.** In 2007, the Scottish Government announced that prescription charges were to be phased out before being abolished in April 2011. Prescription charges have also been abolished in Wales and Northern Ireland, but still apply in England.

### About the audit

**7.** Our audit looked at the value for money of prescribing in general practice. The main objectives were to:

- identify the trends in spending on GP prescribing, the number of prescriptions and the cost pressures on NHS boards' prescribing budgets
- identify the variation in GP prescribing spending and amounts prescribed among NHS boards and general practices, and the potential for cost savings

- examine the effectiveness of initiatives to improve prescribing in general practice.

**8.** We did not look at hospital prescribing, prescribing by dentists and opticians and drugs dispensed by community pharmacies under arrangements to treat minor ailments.

**9.** This audit builds on our earlier reports published in 1999 and 2003.<sup>4,5</sup> The 1999 report provided information on prescribing patterns and identified a number of areas where improvements in quality and cost effectiveness were possible, including increasing generic prescribing.<sup>6</sup> The 2003 report found that generic prescribing had increased but spending on prescribing was rising at a rate of almost six per cent per year in real terms. For this audit, we:

- analysed published data including trends in prescribing across general practices, NHS boards and different parts of the UK
- surveyed NHS boards; interviewed staff in four NHS boards to examine how they manage prescribing (NHS Borders, Fife, Greater Glasgow and Clyde, and Highland). We have used information from these boards to provide case studies in the report
- interviewed staff in the Scottish Government and other national bodies including the Scottish Medicines Consortium, the Royal College of General Practitioners and the British Medical Association.

**10.** Further details of our methodology are set out in Appendix 1 and Appendix 2 lists the members of our advisory group. Data on spending and quantities prescribed in Scotland are based on

1 Audit Scotland analysis of prescribing data provided by ISD Scotland.

2 *Summary of Scottish Health Service Costs* (known as the *Costs Book*), ISD Scotland, November 2012.

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

4 *Supporting prescribing in general practice*, Accounts Commission, September 1999.

5 *Supporting prescribing in general practice – a progress report*, Audit Scotland, June 2003.

6 A generic, or unbranded, drug is comparable to the equivalent branded drug in dosage, strength and quality but is usually cheaper.

our analysis of information produced by Information Services Division (ISD) Scotland.<sup>7</sup>

**11.** This report is structured in three parts:

- Trends in general practice prescribing (**Part 1**).
- Spending and potential savings (**Part 2**).
- Age, deprivation and lifestyle (**Part 3**).

**12.** In addition to this report, we have also published on our website:

- an information supplement containing additional data analysis and survey results
- a checklist for NHS boards
- a checklist of issues for non-executive directors of NHS boards to consider.

### Key messages

- The NHS has improved how it manages prescribing in general practice. The quantity of drugs prescribed increased by 33 per cent between 2004/05 and 2011/12. Spending on drugs fell by 11 per cent in real terms over the same period, to £974 million. This compares with a 50 per cent real-terms increase in spending over the seven-year period prior to 2004/05.
- There is scope to make potential annual savings of up to £26 million without affecting patient care. NHS boards can achieve this by reducing unnecessary waste; reducing the use of drugs considered

less suitable for prescribing; increasing generic prescribing; and only prescribing more expensive versions of drugs to those patients with a clinical need for them. In addition, we estimated the potential annual savings from drug patents that expire in 2012/13 to be at least £86 million.

- NHS boards have access to good quality information about GPs' prescribing patterns, and prescribing support staff are using these data to support GPs in making good clinical and cost-effective decisions about prescribing. All GPs get regular feedback on their prescribing and most GP practices have direct support from pharmacists funded by their NHS board.
- The age of patients and their relative level of deprivation have a significant effect on the amount of drugs prescribed. Over 900,000 people in Scotland over the age of 50 are taking four or more different drugs. People taking many drugs have an increased risk of side effects from their drugs and, in some patients, the combination of drugs could have an adverse effect on their quality of life. GP practices serving the most deprived areas prescribe on average 46 per cent more drugs per head of population than those in the least deprived areas.

### Key recommendations

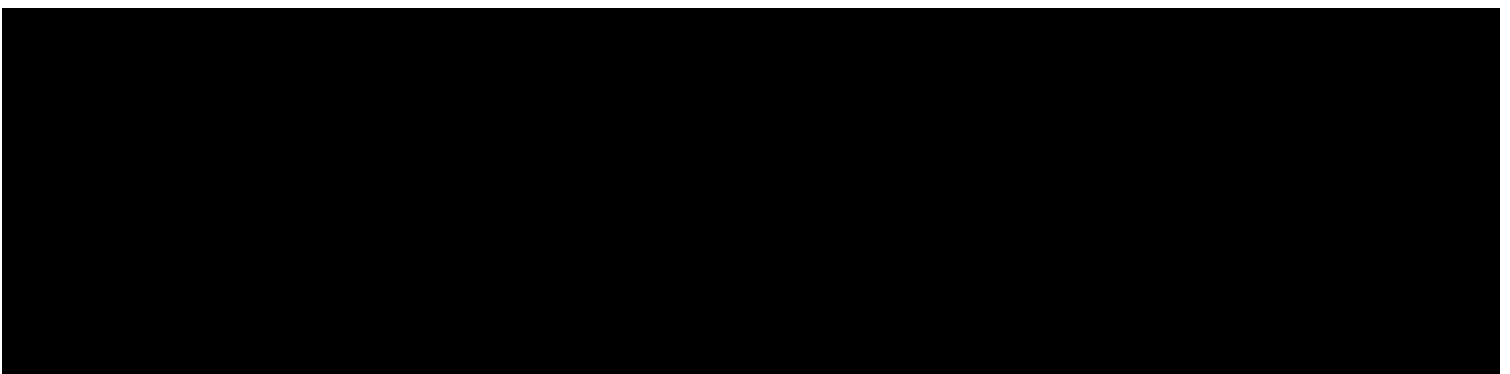
NHS boards should:

- continue to work with GPs to reduce unnecessary waste; reduce the use of drugs considered less suitable for prescribing; increase generic prescribing; and only prescribe more expensive versions of drugs to those patients with a clinical need for them
- consider the business case for employing additional prescribing support staff as part of an invest-to-save initiative, where a board has high levels of prescribing, high spending and below average numbers of prescribing support staff
- work with GPs to implement the national guidelines on prescribing multiple drugs (polypharmacy) and support GPs in reviewing the medication of patients taking multiple drugs.

# Part 1. Trends in general practice prescribing



Spending on drugs fell in real terms while the quantity of drugs prescribed increased.



## Key messages

- The NHS has improved how it manages prescribing in general practice by taking action to improve the quality and cost effectiveness of prescribing.
- The quantity of drugs prescribed increased by 33 per cent between 2004/05 and 2011/12. However, spending on drugs fell by 11 per cent in real terms over the same period, to £974 million. Similar trends are evident in the rest of the UK since 2004/05, although spending in Northern Ireland is higher than in Scotland and the quantities prescribed in Wales are higher.
- Overall spending on drugs is lower in Scotland and the UK as a whole than in most other European countries.

### The quantity of drugs prescribed has increased while real-terms spending has fallen

**13.** In 2011/12, the NHS in Scotland spent about £1.4 billion on drugs (about 12 per cent of total NHS spending). About 70 per cent of this spending was in family health services (by GPs, dentists, opticians and community pharmacists).<sup>8</sup> Spending on drugs prescribed in general practice was £974 million. The remainder of the drugs budget was spent in hospitals (£296 million) and by community services including home visits by district nurses and prevention services such as breast screening and health promotion (£121 million).<sup>9</sup>

**14.** GPs are responsible for the majority of prescribing in general practice although some other practice staff can also prescribe, including community practitioner nurse prescribers. In this report, we refer to prescribing in general practice as GP prescribing, although we recognise that others are involved.

**15.** The quantity of drugs prescribed in general practice in Scotland increased by 33 per cent between 2004/05 and 2011/12, to 3.2 billion defined daily doses (DDDs) per year (equivalent to 1.7 doses per day for every person in Scotland).<sup>10, 11</sup> During this period, spending on prescriptions fell by 11 per cent in real terms to £974 million (Exhibit 1).<sup>12</sup> This compares with a 50 per cent real-terms increase in spending over the seven-year period prior to 2004/05.

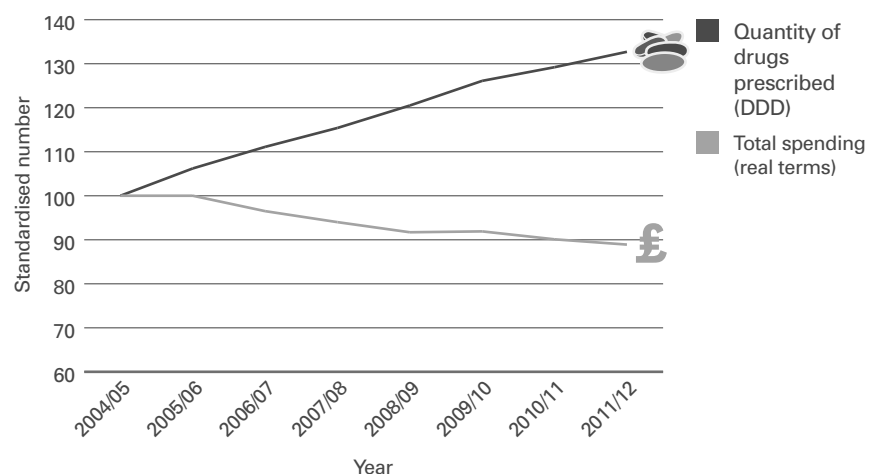
**16.** A number of factors have led to the increase in the quantity of drugs prescribed, including:

- an increase in the number of older people. This accounts for about 20 per cent of the increase in prescribing quantities between 2004/05 and 2011/12<sup>13</sup>
- the introduction of the QOF in 2004
- GPs implementing clinical guidelines
- national initiatives, such as Keep Well health checks for 40- to 64-year-olds, which have led to an increase in people prescribed drugs to treat conditions such as high blood pressure

## Exhibit 1

### Spending and quantity of drugs prescribed by GPs, 2004/05 to 2011/12

The quantity of drugs prescribed in general practice has increased while real-terms spending has fallen.



Note: Changes in spending and drug quantities are presented against an index of 100, with 2004/05 as the base year. Other years are presented relative to 2004/05 to allow comparisons between spending on drugs and the quantity of drugs prescribed to be made on the same scale. Source: Audit Scotland analysis of ISD Scotland data

<sup>8</sup> We estimate that about 98 per cent of family health services spending is in general practice.

<sup>9</sup> *Summary of Scottish Health Service Costs* (known as the *Costs Book*), ISD Scotland, November 2012.

<sup>10</sup> A defined daily dose is the amount of a drug a patient would normally take in a day to treat the condition for which it is usually prescribed. DDDs are defined by the World Health Organisation (WHO) Collaborating Centre for Drug Statistics Methodology.

<sup>11</sup> *Prescribing and medicines: prescription cost analysis 2011/12*, ISD Scotland, June 2012.

<sup>12</sup> When we refer to spending on drugs, we use the paid gross ingredient cost (GIC). This is the cost of drugs to the NHS, excluding the fees paid to community pharmacists for drug dispensing and discounts.

<sup>13</sup> We analysed ISD Scotland data on prescribing by different gender and age groups, together with mid-year population estimates from the National Records of Scotland, to estimate the rise in prescribing quantities due to the increasing number of older people between 2004/05 and 2011/12.



- changes in people's lifestyle, which increase the risk of ill-health; for example, obesity and lack of exercise lead to an increased risk of type 2 diabetes (see Case study 3 on page 26).

**17.** The changes in prescribing are not uniform across all types of drugs. We examined spending and prescribing quantities across the 14 main groups of drugs.<sup>14</sup> Spending on drugs in three groups (cardiovascular, central nervous system and respiratory system) accounted for 52 per cent of the total spending in 2011/12.<sup>15</sup> While spending on drugs for the respiratory system rose broadly in line with the quantities prescribed, spending on central nervous system drugs rose and then fell slightly; and spending on cardiovascular drugs fell, despite an increase in prescribing quantities (Exhibit 2). This partly reflects a fall in the price of statins, which make up 38 per cent of cardiovascular drug prescribing. GPs prescribe statins to lower people's cholesterol levels and reduce the risk of coronary heart disease. This fall in spending is due to drug patents expiring and cheaper generic drugs becoming available, and NHS boards' active management of statin prescribing (see Case study 2 on page 15).<sup>16</sup>

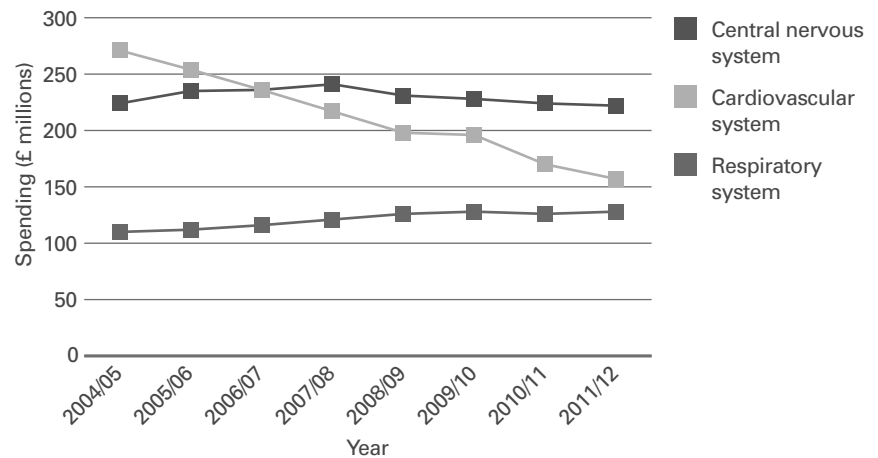
### Trends in spending are similar to the rest of the UK

**18.** GP prescribing in Scotland has changed in broadly similar ways to the rest of the UK. However, there are some differences: in 2011/12, spending in Northern Ireland was 29 per cent higher per head of population than in Scotland; while in Wales prescribing quantities were 40 per cent higher than Scotland.

### Exhibit 2

#### Spending on cardiovascular, central nervous system and respiratory system drugs, 2004/05 to 2011/12

Spending on respiratory system drugs rose while spending on cardiovascular drugs fell.



Note: Spending is in real terms based on 2011/12 prices.  
Source: Audit Scotland, based on ISD Scotland data

England and Scotland were broadly similar in terms of changes in prescribing spending and quantity over the period 2004/05 to 2011/12 (Exhibit 3, overleaf).

### Spending on drugs is lower in the UK than in the rest of Europe

**19.** International comparisons indicate that overall drug spending, including spending in hospitals, is lower in the UK as a whole than in most other European countries. For example, in 2008 spending on drugs per head of population in the UK was about half that in France, Germany, Greece, Italy and Spain. In addition, spending on drugs is falling in real terms in the UK, but increasing in most EU countries.<sup>17</sup>

**20.** There are a number of reasons why drug spending is lower in Scotland and across the UK:

- the UK-wide Pharmaceutical Price Regulation Scheme is able to negotiate lower drug prices than EU countries with insurance-based healthcare systems<sup>18</sup>
- prescribing initiatives have led to a higher percentage of generic prescribing in the UK, meaning that UK patients get the equivalent drugs at a lower cost.

<sup>14</sup> As defined by the British National Formulary (BNF), a national compendium that provides information on the selection and clinical use of medicines. The main chapters are: 1. Gastrointestinal System, 2. Cardiovascular System, 3. Respiratory System, 4. Central Nervous System, 5. Infections, 6. Endocrine System, 7. Obstetrics, Gynaecology and Urinary-tract Disorders, 8. Malignant Disease and Immunosuppression, 9. Nutrition and Blood, 10. Musculo-Skeletal and Joint Diseases, 11. Eye, 12. Ear, Nose and Oropharynx, 13. Drugs acting on the skin, 14. Immunological products and vaccines.

<sup>15</sup> Spending on cardiovascular, central nervous system and respiratory system drugs was £157 million, £222 million and £128 million respectively in 2011/12.

<sup>16</sup> In the UK, the price of drugs under patent is controlled by the Pharmaceutical Price Regulation Scheme (PPRS). When a patent expires, cheaper generic versions of the drug lower the cost to the NHS. As a result, the UK list of drug prices is widely used by other countries as a yardstick for setting their own prices.

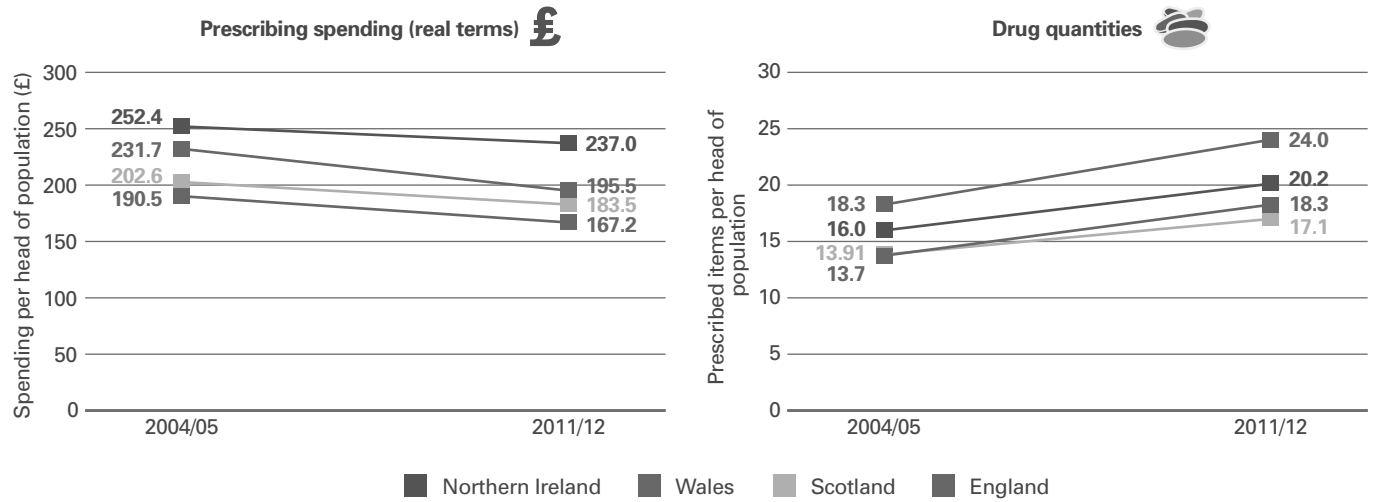
<sup>17</sup> *Differences in costs of and access to pharmaceutical products in the EU*, European Parliament, 2011.

<sup>18</sup> *Comparing Pharmaceutical Prices in Europe*, The Institute for Research in Economics and Business Administration, Bergen, 2011.

### Exhibit 3

GP prescribing spending and drug quantities in the UK per head of population, 2004/05 to 2011/12

Real-terms spending on prescribing fell in all parts of the UK and the quantity of drugs prescribed by GPs increased.



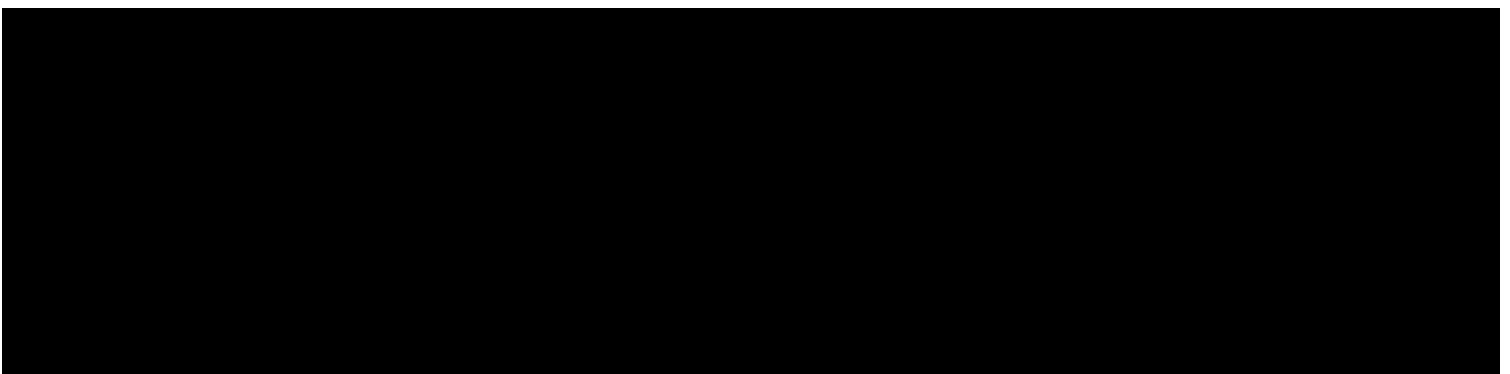
Note: Drug quantities are measured in terms of prescribed items per head of population as information on defined daily doses was not available for all parts of the UK. Spending is in real terms based on 2011/12 prices.

Source: Audit Scotland based on data from ISD Scotland; NHS Wales Shared Services Partnership; Business Services Organisation Pharmstat Database; The NHS Information Centre; and HM Treasury for GDP deflators

# Part 2. Spending and potential savings



There is scope to make further savings.



## Key messages

- NHS boards have access to good quality information about GPs' prescribing patterns and are using these data to support GPs in making good clinical and cost-effective prescribing decisions.
- There is considerable variation in prescribing spending among NHS boards. The NHS spent an estimated £10.5 million on prescribing support staff in 2010/11 although the level of support varies among boards. Mainland NHS boards with higher levels of prescribing support tend to have lower prescribing costs.
- There is scope to make potential annual savings of up to £26 million without affecting patient care. In addition, the NHS could potentially save at least £86 million a year from drugs used in general practice with patents that expire in 2012/13. These savings are likely to outweigh the cost of introducing new drugs in general practice in the short term.
- The average spending per person on drugs prescribed by GPs increases as people get older, from £34 per year for children aged between five and nine to £504 per year for people aged 85 to 89.
- We could find little evidence to date that the abolition of prescription charges has led to a significant increase in the quantity of drugs prescribed by GPs.

## Good information is available to support effective prescribing

**21.** ISD Scotland manages national datasets, which support the national prescribing information system, known as PRISMS. This uses information from all prescriptions dispensed by community pharmacies and dispensing GPs to provide data on GP prescribing.<sup>19</sup> NHS boards, prescribing support staff and GPs access this through a web-based system, which provides them with the information they need to manage and monitor prescribing. Access to PRISMS is restricted because of the sensitivity of the data: GP practices only have detailed access to their own data, and NHS boards only have access to practice-level information for their own board.

**22.** ISD Scotland is currently developing an enhanced prescribing information system by linking the patient's unique community health index (CHI) number to prescribing data. This will make it possible to look at prescribing at a patient level as well as at GP practice level, making more detailed analysis possible. For example, it will be possible to find out how many people in a practice are receiving a particular drug as well as the total quantity of the drug prescribed. This will allow practices and NHS boards to monitor the quality of prescribing and to examine the level of prescribing in particular geographic areas.

**23.** Although NHS boards regard PRISMS as providing excellent management information, during our fieldwork staff made some suggestions for improvement including:

- being able to upload their local formulary into PRISMS would simplify how they manage their formulary and enable them to

monitor off-formulary prescribing more readily

- improving the budget-profiling tool within PRISMS would help NHS boards improve their budget monitoring processes.

## Patterns of prescribing vary among NHS boards

**24.** There is considerable variation in prescribing spending per head of population among NHS boards after taking account of population differences (Exhibit 4). For example, spending on prescribing per weighted head of population in NHS Fife is 25 per cent higher than in NHS Greater Glasgow and Clyde.<sup>20</sup>

**25.** NHS boards' spending on drugs prescribed by GPs has varied over time (Exhibit 5). For example, spending in NHS Greater Glasgow and Clyde fell over most of the period, while spending in NHS Borders rose steadily over most of this time before falling after April 2012. NHS Forth Valley spent the most of all boards at the beginning of the period but launched a number of initiatives in 2010/11 to encourage more cost-effective prescribing. Since October 2010, its spending has fallen steadily.

**26.** The differences in spending on GP prescribing among NHS boards may be due to differences in the amount of prescribing; differences in the choice of drugs prescribed and their cost; or a mixture of both. To examine this, we plotted spending against the amount prescribed per weighted head of population. As would be expected, NHS boards where higher quantities are prescribed tend to have higher spending (Exhibit 6, page 12). However, this is not always the case. The prescribed quantities per weighted head of population in NHS Greater Glasgow and Clyde are close

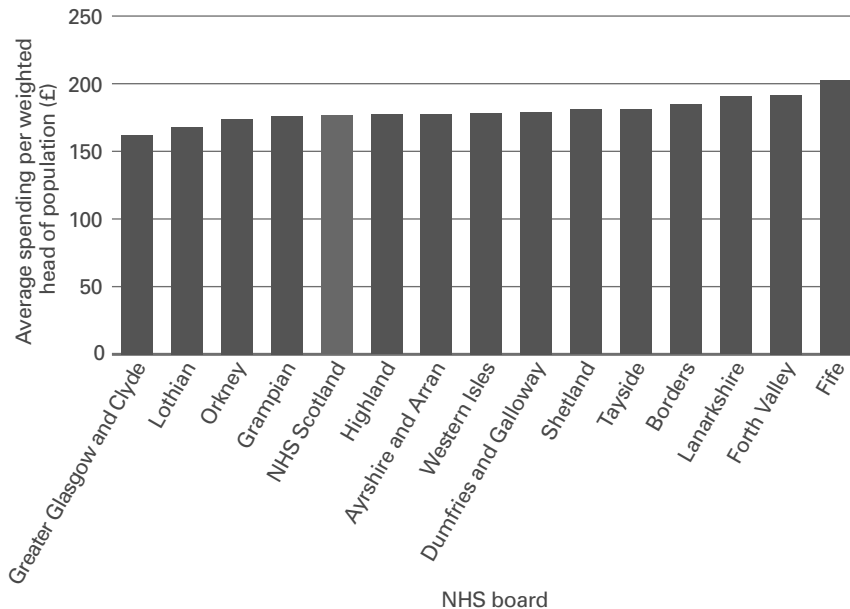
19 Dispensing GPs have been granted the right to dispense medicines to their patients (in rural areas where patients do not have access to a community pharmacist).

20 The NHS uses a number of factors to create weightings, which take account of population differences, such as the age and sex profile of the local population and the level of illness in the community. These weightings allow comparisons of NHS boards' spending.

### Exhibit 4

Average spending on drugs prescribed by GPs per weighted head of population by NHS board, 2011/12

Average spending per weighted head of population ranged from £162 to £203.



Source: ISD Scotland

to the Scottish average, but spending is the lowest of all NHS boards, showing that GPs are prescribing more cost effectively. In contrast, the quantities prescribed in NHS Fife are only just above the Scottish average but its spending per weighted head of population is the highest, showing that its high spending is due to GPs prescribing more expensive drugs. NHS Lanarkshire has the second highest prescribing quantity and the second highest prescribing spending per weighted head of population; in this case, the high cost is mainly due to GPs prescribing more drugs.

### Prescribing advisers have supported better quality and cost-effective prescribing

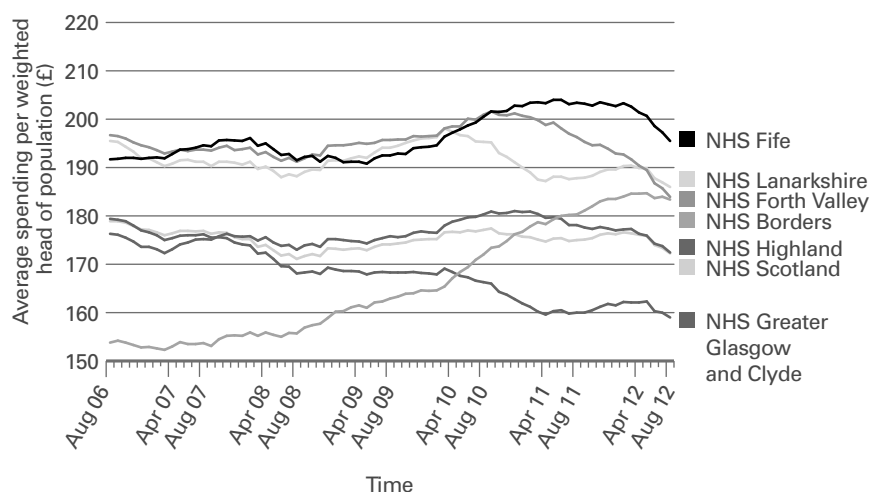
27. NHS boards employ prescribing advisers and other prescribing support staff to help GPs to improve their prescribing by:

- analysing prescribing data and providing regular feedback to GPs about their prescribing patterns
- visiting practices to help GPs to improve the quality and cost effectiveness of their prescribing
- developing and implementing guidance on prescribing
- undertaking projects to improve prescribing quality and reduce prescribing cost
- monitoring whether GPs are complying with the local formulary.

### Exhibit 5

Spending on GP prescribing in a sample of NHS boards, August 2006 to August 2012

There is considerable variation among NHS boards in spending over time.



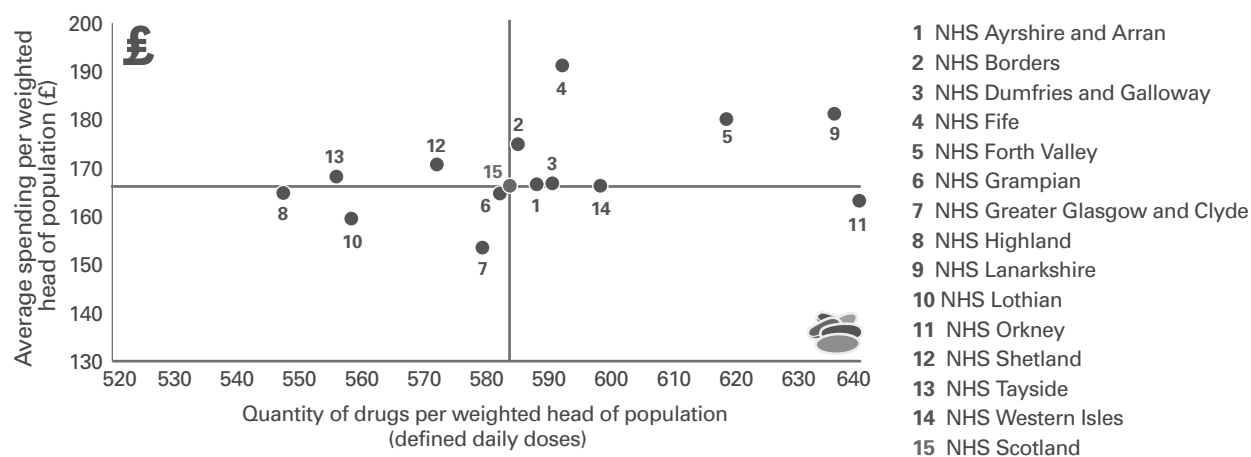
Note: We chose a sample of NHS boards to illustrate variation in spending; complete information is included in the information supplement.  
Source: ISD Scotland (PRISMS)

28. One of the key roles of prescribing support staff is keeping the NHS board's local formulary up to date and monitoring GPs' compliance against it. Since we last looked at prescribing, all NHS boards have developed joint local formularies, which set out guidance for prescribers in both general practice and hospitals. They specify the drugs which GPs and other prescribers should use for different conditions

## Exhibit 6

### Spending and quantity of drugs prescribed per weighted head of population, by NHS board, 2011/12

The two largest NHS boards, Lothian (code 10) and Greater Glasgow and Clyde (code 7), have lower than average spending and prescribing per weighted head of population.



Note: Spending in this exhibit only includes drugs where there is an estimated defined daily dose (about 94 per cent of drug spending). Not all drugs have a defined daily dose, for example creams and ointments for skin conditions. This means the spending figures are not directly comparable with Exhibit 4.  
Source: Audit Scotland analysis of ISD Scotland data

based on their clinical effectiveness, safety, and cost effectiveness. Non-formulary drugs are also available when required by an individual patient.

**29.** NHS boards also employ prescribing support pharmacists who work part-time in practices to help GPs review their prescribing. There are a number of examples of NHS board initiatives that have resulted in improvements and cost savings (Exhibit 7).

**30.** One of the Scottish Government's Efficiency and Productivity Framework workstreams on GP prescribing is making better use of the prescribing advisers' network. Prescribing advisers meet regularly to share information and good practice. They also inform the Scottish Government about prescribing issues at a local level that may require national action.<sup>21</sup>

## Exhibit 7

### Examples of successful initiatives undertaken by NHS boards

Different initiatives can help to improve patient care and make savings.

#### Medicine reviews in NHS Fife

In 2011/12, NHS Fife completed a review of drugs prescribed to patients with asthma and chronic obstructive pulmonary disease (COPD). A practice pharmacist employed by NHS Fife assessed patients' drugs and made suggestions to improve care using more cost-effective devices (such as inhalers). The pharmacist reviewed 3,700 patients' medication and changed 1,040 prescriptions to improve clinical quality, which also resulted in savings of £177,000.

#### NHS Tayside's review of formulary compliance

In 2011/12, NHS Tayside reviewed prescribing to improve GPs' compliance with the local formulary. This resulted in changes to prescribing that delivered savings of over £1 million from a total budget of £76 million.

#### NHS Borders' spend-to-save strategy

In June 2010, NHS Borders recruited two pharmacy technicians for 20 months to the prescribing support team as part of a 'spend-to-save' initiative. This aimed to save £170,000 after taking off the cost of employing the technicians. Over the 20 months, the board saved £229,000 through the technicians improving data analysis and releasing prescribing advisers to undertake other tasks. In 2012, NHS Borders converted the temporary posts to permanent appointments to retain the skill mix within the team and to ensure savings are sustained.

Source: Audit Scotland fieldwork

### The level of prescribing support varies among NHS boards

**31.** Spending on prescribing support in 2011/12 was £9.1 million in the 12 boards that provided this information as part of our survey. This is equivalent to about £10.5 million for all 14 boards, if spending in the remaining boards is assumed to be at the same average level per head of population as the NHS boards that provided information.<sup>22</sup> The number of prescribing support staff (including prescribing advisers, lead pharmacists, prescribing support pharmacists and formulary pharmacists) and analytical support staff varies among NHS boards (Exhibit 8).

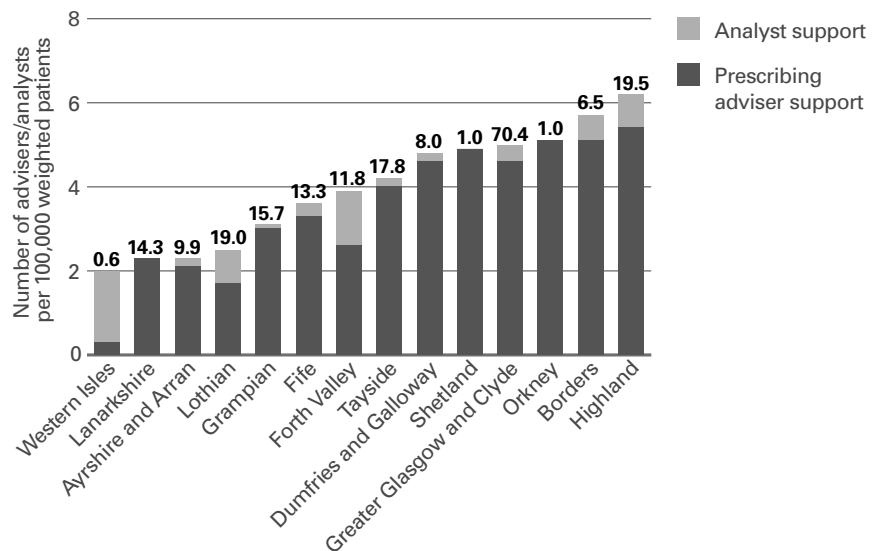
**32.** Most NHS boards have between 3.5 and 6 whole-time equivalent (WTE) staff per 100,000 population. Some of the rural boards have more staff relative to their population and they support practices dispersed over a wide area. Among the mainland boards, prescribing adviser support is lower in NHS Lanarkshire, NHS Ayrshire and Arran, and NHS Lothian. Mainland NHS boards with higher levels of prescribing support tend to have lower prescribing spending. NHS Lothian is an exception, with a lower level of prescribing support and lower spending.

**33.** A board's ability to develop, plan and manage prescribing initiatives depends to some extent on the number of staff providing prescribing support. For example, NHS Greater Glasgow and Clyde has 70.4 WTE staff involved in prescribing support, more than any other board. This level of investment, combined with economies of scale, may have helped NHS Greater Glasgow and Clyde reduce its spending on GP prescribing (Case study 1).

### Exhibit 8

#### Prescribing support by NHS board, at 1 April 2012

The level of prescribing support varies considerably among NHS boards.



Note: Total staff numbers, in terms of whole-time equivalents (WTE), are shown at the top of each bar. A small number of staff work across the hospital and community sectors, particularly in smaller boards.

Source: Audit Scotland survey of NHS boards

### Case study 1

#### NHS Greater Glasgow and Clyde 'invest-to-save' initiative

NHS Greater Glasgow and Clyde has recruited prescribing support pharmacists, technicians and dieticians through an 'invest-to-save' initiative. The NHS board has reinvested a proportion of the savings made through this initiative in recruiting additional specialist staff who work with GPs to help patients make better use of their drugs.

Although NHS Greater Glasgow and Clyde has always had a prescribing support team, this initiative has allowed the team to grow and develop. For example, there is now a data analyst team which analyses PRISMS data for use by specialist staff who work with GPs.

This initiative has reportedly led to improvements in prescribing quality across a range of types of drugs and helped the board to meet a three per cent savings target each year.

Source: Audit Scotland fieldwork

22 NHS Lanarkshire and NHS Highland did not provide information on their spending on prescribing support staff.

**Generic prescribing and NHS board-led initiatives have helped manage spending on statins**

**34.** The NHS spent £59 million on statins in 2011/12, 38 per cent of all GP spending on cardiovascular drugs. The introduction of the QOF and clinical guidelines led to increases in statin prescribing from 2004 onwards. The three main statins prescribed are:

- simvastatin – this has been available as a generic drug since 2003 and accounted for 59 per cent of all statins prescribed in Scotland in 2011/12 (price £2.21 per 28 tablet pack)
- atorvastatin – this came off patent in May 2012 and accounted for 33 per cent of all statins prescribed in Scotland in 2011/12. NHS

boards spent more on atorvastatin than on any other individual drug in 2011/12 (price before May 2012, £37.90 per 28 tablet pack)

- rosuvastatin – this was introduced in 2003 and is not coming off patent until 2016. It accounted for about five per cent of all statins prescribed in Scotland in 2011/12 (price £32.24 per 28 tablet pack).<sup>23</sup>

**35.** There have been significant changes in the amount of statins prescribed and in spending in Scotland over the past seven years (Exhibit 9). NHS boards have undertaken a number of initiatives to manage prescribing in this area. However, our report on cardiology services showed that there is considerable variation in the types of statin prescribed among NHS

boards and scope for making further efficiency savings.<sup>24</sup>

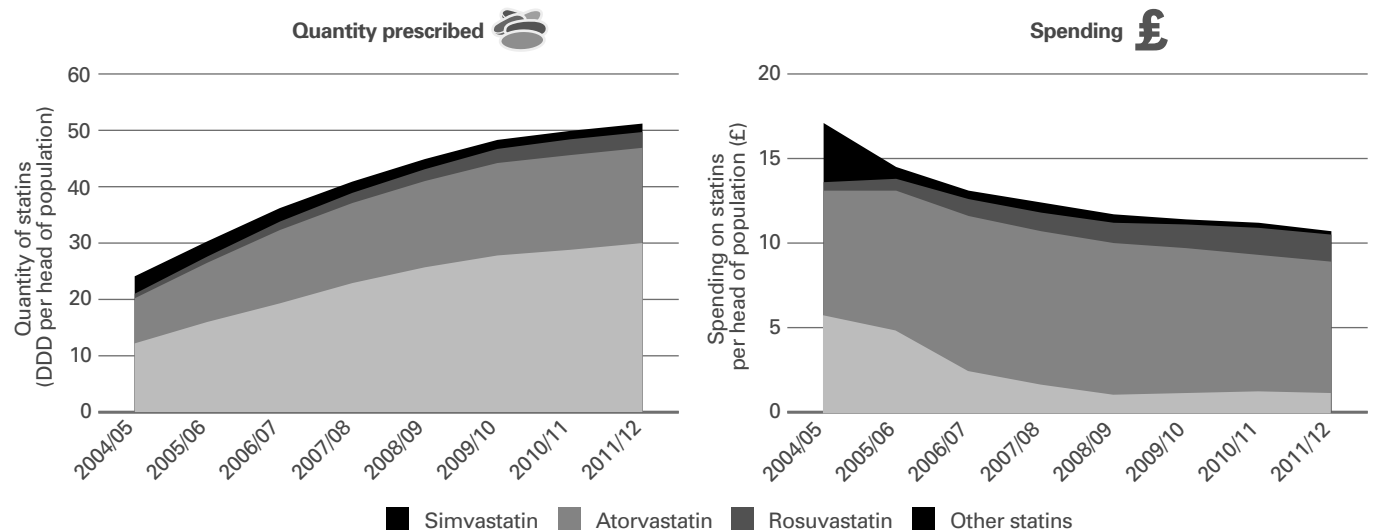
**36.** We examined the changes in statins prescribing in the sample of NHS boards that we visited and identified several factors that influence these changes (Case study 2):

- significant reductions in the cost of drugs when they come off patent
- variation in the use of a higher cost statin among NHS boards
- the importance of NHS boards responding to new clinical evidence
- using local targets to change prescribing practice and reduce spending.

**Exhibit 9**

**Spending and quantity of statins prescribed, 2004/05 to 2011/12**

Spending on statins has fallen despite increases in statin prescribing, mostly due to increased use of Simvastatin which is the lowest cost statin.



Note: Spending is in real terms based on 2011/12 prices. Simvastatin moved off patent in 2003/04 and became the cheapest statin, which led to it being the most commonly prescribed statin. Rosuvastatin was introduced in 2003/04. Source: Audit Scotland analysis of ISD Scotland data

<sup>23</sup> Prescription cost analysis for financial year 2011/12, ISD Scotland, June 2012.  
<sup>24</sup> Cardiology services, Audit Scotland, February 2012.

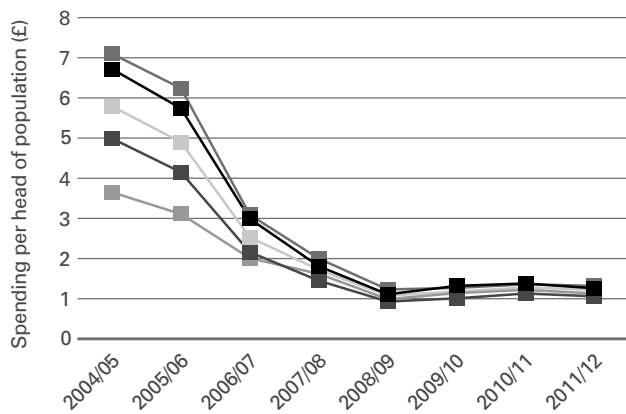


## Case study 2

### Factors influencing statin prescribing and spending<sup>1</sup>

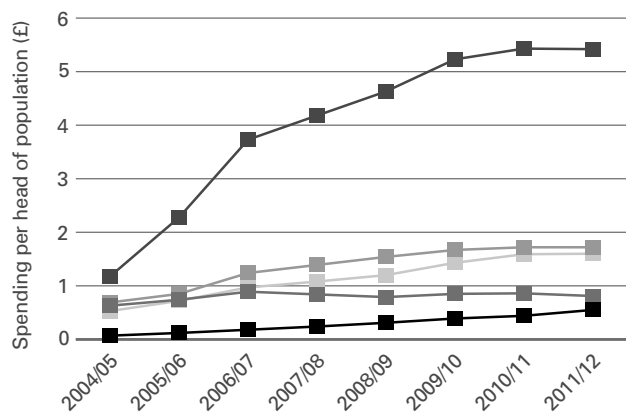
#### Simvastatin – an example of NHS boards prescribing generic statins

The price of simvastatin fell by 94 per cent in Scotland after the drug moved off patent in 2003. Initiatives by NHS boards to encourage GPs to prescribe generic simvastatin led to it accounting for 59 per cent of all statins prescribed in 2011/12.



#### Rosuvastatin – variation in use of a higher cost statin among NHS boards

Rosuvastatin is the newest statin and was introduced in 2003. It accounted for about five per cent of all statins prescribed in Scotland in 2011/12. NHS Fife has a much higher usage of rosuvastatin than other NHS boards. It could save about £1 million a year if patients prescribed rosuvastatin are switched to clinically appropriate, but more cost-effective, alternatives.

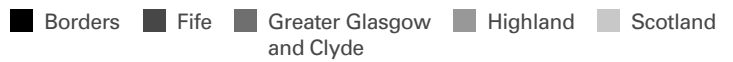


Notes:

1. Spending is in real terms based on 2011/12 prices.

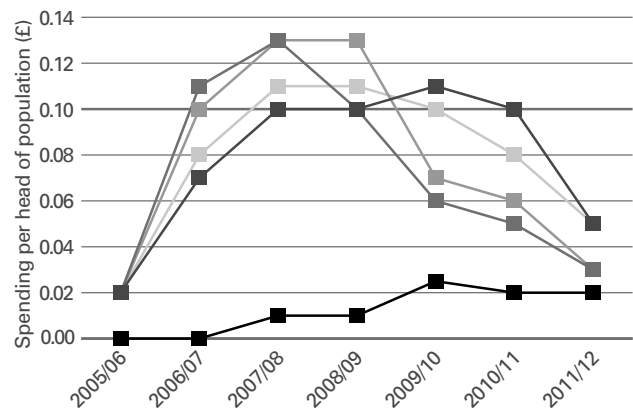
2. Ezetimibe acts by decreasing cholesterol absorption in the intestine. It is recommended for restricted use within NHS Scotland for patients who have failed to reach target cholesterol levels with statins alone.

Source: Audit Scotland analysis of ISD Scotland data and fieldwork



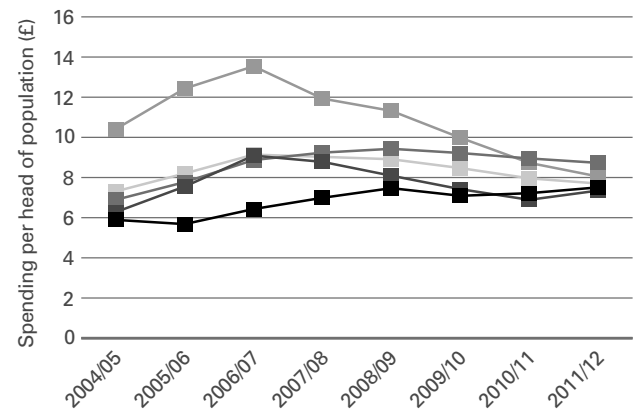
#### Ezetimibe and simvastatin – responses by NHS boards to clinical evidence

Ezetimibe and simvastatin, a combination of a drug to inhibit cholesterol absorption in the gut and a statin was introduced in 2005. However, around 2007, the effectiveness of ezetimibe came into question.<sup>2</sup> In 2007/08, NHS Greater Glasgow and Clyde introduced an incentive scheme to reduce the use of ezetimibe and this led to a significant fall in spending. NHS Highland used a similar approach shortly afterwards and other NHS boards then followed between 2008/09 and 2010/11. Before this, spending was still rising in some boards while it was falling in NHS Greater Glasgow and Clyde. This illustrates the importance of NHS boards being quick to respond to new clinical evidence.



#### Atorvastatin – how an NHS board controlled costs

GPs prescribe atorvastatin for patients when other statins are not effective. It is more expensive than simvastatin and accounted for a third of statins prescribed in 2011/12, but two-thirds of spending. Spending per head of population on atorvastatin increased until 2007/08 before levelling off. In NHS Highland, spending increased rapidly until 2006 when the board set targets for community health partnerships (CHPs) to encourage GPs to prescribe lower-cost, but equally effective, statins for suitable patients. This resulted in reduced spending. In May 2012, atorvastatin moved off patent and is now available at a lower price.



### **The NHS could potentially save up to £26 million a year without affecting patient care**

**37.** Our 1999 report indicated that annual cost savings of at least £53 million could be made without compromising patient care. Our 2003 report suggested that efficiency savings could amount to a further £28 million a year. The NHS has implemented many of the measures recommended in these reports and spending has been generally well managed in recent years. However, we estimate that further annual savings could be made without affecting patient care by:

- reducing drug wastage (£12 million)
- reducing the use of drugs considered less suitable for prescribing (£8 million)
- increasing generic prescribing (£2 million)
- only prescribing more expensive versions of drugs to patients who have a clinical need for them (£2 million)
- achieving the targets in the national therapeutic indicators (£2 million).

**38.** Although these potential savings add up to £26 million, achievable savings will be lower. In the case of drugs considered to be less suitable for prescribing, the cost of prescribing alternative drugs needs to be taken into account and in some cases spending will be required to achieve savings. While the potential savings are small in relation to overall drug spending they are still important in the light of the cost pressures that NHS boards are facing.

### **Drug wastage costs the NHS in Scotland up to £20 million a year**

**39.** Research in 2009 found that about £300 million a year was spent on wasted drugs in England, about four per cent of total prescribing spending. This includes an estimated £90 million worth of unused prescription drugs that are kept in people's homes at any one time; £110 million of drugs returned to community pharmacies over the course of a year; and £50 million worth of unused NHS drugs disposed of by care homes. However, not all waste is avoidable or the result of poor practice, and less than 50 per cent of this waste (£100 to £150 million) is likely to be avoidable without undue cost.<sup>25</sup>

**40.** Using these data, we estimated the equivalent avoidable drug wastage for Scotland to be between £12 million and £18 million a year. This figure is broadly supported by our survey of NHS boards, where NHS Forth Valley estimated that drugs worth £1.75 million are returned to pharmacies unused each year and NHS Lothian estimated that wasted drugs cost about £3 million a year.<sup>26</sup>

**41.** NHS boards consider that there are five main causes of drug wastage:

- repeat prescribing (reported by 11 NHS boards)
- over-ordering by patients (seven NHS boards)
- prescribing in care homes (five NHS boards)
- effect of abolition of prescription charges (five NHS boards)
- patients prescribed multiple drugs (four NHS boards).<sup>27</sup>

**42.** NHS boards expressed concern about the contribution to drug wastage of repeat prescription services provided by community pharmacists. Under this scheme, the pharmacy keeps the patient's repeat prescription and submits it to the surgery on their behalf at the appropriate time. The pharmacy then collects and dispenses the prescription, ready for the patient to collect it. The scheme helps to ensure patients do not run out of drugs that they need regularly. However, NHS boards and patients have reported a number of problems, particularly that they receive all their drugs, including drugs such as painkillers, that they would normally only order when required. The Scottish Government recently issued guidance to try to reduce this problem.<sup>28</sup> It is also in the process of changing the community pharmacy contract to move it away from a payment per item dispensed service.

**43.** NHS boards reported that information campaigns at Christmas, which encourage people to stock up on drugs, are successful and lead to an increased take-up of repeat prescriptions. However, this was not always balanced by a fall in prescribing in the following months. This would suggest that at least some of these drugs were not being used or being stockpiled in people's homes. Patient information campaigns to encourage people to value medicines and use them correctly could help reduce wastage.

### **Reducing the use of drugs considered to be less suitable for prescribing could save up to £8 million**

**44.** The British National Formulary describes a number of drugs as 'considered by the Joint Formulary Committee to be less suitable for prescribing'. This does not mean they should not be prescribed at all

<sup>25</sup> *Evaluation of the Scale, Causes and Costs of Waste Medicines, Final Report*, York Health Economics Consortium and the School of Pharmacy, University of London, 2009.

<sup>26</sup> If the level for drug wastage in other NHS boards is similar to NHS Lothian and NHS Forth Valley, it would be equivalent to £23 million across Scotland. However, some of this waste is likely to be unavoidable.

<sup>27</sup> Response to Audit Scotland survey by 14 NHS boards.

<sup>28</sup> *Managed Repeat/Express Repeat Prescription Schemes*, Scottish Government letter to NHS boards, July 2012.

but that the evidence of their benefit is uncertain, more effective drugs have superseded them, or they have significant side effects. Overall spending on these drugs in Scotland was almost £25 million in 2011/12. There is a fourfold variation in the level of GP prescribing of these drugs between the highest and lowest spending NHS boards (Exhibit 10). GPs in NHS boards with lower levels of prescribing adviser support tend to prescribe more of these drugs.

**45.** We calculated that potential savings of about £8 million could be achieved if all GP practices reduced their prescribing to the same level as that of the lowest 25 per cent of practices. However, it will be difficult for NHS boards to work with GPs to achieve this because the savings need to be made across a wide range of drugs. In addition, savings would be reduced by the need to prescribe alternative drugs. NHS boards are most likely to reduce the use of these drugs through actions to improve further GPs' compliance with their local formulary.

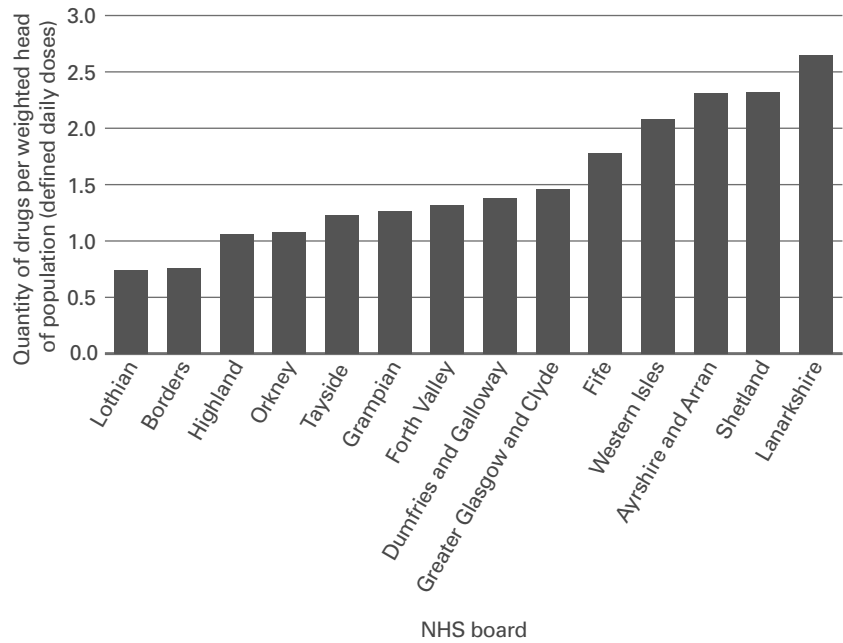
### Increasing use of generic drugs could lead to savings of up to £2 million

**46.** Our 2003 report found that potential savings of about £1.5 million could be made by increasing generic prescribing. At that time, the generic prescribing rate was 76 per cent and the optimum rate was considered to be 80 per cent. Generic prescribing rates reached the 80 per cent level in 2005/06 and have remained at a similar level since then. Computer systems in GP practices now automatically fill in the generic version of a drug when a GP writes a prescription and the GP has to choose actively to change it. However, shortages of generic versions of drugs have sometimes led to community pharmacists dispensing more expensive branded versions of the same drugs.

### Exhibit 10

#### Prescribing of drugs classed as less suitable for prescribing, 2011/12

There is a fourfold variation in the amount prescribed by GPs among NHS boards.



Source: Audit Scotland analysis of ISD Scotland data

**47.** ISD Scotland estimates that annual savings of up to £2 million may still be possible across the NHS by increasing generic prescribing in a further ten drugs.<sup>29</sup> This level of savings may be difficult to achieve as some patients taking these drugs cannot be switched to the generic alternative for clinical reasons, for example patients using drugs to suppress rejection after transplant surgery. In other instances, switching to generic versions of drugs may be more straightforward, for example for proton pump inhibitors which treat reflux and drugs to treat migraine. However, achievable savings are likely to be modest when set against the overall drugs bill as most of the potential savings from switching to generic drugs have already been made.

### Switching to less expensive versions of drugs could save £2 million

**48.** Prescribing standard versions of drugs instead of more expensive ones, for appropriate patients, can reduce costs while maintaining quality of care. However, there is a trade-off between the potential benefits and the increased cost; for example the patient only needing to take one pill a day compared to having to take three pills at regular intervals. For some patients the additional cost of the single dose is justified if the GP is concerned that the patient may not take drugs regularly. There can also be difficulties in switching a patient to a different version of a drug; for example, it can be difficult for a patient to change from one medicine to another and it is sometimes better to recommend the most cost-

effective option for new patients. This will result in a shift in prescribing and savings over time.

**49.** We looked at five expensive versions of drugs highlighted in our 2003 report as having scope for savings.<sup>30</sup> The NHS could make annual savings of about £2 million if GPs could halve the current level of the two most expensive drugs by:

- Substituting the modified-release version of isosorbide mononitrate (a drug used to manage angina) which only needs to be taken once daily with the standard version, which needs to be taken two or three times a day. The modified-release version is more expensive but is more convenient for patients if GPs are concerned that they are less likely to take their drugs (current spending on the modified-release version is £2.9 million).
- Substituting salbutamol dry powder automated inhalers with standard inhalers for patients with asthma. The automated inhalers are more expensive but may be required if patients are unable to use a standard inhaler (current spending is £2.6 million).

#### **Achieving national therapeutic indicators targets could lead to savings of up to £2 million**

**50.** The Scottish Government published 12 national therapeutic indicators in March 2012 as part of its Efficiency and Productivity Framework. The indicators were chosen based on improving both the quality and cost effectiveness

of prescribing. For example, there is an indicator on increased use of lower-cost statins and an indicator on less antibiotic use. GPs who take part in the programme receive a payment if they achieve two targets of their choice from the list of 12. If GPs choose the indicators with the biggest potential for cost savings and achieve the targets, about £2 million of annual savings would result (at a one-off cost of about £780,000 in QOF payments). If the targets for all 12 indicators were achieved across all GP practices, annual savings of £5 million could theoretically be achieved, although significant one-off costs would be incurred. Actual savings will depend on the choice of indicator and whether GPs achieve their targets and will need to be set against the cost of the scheme.<sup>31</sup>

#### **It is too early to tell whether the abolition of prescription charges has had an impact on prescribing**

**51.** Prescription charges in Scotland started to be phased out from April 2008 and were abolished in April 2011. The Scottish Government estimated that the total cost would be £73 million for the three years up to 2011/12, and £57 million in 2011/12 and in subsequent years. There is a risk that the abolition of prescription charges could lead to an increase in the overall quantity of prescribing beyond that anticipated. This is because people who previously paid for drugs over the counter can now request a prescription from their GP for the same drugs. If this happens on a significant scale, it could add pressure to prescribing budgets.<sup>32</sup>

**52.** It is difficult to measure the impact of the abolition of prescription charges at present because:

- the changes were brought in over a three-year period, making it difficult to identify a break point when trends changed
- the change took place against a background of increases in prescribing for many drugs
- over 90 per cent of prescriptions were for people who were exempt from charges, making it difficult to distinguish any impact of the abolition of charges from overall trends
- changes to the community pharmacy contract make it difficult to assess the impact of drugs prescribed by community pharmacists under the Minor Ailment Scheme<sup>33</sup>
- the total abolition of prescription charges took place in April 2011, too recently for our audit to identify emerging trends.

**53.** However, we looked at prescribing trends for three common drugs available to buy that are also available on prescription: paracetamol and ibuprofen (both painkillers), and antihistamines. We compared changes in prescribing trends for three years before and after April 2008 when prescription charges started to be phased out:

- paracetamol – there was a reduction in the trend from an average annual increase of 16 per cent before 2008 to an average annual increase of nine per cent after April 2008

30 Substitution of effervescent co-codamol 8/500 with standard co-codamol 8/500 (and substituting both of them with paracetamol); isosorbide mononitrate (ISMN) modified release with ISMN standard; diclofenac modified release with diclofenac standard; transdermal oestrogen only HRT with an oral preparation; salbutamol dry powder and automated inhaler devices with Metered Dose Inhalers (MDIs).

31 GP practices can gain the funding equivalent of six QOF points if they deliver two prescribing targets in 2012/13. The value of six QOF points was about £830 in 2011/12, although this will vary depending on the number of patients in the practice and disease prevalence in the practice population. The value of a QOF point for 2012/13 is yet to be calculated.

32 The Scottish Government anticipated an increase in uptake of one per cent in 2008/09, one per cent in 2009/10, two per cent in 2010/11 and five per cent in 2011/12. The amounts per year allocated for phased abolition in the Spending Review are higher than the estimated costs to 'include a generous element of overhead for unexpectedly high additional demand for prescriptions', *Prescription charges proposed phased abolition*. SPICe briefing, February 2008.

33 The Minor Ailment Scheme (MAS) enables eligible people to register and use their community pharmacy as the first port of call for consulting and treating a common condition without the need to visit a GP.

- ibuprofen – there was a small increase in the trend, from an average annual decrease of three per cent to an average annual increase of four per cent
- antihistamines – there was an increase in the trend, from an average annual increase of three per cent to an average annual increase of eight per cent.<sup>34</sup>

**54.** It is difficult to reach a conclusion based on the limited information available at present.

**A growth in the number of older people will lead to increased prescribing but may not lead to increased overall spending**

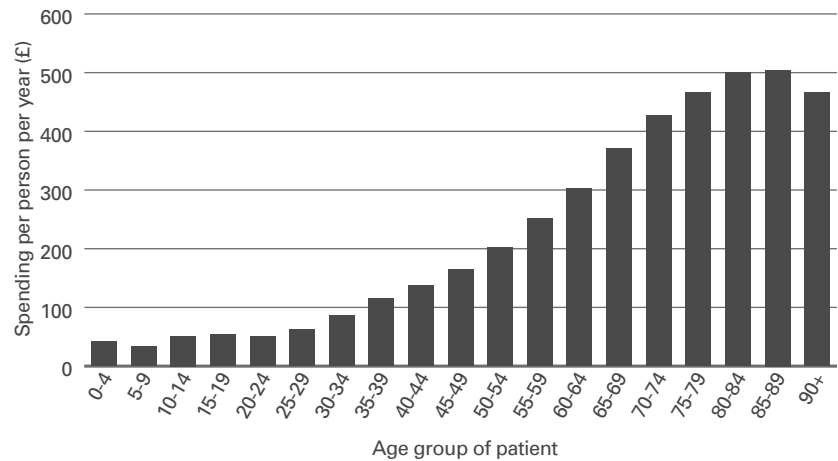
**55.** The average spending per person on drugs prescribed by GPs in 2011/12 increases as people grow older. Prescribing costs increase from £34 per year for children aged between five and nine to £504 per year for people aged 85 to 89 (Exhibit 11). As the proportion of older people in the population rises, we would expect spending on drugs to increase. Based on current spending by age group, we estimate that overall drug spending would increase by 4.2 per cent by 2020 and 24 per cent by 2035 in real terms.

**56.** However, although increases in the elderly population will tend to increase prescribing spending this can be offset by falls in drug prices and other factors. For example, increases in the number of older people between 2004/05 and 2011/12 would have been expected to lead to an increase in spending, but spending actually fell in real terms. This shows that other factors, particularly the expiry of drug patents and increased use of generic drugs, have a significant effect.

**Exhibit 11**

**Average spending on prescribed drugs by age group, 2011/12**

Spending on prescribed drugs increases as people grow older.



Source: Audit Scotland analysis of ISD Scotland data

**Expiry of drug patents is likely to lead to significant savings in the short term**

**57.** A number of commonly prescribed drugs are coming off patent in 2012/13 and the cost of GP prescribing is likely to fall in the short term. For example, spending on atorvastatin (which cost £43 million in 2011/12) is likely to fall significantly over the next few years as it came off patent in May 2012. Drug prices typically fall by between 70 and 90 per cent after they come off patent, depending on how difficult it is to manufacture the generic version. The potential annual saving in general practice from patents that expire in 2012/13, assuming current prescribing rates apply, is £86 million if prices fall by 70 per cent. Longer-term savings for NHS boards will depend on how far prices actually fall and changes to the drug tariff in 2013/14 and in future years.<sup>35</sup>

**58.** Analysis by the Office of Health Economics undertaken on behalf of the Association of British Pharmaceutical Industries (ABPI) suggests that the cumulative savings from medicines coming off patent over the period 2012 to 2015 would total £316 million for the NHS in Scotland (general practice and hospital care).<sup>36</sup>

**59.** New drugs developed by pharmaceutical companies will offset some of these savings. However, the ABPI and the Scottish Medicines Consortium (the body that provides NHS boards with advice about the clinical appropriateness and cost effectiveness of all newly licensed medicines) consider that the cost of introducing new drugs currently in the pipeline is unlikely to outweigh the savings made by patent expiry. Therefore, there is likely to be a real-terms fall in spending on drugs prescribed by GPs over the next two years.

<sup>34</sup> We used linear regression to compare the rate of increase in prescribing for these drugs before and after 2008.

<sup>35</sup> The Drug Tariff sets out the rates the NHS pays to community pharmacists to reimburse them for the drugs they dispense.

<sup>36</sup> UK NHS Medicines Bill Projection 2012–15, *Four Nations: Key Results*, The Office of Health Economics, October 2012.

**60.** The main new drugs coming on-stream that are likely to be prescribed by GPs include:

- drugs for the treatment of diabetes
- oral anticoagulants (drugs to thin the blood) for the treatment of cardiovascular problems
- drugs to manage COPD
- antiviral drugs to treat hepatitis C.

**Other factors will affect prescribing in the long term**

**61.** A number of other factors will have a longer-term impact on GP prescribing, including:

- treating conditions such as diabetes earlier and more rigorously
- improved diagnosis, leading to conditions being treated earlier
- higher incidences of some illnesses because of patients' lifestyles
- drugs currently only used in hospitals may be prescribed in general practice in future (for example, some drugs used to treat cancer).

**62.** In addition, the current UK Pharmaceutical Price Regulation Scheme (the 2009 PPRS) ends in December 2013. The PPRS aims to achieve a balance between reasonable prices for the NHS and a fair return for the industry. The new arrangements will incorporate a broader assessment of the value of a new medicine, known as value-based pricing, and will affect spending because the costs of drugs will change.

**63.** These changes make it more difficult to forecast potential changes in the spending and quantity of GP prescribing after 2014.

**Recommendations**

NHS boards should:

- continue to work with GPs to reduce unnecessary waste; reduce the use of drugs considered less suitable for prescribing; increase generic prescribing; and only prescribe more expensive versions of drugs to those patients with a clinical need for them
- consider the business case for employing additional prescribing support staff as part of an invest-to-save initiative, where a board has high levels of prescribing, high spending and below average numbers of prescribing support staff.

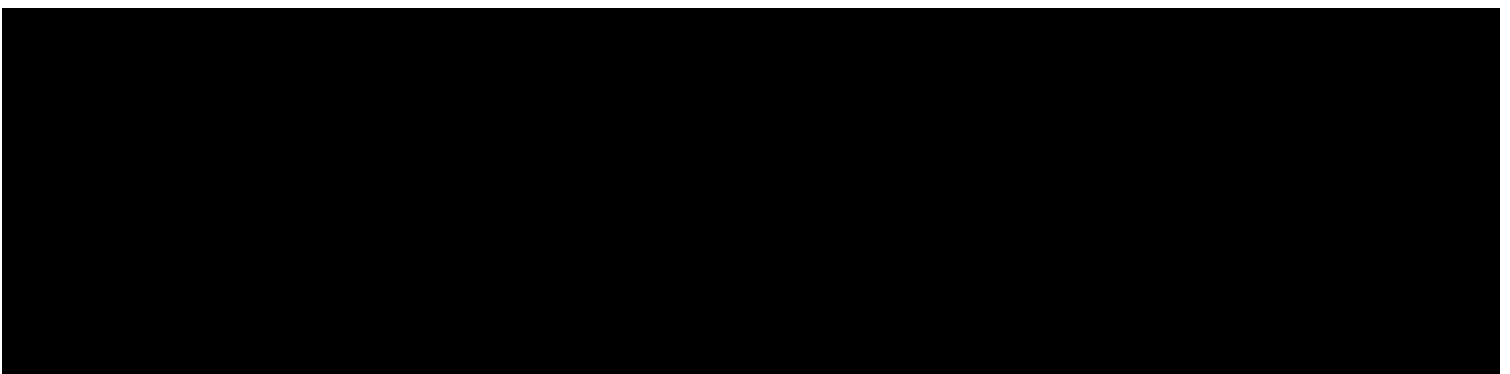
The Scottish Government should:

- remove the incentive for pharmacists to over-order repeat drugs as part of the changes to the community pharmacy contract
- consider running a national public information campaign to encourage the public to recognise the value of prescribed drugs and reduce drug wastage
- monitor the impact of the abolition of prescription charges on an annual basis by examining any change in prescribing of a basket of drugs that are also available to buy.

# Part 3. Age, deprivation and lifestyle



Age of patients and deprivation have a significant effect on prescribing.



## Key messages

- Over 900,000 people in Scotland over the age of 50 are taking four or more different drugs. These people have an increased risk of side effects from their drugs, and the combination of drugs could have an adverse effect on their quality of life.
- GP practices serving the most deprived populations prescribe on average 46 per cent more drugs per head of population than those in the least deprived areas. Spending is also 37 per cent higher per head of population.
- Lifestyle factors, such as higher rates of obesity, are leading to increased prescribing, for example increases in drugs prescribed for the growing number of people with type 2 diabetes, which is associated with obesity.

### A number of factors affect prescribing, including patient age and deprivation

**64.** The biggest causes of variation in the overall spending and quantities of drugs prescribed by a GP practice are:

- patient age – older patients are prescribed more drugs
- deprivation – people living in deprived areas are prescribed more drugs
- NHS board – board policies and the level of prescribing support staff have a significant impact on prescribing (as discussed in Part 2)

- other factors such as rurality may have an impact on prescribing for particular items, for example diabetes testing strips.

**65.** The biggest factors that affect prescribing are patient age and deprivation and we examined these in more detail.

### Older people tend to take more drugs

**66.** The demographic profile of the population will have a significant effect on current and future prescribing. Although there is some variation by gender, the number of drugs people are prescribed rises after age 50, and many people over 75 are taking four drugs or more (Exhibit 12).<sup>37</sup> Overall 1.25 million people in Scotland

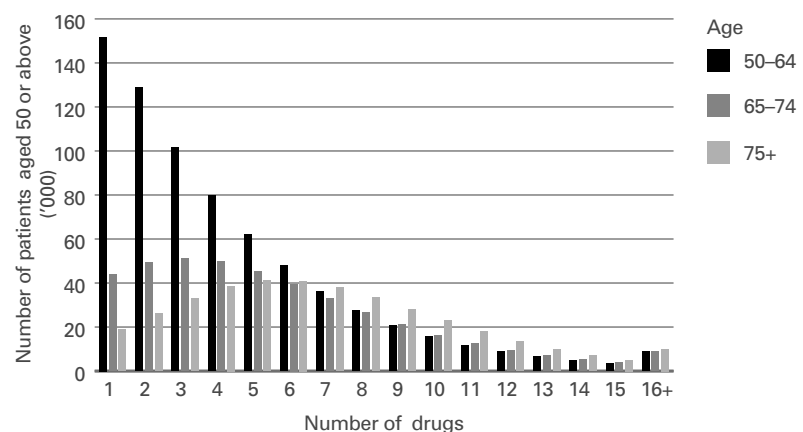
(about 24 per cent of the population) are taking four or more different drugs, most of whom (900,000) are aged over 50.

**67.** People who are prescribed a large number of drugs (known as polypharmacy) can sometimes have health problems caused by their drugs. This usually happens because people have more than one illness, particularly older people. For example, applying clinical guidelines to a patient with high blood pressure, high cholesterol, diabetes and heart disease could lead to them being prescribed three different drugs for their blood pressure, a statin to lower their cholesterol, aspirin and drugs for diabetes. Clinical guidelines usually focus on a single condition while GPs care for people with a number of concurrent illnesses.

## Exhibit 12

### Number of drugs taken by people aged over 50 by age group, January to March 2012

People tend to take more drugs as they grow older.



Source: Audit Scotland analysis of ISD Scotland data

<sup>37</sup> The number of drugs prescribed to people was calculated by linking how many individual drugs were prescribed for each CHI number over a three-month period. We excluded prescribed items that are not drugs such as dressings, elasticated garments and food supplements.



**68.** A further difficulty in prescribing safely is changes in the way the body responds to drugs as people grow older, for example in the way the body absorbs, breaks down and gets rid of drugs.<sup>38</sup> Even when all prescribed drugs are proven to help the illnesses the patient has, there may be too many drugs for an older person's system to cope with. Drug side-effects and the combinations of drugs taken together can make older people unwell. Adverse reactions to drugs are a factor in five to 17 per cent of hospital admissions of older people.<sup>39</sup> In addition, people who take many drugs may forget to take all of them at the correct time and may also take over-the-counter remedies, such as laxatives, antacids and painkillers without informing their GP.

**69.** The Scottish Government has developed a patient medication review process based on the work of the Polypharmacy Action Group in NHS Highland and work by NHS Tayside. Reviewing patient medication in this way resulted in better patient care, an overall reduction in the number of drugs being prescribed and, usually, a net cost saving.

**70.** The work undertaken to develop this review process highlighted a number of themes:

- many prescribers consider that the QOF and clinical guidelines have encouraged GPs to prescribe too many different drugs to older people
- NHS boards should identify frail patients and focus their medication reviews on high-risk drugs using information supplied by ISD Scotland
- GPs, pharmacists and geriatricians should work together on the drug review

- it is sometimes appropriate that patients are on a high number of drugs.<sup>40</sup>

**71.** The Scottish Government published guidelines on managing polypharmacy in October 2012. The guidelines are intended to improve the quality of prescribing and help clinicians undertake face-to-face drug reviews with patients. The guidance recommends that NHS boards should prioritise patients aged over 75 taking ten or more drugs and/or high-risk drugs for review. It identifies just over 36,000 patients as being in this priority category and estimated potential annual savings of £2.25 million to £4.5 million depending on whether the average number of drugs per patient fell by one or two per year.

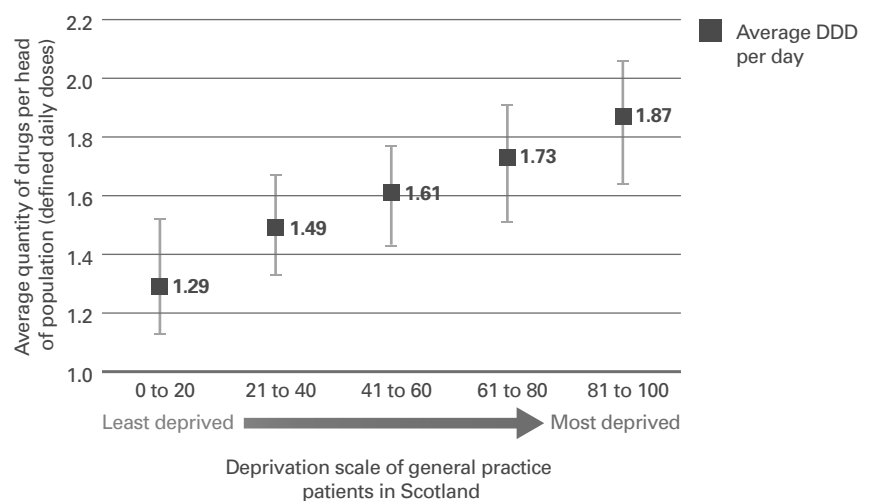
### Practices with patients living in deprived areas prescribe significantly more drugs

**72.** Practices serving the most deprived populations prescribe on average 46 per cent more drugs per head of population than those in the least deprived areas (Exhibit 13). Spending is also 37 per cent higher per head of population. There is still considerable variation among practices when deprivation is taken into account, and a small number of practices with patients living in the least deprived areas have high prescribing rates. Conversely, some practices where patients live in the most deprived areas have low levels of prescribing. Prescribing advisers can use information such as this to identify which practices will benefit most from support.

#### Exhibit 13

##### The average quantity of drugs prescribed in practices by different levels of deprivation, 2011/12

Patients living in deprived areas are prescribed significantly more drugs.



#### Notes:

1. Half of the practices within each deprivation category prescribe quantities between the bars. The marker shows the average quantity prescribed in each category.
  2. The average figures have been rounded to two decimal places. The 46 per cent difference between the average for the most deprived patients (1.87) and the least deprived (1.29) is based on the unrounded figures.
- Source: Audit Scotland analysis of ISD Scotland data

38 'Adverse drug reactions in elderly patients', P A Routledge, M S O'Mahony, & K W Woodhouse, *British Journal of Clinical Pharmacology*, February 2004.

39 'Co-morbidity and repeat admission to hospital for adverse drug reactions in older adults: retrospective cohort study', M Zhang et al, *British Medical Journal*, 2009.

40 *Guidance on polypharmacy*, Scottish Government, October 2012.

**There is a clear link between deprivation and prescribing of particular types of drugs**

**73.** GP practice-level data provide only partial evidence of the link between deprivation and prescribing. This is because people living in one area may be registered with a general practice in another area and GP practices may serve diverse

communities. To get a better picture of the link between prescribing and deprivation, we looked at the relationship between deprivation and five groups of drugs (painkillers; hypnotics and anxiolytics (sleeping pills and drugs to treat anxiety); statins; antibiotics; and drugs for treating diabetes).

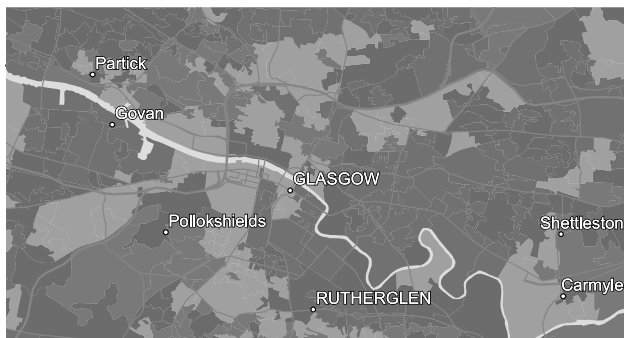
**74.** ISD Scotland provided us with data on the quantity of these drugs prescribed for each datazone in NHS Greater Glasgow and Clyde. We used these data to create maps showing the level of prescribing of particular drugs and the level of deprivation. This shows that the pattern of prescribing of some drugs closely reflects the pattern of deprivation in the areas around Glasgow (Exhibit 14).

**Exhibit 14**

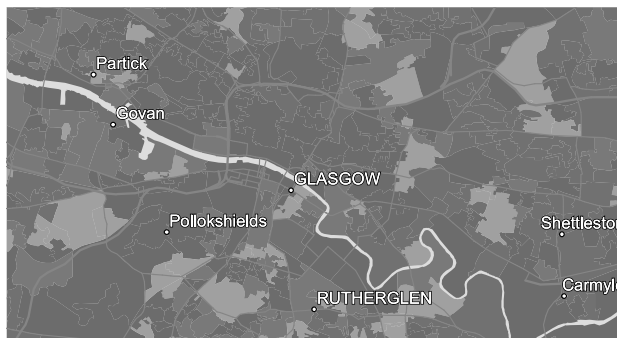
**Comparison of deprivation and prescribing in Glasgow, 2011/12**

Prescribing of hypnotic and anxiolytic drugs is closely linked to deprivation.

Deprivation in NHS Greater Glasgow and Clyde



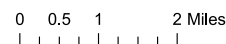
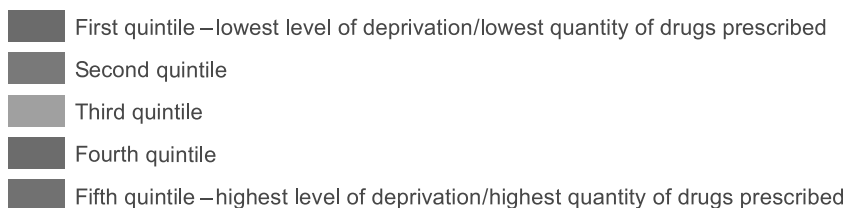
Use of statins



Use of hypnotics and anxiolytics



Use of painkillers



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 Source: Audit Scotland analysis of ISD Scotland data and Scottish Government Scottish Index of Multiple Deprivation data

**75.** Although prescribing of all of these drugs has a statistically significant correlation with deprivation, the strength of the link varies (as does the variation in the quantities of drugs prescribed between the most and the least deprived datazones) (Exhibit 15). Prescribing of hypnotics and anxiolytics was more than four times higher in the most deprived ten per cent of areas compared to the least deprived ten per cent. Research has shown similar variation in antidepressant prescribing where the level of long-term illness, which is highly correlated with deprivation, is the most influential factor affecting prescribing.<sup>41</sup>

**76.** The link between statin use and deprivation, although statistically significant, was less strong than might be expected given the link between deprivation and ill health. NHS Greater Glasgow and Clyde

has identified this as an issue and its Keep Well initiatives have led to an increase in statin prescribing in deprived areas of Glasgow.

#### Antibiotic prescribing varies among practices

**77.** Reducing the unnecessary use of antibiotics is essential to combat the emergence of antibiotic resistant bacteria. The use of some types of antibiotics is also associated with a higher risk of patients developing *Clostridium difficile* infections. Although the overall use of antibiotics across Scotland increased by two per cent in 2010/11, there was a 15 per cent decrease in GPs prescribing these higher risk antibiotics.<sup>42</sup>

**78.** Practices with a higher proportion of elderly people prescribe more antibiotics. However, there is still considerable variation among GP practices not explained by the age

of the population, with a more than threefold difference in prescribing rates among practices (Exhibit 16, overleaf). Prescribing advisers can use PRISMS data to identify practices with high levels of antibiotic prescribing and advise them on how to improve quality and reduce unnecessary prescribing.

#### Changes in lifestyle are leading to increased prescribing

**79.** People living in deprived areas tend to have higher levels of avoidable illness associated with lifestyle and lower life expectancy.<sup>43</sup> This includes illnesses linked with smoking, drinking and obesity. This has an impact on prescribing, for example more drugs for diabetes, which is linked with obesity, are prescribed in deprived areas and prescribing is increasing (Case study 3, overleaf).

### Exhibit 15

Relationship between deprivation and prescribing in NHS Greater Glasgow and Clyde, 2011/12  
Prescribing of these five groups of drugs is significantly higher in the most deprived areas.

Group of drug	Correlation between prescribing and deprivation (R-squared)	Quantity prescribed in the most deprived ten per cent of areas (DDDs)	Quantity prescribed in the least deprived ten per cent of areas (DDDs)	Ratio of quantity prescribed in the least deprived areas to the most deprived areas
Hypnotics and anxiolytics	0.51	20.3	4.7	1 : 4.3
Painkillers	0.46	45.9	20.0	1 : 2.3
Statins	0.17	72.4	47.5	1 : 1.5
Diabetes	0.15	34.1	20.5	1 : 1.7
Antibiotics	0.14	9.0	7.2	1 : 1.3

#### Notes:

- Quantity prescribed is measured as defined daily doses per head of population per year.
- The R-squared value measures the strength of the correlation. A value of 0 would indicate no correlation and a value of 1 would indicate perfect correlation. All of the correlations in this table are statistically significant.

Source: Audit Scotland analysis of ISD Scotland data and Scottish Government Scottish Index of Multiple Deprivation data

41 'Factors influencing the variation in antidepressant prescribing by general practices in Scotland', Morrisson et al, *British Journal of General Practice*, February 2009.

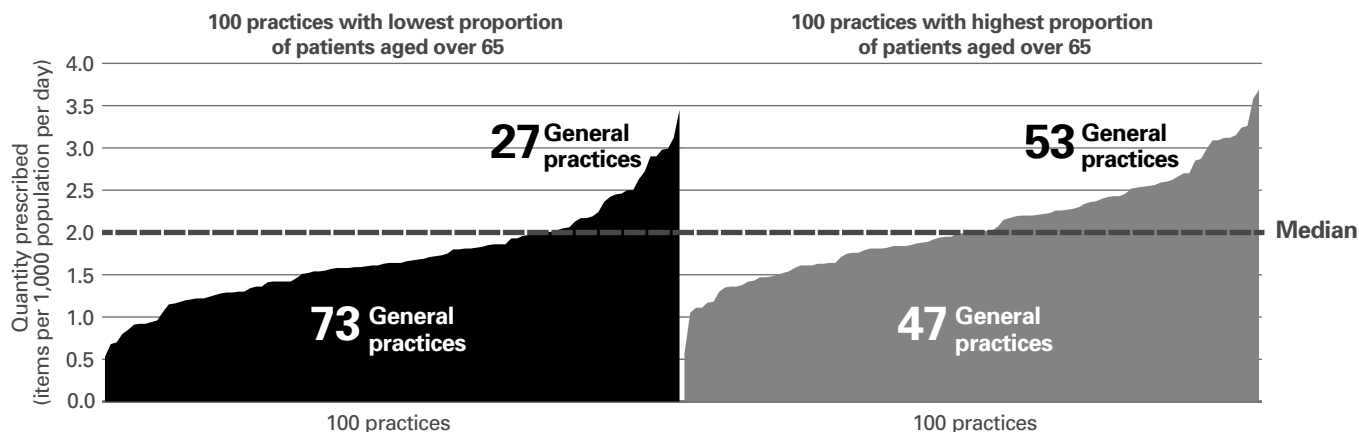
42 *Scottish antimicrobial prescribing group, primary care prescribing indicators, Annual Report 2011/12*, October 2012.

43 *Health inequalities in Scotland*, Audit Scotland, December 2012.

## Exhibit 16

### Variation in antibiotic prescribing among GP practices, 2010/11

Practices with older populations prescribe more antibiotics but there is still wide variation among practices when this is taken into account.



Note: The line shows the median value for all GP practices.

Source: Audit Scotland analysis of ISD Scotland data

## Case study 3

### Prescribing for type 2 diabetes

Between 85 and 90 per cent of people with diabetes have type 2 diabetes, which is caused by the body not effectively using the insulin it produces or by its cells being resistant to the action of the insulin. Obesity, age and family history are risk factors and onset usually occurs after age 40. The most deprived people are 2.5 times more likely to have type 2 diabetes.

The number of people in Scotland with diabetes is increasing by about 10,000 each year. There are now over 218,000 people with type 2 diabetes, 4.1 per cent of the population.<sup>1</sup>

The increase in type 2 diabetes has significant economic implications. As well as the direct costs of treating the illness, there are associated risks of other health problems such as heart disease, stroke, blindness, lower limb amputations and kidney damage. Complication rates are 3.5 times higher in people from the most deprived areas.<sup>2</sup>

York Health Economics Consortium has estimated that the number of people with type 2 diabetes in the UK is likely to increase from 3.4 million to 5.6 million between 2010/11 and 2035/36. Applying these estimates to Scotland would suggest an increase to almost 350,000 people, about 7.5 per cent of the population. This would lead to a rise in prescribing costs for treating diabetes from £87 million to £146 million. In the next few years, new drugs for treating diabetes are likely to come on to the market, which will improve the quality of patient care, but increase cost pressures on the NHS.

#### Notes:

1. *Scottish Diabetes Survey 2011*, Scottish Diabetes Survey Monitoring Group.

2. *Diabetes in the UK 2010: Key statistics on diabetes*, Diabetes UK, 2011.

Sources: York Health Economics Consortium and ISD Scotland.

## Recommendations

NHS boards should:

- implement Scottish Government guidance for people who have multiple illnesses in old age and need to take a lot of different drugs. They should use the prescribing information system to identify patients at most risk of drug interactions
- use the link between CHI numbers and prescription data to identify areas where drugs appear to be under-prescribed or over-prescribed, and target resources to areas where they will have the most benefit and improve longer-term outcomes
- work with GP practices to help them reduce the unnecessary use of antibiotics.

# Appendix 1

## Audit methodology

### Published data

We reviewed reports on GP prescribing by the National Audit Office, York Health Economics Consortium and the King's Fund.

We used published data from ISD Scotland, population statistics from the National Records of Scotland and published data from their equivalents in England and other devolved administrations. We also used data from the Scottish Government's Scottish Index of Multiple Deprivation, 2012.

We commissioned ISD Scotland to provide detailed information about:

- prescribing data by age group categories for 2011/12 to look at the impact of demographic change on prescribing and to look at polypharmacy
- prescribing data from 2002/03 to 2011/12 to look at changes in prescribing costs and quantities over time
- information to allow us to look at potential savings
- prescribing data at patient level for NHS Greater Glasgow and Clyde and NHS Fife for 2011/12.

### Data analysis

Real-terms spending was calculated using the GDP deflator.

Savings were calculated on the following basis:

- reducing drug wastage – we assumed savings in Scotland would be in the same proportion of drug spending as those calculated for England in the report by York Health Economics Consortium and the University of London School of Pharmacy

- generic prescribing – savings were calculated on the basis of a 50 per cent saving on the top ten drugs where savings from generic substitution were available

- reducing use of more expensive versions of drugs – we analysed potential savings for five drugs highlighted in our 2003 report as having scope for savings. The savings assume that GPs could halve their current level of prescribing of the two most expensive drugs

- the national therapeutic indicators – we assumed GPs would choose the indicators with the biggest potential for cost savings and achieve the targets

- drugs considered less suitable for prescribing – savings were calculated on the basis that all practices achieved the rate of the lowest 25 per cent of practices

- drugs going off-patent – we calculated the potential savings based on current spending on drugs prescribed by GPs. The savings were calculated on the basis that spending would fall by 70 per cent.

Population projections and mid-year population estimates by age group and gender were taken from the National Records of Scotland. ISD Scotland also provided information on prescribing by patient gender and different age groups over a three-month period from January to March 2012. We used these figures to estimate the proportion of people in Scotland who received a number of different drugs and to estimate the impact of the increasing older population on the quantities of drugs prescribed between 2004/05 and 2011/12.

### Fieldwork with NHS boards and other stakeholders

We carried out a survey of all 14 territorial NHS boards in Scotland. This focused on levels of prescribing support provided to general practices for prescribing, and unnecessary prescribing and drug wastage.

We carried out interviews in four NHS boards – Borders, Fife, Greater Glasgow and Clyde, and Highland. We interviewed a range of people at each board including medical directors, prescribing advisers and other key prescribing support specialists, GPs, finance directors and assistant directors of finance.

We interviewed Scottish Government staff, representatives from the Royal College of GPs and British Medical Association, and representatives from the Scottish Medicines Consortium. We also liaised with colleagues from the Wales Audit Office and the Northern Ireland Audit Office to share and discuss findings.

We developed the case studies included in our report through a combination of discussions with NHS boards and reviews of published reports, using information submitted to us from ISD Scotland and NHS boards.

The information included in our report was validated with all NHS boards. This validation also gave an opportunity for NHS boards to provide any further comments or information, including good practice examples and case studies.

# Appendix 2

## Project advisory group

Audit Scotland would like to thank the members of the project advisory group for their advice and support throughout the audit.

<b>Member</b>	<b>Organisation</b>
Dr John Duncan	Deputy Chair (Policy), Royal College of General Practitioners
Dr Simon Hurding	GP Adviser, NHS Lothian Medicines Management Team and GP Prescribing Adviser, Scottish Government Health and Social Care Directorates
Stuart McTaggart	Principal Pharmacist, ISD Scotland
Ian McDonald	Director of Finance, NHS Tayside
Dr Philip McMenemy	Associate Medical Director (Primary Care), NHS Lanarkshire
Margaret Ryan	Lead Prescribing Governance, NHS Greater Glasgow and Clyde and Chair of Scottish Prescribing Advisers Association
Sean MacBride Stewart	Medicines Management Resources Lead, NHS Greater Glasgow and Clyde and Prescribing Adviser, Scottish Government Health and Social Care Directorates

Note: Members of the project advisory group sat in an advisory capacity only. The content and conclusions of this report are the sole responsibility of Audit Scotland.

# Prescribing in general practice in Scotland

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