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NHS Quality Improvement Scotland

Clinical Outcomes Group ~ *November 2003*

Clinical Outcome Indicators

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www.nhshealthquality.org

Foreword

This has been a significant year for the Clinical Outcomes Group. The group, established as a committee of the Clinical Resource and Audit Group (CRAG), has overseen the publication of national clinical outcome indicators for a decade - this is the tenth indicators report published. Throughout this time the Clinical Outcomes Group has endeavoured to refine its approach to publishing indicators, while maintaining a focus on the commitment that lies at the heart of this work - to produce information that can meaningfully contribute to quality assurance within the health service in Scotland.

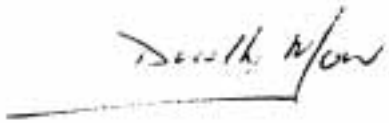
As anticipated in last year's report, 2003 has also been a year of change. In particular, CRAG is now a part of NHS Quality Improvement Scotland (NHS QIS) - a Special Health Board established in January of this year in order to achieve better integration and co-ordination of work on effectiveness of clinical care and quality improvement.

NHS Quality Improvement Scotland has been tasked with producing, by April 2004, a national framework for improving the quality of patient care. While the work on indicators will continue, the development of this framework will undoubtedly impact on the work programme right across the organisation, to ensure this programme is focused and cohesive.

Despite the changes taking place, the Clinical Outcomes Group remains committed to producing reports that can help the NHS improve the quality of care it provides for the people of Scotland. This report includes measures covering a range of health and healthcare issues. Some of these topics have been covered in previous reports, for example breastfeeding, whereas others such as kidney disease are included for the first time.

One comment made about previous indicators reports is that they can be rather complex documents to navigate, particularly for those without expertise in the areas covered. Efforts have been made to address this for the 2003 report. For the first time, a short guide to the report has been produced summarising - for both the public and health service staff - the key points from the full document. In addition, while efforts have been made to include all the information needed to use the report, other sources of information are highlighted for those readers who would like to find out a bit more.

We would like to thank the many people who have contributed to the production of Clinical Outcome Indicators reports throughout the last ten years, and look forward to building upon this work - ultimately for the benefit of those people cared for by NHSScotland.



Dr Dorothy Moir
Chairman, Clinical Outcomes Group

Contacts and Further Information

Further information about the Clinical Outcomes Group is available on the NHS Quality Improvement Scotland website:

www.nhshealthquality.org

To facilitate the production and use of indicators, the Clinical Indicators Support Team was set up in May 2000 at the Information and Statistics Division of the Common Services Agency for NHSScotland. Further information about this team can be found on its website:

www.show.scot.nhs.uk/indicators

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NHSScotland Regional Breakdown

NHS Board areas, with population estimated at 30 June 2002

1	Argyll & Clyde	418,750
2	Ayrshire & Arran	367,060
3	Borders	107,400
4	Dumfries & Galloway	147,310
5	Fife	350,620
6	Forth Valley	279,370
7	Grampian	523,290
8	Greater Glasgow	866,080
9	Highland	208,140
10	Lanarkshire	552,910
11	Lothian	779,100
12	Orkney	19,210
13	Shetland	21,940
14	Tayside	387,420
15	Western Isles	26,200

1. Setting the Scene

What is NHS Quality Improvement Scotland?

NHS Quality Improvement Scotland (NHS QIS) was established as a Special Health Board on 1 January 2003, bringing together the Clinical Resource and Audit Group (CRAG), Clinical Standards Board for Scotland (CSBS), Health Technology Board for Scotland (HTBS), Nursing and Midwifery Practice Development Unit (NMPDU), and Scottish Health Advisory Service (SHAS).

The purpose of NHS Quality Improvement Scotland is to improve the quality of healthcare in Scotland by setting standards and monitoring performance, and by providing NHSScotland with advice, guidance and support on effective clinical practice and service improvements.

One way in which NHS Quality Improvement Scotland will achieve this objective is by publishing clinical outcome and performance data.

What is the purpose of this report?

The Clinical Outcomes Group was set up in 1992 to produce comparative clinical outcome indicators for the health service in Scotland. This is the tenth report produced by the group.[1] Like the previous reports, it includes a range of different measures - collected throughout Scotland - covering a wide spectrum of health/healthcare topics.

The main reason this report is published is to provide information that, when used carefully, can help NHSScotland improve the quality of care provided for patients. A more thorough discussion of what indicators are and how they should/should not be used is provided later in this section.

In addition, this report is one means of contributing to public accountability in the NHS, by providing information about a variety of health topics - including clinical outcomes - in an open and transparent manner.

What information is included in this report?

Some of the topics included this year have been covered in previous reports (eg breastfeeding), whereas others are included for the first time (eg kidney disease). The indicators included in the previous reports are listed in the appendices.

1. While this is the tenth outcome indicators report, it is the first to be published by NHS Quality Improvement Scotland. Between 1992 and 2002 the Clinical Outcomes Group was a committee of CRAG (now a part of NHS Quality Improvement Scotland).

For each topic, the section begins with some key points about the background, data collected and the general findings (some of which are included in a short guide to this report). This is followed by a more thorough explanation of how the data were gathered, and the data are also presented in detail for different NHSScotland organisations and/or regions of the country.

There are some topics the Clinical Outcomes Group would like to include, but for which there is currently a lack of good quality data to produce robust measures. Further information about these, together with efforts being made to bridge the 'data gaps', is given in Section 3.

What are indicators and how should they be used?

Generally speaking, an indicator is a measure that provides a picture about a specific aspect of health/healthcare (including clinical outcomes) at a particular time. To illustrate, an indicator in last year's report was survival rate following emergency admission to hospital with a heart attack.

Used carefully and in an appropriate context, indicators can contribute to quality assurance within NHSScotland - by highlighting variations which can then be investigated and, where necessary, appropriate action taken.

Interpreting the indicators, however, remains difficult. This is because variation apparent in an indicator may be due to a number of factors, which may or may not include the quality of care provided. Therefore, in publishing indicators over the last ten years, great care has been taken to explain why they should be treated with caution.

It is important to re-emphasise that *no conclusions should immediately be drawn*, from any of the comparisons in this report, about the quality/effectiveness of the services provided for patients by different NHSScotland organisations or in different regions of the country.

Some key dos and don'ts about using indicators are summarised below, and a detailed guide to interpreting indicators can be found in the 1999 report. Further information about the production of indicators (eg what standardisation is and why this is important), together with the 1999 report, is available on the website of the Clinical Indicators Support Team (www.show.scot.nhs.uk/indicators).

Clinical outcome indicators do…

- Provide useful clues and evidence about the quality of care or performance.

- Focus attention on variations in outcome whose existence might otherwise have remained unsuspected - variations which, at the very least, may be worthy of further investigation.

- Fulfil a 'backstop' monitoring role to highlight potentially poor performance.

- Illustrate past performance which may provide an insight into current practice.

- Highlight possible examples of good practice.

- Represent only one component of a comprehensive and concerted effort to ensure that NHSScotland provides a high standard of clinical care.

Clinical outcome indicators do not…

- Include the patients' views about outcome.

- Provide definitive proof about performance or quality of care.

- Constitute a 'league table' of performance.

- Justify taking action in the absence of corroborative evidence.

Frequently Asked Questions

Where do the data come from? When a person is in contact with the health service (eg visits hospital) in Scotland, details about their health and healthcare are recorded. This information is needed to care for the person properly. Such information is also valuable for improving healthcare for everybody, eg it helps NHSScotland check that services are run efficiently, and to plan services for the future.

Personal health information is kept in the individual's medical case record folder, or on computer. When a person visits hospital, some of this information is recorded in a national database - and this is a key source of information used to produce the indicators.

How is personal information protected? The confidentiality and security of all personal information are regarded with utmost importance by NHSScotland. A number of measures are taken to protect patient confidentiality, eg all staff working in the NHS are bound by a strict code of confidentiality. In addition the Data Protection Act gives a person important rights about how their personal information is used.

Further details - including a guide for patients on these rights and how NHSScotland uses personal health information - can be found at the following website: www.show.scot.nhs.uk/confidentiality

Does this report include league tables? No. The indicators are in no sense league tables, and must not be used as a basis for inappropriate and premature conclusions about which NHSScotland organisations provide the best healthcare. The reasons for this have already been explained in this report.

What changes can be expected as a result of publishing this report? The data presented will highlight areas that local NHSScotland services will want to explore further. In some cases, there may be changes in clinical practice or in the way services are organised and managed, leading to a higher quality of care being provided for patients.

What happens if the results suggest more resources are needed? Sometimes improvements in the quality of care can be made without additional resources. Realistically, more resources are sometimes needed to improve services, and each NHSScotland organisation will review this locally, taking into account all the evidence available and competing demands.

Why do some data appear out-of-date? Sometimes it is helpful to provide data for a number of years, so that the health service can monitor its performance over a longer period of time, eg are outcomes getting better, worse, or staying the same? At other times, the data available are not as up-to-date as would be liked - this issue is discussed in more detail in section 2.1.

What will the public make of this information? These reports contain detailed information about health and healthcare across Scotland, and are aimed primarily at health service staff with expertise in the relevant area. However this information may also be of interest to the public, and the key findings are presented at the beginning of each section and also in a short guide that accompanies this full report.

2. Indicators

2.1 Data Completeness

Background

- In order to plan, deliver, monitor and improve the quality of services, it is essential that the NHS has complete and up-to-date information on patients' health and healthcare.
- The Scottish Morbidity Record (SMR) schemes are important ways of gathering such information from hospitals throughout the country. In particular, the SMR01 scheme is used to record information about patients admitted to Scottish hospitals as inpatients or day cases (with the exception of maternity and mental health services, for which other SMR schemes are used).
- The SMR01 data are used for a variety of purposes, and several of the outcome indicators included in this and previous reports are based on this information. This section focuses on the completeness of SMR01 submissions at the time when the indicators based on these data (sections 2.6 and 2.9 of this report) were prepared.

Key Findings

- At March 2003, submissions of SMR01 records for the period April 2000 to December 2001 were nationally complete (ie were around 100% of the expected numbers).
- Completeness of submissions began to fall from the start of 2002, decreasing for each successive 3-month period, down to around 70% by the end of 2002. This drop largely reflects delays in submitting SMR01 records.
- While some delay is inevitable, there was variation across Scotland in the completeness of SMR01 records submitted. In five regions - Borders, Highland, Orkney, Shetland and the Western Isles - submissions were at least 95% complete throughout 2002. All these areas have a relatively small share of Scotland's hospital patients. Meanwhile, for three trusts which together account for far larger numbers of hospital patients - Dumfries & Galloway, South Glasgow, and Lothian - submissions were less than 95% for each quarter of 2002, and dropped below 60% by the end of the year.
- Overall, this section demonstrates why national measures based on SMR01 data have been presented for the timescales covered in this report.

Introduction

Data quality is a major factor that influences indicator development and use. The concept of data quality has a number of components, including accuracy, completeness, and timeliness. Addressed in this section is the issue of overall data completeness at a given time point (which can be affected by timeliness). This is to explain why some of the published indicators relate to a less recent time period than would be ideal.

To date, measures of data completeness have not been included explicitly in this series of Clinical Outcome Indicators reports. However they have influenced decisions regarding other published indicators, with the effect that some time trend information has been truncated or excluded. For example, in sections C and D of the 2002 report, data for the most recent time period considered (year 2000) were not shown for certain trusts as the overall level of data completeness was low (these instances were noted briefly in the text and/or tabulations[1]).

Included for the first time in this series of reports is an explicit consideration of overall completeness of the source data used to produce some of the indicators. The national Scottish Morbidity Record (SMR) schemes are important sources for these reports. Of these, SMR01 is the data set most commonly used by the Information and Statistics Division of NHSScotland (ISD) to provide information on the acute care sector. Several of the indicators included in this report are based on SMR01 data, and the contents of this section are therefore specifically relevant to the indicators contained in sections 2.6 and 2.9.

The choice of the time period for which to present SMR-based indicators is largely based on considerations of overall data completeness at national level (see Results and Discussion section). In particular, SMR01-based indicators are published for a given time period once the data are fully (or very nearly) complete, as this means that the figures are more reliable than they would be if they were based on incomplete data. By presenting completeness information for Scotland and for each acute hospital trust or island health board individually, two points can be demonstrated:

- Why SMR01-based indicators are not published for very recent time periods; and
- Which trusts are further behind, relatively, in terms of data submission.

1. Clinical Resource and Audit Group. Clinical Outcome Indicators. Edinburgh: Scottish Executive (2002). www.nhshealthquality.org and www.showscot.nhs.uk/indicators

The data completeness indicator presented here is a comparison of submissions of SMR01 records with the target counts from ISD(S)1 aggregate returns (the latter summarising a range of hospital activity - see below for details). This measure has been used for some time by ISD and by trust/unit/hospital medical records and information staff, and will be familiar to a number of other readers.

Data and Methods

As noted above, two data sources are used for this indicator:

i) SMR01 records. These contain data on inpatient and daycase episodes in general and acute specialties. An SMR01 record should be completed each time a patient is discharged from an episode of care (eg when they go home, or are transferred to another specialty or hospital).

ii) ISD(S)1 returns. ISD(S)1 is a standard set of summary statistics on resources and activity in hospitals and other healthcare settings in Scotland. These statistics include aggregate numbers of inpatient/day case episodes by specialty, location (eg hospital) and trust. ISD(S)1 returns (which are much less detailed than SMR01) are submitted to a tight timescale and are generally available before the corresponding SMR records.

The actual number of SMR01 records submitted by each organisation is compared with the 'expected' number of SMR01s based on the equivalent portion of that organisation's ISD(S)1 returns. When the number of SMR01 records submitted for a given time period matches closely the count based on ISD(S)1, the SMR submissions are deemed to be 'complete'. However, in practice, the two counts are not expected to be absolutely identical, as there may be differences at some trusts/units/hospitals in the way data are recorded for ISD(S)1 and the individual SMR schemes. Additionally, although ISD(S)1 is considered the 'gold standard' for recording counts of patient episodes, it may itself not always be entirely accurate or complete.

The information presented below illustrates the status of the national SMR01 database as at March 2003. The data used to produce the indicators presented in sections 2.6 and 2.9 of this report were extracted at a similar time. Meanwhile, the completeness figures presented below are shown to December 2002 as this was the latest information available at March 2003.

Results and Discussion

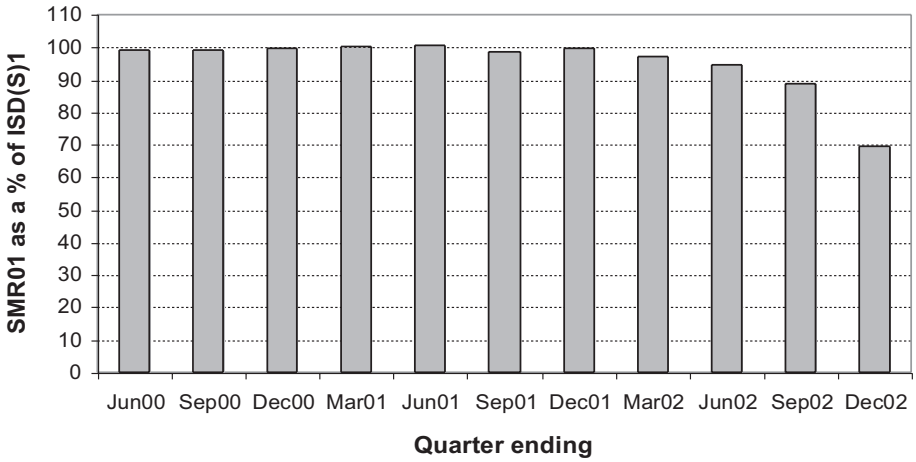
SMR01 data completeness at national level

Figure 1 shows national SMR01 submissions as a percentage of the equivalent portion of ISD(S)1, by three month period (quarter) of patient discharge, for the period April 2000 to December 2002. For quarters where SMR01 submissions are close to, or equal to, 100% of the count based on ISD(S)1, the data are deemed to be 'complete'. The decline in the heights of the bars in Figure 1 (and in Figure 2, shown later) coming closer to the present time indicates a progressive decline in overall data completeness.

This type of graph helps to illustrate why SMR01-based indicators are not published for very recent time periods. It can be seen that, for Scotland as a whole, submission of SMR01 records appeared complete for the period to December 2001. From the start of 2002 onwards, completeness starts to fall, to just under 70% by the end of December 2002.

Inevitably there will be a time lag between patient discharge and submission of the SMR01 record, so data completeness is not necessarily expected to be 100% within a very short time after discharge (eg within a few days/weeks). However, the size and duration of the drop in completeness seen in Figure 1 reflects delays in returning SMR01 data, over and above any inevitable time lag. Over time it is expected that all of the data for 2002 will be submitted and that eventually data for this year will be complete (unless for any reason there is a total failure at one of more hospitals to submit SMR01 records).

Figure 1. Scotland: Volume of SMR01 records on the national database, as a percentage of the equivalent figure from ISD(S)1, by quarter of patient discharge (status as at March 2003).



Selection of time period for the SMR01 based indicators

The year ending 31 March 2002 was selected as the most recent time period for which to present the SMR01-based indicators.

The selection of a time period for which to present the SMR01-based indicators is not based on hard and fast rules. It is based on a reasoned judgement, the choice made following a series of considerations relating to national completeness of these data and the way they are submitted. One particular difficulty is that completeness data are routinely compiled according to month of patient *discharge* (SMR01 episodes are submitted and counted according to period of discharge, as are ISD(S)1 returns). In contrast, however, the indicators shown in sections 2.6 and 2.9 consider *admission* or *readmission* to hospital. These differences need to be allowed for when selecting the time period for which to publish those indicators.

From the data shown in Figure 1 it can be seen that total national submissions of SMR01s were reasonably near to completeness for the quarters ending March 2002 (97%) and June 2002 (95%). This means that submission of records relating to patients *discharged* between April and June 2002 was approximately 95% complete. Completeness in respect of patients *admitted* during that same period will be lower, however. For example, a patient admitted in June might not have been discharged until July (or later) and therefore that episode would appear in SMR01s submitted for a later quarter. Overall, it was felt that, although data for the period April-June 2002 were insufficiently complete for presentation here, those for the previous quarter, ending March 2002, would be sufficiently complete as they would have an acceptably low proportion of "missing" (ie yet to be submitted) records overall.

SMR01 data completeness at trust/unit level

The more recent quarterly completeness figures shown for Scotland in Figure 1 will represent 'complete' submission by some trusts whilst others lag behind. A series of graphs for individual trusts helps to highlight where the biggest gaps in the data are, and why (because data submission is not sufficiently complete) it is sometimes sensible to truncate time trend information for certain trusts (as occurred in last year's report[1]). The series of graphs shown in Figure 2 illustrates data completeness for each acute hospital trust/island health board.

As already explained, in theory SMR and ISD(S)1 figures should agree for a given time period, but in practice this may not occur. For some trusts/units/hospitals, the number of SMRs submitted may consistently exceed, or fall below, the number of corresponding ISD(S)1 records. This is because there may be systematic differences in the way SMR and ISD(S)1 data are submitted. Therefore, when viewing the comparison between ISD(S)1 and SMR counts for individual trusts/units/hospitals, it is sensible to look not just at whether completeness appears to be 100% or not, but also whether there is a consistent difference apparent between the numbers of SMR01 and ISD(S)1 submissions. Any consistent differences for older time periods should be borne in mind when looking at any apparent drops in data completeness for more recent time periods.

The series of graphs shown in Figure 2 illustrates wide trust-level or unit-level variations in SMR01 data completeness over recent months. In five regions (all of which have a relatively small share of Scotland's hospital patients) - Borders, Highland, Orkney, Shetland and the Western Isles - submissions were at least 95% complete throughout 2002. Meanwhile, for three trusts (together accounting for far larger numbers of hospital patients) - Dumfries & Galloway, South Glasgow, and Lothian - submissions were less than 95% for each quarter of 2002, and dropped below 60% by the end of the year. The remaining trusts/regions sit between these two groups in terms of their trends in data completeness.

If all trusts/units were able to submit data at the speed of the fastest, it would be possible to present national time trend information extending at least another six months beyond March 2002. However, this still means that the data are about a year behind by the time of publication, partly reflecting the time scales involved in preparing a report of this type. The move towards regular web-based publication of some of the more established indicators should go some way to allowing the published figures to reflect more recent data (see section 2.2).

The wider context

Timeliness and overall completeness of trust/unit data submissions are only two elements of overall data quality. The fullness with which individual data items are recorded, and the accuracy of recording, are also vitally important. Any improvements in timeliness of submission should not be achieved at the expense of detail and accuracy. This is to say that data completeness close to 100% is only 'good' if the contents of the SMR01 records are full and accurate. A range of factors may affect the ability of a trust/unit to submit accurate data in timely fashion. Of

particular impact have been shortages of experienced coding staff at some locations.

This indicator complements another which is provided in NHSScotland's Performance Assessment Framework (PAF)[2]. The PAF indicator measures overall completeness of SMR00 (outpatient attendances) and SMR01 combined, at NHS Board level, and also measures performance in that it examines whether the data were submitted within a PAF-specified deadline. The importance of measuring overall quality (completeness, accuracy, timeliness, etc) of SMR and other health service data is increasingly recognised in many policy areas, and is likely to have a higher profile over the coming months and years.

Further information on data completeness and other aspects of data quality can be obtained by visiting the Scottish Health Statistics website of ISD[3].

2. Performance Assessment Framework. Indicator Number 7.10.01: Inpatient and Outpatient Data. www.paf.scot.nhs.uk/paf

3. Scottish Health Statistics: The Website of ISD Scotland. www.isdscotland.org (select 'collecting information' then 'managing data quality').

Figure 2. Acute Hospital Trusts/Island Health Board Units: Volume of SMR01 records on the national database, as a percentage of the equivalent figure from ISD(S)1, by quarter of patient discharge (status as at March 2003).

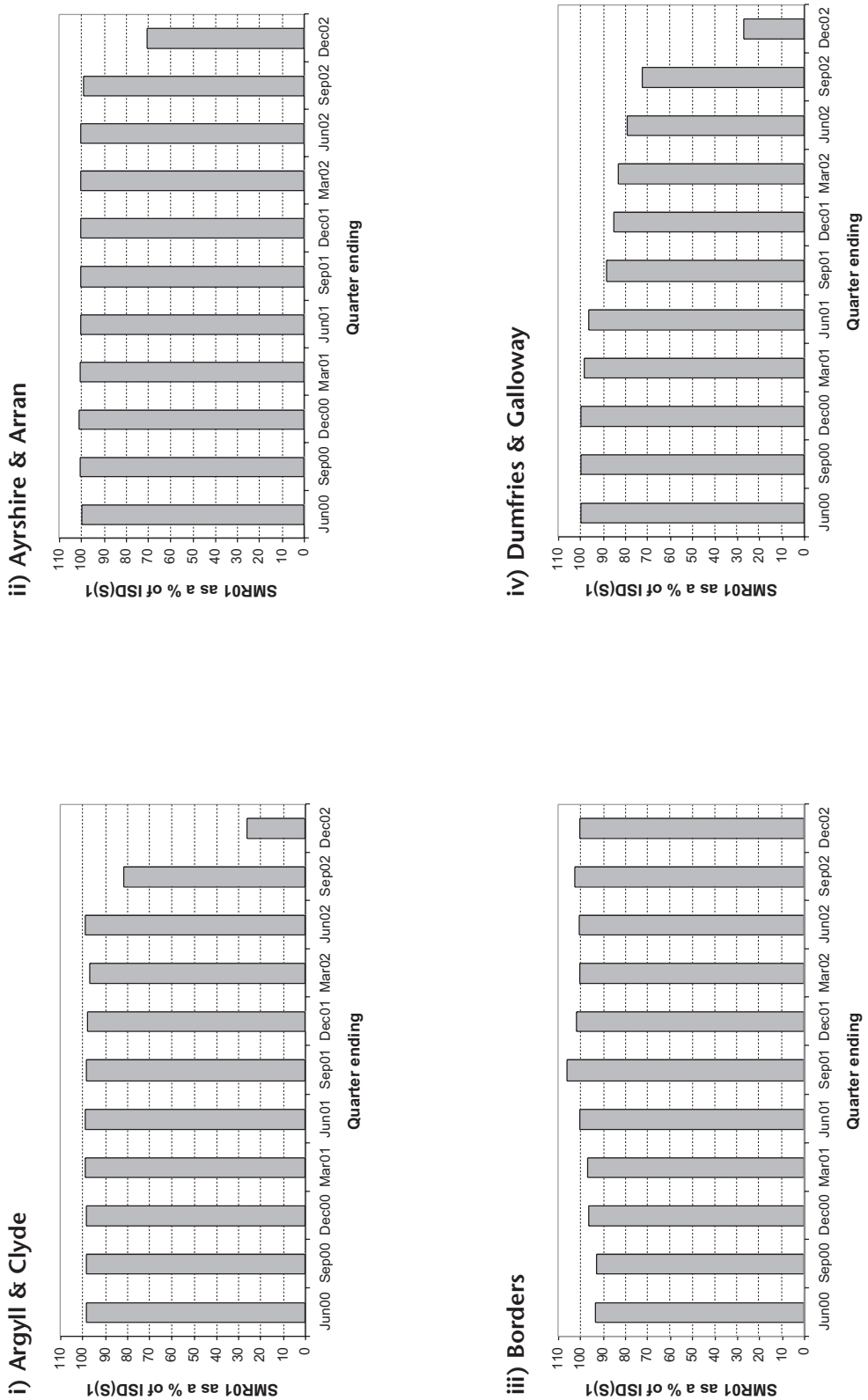
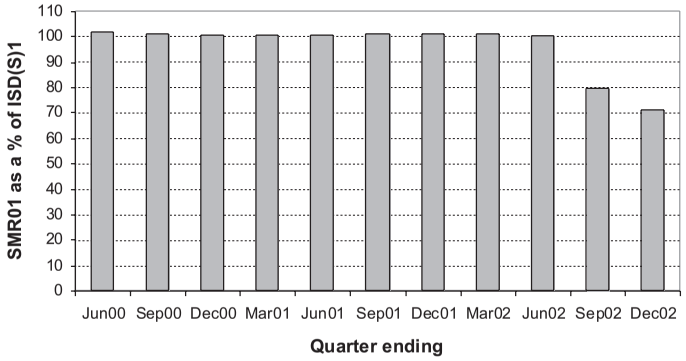
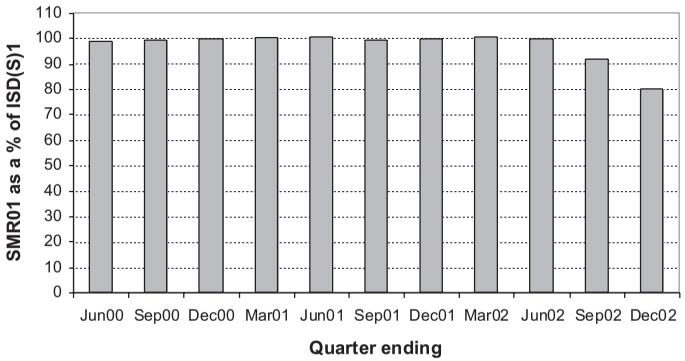


Figure 2 continued. Acute Hospital Trusts/Island Health Board Units: Volume of SMR01 records on the national database, as a percentage of the equivalent figure from ISD(S)1, by quarter of patient discharge (status as at March 2003).

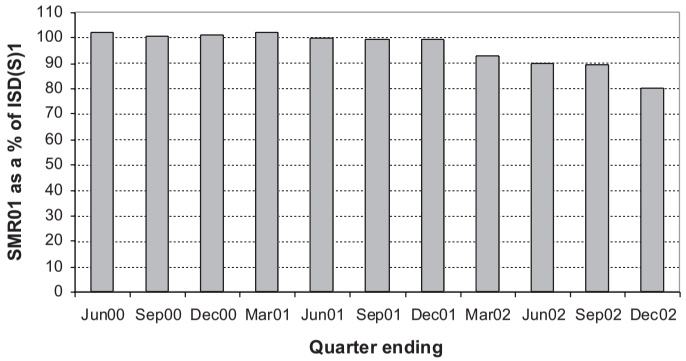
v) Fife



vi) Forth Valley



vii) North Glasgow



viii) South Glasgow

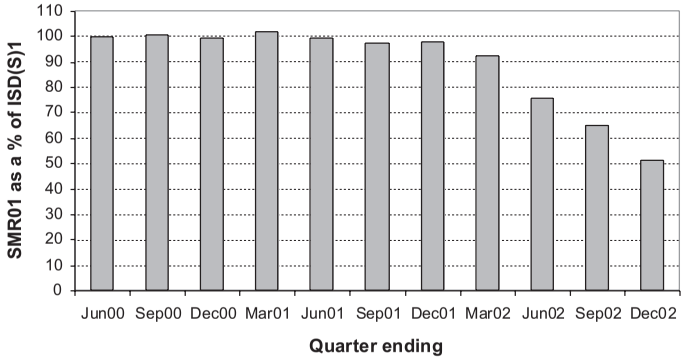
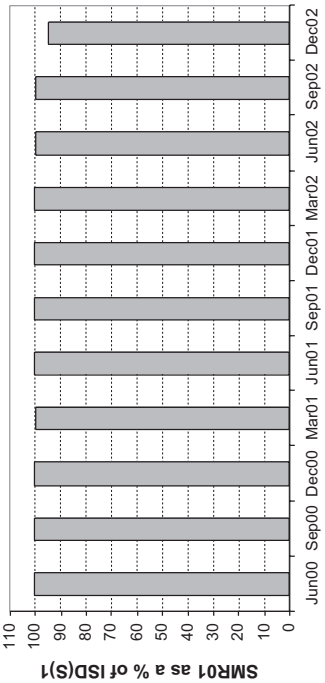
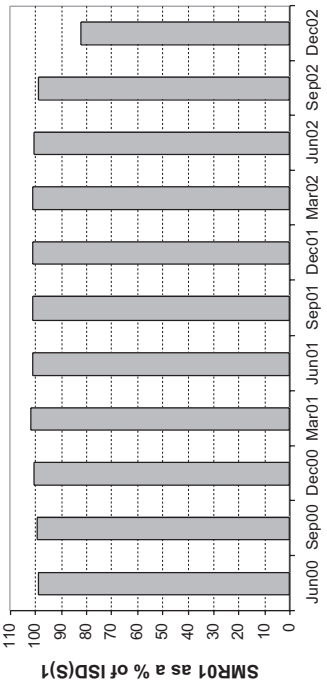


Figure 2 continued. Acute Hospital Trusts/Island Health Board Units: Volume of SMR01 records on the national database, as a percentage of the equivalent figure from ISD(S)1, by quarter of patient discharge (status as at March 2003).

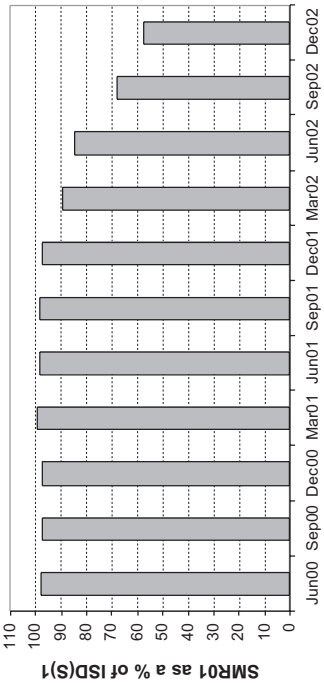
x) Highland



ix) Grampian



xii) Lothian



xi) Lanarkshire

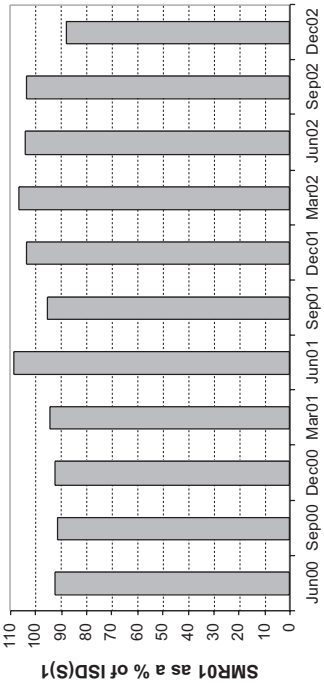
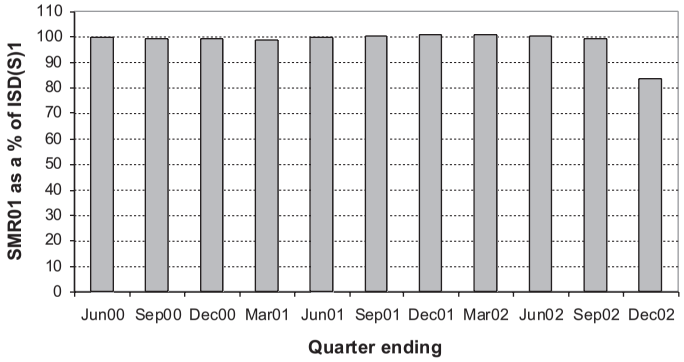
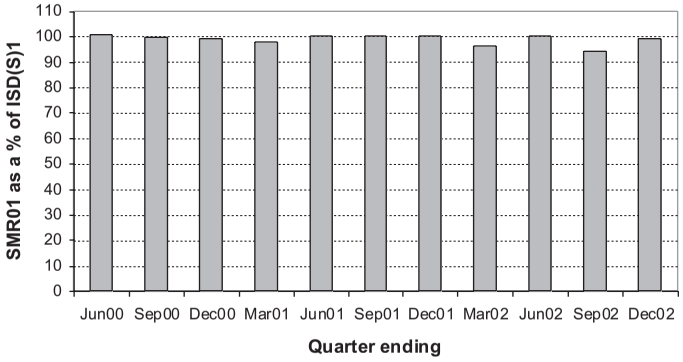


Figure 2 continued. Acute Hospital Trusts/Island Health Board Units: Volume of SMR01 records on the national database, as a percentage of the equivalent figure from ISD(S)1, by quarter of patient discharge (status as at March 2003).

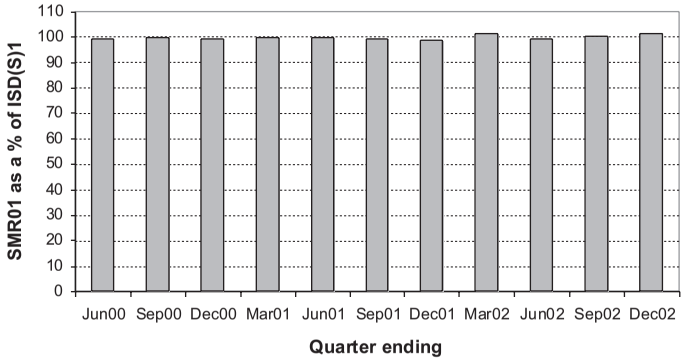
xiii) West Lothian



xiv) Orkney Health Board Unit



xv) Shetland Hospital and Community Unit



xvi) Tayside

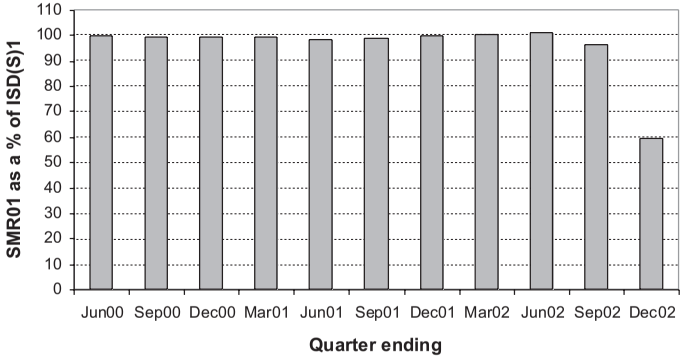
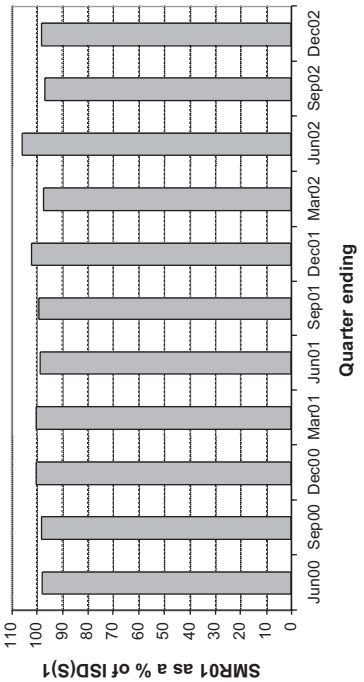
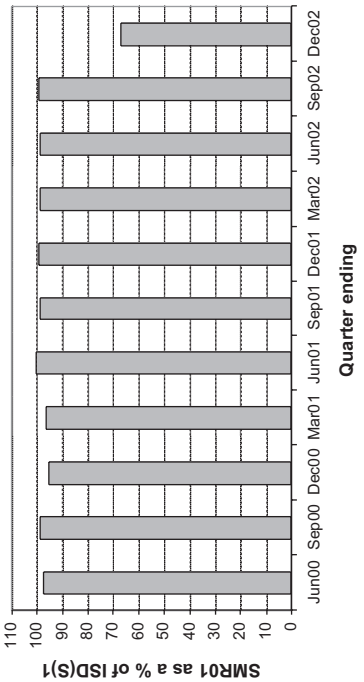


Figure 2 continued. Acute Hospital Trusts/Island Health Board Units: Volume of SMR01 records on the national database, as a percentage of the equivalent figure from ISD(S)1, by quarter of patient discharge (status as at March 2003).

xvii) Western Isles Health Unit



xviii) Yorkhill



2.2 Web-based Indicators

Key Points

- There is increasing momentum for publishing indicators via the internet.
- Four established acute care indicators have been published on the web, at www.show.scot.nhs.uk/indicators

A number of indicators published in this series of reports have been simply updates of information published previously. For instance, survival at 30 days following emergency admission with stroke was published in the 1994, 1995, 1999 and 2002 reports.

Four established indicators which were published in the May 2002 report (and are also included in the NHSScotland Performance Assessment Framework - see Appendix D) have now been redeveloped specifically for web-based publication. These indicators are:

i) Survival at 30 days following admission with acute myocardial infarction (heart attack);

ii) Survival at 30 days following admission with stroke;

iii) Survival at 30 and 120 days following admission with hip fracture; and

iv) Mortality within 30 days of selected planned operations.

These four indicators are tried, tested and relatively non-controversial, and it is hoped that they will be looked at routinely to help monitor care. It therefore makes sense to update these as frequently as possible, and using the most up to date data available. The easiest way to do this, whilst at the same time making them widely available, is to publish on the web.

These indicators can be found on the website for the Clinical Indicators Support Team: www.show.scot.nhs.uk/indicators. It is hoped that, over time, other indicators will also be published this way.

2.3 Smoking and Pregnancy

Background

- Encouraging women to stop smoking during pregnancy is important because tobacco smoke is harmful to both mother and baby. Pregnancy is also a key factor in helping women quit smoking. While many start again after giving birth, pregnancy does have a long term effect in helping women stop.
- The national target is that the proportion of women who smoke during pregnancy should reduce, from 29% in 1995 to 23% by 2005, and to 20% by 2010. This target is based on the number of women who say they smoke at the time of their first antenatal appointment.

Key Findings

- For 2001-2002, it is estimated that 27.4% of Scottish women smoked at the start of pregnancy.
- Smoking rates were between 25% and 30% in most regions of the country. In Grampian 21.9% of women smoked during pregnancy, and this was the only region in which the 2005 target was already met.
- Smoking rates, which take into account age and deprivation in each region, show that in Lanarkshire significantly fewer mothers than expected smoked during pregnancy. In Forth Valley and Tayside significantly more mothers smoked than expected.
- Smoking during pregnancy was more common among women from socially disadvantaged backgrounds. The rate for least disadvantaged mothers was 14.8%, and this rose to 37.8% for the most disadvantaged.

Introduction

There is widespread acceptance that smoking during pregnancy is harmful for both mother and baby. The national target, set out in Towards a Healthier Scotland[1], is based on the percentage of mothers 'smoking at booking' and seeks a:

"reduction in the proportion of women who smoke during pregnancy from 29% to 23% between 1995 and 2005 and to 20% by 2010".

1. Scottish Office. Towards a Healthier Scotland - A White Paper on Health. Edinburgh: Scottish Office (1999). **www.scotland.gov.uk**

Data and Methods

Data sources

Information on smoking behaviour in pregnancy is collected at a woman's first antenatal booking, which can take place either at hospital or in the community (usually within the first three months of pregnancy). This information is recorded on the SMR02 (Maternity Discharge Record), which is submitted to the Information and Statistics Division of NHSScotland (ISD) after the delivery.

Data issues

At the booking visit, it is recorded whether a mother has never smoked, is a current smoker, a former smoker or whether their smoking status is 'not known'. There are issues concerning the quality of some of the data items on SMR02 from which this indicator of smoking is derived. This indicator should therefore be seen as providing potentially useful information and highlighting an important area of health care, but the quality issues make it difficult to draw reliable conclusions from the data presented.

There has been a shortfall in data submitted from the Royal Infirmary of Edinburgh (Lothian) for February and March 2002, and for January to March 2002 from The Princess Royal Maternity Hospital (Greater Glasgow). The Scotland totals in the tables and charts in this section have therefore been estimated by replacing these missing data with data for the same period in the previous year. The data for Lothian and Greater Glasgow NHS Boards are not shown.

Data submitted by Orkney, Shetland and the Western Isles are excluded from all tables and graphs for reasons of confidentiality, due to the small numbers involved.

Standardisation

Maternal age and deprivation are known to be strongly associated with the likelihood of smoking during pregnancy. For this reason, smoking at booking has been indirectly standardised for maternal age and deprivation using the recorded population of mothers in Scotland as the reference.

The standardised ratio reflects the difference between the actual and expected smoking at booking rates, with a value of greater than 100 indicating that the actual rate is higher than expected given the profile of maternal age and deprivation in that area. The 95% confidence interval suggests that there is a 95% probability that the true rate lies somewhere between the upper and lower confidence interval. An estimate of the statistical significance of the standardised ratio can be obtained from the confidence interval. If this range does not include 100, then the difference in smoking at booking rates recorded for a particular population compared to the standard population is said to be 'statistically significant'.

Results and Discussion

The smoking at booking rates are presented by NHS Board of residence and deprivation quintile for the financial year 2001-2002. Data presented by NHS Board of residence (see Table 1 and Figure 1) are the actual and expected number and percentage of women smoking, standardised ratios and 95% confidence intervals (CIs). Data presented by deprivation quintile (see Table 2 and Figure 2) are the actual number and percentage of women smoking.

Further details on maternal smoking can be found at Scottish Health Statistics (the website of ISD[2]).

Smoking at booking by NHS Board

The standardised ratios in Tayside and Forth Valley are 109.4 (95% CI; 103.1, 116.1) and 109.8 (95% CI; 102.2, 117.8) respectively, and are both significantly greater than 100, indicating more mothers are smoking at time of booking than expected. For Lanarkshire the standardised ratio of 94.9 (95% CI; 90.4, 99.6) is lower than 100, indicating fewer mothers are smoking at time of booking than expected. The remaining boards (Argyll & Clyde, Ayrshire & Arran, Borders, Dumfries & Galloway, Fife, Grampian and Highland) have rates that are not significantly different from those expected.

Smoking at booking by deprivation quintile

The proportion of women smoking at booking varies considerably according to deprivation category, from 14.8% in the least deprived areas to 37.8% in the most deprived areas.

2. Scottish Health Statistics: The Website of ISD Scotland. www.isdscotland.org (select 'Information and Statistics' then 'Health and Care' then 'Women and Children's Health')

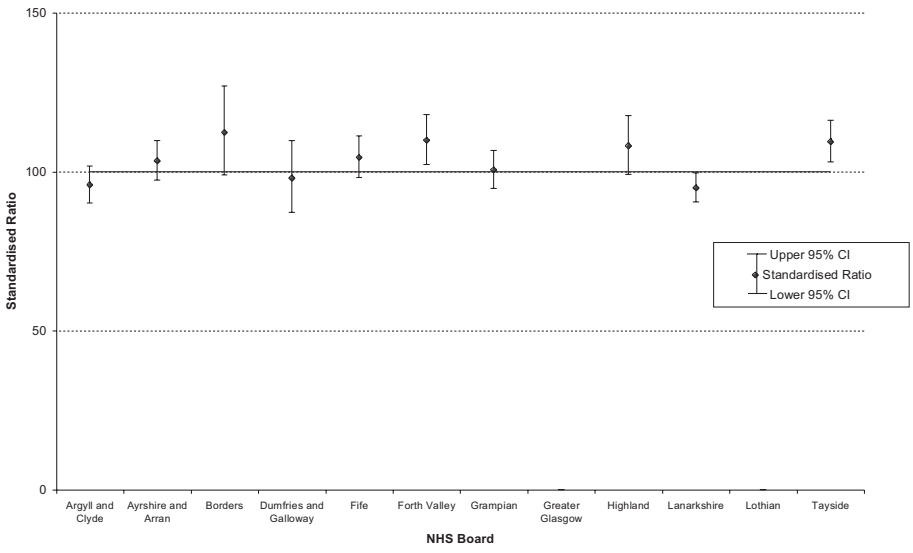
Table 1. Women[1] smoking at booking[2] by NHS Board: standardised by maternal age and deprivation quintile[3]: year ending 31 March 2002[p].

	Number Smoking		Total Births	% Women smoking at booking		Standardised Ratio [5]	Confidence Intervals
	Actual	Expected		Actual	Expected		
Total [4, e]	**13 403**	**13 403**	**48 935**	**27.4**	**27.4**	**100.0**	
Argyll and Clyde	1 068	1 114	3 920	27.2	28.4	95.8	(90.2,101.8)
Ayrshire and Arran	1 061	1 026	3 531	30.0	29.1	103.4	(97.3,109.8)
Borders	255	227	1 025	24.9	22.2	112.3	(98.9,127)
Dumfries and Galloway	300	306	1 184	25.3	25.9	98.0	(87.2,109.7)
Fife	989	947	3 470	28.5	27.3	104.5	(98,111.2)
Forth Valley	774	705	2 711	28.6	26.0	109.8	(102.2,117.8)
Grampian	1 092	1 086	4 978	21.9	21.8	100.5	(94.7,106.7)
Greater Glasgow	x	x	x	x	x	x	x
Highland	547	506	1 976	27.7	25.6	108.1	(99.2,117.5)
Lanarkshire	1 643	1 731	5 686	28.9	30.4	94.9	(90.4,99.6)
Lothian	x	x	x	x	x	x	x
Tayside	1 098	1 003	3 710	29.6	27.0	109.4	(103.1,116.1)

1 Comprises women aged 15 - 44.
2 Data on smoking behaviour is based on self-reported information obtained from mothers at their booking ante-natal visit to hospital.
3 Excludes unknown deprivation category.
4 Excludes the Island boards.
5 Indirect Standardised Ratio - standardised by age and deprivation category.
p Provisional.
e Data has been estimated due to a shortfall in data submission from Glasgow and Lothian.
x Data has been surpressed due to a shortfall in data submissions.

Source: SMR02
ISD Scotland

Figure 1. Women smoking at booking by NHS Board: standardised by maternal age and deprivation quintile: year ending 31 March 2002[p].



p Provisional.

Source: SMR02
ISD Scotland

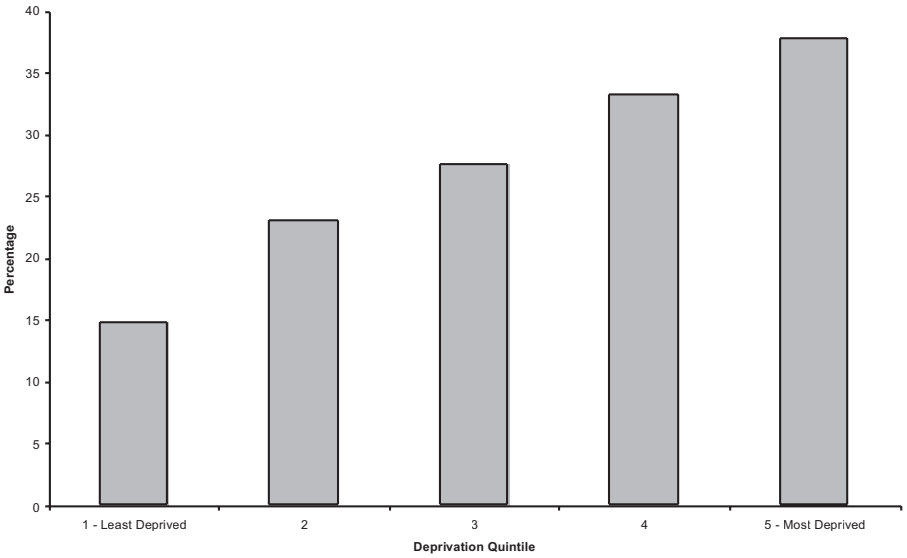
Table 2. Women[1] smoking at booking[2] by deprivation quintile[3]: year ending 31 March 2002[p].

	Number Smoking	Total Births	% Women Smoking
Total [4,e]	**13,403**	**48,935**	**27.4**
1 - Least Deprived	1,475	9,957	14.8
2	2,042	8,900	22.9
3	2,728	9,903	27.5
4	3,324	10,026	33.2
5 - Most Deprived	3,834	10,149	37.8

1 Comprises women aged 15 - 44.
2 Data on smoking behaviour is based on self-reported information obtained from mothers at their booking ante-natal visit to hospital.
3 Excludes unknown deprivation category.
4 Excludes the Island boards.
p Provisional
e Data has been estimated due to a shortfall in data submission from Glasgow and Lothian.

Source: SMR02
ISD Scotland

Figure 2. Women smoking at booking by deprivation quintile: year ending 31 March 2002.



Source: SMR02
ISD Scotland

2.4 Breastfeeding

Background

- Breastfeeding is the healthier option for both mother and baby. Breastfed babies have a lower risk of stomach upsets, ear and chest infections, childhood diabetes and asthma. There is evidence that mothers who breastfeed have less risk of pre-menopausal breast cancer and ovarian cancer.
- While a range of factors influence breastfeeding rates, the health service has a key role to play in encouraging mothers to breastfeed their babies.
- Scotland has one of the lowest breastfeeding rates in Europe. A national target was therefore set in 1994 - by the year 2005, more than 50% of women should still be breastfeeding their babies at six weeks of life.

Key Findings

- 36.5% of babies born in Scotland in 2002 were breastfed at six to eight weeks of life. While this rate was below the target of 50% by 2005, overall rates of breastfeeding are increasing year on year.
- There was variation in breastfeeding rates across NHS Boards. Borders (48.7%) and Lothian (47.0%) were close to achieving the target for 2005, whereas rates in Ayrshire & Arran (29.8%) and Lanarkshire (26.2%) were under 30%.
- Breastfeeding rates, which take account of age and deprivation in each region, show that in Greater Glasgow and Lothian there were significantly more mothers breastfeeding than would be expected. In Ayrshire & Arran, Argyll & Clyde, Lanarkshire and Forth Valley significantly fewer mothers breastfed than expected.
- Breastfeeding rates were lowest in areas of social disadvantage. The rate for least disadvantaged mothers (56.0%) was more than double that for the most disadvantaged (23.5%).

Introduction

Scotland has one of the lowest breastfeeding rates in Europe. The national target[1] set in 1994 states that by the year 2005 more than 50% of women should still be breastfeeding their babies at 6 weeks of life. This target was based on data available from the Infant Feeding Survey 1990 (published 1992). According to the current Infant Feeding Survey 2000 (published 2002) the overall Scottish breastfeeding rate at six weeks was 40%. The situation continues to improve with Scotland noted as the UK country making most progress. Further data about breastfeeding can be found on the Breastfeeding in Scotland website[2].

Breastfeeding data are also available from other sources. Data presented within this section are based on information extracted from the Child Health Surveillance Programme - Pre-school (CHSP-PS). The system is currently used by 10 of the 15 NHS Boards, and accounts for approximately 84% of Scotland's pre-school population. There are slight variations between the Infant Feeding Survey data and the CHSP-PS data, due to differences in the way the data are collected. For example, the Infant Feeding Survey is a random sample with a 27% non response rate, whereas the CHSP-PS data are based on all babies within 10 NHS Board areas who have received a 6-8 week review.

Breastfeeding has major health benefits for both mother and baby and confers health advantages beyond infancy into childhood. Scottish Executive policies support breastfeeding and 13 NHS Boards have established breastfeeding strategies. These strategies provide a comprehensive framework to support breastfeeding. They include staff education, best practice standards, data collection, group and peer support as well as education for young people.

While maternity and primary care services can support and encourage mothers to start and continue breastfeeding, there is a wide range of other factors that influence mothers. Low maternal age and deprivation are associated with a lower level of breastfeeding, although other factors are also important.

1. Scottish Office. Local Breastfeeding Targets. NHS MEL(1994)110. Edinburgh: Scottish Office.

2. Breastfeeding in Scotland Website: www.show.scot.nhs.uk/breastfeed

Data and Methods

Data sources

Breastfeeding information was extracted from the Child Health Surveillance Programme - Pre-school (CHSP-PS). This system allows health care professionals carrying out routine surveillance to record information about the child, including whether or not they were breastfed. The system, introduced in 1991, now has 10 participating NHS Boards (Argyll & Clyde, Ayrshire & Arran, Borders, Dumfries & Galloway, Fife, Forth Valley, Greater Glasgow, Lanarkshire, Lothian, Tayside) which account for approximately 84% of Scotland's pre-school population. The NHSScotland National Strategic Programmes for IM&T 2001-2005 recommended that the pre-school system be rolled out to all NHS Boards by 2003.

The data presented were recorded at the review held between 6 and 8 weeks after the birth of the baby. It is recorded whether the baby is breast fed, bottle fed or both. For the purposes of this analysis breast fed is defined as exclusively breast fed or fed both breast and formula milk.

Standardisation

Low maternal age and deprivation are associated with a lower level of breastfeeding. For this reason, in Table 1 and Figure 1 breastfeeding rates have been indirectly standardised for maternal age and deprivation, taking the population at the 6-8 week review as the reference.

The standardised ratio reflects the difference between the actual and expected breastfeeding rates, with a value of greater than 100 indicating that the actual rate is higher than expected given the profile of maternal age and deprivation in that area. The 95% confidence interval suggests that there is a 95% probability that the true rate lies somewhere between the upper and lower confidence interval. An estimate of the statistical significance of the standardised ratio can be obtained from the confidence interval. If this range does not include 100, then the difference in breastfeeding rates recorded for a particular population compared to the standard population is said to be 'statistically significant'.

Results and Discussion

Breastfeeding rates by NHS Board and deprivation quintile are presented for children born in 2002. Data presented by NHS Board of residence (Table 1 and Figure 1) are the actual percentage breastfed, expected percentage, the standardised ratio and 95% confidence intervals (CIs). Data presented by deprivation quintile (Table 2 and Figure 2) are the actual number and percentage of mothers who breastfed.

The recorded breastfeeding rate at the 6-8 week review, covering all NHS Boards using the CHSP-PS system, is 36.5%. There is wide variation between NHS Boards (see Table 1), with Borders and Lothian having the highest rates (48.7% and 47.0%, respectively) whilst Lanarkshire and Ayrshire & Arran have the lowest rates (26.2% and 29.8%, respectively).

The standardised ratios for Greater Glasgow (95% CI; 102.2, 110.3) and Lothian (95% CI; 114.7, 122.5) are significantly greater than 100, indicating more mothers breastfed than expected. For Ayrshire & Arran (95% CI; 80.8, 92.3), Argyll & Clyde (95% CI; 87.3, 98.0), Lanarkshire (95% CI; 74.8, 83.2) and Forth Valley (95% CI; 76.4, 88.6) the standardised ratios are significantly lower than 100, indicating fewer mothers breastfed than expected. The remaining boards (Borders, Fife, Tayside and Dumfries & Galloway) have breastfeeding rates that are not significantly different from those expected.

There is wide variation between deprivation quintiles, with quintile 1 (least deprived) having the highest breastfeeding rate at 56.0%, whilst quintile 5 (most deprived) had the lowest rate at 23.5% (Table 2).

Although still below the target of 50% of mothers breastfeeding by 2005, overall rates are increasing year on year, from 33.4% in 1997 to 35.1% in 2001 and 36.5% in 2002. Full details of historical rates and time trends can be found on Scottish Health Statistics (the website of ISD[3]).

3. Scottish Health Statistics: The Website of ISD Scotland. www.isdscotland.org (select 'Information and Statistics' then 'Health and Care' then 'Children' then 'Information')

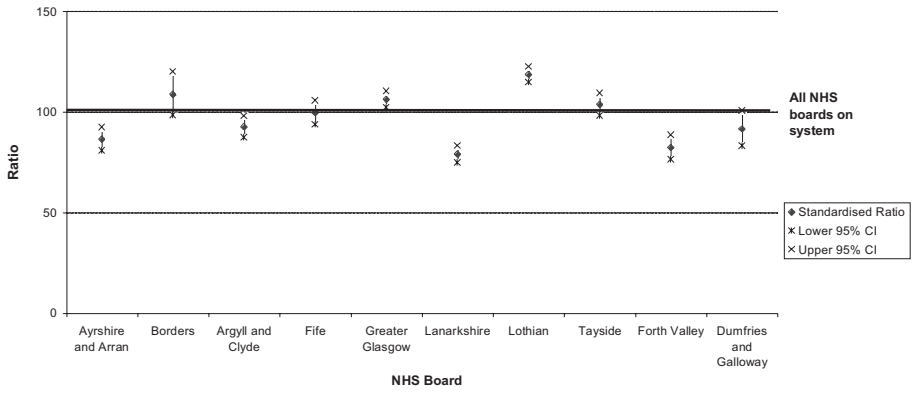
Table 1. Breastfeeding[1] 6-8 weeks after birth by NHS Board: year of birth 2002.

NHS Board	6-8 Week Breastfed[2] Actual	Expected	Total[3]	Actual %	Expected %	Standardised Ratio	95% Confidence Intervals
NHS Boards on System	**13,466**	**13,466**	**36,948**	**36.5**	**36.5**	**100**	
Ayrshire and Arran	868	1,005	2,915	29.8	34.5	86.4	(80.8, 92.3)
Borders	391	380	803	48.7	44.8	108.6	(98.4, 120.0)
Argyll and Clyde	1,145	1,238	3,464	33.1	35.7	92.5	(87.3, 98.0)
Fife	1,076	1,081	2,885	37.3	37.5	99.5	(93.7, 105.6)
Greater Glasgow	2,639	2,485	7,415	35.6	33.5	106.2	(102.2, 110.3)
Lanarkshire	1,355	1,717	5,175	26.2	33.2	78.9	(74.8, 83.2)
Lothian	3,562	3,005	7,585	47.0	39.6	118.5	(114.7, 122.5)
Tayside	1,309	1,264	3,315	39.5	38.1	103.8	(98.1, 109.4)
Forth Valley	701	852	2,212	31.7	38.5	82.2	(76.4, 88.6)
Dumfries and Galloway	420	459	1,179	35.6	39.0	91.5	(83.1, 100.6)

1. Missing and invalid breastfeeding status have been excluded. Maternal age group 0-14 and 45+ have also been excluded.
2. Includes those children who were breastfed or fed breast and formula milk.
3. Total children who have received a 6-8 week review.

Source: CHSP-PS, ISD Scotland. May 2003 extract

Figure 1. Standardised ratio at 6-8 weeks after birth by NHS Board, standardised by maternal age and deprivation: year of birth 2002.



Source: CHSP-PS, ISD Scotland. May 2003 extract

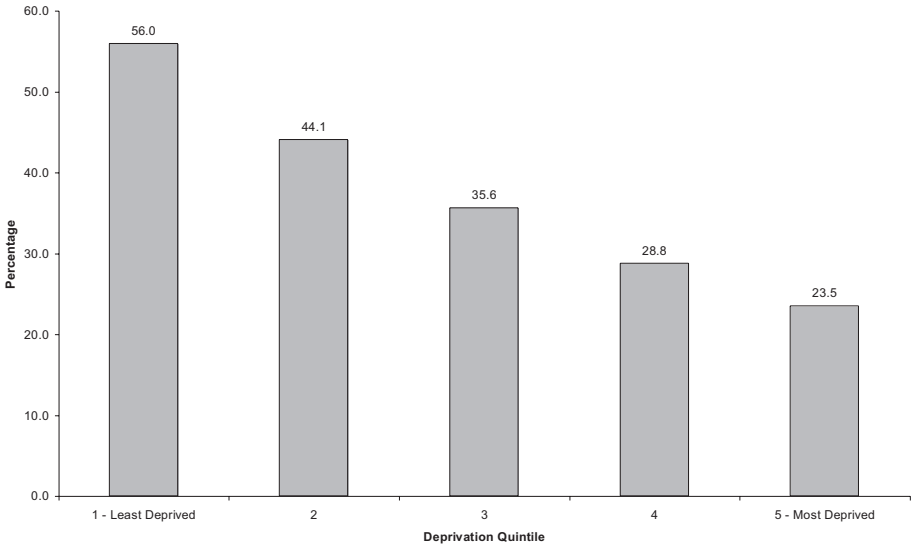
Table 2. Breastfeeding[1] 6-8 weeks after birth by deprivation quintile: year of birth 2002.

Deprivation Quintile	Total[2]	Breastfed[3] at 6-8 weeks No.	%
NHS Boards on System	**36,948**	**13,466**	**36.5**
1 - Least Deprived	6,699	3,751	56.0
2	6,464	2,850	44.1
3	7,049	2,510	35.6
4	8,059	2,318	28.8
5 - Most Deprived	8,677	2,037	23.5

1. Missing and invalid breastfeeding status has been excluded. Maternal age group 0-14 and 45+ have also been excluded.
2. Total children who have received a 6-8 week review.
3. Includes those children who were breastfed or fed breast and formula milk.

Source: CHSP-PS, ISD Scotland. May 2003 extract

Figure 2. Breastfeeding at 6-8 weeks after birth by deprivation quintile: year of birth 2002.



Source: CHSP-PS, ISD Scotland. May 2003 extract

2.5 Obesity in Children: Using Body Mass Index as a Measure

Background

- There is growing concern over the levels of obesity in the Scottish population, particularly among children. Obesity is a health concern in itself, and also increases the risk of high blood pressure, diabetes, and psychological distress.
- The Scottish Intercollegiate Guidelines Network (SIGN) recently published a guideline to be used to manage obesity in children and young people (www.sign.ac.uk).
- Body mass index is a simple measure which can be used to identify obesity. It is calculated by dividing a person's weight in kilograms by their height in metres squared.
- To estimate levels of obesity in Scottish children, information collected by the Child Health Surveillance Programme was used to calculate measures of body mass index. These data were then compared with the reference growth charts for the UK.
- Not all NHS Boards participate in the Child Health Surveillance Programme. It is only possible therefore to estimate national levels of obesity, rather than provide figures for each region of the country.

Key Findings

- Using the 1990 UK reference standards it is expected that 15% of children would be overweight, 5% obese, and 2% severely obese. These figures apply to children of any age and in any part of the UK, including Scotland.
- Among Scottish children born in 1998, 21.3% were overweight by the time they reached 3.5 years of age, 8.8% were obese, and 4.5% were severely obese.
- For the 2001-2002 school year, older children had higher levels of obesity. By the time Scottish children were 12 years old, 33% were overweight, 18% obese and 10-11% severely obese.
- At all ages, the percentages of Scottish children who were estimated to be overweight, obese, and severely obese were higher than expected.

Introduction

There is growing concern over the levels of obesity in the Scottish population, particularly among children. This is reflected in the recent publication by the Scottish Intercollegiate Guidelines Network (SIGN) of a guideline for the management of obesity in children and young people[1].

Data and Methods

Body mass index as a measure of obesity in children

Information on children's health is gathered through the National Child Health Surveillance systems. Both the pre-school and school systems routinely collect data on height and weight. These data can be used to calculate body mass index (BMI) and estimate the prevalence of over and under-nutrition in Scottish children.

In 1995 new reference growth curves for the weight and height of UK children were published, replacing the Tanner-Whitehouse reference curves for children's growth in the 1960s. The new curves represent UK children in 1990 and are widely accepted as the reference for growth screening for the UK. The reference data used were collected between 1978 and 1990 and were obtained by combining data from 11 distinct surveys which were representative of children in England, Scotland and Wales. From this national data set, BMI reference curves for children and young people were established providing BMI centiles covering birth to 23 years of age[2].

Calculation of body mass index

BMI is a simple ratio of weight adjusted for height *[weight(kg)/height(m)^2]* which provides an index of fatness or thinness. The prevalence of over and under-nutrition in a population of children relative to the UK 1990 population can be estimated by comparing the distribution of this ratio. For the purposes of this analysis, the following definitions apply: children who fall under the 5th centile are defined as having low BMI and those under the 2nd centile are defined as very low BMI. Those children who are above the 85th centile are defined as overweight, those above the 95th centile are defined as obese and children over the 98th centile are severely obese.

1. Scottish Intercollegiate Guidelines Network. Guideline 69: Management of Obesity in Children and Young People. Edinburgh: Scottish Intercollegiate Guidelines Network (2003). www.sign.ac.uk

2. Cole TJ, Freeman JV & Preece MA. Body Mass Index Reference Curves for the UK, 1990. *Archives of Diseases in Childhood* (1995) 73: 25-9.

Data extraction

The data presented were recorded on both the Child Health Surveillance Programme - Pre-school (CHSP-PS) and School (CHSP-S) systems. Further information on child health data can be found on Scottish Health Statistics (the website of ISD Scotland[3]). The CHSP-PS system was introduced in 1991 and now has 10 participating NHS Boards. These boards (Argyll & Clyde, Ayrshire & Arran, Borders, Dumfries & Galloway, Fife, Forth Valley, Greater Glasgow, Lanarkshire, Lothian, Tayside) account for approximately 84% of Scotland's pre-school population (147,417 children). The NHSScotland National Strategic Programmes for IM&T 2001-2005 recommended that the pre-school and school systems be rolled out to all NHS Boards by 2003 and 2004, respectively.

BMI is presented and based on the height and weight measurements made at the children's 39 to 42 month review (ie when the children were approximately 3.5 years of age).

The CHSP-S system was introduced in 1995 and now covers 6 NHS Boards. However, some have been introduced to the system fairly recently and therefore the analysis has concentrated on Borders, Fife and Lanarkshire NHS Boards and West Lothian NHS Trust only (10,320 children). In the CHSP-S system, data are recorded based on school year groups (P1: Primary 1, P3: Primary 3, P7: Primary 7, S3: Secondary 3). In addition, an indication of the ages of the children is given on the graphs, but this will not be accurate in all cases. It should be noted that a different group of children was measured for each age. This is because there are not yet sufficient years of data to present analyses for the same group of children as they grow up.

Results

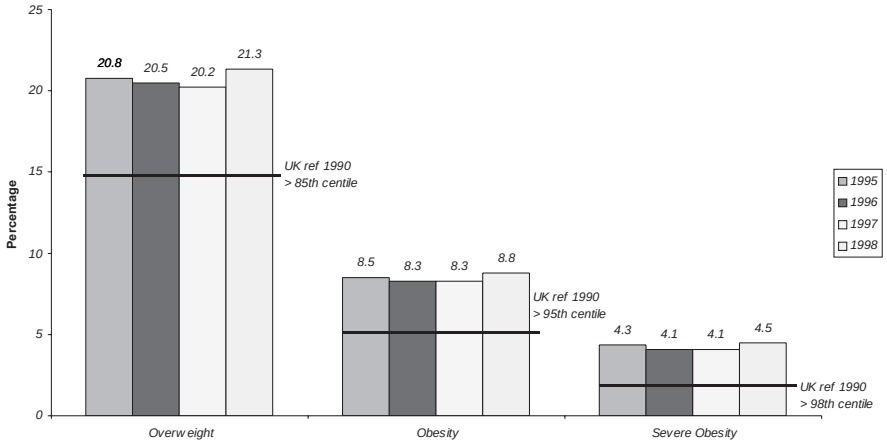
Pre-school children

The percentage of overweight, obese and severely obese pre-school children in Scotland is presented in Figure 1. The percentage of children expected to fall into each of these categories according to the UK reference population is also shown. While the percentage of children falling into each category remained relatively stable for children born between 1995 and 1998, it was nonetheless higher in all categories than the UK reference population (20-21% of children were overweight compared to a reference standard of 15%; 8-9% of children were obese compared to a standard of 5%, and; 4-4.5% of children were severely obese compared to a standard of 2%).

3. Scottish Health Statistics: The Website of ISD Scotland. www.isdscotland.org (select 'Information and Statistics' then 'Health and Care' then 'Children' then 'Information')

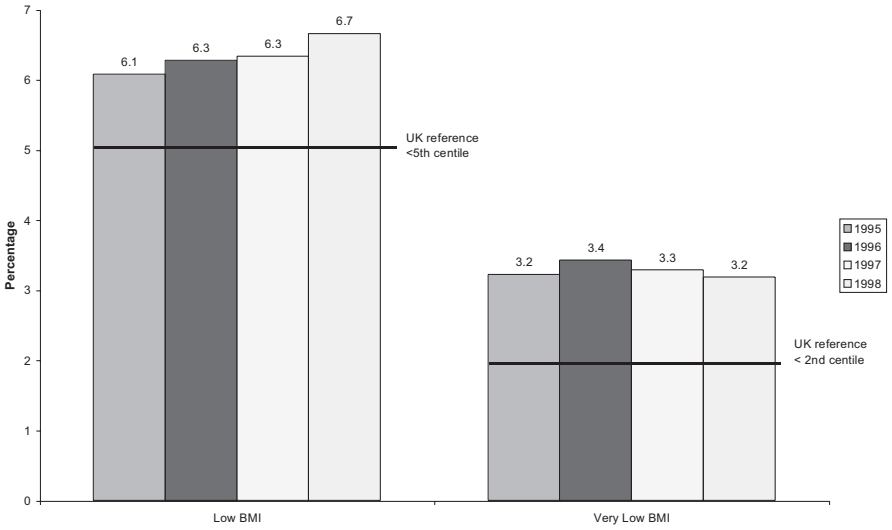
The proportion of children with low and very low BMI is presented in Figure 2 - again the graph includes an indication of the UK reference standards. The percentage of children aged 3.5 years with low BMI increased from 6.1% for children born in 1995 to 6.7% in 1998. This compares with a reference figure of 5%. The percentage of children with very low BMI remained around 3-3.5%, which again is higher than the reference standard of 2%.

Figure 1. High BMI distribution: children aged 3-3.5 years by year of birth.



1. Includes NHS Boards that participate in CHSP-PS (see text for details). **Source: CHSP-PS, ISD Scotland.**

Figure 2. Low BMI distribution: children aged 3–3.5 years by year of birth.



1. Includes NHS Boards that participate in CHSP-PS (see text for details). **Source: CHSP-PS, ISD Scotland.**

Body mass index for different ages

Figures 3 to 5 present the prevalence of high BMI at different ages. As previously mentioned, school data were available for three NHS Boards and one NHS Trust. Therefore, pre-school data have only been included for these areas (Borders, Fife, and Lanarkshire NHS Boards and West Lothian NHS Trust).

The percentages of children who fall into each of the three categories (overweight, obese and severely obese) are higher than the UK reference standards for every age group considered.

Up to 8 years of age, the percentage of children overweight (22-23%) is in excess of the reference standard (15%). The percentage of children categorised as obese rose from 9% for pre-school children to 11.5% for 7-8 year olds (compared with the reference standard for all ages of 5%). This rise was even more marked for severely obese children - 4.4% for pre-school children increased to 7.3% for 7-8 year olds (reference standard is 2%).

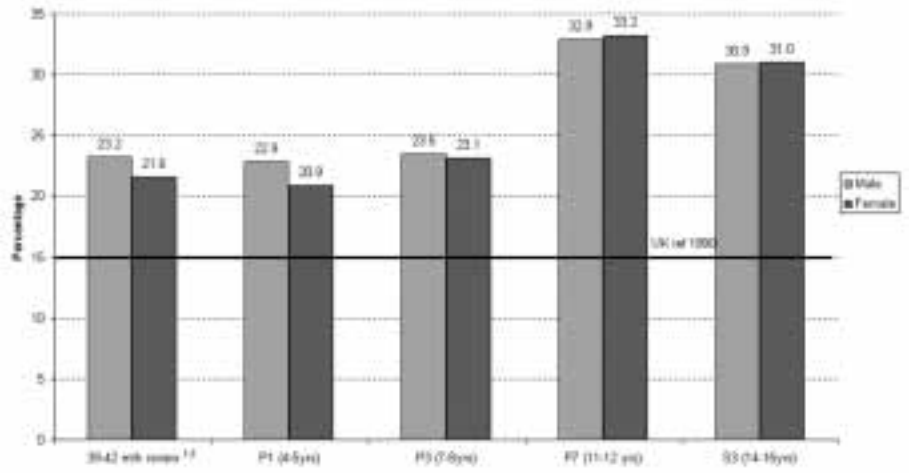
For older children, there is a broadly similar picture in all three categories, with the highest percentage of children categorised with weight problems at 11-12 years of age (33% overweight, 18% obese and 10% severely obese). These results are consistent with other UK reports where the percentage of young people with high BMI increases with age. Data from a nationally representative sample of English children in 1996 shows the percentage of children who were overweight rose from 22% for 6 year olds to 31% for 15 year olds. Levels of obesity also rose, from 10% for 6 year olds to 17% for 15 year olds[4].

The prevalence of school age children with low or very low BMI was similar to the 1990 UK reference standards (5% for low BMI and 2% for very low BMI) and has not been presented here.

Overall, in this sample of Scottish schoolchildren, there is an excess of children with weight problems (over and above what would normally be expected).

4. Reilly JJ & Dorosty AR. Epidemic of Obesity in UK Children. *Lancet* (1999) 354: 1874-5.

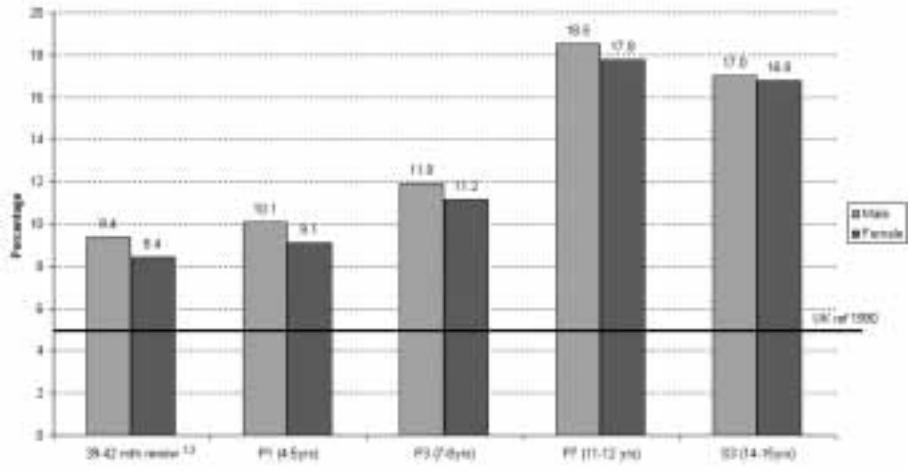
Figure 3. High BMI distribution: percentage overweight (> 85th centile) in school year 2001-02.



1. Includes only those areas that participate in both CHSP:Pre-School & School.
2. Born in 1998, examined in 2001/02.

Source: CHSP-PS & CHSP-School
ISD Scotland

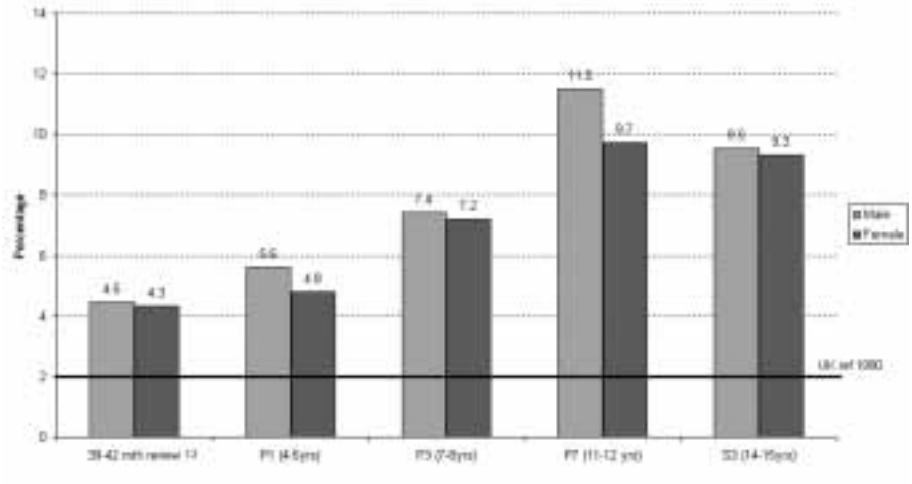
Figure 4. High BMI distribution: percentage obese (> 95th centile) in school year 2001-02.



1. Includes only those areas that participate in both CHSP:Pre-School & School.
2. Born in 1998, examined in 2001/02.

Source: CHSP-PS & CHSP-School
ISD Scotland

Figure 5. High BMI distribution: percentage severely obese (> 98th centile) in school year 2001-02.



1. Includes only those areas that participate in both CHSP:Pre-School & School.

2. Born in 1998, examined in 2001/02.

Source: CHSP-PS & CHSP-School
ISD Scotland

2.6 Emergency Admission to Hospital by LHCC (for Diabetes, Asthma and Epilepsy)

Background

- Diabetes, asthma and epilepsy are all conditions for which a high quality of care can be provided in the community. Emergency admissions to hospital are potentially avoidable.
- Guidance and advice for NHSScotland on providing care for people with these conditions has been provided by NHS Quality Improvement Scotland (www.nhshealthquality.org) and the Scottish Intercollegiate Guidelines Network (www.sign.ac.uk).
- The rates of emergency admission to hospital for diabetes, asthma and epilepsy are presented for the 3 years between April 1999 and March 2002. For the first time, these rates are presented at the very detailed level of each local health care co-operative (a grouping of general practices).

Key Findings

- For diabetes, the national rate for emergency admission to hospital has remained fairly constant in recent years. In 1999-2000, 56 people per 100,000 population were admitted to hospital for diabetes, compared with 54 in 2001-2002.
- The rate for emergency admission for asthma across Scotland dropped, from 104 people per 100,000 population in 1999-2000 to 86 in 2001-2002. This decrease is, in part, due to a particularly high number of admissions in the winter of 1999-2000.
- The national emergency admission rate for epilepsy dropped slightly from 59 people per 100,000 population in 1999-2000 to 55 in 2001-2002.
- There is considerable variation in emergency admission rates throughout Scotland, both between and within NHS Board areas. These variations must be interpreted with caution as they will reflect a number of factors including, for example, different hospital admission policies.

Introduction

The Department of Health in England has published an indicator for the total number of emergency admissions for asthma and diabetes in each Health Authority for the years 1998-99, 1999-2000 and 2000-01[1]. It considered these hospitalisations to be potentially avoidable since, in most instances, these conditions should largely be managed in the primary care setting. It considered asthma and diabetes to be representative of all chronic care management.

Several papers have been published which explore a range of diagnoses that should be treatable mainly within the primary care sector. Giuffrida et al[2], in particular, consider the examination of asthma, diabetes and epilepsy as chronic conditions for which a high quality primary care service could be expected to reduce the number of hospital admissions. They do, however, caution that these admission rates may be influenced by factors outwith the control of the primary care team, such as population characteristics and factors to do with the acute sector such as differing policies on admission in different hospitals.

Some exploratory analysis using the Scottish data has revealed that while the majority of patients with emergency admissions were admitted only once per year, a small proportion of patients had a high number of repeated emergency admissions. It was felt that the small proportion of patients who were admitted a high number of times would create an unfair bias for their local health care co-operative (LHCC). In Scotland, the number of patients in each LHCC who have had an emergency admission, rather than the total number of emergency admissions, are therefore considered.

Consideration of numbers of emergency admissions for asthma, diabetes or epilepsy has emphasised the need for a reliable system of collecting national data on attendances at Accident and Emergency (A&E) departments. Rather than attend their GP practice, many of these patients will go to an A&E department for treatment, and only a proportion of these are admitted. Current national data does not provide any information on patients who attend A&E but who are not subsequently admitted.

1. Department of Health Performance Indicators: www.doh.gov.uk/**nhsperformanceindicators**
2. Giuffrida A, Gravelle H & Roland M. Measuring Quality of Care with Routine Data: Avoiding Confusion between Performance Indicators and Health Outcomes. *British Medical Journal* (1999) 319: 94-98.

Presentation at LHCC level

Data are presented at LHCC level, using the configuration of LHCCs at a fixed point in time – the most recent LHCC configuration available when this analysis was carried out (March 2003). The exceptions to this are the Island NHS Boards (Orkney, Shetland and the Western Isles). The primary care services within these boards effectively operate as LHCCs and the figures for these boards are therefore presented alongside the LHCCs.

For the purposes of presentation, the LHCCs are divided into 15 groups, relating to the NHS Board to which they belong. LHCCs are presented if they have a total LHCC population greater than 15,000. The NHS Board figures contain all of the LHCCs and non-aligned practices (ie GP practices which do not belong to an LHCC) within each area. Table 1 shows the LHCC population size for each of the years being considered and indicates which chart illustrates the data for each LHCC.

Specific points for interpretation

Data are only available for patients who are admitted to acute hospitals. Patients who are treated in an A&E department only are therefore not included in this outcome indicator. Some hospitals may tend to admit patients while others are more likely to treat them in A&E only. Hospitals which operate a policy of direct admissions to a medical assessment unit may yield higher admissions figures than hospitals that admit all emergency patients via A&E. For example, admissions due to epilepsy may be higher in areas with a specialist neurology service. Differences in acute hospital policies may therefore partially explain some of the variation between LHCCs.

It is likely that the emergency admission rates for the LHCCs will also be influenced by factors relating to hospital access such as rurality.

It should be noted that low levels of emergency admission are not necessarily associated with better quality care.

Table 1: LHCC populations

Figure		Population 1999-2000	2000-01	2001-02
	Scotland	**5356641**	**5341235**	**5346420**
	Argyll & Clyde NHS Board	**436442**	**434487**	**433589**
a	Argyll & Bute LHCC	65007	64415	64442
a	Inverclyde LHCC	88001	87405	86900
a	Leven Valley LHCC	24106	24073	24097
a	Lomond Primary Care Cooperative	66038	65580	65453
a	Paisley LHCC	85121	84770	84389
a	Renfrew LHCC	19739	19793	19800
a	West Renfrew LHCC	77883	77955	78045
	Ayrshire & Arran NHS Board	**389653**	**387489**	**387118**
a	Ayr, Prestwick & Troon LHCC	89717	89150	89116
b	East Ayrshire LHCC	115277	114565	114707
b	Irvine, Kilwinning & Dundonald LHCC	58887	58186	57780
b	Carrick & Doon Valley LHCC	25117	24928	24810
b	North West Ayrshire & Cumbrae LHCC	33926	33754	33627
b	Stevenston, Saltcoats and Ardrossan LHCC	36977	36788	36687
	Borders NHS Board	**106903**	**107107**	**107782**
b	Borders LHCC	90309	90049	90425
b	Borders West LHCC	16594	17058	17357
	Dumfries & Galloway NHS Board	**151734**	**150948**	**151126**
b	Annandale & Eskdale LHCC	40068	39968	39934
c	Dumfries & Upper Nithsdale LHCC	58301	58076	58169
c	Stewartry LHCC	23023	22879	22937
c	Wigtownshire LHCC	30342	30025	30086
	Fife NHS Board	**355175**	**356113**	**357641**
c	Dunfermline LHCC	60244	60806	61681
c	Glenrothes LHCC	51389	51271	51341
c	Kirkcaldy & Levenmouth LHCC	97035	97064	96857
c	North East Fife LHCC	72123	72471	72938
c	West Fife LHCC	74384	74501	74824
	Forth Valley NHS Board	**292778**	**292562**	**292915**
d	Forth Valley LHCC (North)	145824	145810	145804
d	Forth Valley LHCC (South)	146954	146752	147111
	Grampian NHS Board	**545222**	**542057**	**539700**
d	Aberdeen and North LHCC	54093	53979	54281
d	Aberdeen Inner City LHCC	137519	134984	133136
d	Aberdeen West LHCC	79883	80254	80192
d	Banff & Buchan LHCC	83818	83186	82949
d	Central Aberdeenshire LHCC	47760	48193	47059
d	Deeside LHCC	21453	21306	21447
e	Kincardine LHCC	35434	35404	35419
e	Moray LHCC	84583	84079	84553

Table 1 continued: LHCC populations

Figure		Population 1999-2000	2000-01	2001-02
	Scotland	**5356641**	**5341235**	**5346420**
	Greater Glasgow NHS Board	**972948**	**966568**	**969870**
e	Anniesland, Bearsden & Milngavie LHCC	49992	49826	49743
e	Bridgeton & Environs LHCC	32348	31286	30756
e	Camglen LHCC	55073	54928	54937
e	Clydebank LHCC	50867	50399	50074
e	Dennistoun LHCC	34225	34179	34545
e	Drumchapel LHCC	16948	18893	18604
f	Eastern Glasgow LHCC	117703	116523	115933
f	Eastwood LHCC	60254	60844	61492
f	Greater Shawlands LHCC	65694	66749	67327
f	Maryhill & Woodside LHCC	61811	60956	62695
f	North Glasgow LHCC	51457	52435	53376
f	Riverside LHCC	50880	50532	50554
f	South East Glasgow LHCC	91236	89055	89877
f	South West Glasgow LHCC	98270	97416	97142
g	Strathkelvin LHCC	68261	67796	67810
g	Westone LHCC	51421	49125	49522
	Highland NHS Board	**217454**	**217174**	**217403**
g	Caithness LHCC	24832	24627	24464
g	East Highland LHCC	51324	51242	51485
g	Inverness LHCC	59996	60340	60559
g	Lochaber LHCC	20869	20575	20537
	Lanarkshire NHS Board	**582185**	**582142**	**581261**
g	Airdrie LHCC	39229	39311	39328
g	Clydesdale LHCC	54981	55196	55552
h	Coatbridge LHCC	52450	52337	51987
h	Cumbernauld LHCC	70059	70247	70261
h	East Kilbride LHCC	75165	75217	74966
h	Hamilton & Blantyre LHCC	116461	116232	115833
h	Motherwell LHCC	65261	65097	64972
h	Wishaw, Newmains & Shotts LHCC	58229	58009	57838
	Lothian NHS Board	**827389**	**828393**	**833600**
h	East Lothian LHCC	79692	80116	80462
h	Midlothian LHCC	84242	84503	84270
i	North East Edinburgh LHCC	78761	78607	79283
i	North West Edinburgh LHCC	142045	141707	142164
i	South Central Edinburgh LHCC	80570	81260	81643
i	South East Edinburgh LHCC	106585	106252	106233
i	South West Edinburgh LHCC	70154	70903	73013
i	West Lothian LHCC	160310	162026	163689
i	**Orkney NHS Board**	**19686**	**19564**	**19455**
i	**Shetland NHS Board**	**22364**	**22070**	**21989**
	Tayside NHS Board	**408259**	**406569**	**405279**
j	Angus LHCC	104319	104145	104030
j	Dundee LHCC	171484	170036	168906
j	Perth & Kinross LHCC	132456	132388	132343
j	**Western Isles NHS Board**	**28449**	**27992**	**27692**

Emergency Admission for Diabetes

Indicator

The proportion of patients having an emergency admission with a principal diagnosis of diabetes.

Period of coverage

Data are presented for patients admitted during the three single-year periods from April 1999 to March 2000, April 2000 to March 2001 and April 2001 to March 2002. Please refer to section 2.1 for more information on the completeness of these data.

Data sources

Practice population sizes in each year are based on Community Health Index (CHI) registrations at the midpoint of that year, ie 30 September 1999, 30 September 2000 and 30 September 2001.

Emergency admissions are identified from SMR01 records (see section 2.1).

Criteria for inclusion

The indicator is for patients, regardless of age, who are registered with a GP in Scotland. GP practices are included if they are in Scotland, and are open at both the start and end of the time period being considered. Practices which are involved in splits or mergers during the course of the year are included if the old and new practice codes can be mapped to each other and they are all aligned to the same LHCC. Practices are then aggregated up to LHCC level for reporting.

Definition of outcome

The outcome is defined as an emergency admission for diabetes occurring during the periods from April 1999 to March 2000, April 2000 to March 2001 and April 2001 to March 2002. The codes taken as indicating this diagnosis are as follows:

Diabetes	ICD10 codes E10 – E14
E10	Insulin dependent diabetes mellitus
E11	Non insulin dependent diabetes mellitus
E12	Malnutrition related diabetes mellitus
E13	Other specified diabetes mellitus
E14	Unspecified diabetes mellitus

Standardisation

Results are indirectly standardised for age, sex and deprivation category. The reference population in terms of which the rates are standardised is the total for Scotland over the period.

Results

Standardised rates and confidence intervals for each LHCC have been plotted in Figures 1a-1j, along with the Scottish rate and the appropriate NHS Board rate for reference.

Click here to download tables of crude and standardised emergency admission rates per 10,000

Figure 1a. Emergency admission for diabetes: Standardised rates per 10,000 population

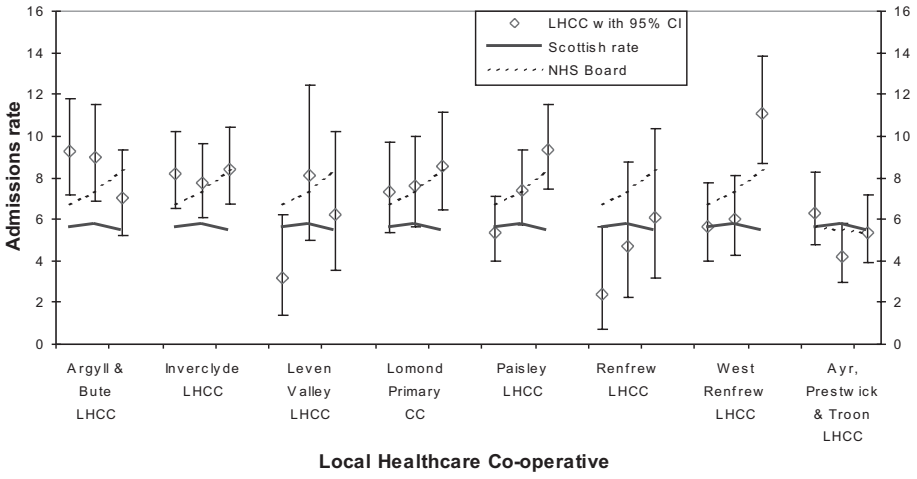


Figure 1b. Emergency admission for diabetes: Standardised rates per 10,000 population

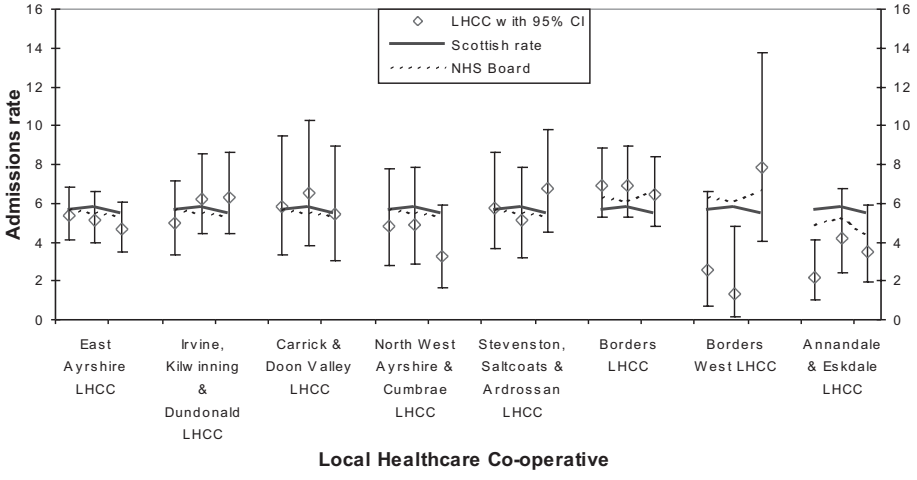


Figure 1c. Emergency admission for diabetes: Standardised rates per 10,000 population

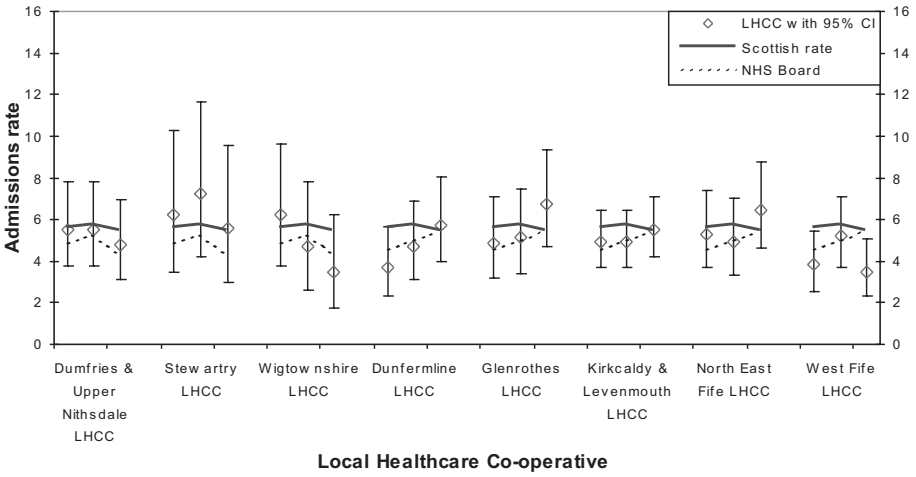


Figure 1d. Emergency admission for diabetes: Standardised rates per 10,000 population

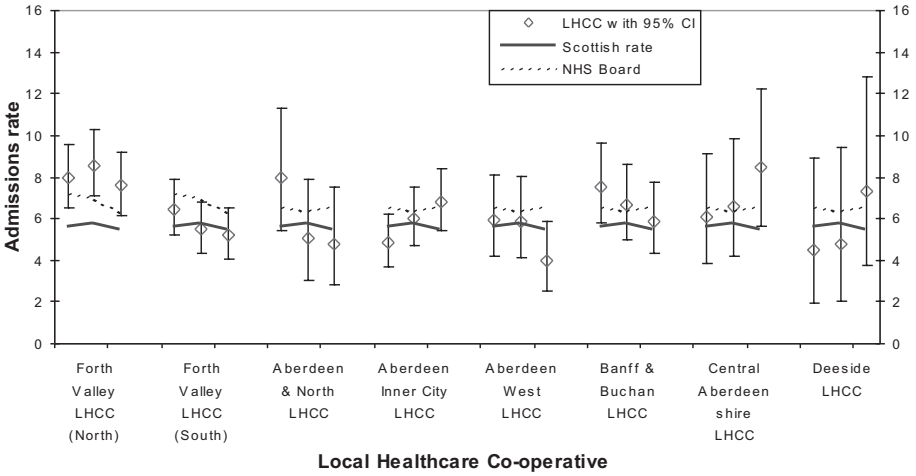


Figure 1e. Emergency admission for diabetes: Standardised rates per 10,000 population

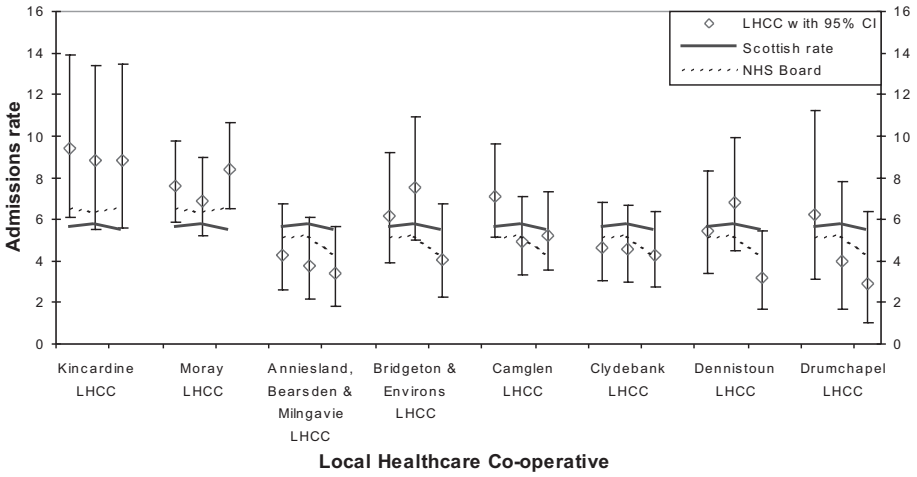


Figure 1f. Emergency admission for diabetes: Standardised rates per 10,000 population

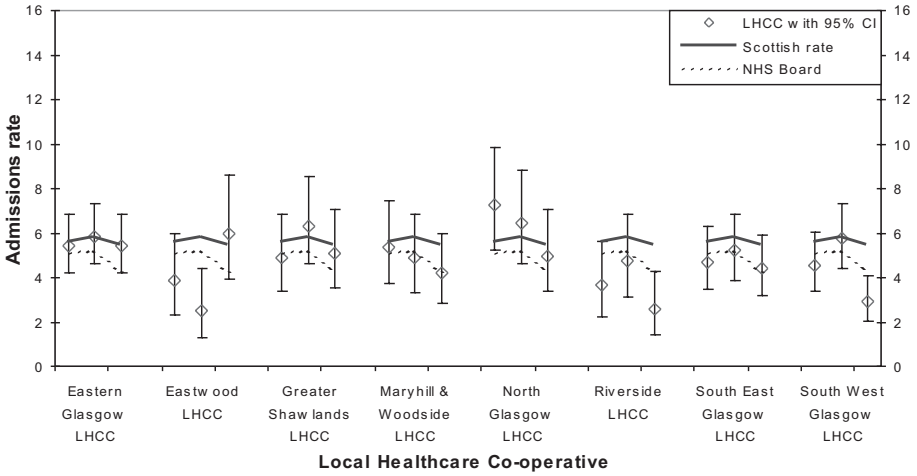


Figure 1g. Emergency admission for diabetes: Standardised rates per 10,000 population

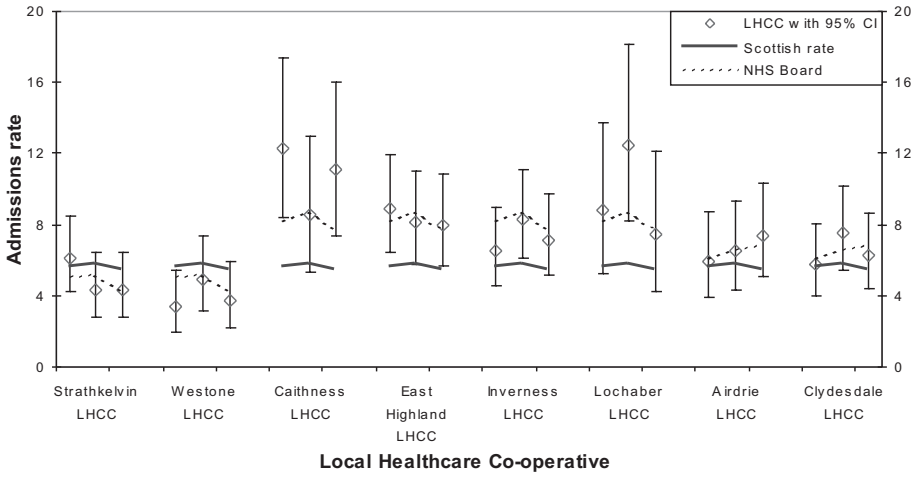


Figure 1h. Emergency admission for diabetes: Standardised rates per 10,000 population

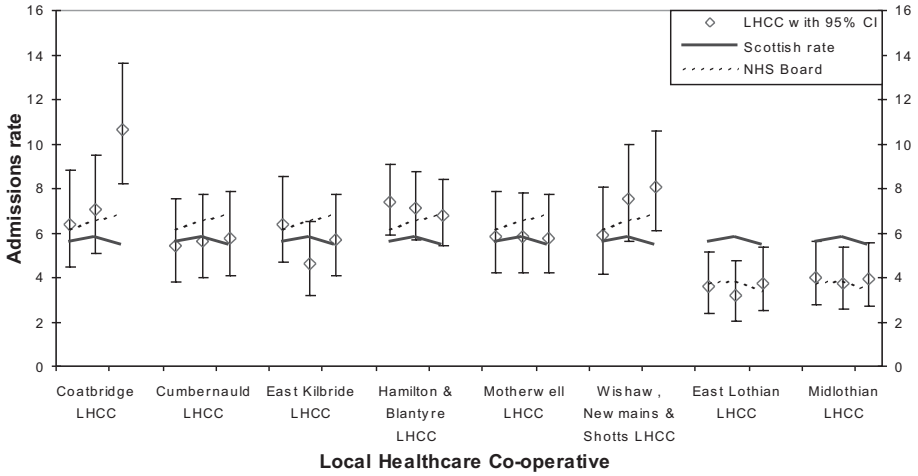


Figure 1i. Emergency admission for diabetes: Standardised rates per 10,000 population

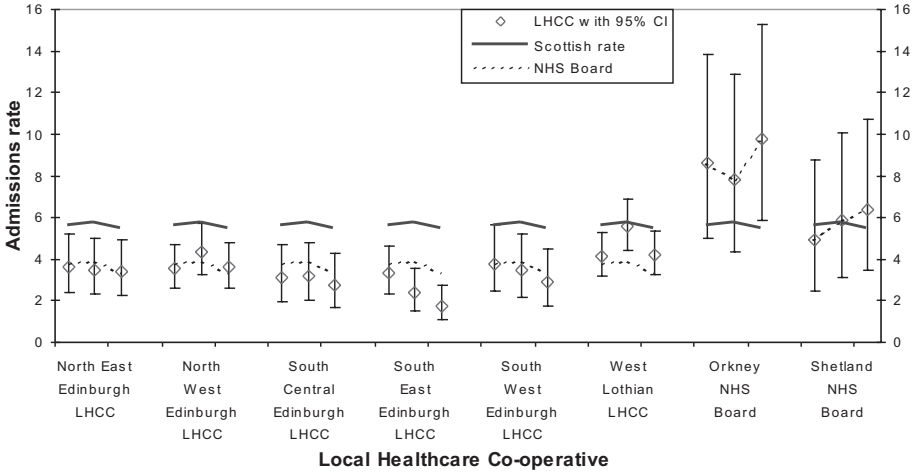
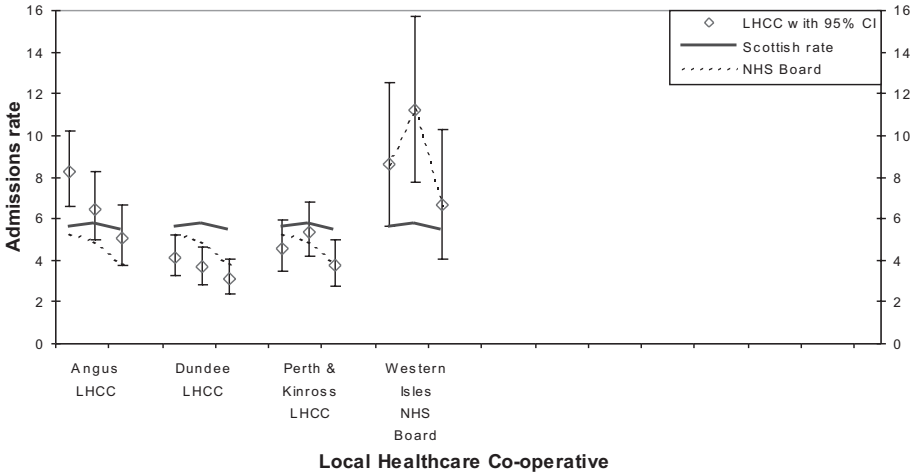


Figure 1j. Emergency admission for diabetes: Standardised rates per 10,000 population



Emergency Admission for Asthma

Indicator

The proportion of patients having an emergency admission with a principal diagnosis of asthma.

Period of coverage

Data are presented for patients admitted during the three single-year periods from April 1999 to March 2000, April 2000 to March 2001 and April 2001 to March 2002. Please refer to section 2.1 for more information on the completeness of these data.

Data sources

Practice population sizes in each year are based on Community Health Index (CHI) registrations at the midpoint of that year, ie 30 September 1999, 30 September 2000 and 30 September 2001.

Emergency admissions are identified from SMR01 records (see section 2.1).

Criteria for inclusion

The indicator is for patients, regardless of age, who are registered with a GP in Scotland. GP practices are included if they are in Scotland, and are open at both the start and end of the time period being considered. Practices which are involved in splits or mergers during the course of the year are included if the old and new practice codes can be mapped to each other and they are all aligned to the same LHCC. Practices are then aggregated up to LHCC level for reporting.

Definition of outcome

The outcome is defined as an emergency admission for asthma occurring during the periods from April 1999 to March 2000, April 2000 to March 2001 and April 2001 to March 2002. The codes taken as indicating this diagnosis are as follows:

Asthma	ICD10 codes J45 - J46
J45	Asthma
J46	Status asthmaticus

Standardisation

Results are indirectly standardised for age, sex and deprivation category. The reference population in terms of which the rates are standardised is the total for Scotland over the period.

Results

Standardised rates and confidence intervals for each LHCC have been plotted in Figures 2a-j, along with the Scottish rate and the appropriate NHS Board rate for reference.

Click here to download tables of crude and standardised emergency admission rates per 10,000

Figure 2a. Emergency admission for asthma: Standardised rates per 10,000 population

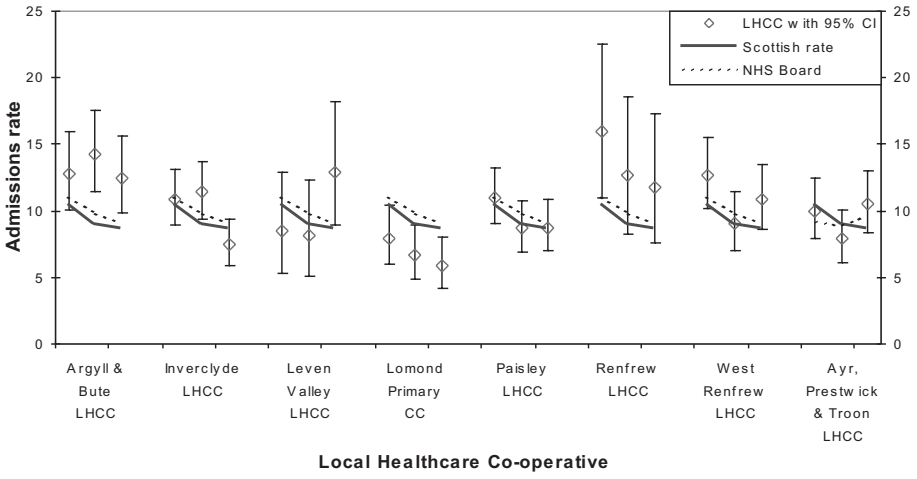


Figure 2b. Emergency admission for asthma: Standardised rates per 10,000 population

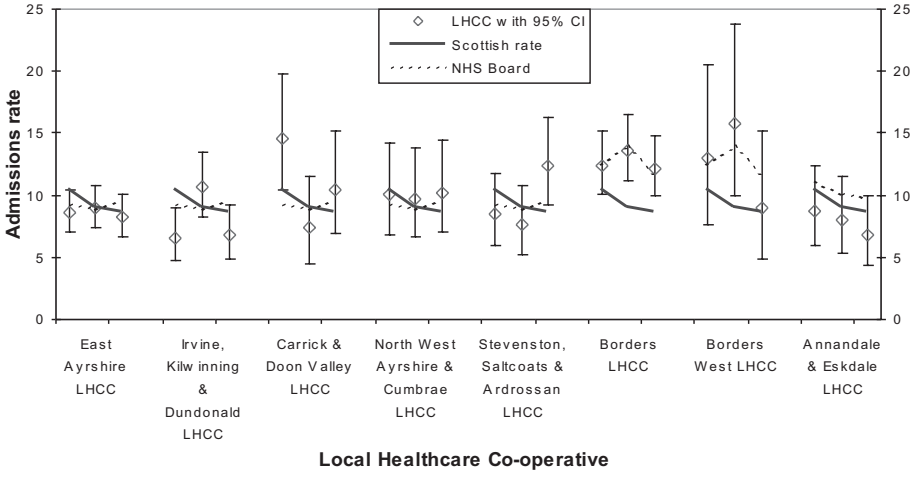


Figure 2c. Emergency admission for asthma: Standardised rates per 10,000 population

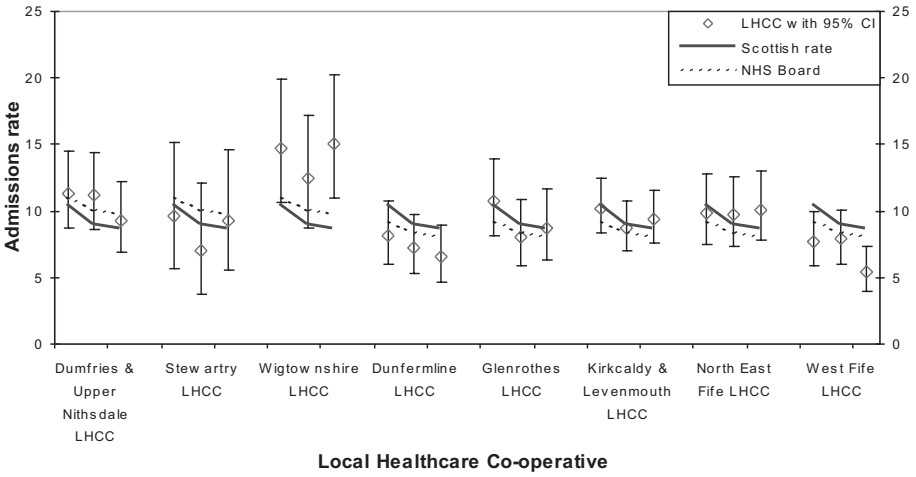


Figure 2d. Emergency admission for asthma: Standardised rates per 10,000 population

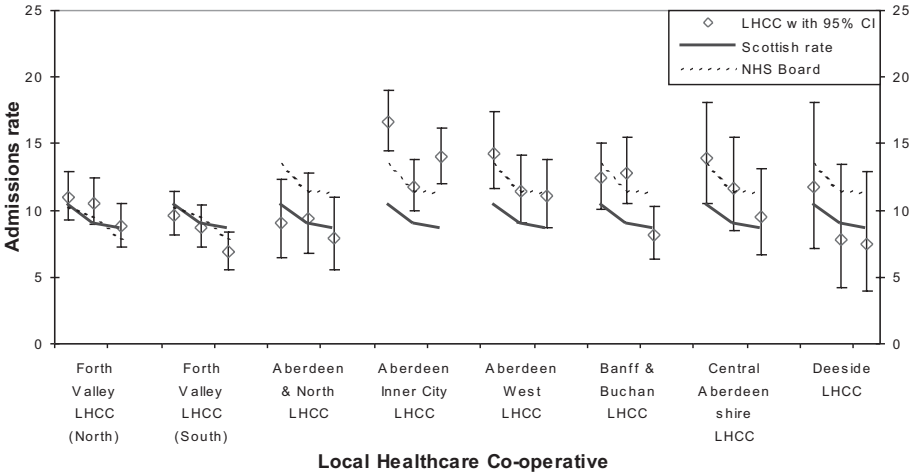


Figure 2e. Emergency admission for asthma: Standardised rates per 10,000 population

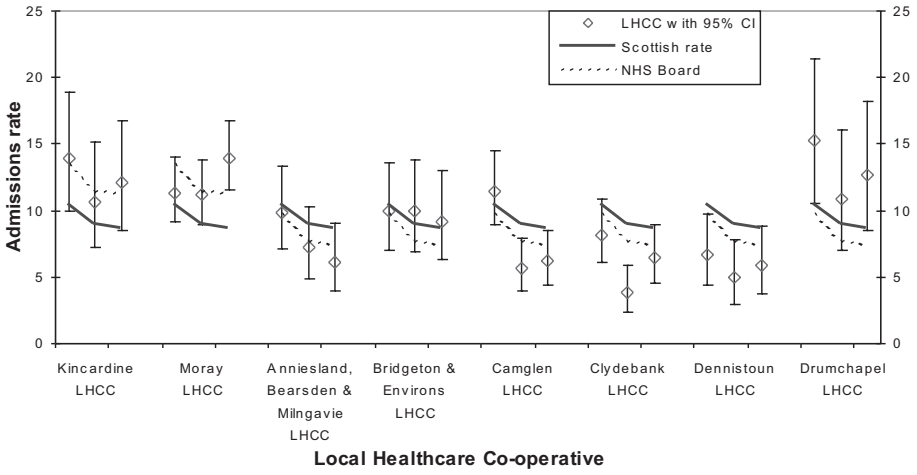


Figure 2f. Emergency admission for asthma: Standardised rates per 10,000 population

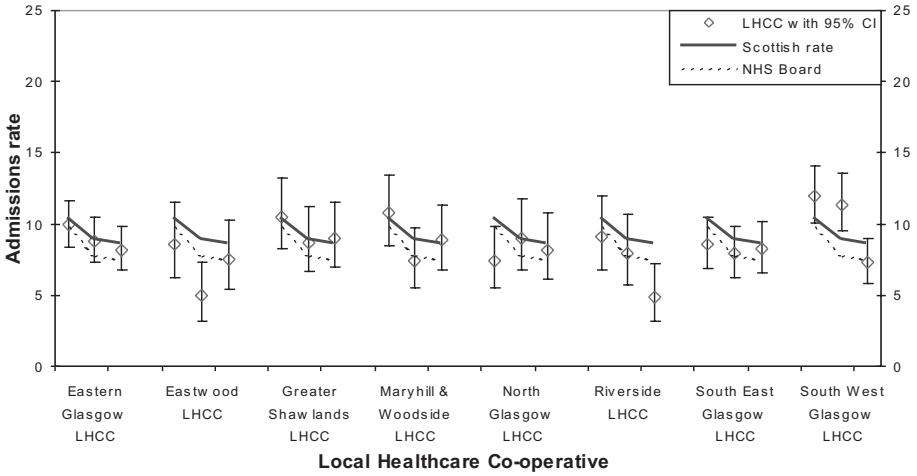


Figure 2g. Emergency admission for asthma: Standardised rates per 10,000 population

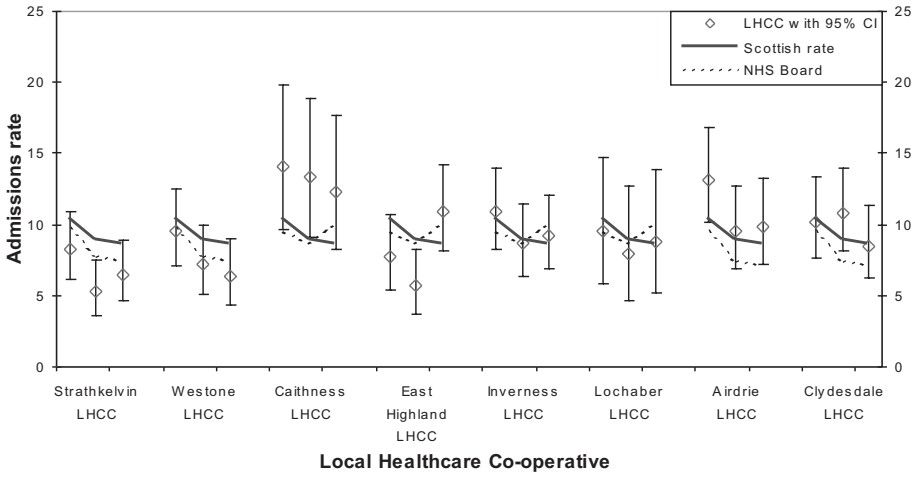


Figure 2h. Emergency admission for asthma: Standardised rates per 10,000 population

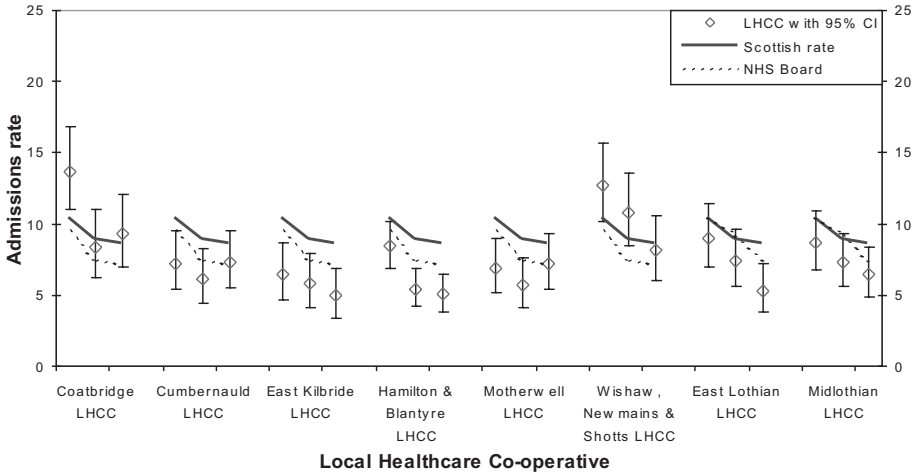


Figure 2i. Emergency admission for asthma: Standardised rates per 10,000 population

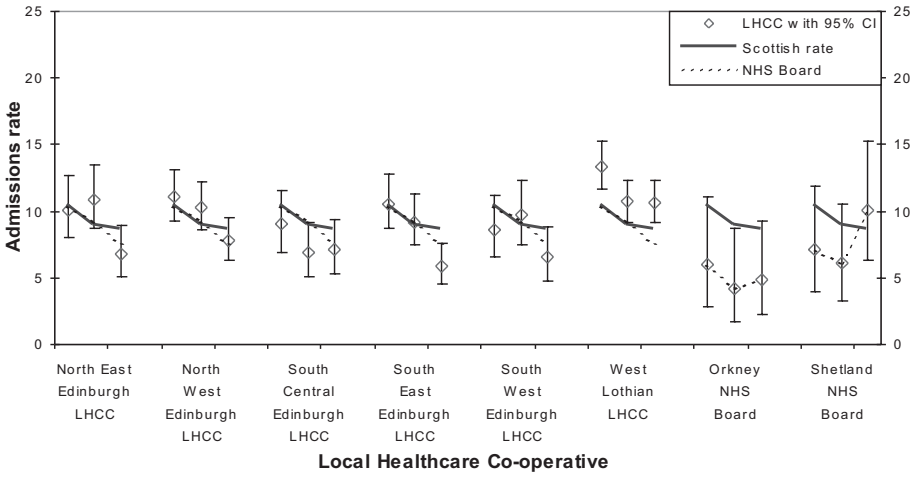
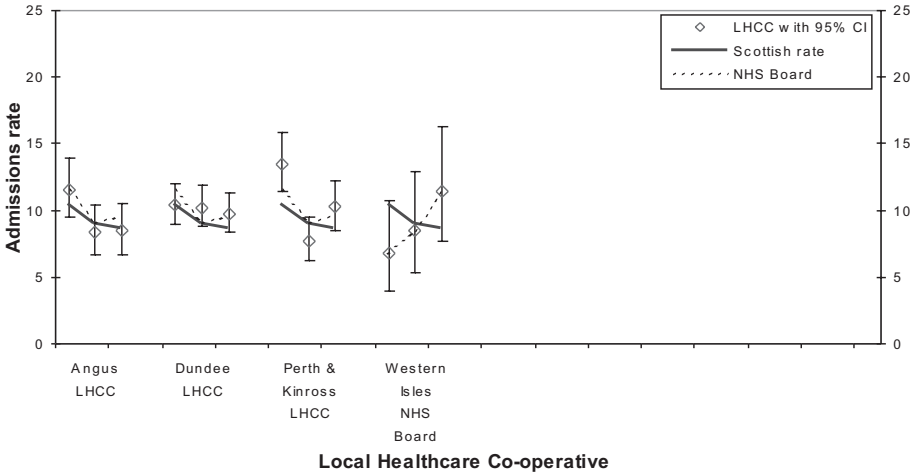


Figure 2j. Emergency admission for asthma: Standardised rates per 10,000 population



Emergency Admission for Epilepsy

Indicator

The proportion of patients having an emergency admission with a principal diagnosis of epilepsy.

Period of coverage

Data are presented for patients admitted during the three single-year periods from April 1999 to March 2000, April 2000 to March 2001 and April 2001 to March 2002. Please refer to section 2.1 for more information on the completeness of these data.

Data sources

Practice population sizes in each year are based on Community Health Index (CHI) registrations at the midpoint of that year, ie 30 September 1999, 30 September 2000 and 30 September 2001.

Emergency admissions are identified from SMR01 records (see section 2.1).

Criteria for inclusion

The indicator is for patients, regardless of age, who are registered with a GP in Scotland. GP practices are included if they are in Scotland, and are open at both the start and end of the time period being considered. Practices which are involved in splits or mergers during the course of the year are included if the old and new practice codes can be mapped to each other and they are all aligned to the same LHCC. Practices are then aggregated up to LHCC level for reporting.

Definition of outcome

The outcome is defined as an emergency admission for epilepsy occurring during the periods from April 1999 to March 2000, April 2000 to March 2001 and April 2001 to March 2002. The codes taken as indicating this diagnosis are as follows:

Epilepsy ICD10 codes G40 - G41
G40 Epilepsy
G41 Status epilepticus

Standardisation

Results are indirectly standardised for age, sex and deprivation category. The reference population in terms of which the rates are standardised is the total for Scotland over the period.

Results

Standardised rates and confidence intervals for each LHCC have been plotted in Figures 3a-j, along with the Scottish rate and the appropriate NHS Board rate for reference.

Click here to download tables of crude and standardised emergency admission rates per 10,000

Figure 3a. Emergency admission for epilepsy: Standardised rates per 10,000 population

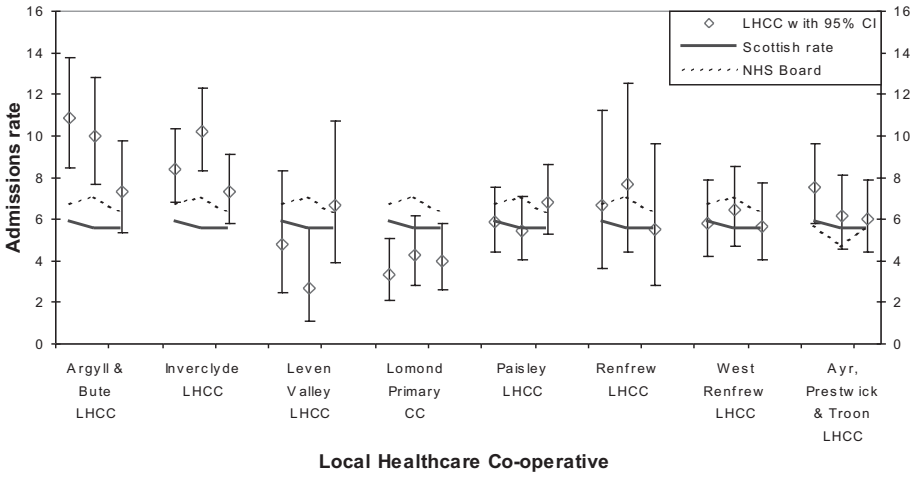


Figure 3b. Emergency admission for epilepsy: Standardised rates per 10,000 population

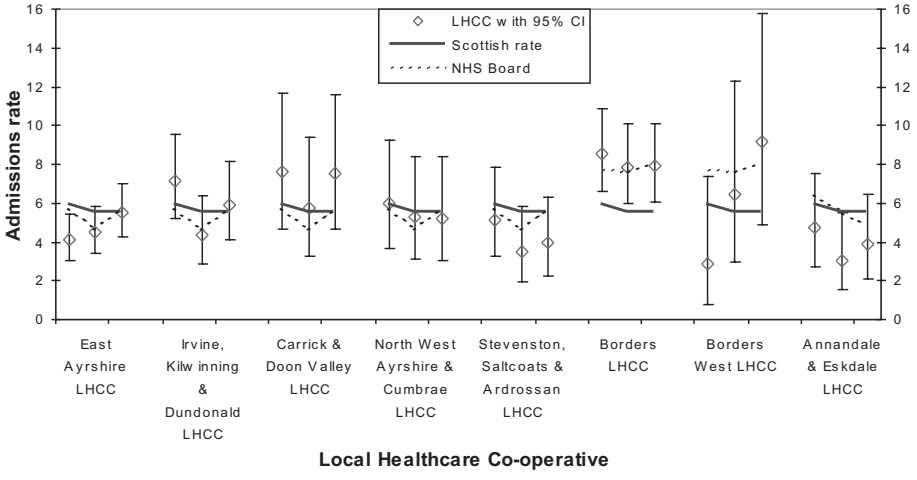


Figure 3c. Emergency admission for epilepsy: Standardised rates per 10,000 population

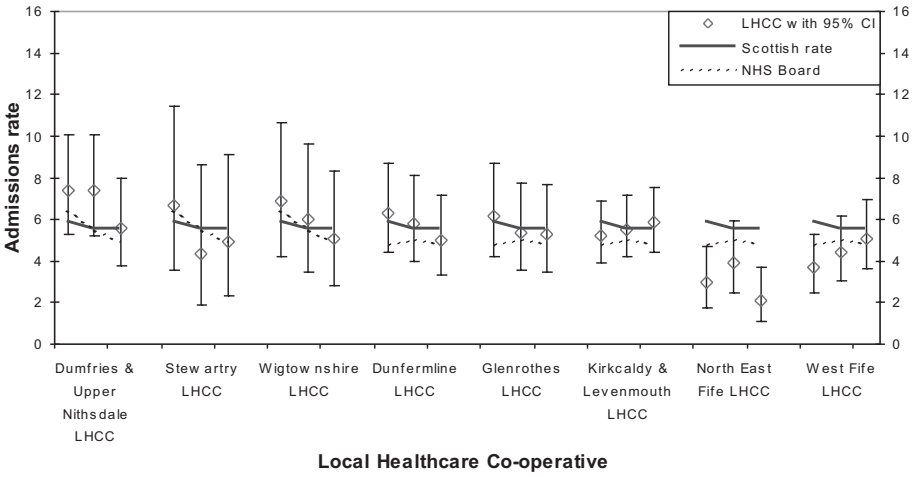


Figure 3d. Emergency admission for epilepsy: Standardised rates per 10,000 population

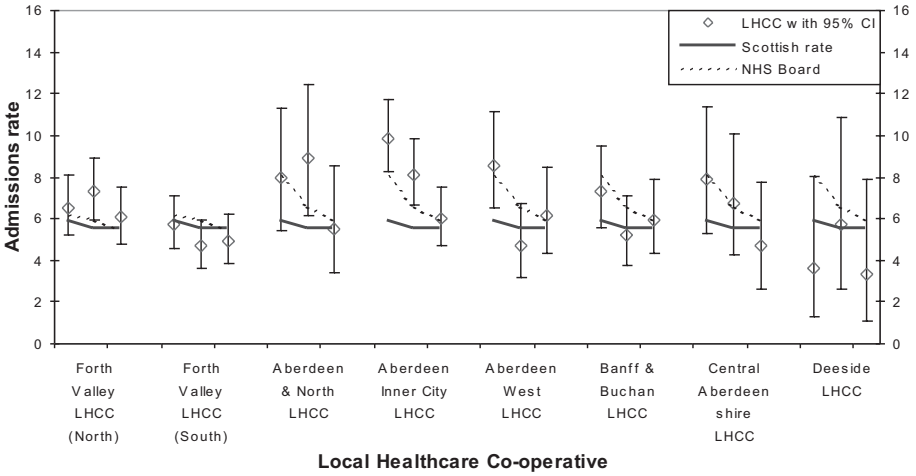


Figure 3e. Emergency admission for epilepsy: Standardised rates per 10,000 population

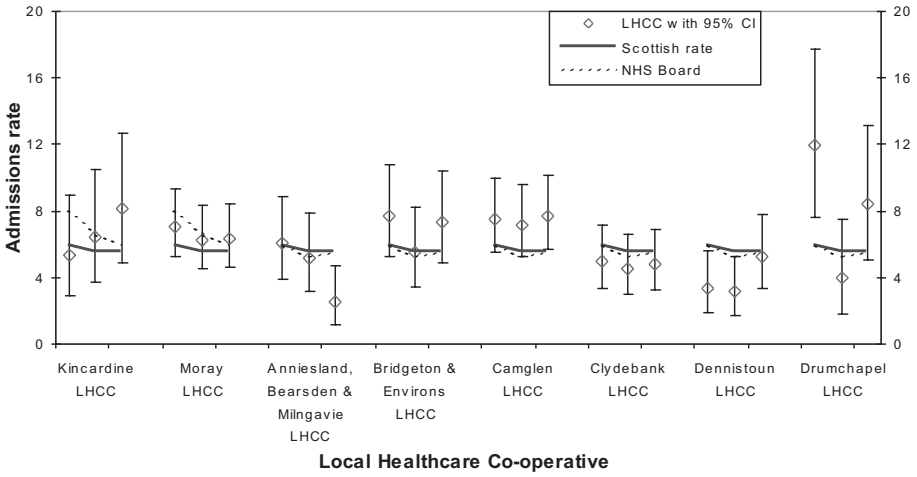


Figure 3f. Emergency admission for epilepsy: Standardised rates per 10,000 population

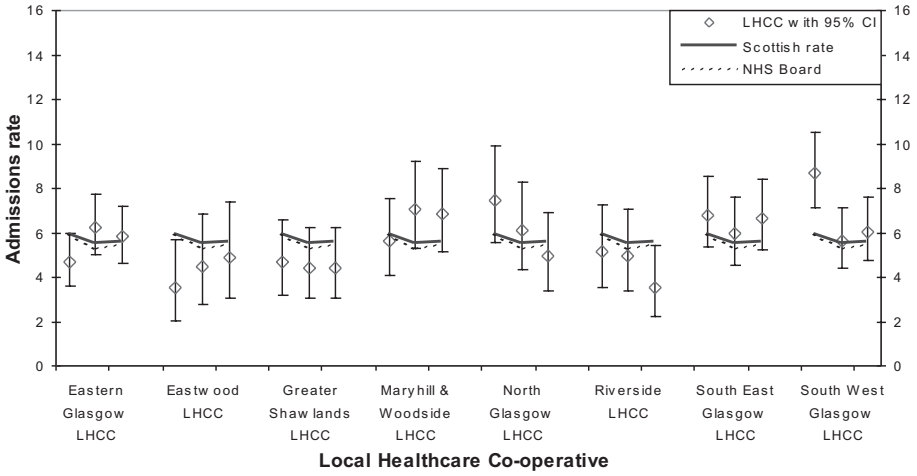


Figure 3g. Emergency admission for epilepsy: Standardised rates per 10,000 population

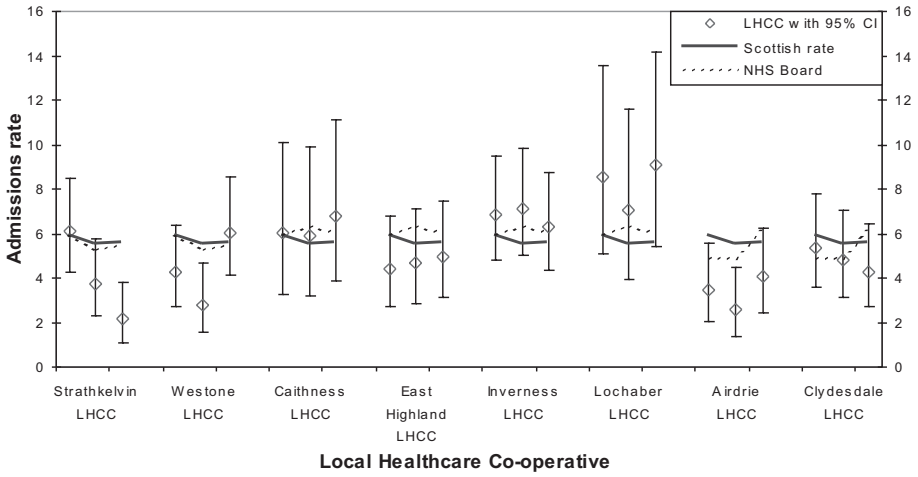


Figure 3h. Emergency admission for epilepsy: Standardised rates per 10,000 population

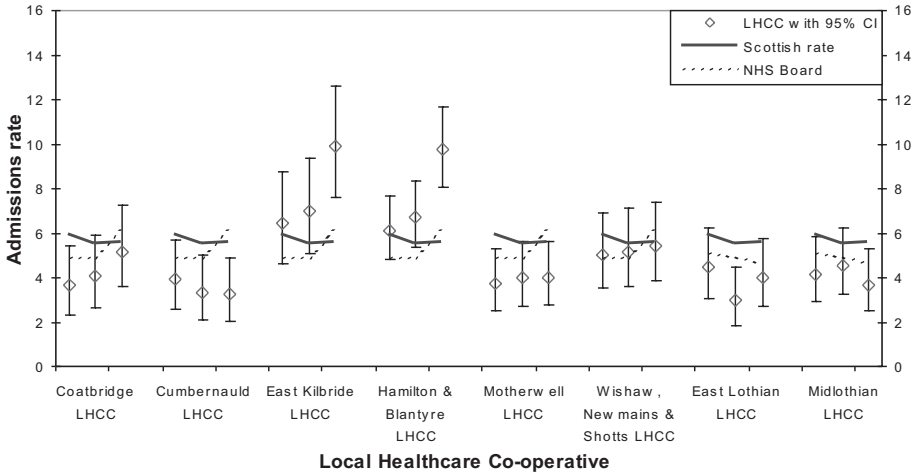


Figure 3i. Emergency admission for epilepsy: Standardised rates per 10,000 population

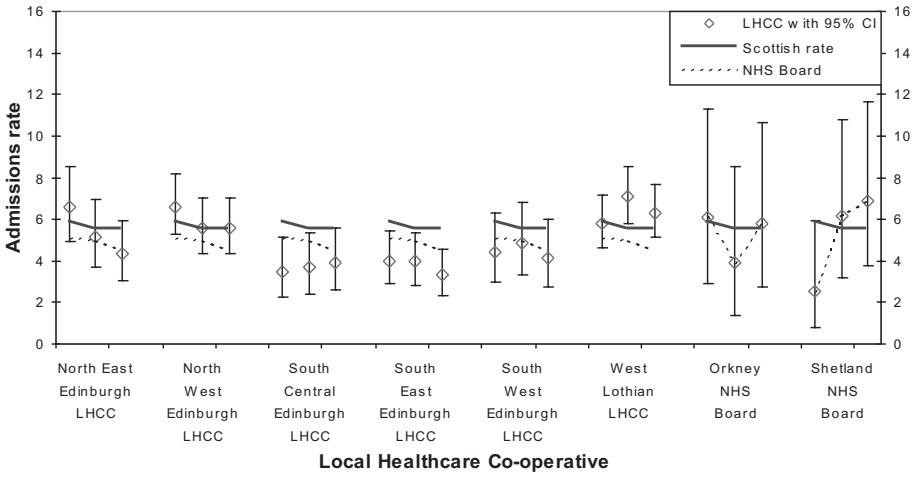
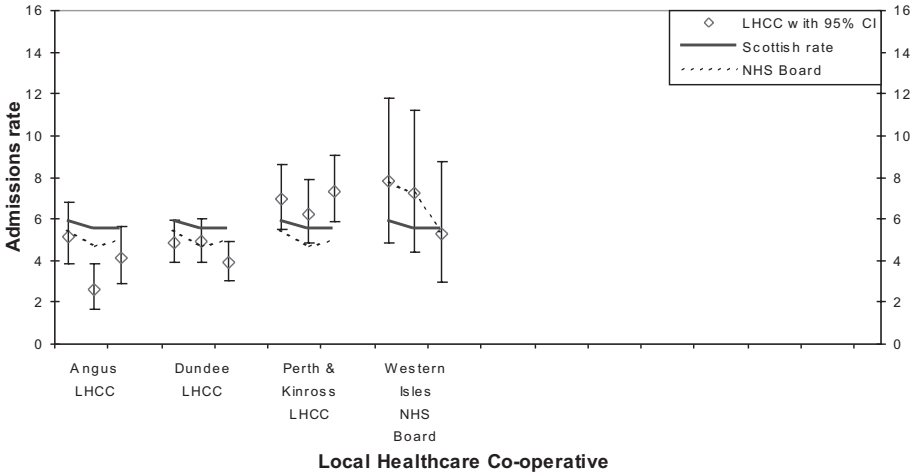


Figure 3j. Emergency admission for epilepsy: Standardised rates per 10,000 population



2.7 Kidney Disease: Treatment of Anaemia in Patients on Haemodialysis

Background

- Anaemia is a condition in which there is a reduction in the level of haemoglobin - the red component of blood which carries oxygen around the body. This is a common problem in patients with renal (kidney) failure.
- Achieving and maintaining a satisfactory haemoglobin level for patients on haemodialysis (a treatment for renal failure) is a marker of good overall health care.
- The *Clinical Standards for Adult Renal Services*, available from NHS Quality Improvement Scotland, give guidance on providing clinical services in hospital settings for people with renal failure.
- These standards include the national target for treating anaemia: For a minimum of 85% of patients, the haemoglobin concentration is no less than 10 grams per decilitre (g/dL) after three months on haemodialysis.
- As part of its quality assurance programme, the Scottish Renal Registry collects data on the haemoglobin levels of patients with renal failure from throughout Scotland.

Key Findings

- In the last five years, there has been an increase of about 15% in the proportion of Scottish patients with a haemoglobin concentration of no less than 10 g/dL.
- In September 2002, 76% of Scottish patients on haemodialysis for three months or more achieved a haemoglobin concentration of no less than 10 g/dL.
- While the variations between the ten renal units in Scotland were small, in this audit cycle only Crosshouse Hospital, Kilmarnock and Raigmore Hospital, Inverness achieved the national target for treatment of anaemia in patients on haemodialysis.

Introduction

Haemoglobin is the red component of blood which carries oxygen to the tissues in the body. In good health the haemoglobin concentration in the blood is about 15 grams per decilitre (g/dL) in men and 14 g/dL in women. Anaemia is a condition in which there is a reduction of haemoglobin in the blood. Even minor degrees of anaemia can result in a reduced quality of life, poor exercise tolerance, impaired heart function, upset sleep patterns, difficulty concentrating, increased susceptibility to infection and reduced libido.

Anaemia is a common problem in renal (kidney) failure. When the kidneys begin to fail, they produce less of the hormone erythropoietin and the body makes less haemoglobin. Anaemia can also occur as a result of reduced intake/use of the food stuffs (haematinics) required by the body to manufacture haemoglobin, interference in the production of blood by waste products which build up, and sometimes because of increased loss of blood. Without treatment, the haemoglobin concentration can fall to as low as 5 g/dL. A satisfactory haemoglobin level can only be achieved if all factors contributing to the anaemia are treated.

Achieving a satisfactory haemoglobin concentration reduces the problems of anaemia and is a marker of good overall health care. When all other aspects of a patient's care have been addressed, epoetin (a form of erythropoietin) can be prescribed as a medicine to increase the blood count. Epoetin is expensive and in the past this sometimes restricted its use, although more recently epoetin has been more widely available.

It is currently unclear exactly what the optimal haemoglobin concentration for patients with renal failure is. Attempts to achieve normal haemoglobin levels in all patients on dialysis may have disadvantages. The current recommendations for Scotland[1], which are outlined below and are essentially the same as those for the rest of the UK, represent a reasonable compromise and provide a standard against which practice can be compared.

1. Clinical Standards Board for Scotland. Clinical Standards for Adult Renal Services. Edinburgh: Clinical Standards Board for Scotland (2002). www.nhshealthquality.org

Data and Methods

The Scottish Renal Registry (SRR) collects and analyses information on haemoglobin concentration in haemodialysis patients from all adult renal units in Scotland.

There are 10 adult and one paediatric renal units in Scotland. They cooperate closely to offer a full range of care and facilities to patients with renal disorders. The 10 adult renal units also provide services at 8 satellite haemodialysis units (further details are available on the SRR website). For audit purposes, the results from these satellite units are included with those from the respective main renal unit. This report concerns adult renal units.

The SRR was established by the Scottish Renal Association (SRA) in 1991. It is a paperless registry which is run in collaboration with the Information and Statistics Division of NHSScotland (ISD) by doctors, nurses, statisticians and administrators who are actively involved in the renal service. The SRR helps to monitor the quality and availability of the service by running a continuously expanding audit and quality assurance programme.

The Scottish renal units have been working to improve the treatment of anaemia in patients using haemodialysis, with the support of the SRA and using evidence from the SRR. The renal units and the SRR have gone to great lengths to ensure full patient registration and the collection of complete and accurate data. In addition to collecting data, senior staff from the renal units have contributed to the definitions required to ensure comparability of data from different units. Training sessions have also been organised for staff, to ensure data are collected accurately and that any action necessary to improve on under performance can be identified and implemented quickly.

The SRR has also collaborated with NHS Quality Improvement Scotland (NHS QIS) in both developing standards for adult renal services[1] and reviewing performance against these standards nationwide[2]. The national target, stated in these standards, is that in a minimum of 85% of haemodialysis patients, a haemoglobin concentration of not less than 10 g/dL should be achieved after three months of dialysis.

2. NHS Quality Improvement Scotland. National Overview for Adult Renal Services. Edinburgh: NHS Quality Improvement Scotland (2003). www.nhshealthquality.org

Results and Discussion

In September 2002, 1209 patients had been on haemodialysis for at least three months and were therefore eligible for the audit. The SRR has valid data on 1166 patients and data are missing from only 4% of patients (eg patients who had a recent blood transfusion).

Figure 1 shows the percentage of patients in each renal unit who had a haemoglobin concentration of not less than 10 g/dL. This allows a comparison with the target for each unit and for Scotland as a whole.

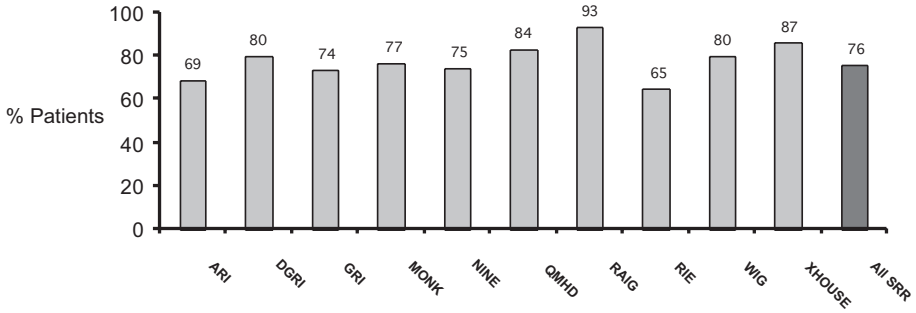
The SRR has also presented the September 2002 data as a set of cumulative frequency curves (Figure 2), with one curve for each renal unit and one for the whole country. While Figure 1 is easier to read at a glance, the cumulative frequency curves provide more detailed information about haemoglobin levels throughout Scotland, namely:

i) the percentage of patients which achieve a given haemoglobin concentration;
ii) the median haemoglobin concentration; and
iii) the distribution pattern, eg the proportion of patients with very low or high results.

As the results from all the renal units are very similar, the curves overlap making it hard to distinguish individual renal units. To improve clarity the data are presented in two graphs, with five renal units per graph.

Figure 3 presents data collected for the last 5 years, depicting the proportion of Scottish patients with a haemoglobin concentration of no less than 10 g/dL.

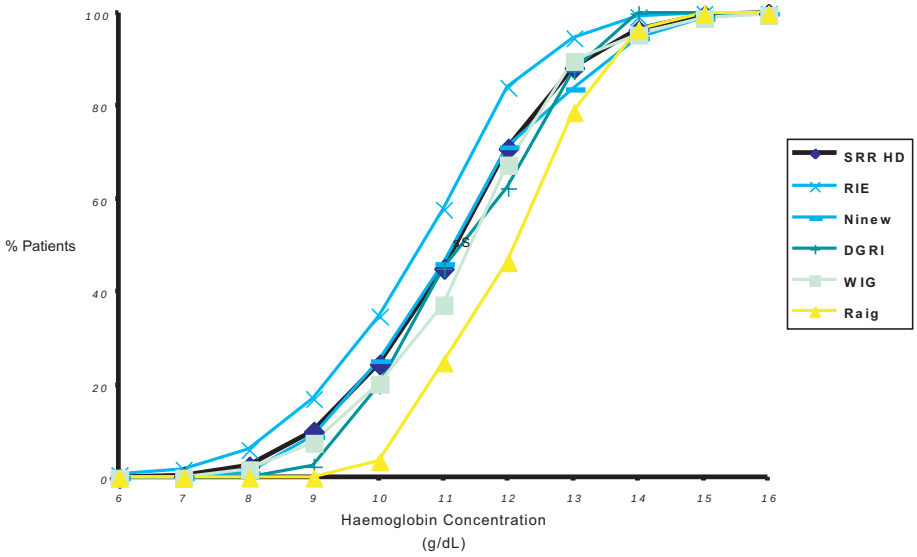
Figure 1. The percentage of patients with a haemoglobin concentration of 10 g/dL or more, for each adult renal unit for September 2002.

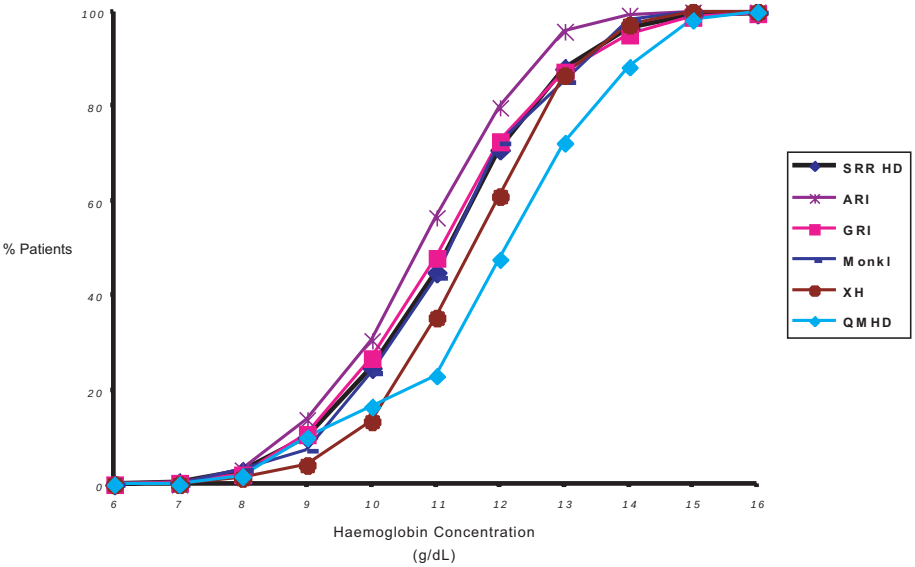


Abbreviations:

Scotland (ALL SRR)
Aberdeen Royal Infirmary (ARI)
Crosshouse Hospital, Kilmarnock (XHOUSE)
Dumfries & Galloway Royal Infirmary (DGRI)
Glasgow Royal Infirmary (GRI)
Monklands Hospital, Airdrie (Monk)
Ninewells Hospital, Dundee (Nine)
Queen Margaret Hospital, Dunfermline (QMHD)
Raigmore Hospital, Inverness (Raig)
Royal Infirmary, Edinburgh (RIE)
Western Infirmary, Glasgow (WIG)

Figure 2. Haemoglobin concentration of patients on dialysis for three months or more, for each adult renal unit for September 2002.

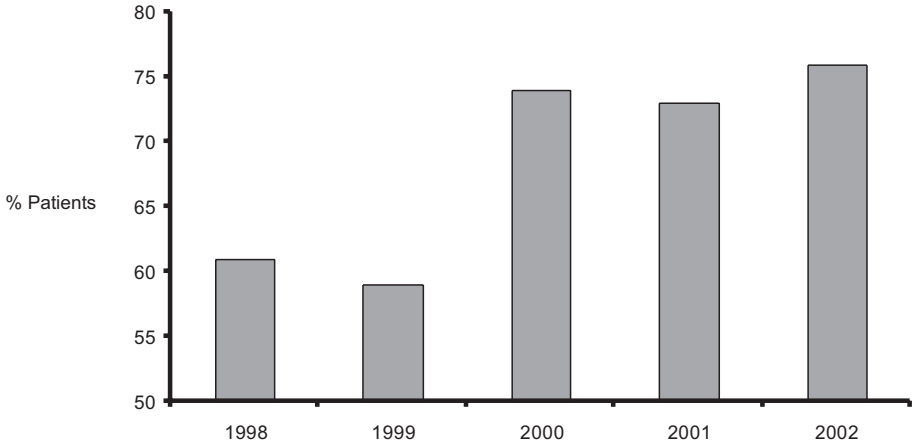




Abbreviations:

Scotland (SRR HD)
Aberdeen Royal Infirmary (ARI)
Crosshouse Hospital, Kilmarnock (XH)
Dumfries & Galloway Royal Infirmary (DGRI)
Glasgow Royal Infirmary (GRI)
Monklands Hospital, Airdrie (Monkl)
Ninewells Hospital, Dundee (Ninew)
Queen Margaret Hospital, Dunfermline (QMHD)
Raigmore Hospital, Inverness (Raig)
Royal Infirmary, Edinburgh (RIE)
Western Infirmary, Glasgow (WIG)

Figure 3. The percentage of patients with a haemoglobin concentration of 10 g/dL or more, for Scotland between 1998 and 2002.



The national target is that a haemoglobin concentration of no less than 10 g/dL should be achieved in a minimum of 85% of patients after three months on haemodialysis[1]. In September 2002, 76% of patients on haemodialysis throughout Scotland achieved a haemoglobin concentration of no less than 10 g/dL (Figure 1).

As can be seen from Figures 1 and 2, there are only small differences between the 10 units in Scotland. Nonetheless, at this time only Raigmore Hospital, Inverness and Crosshouse Hospital, Kilmarnock met the national target for treatment of anaemia in haemodialysis patients.

In recent years there has been a rise, of about 15%, in the proportion of patients with a haemoglobin concentration of no less than 10 g/dL (Figure 3). This is almost certainly due to an overall improvement in the quality of haemodialysis, which the SRR has reported elsewhere, to improved and increased use of haematinics and epoetin as funding has become available, and to an increase in experience and knowledge.

This audit is continuing. The SRR is examining in more detail the use of haematinics (eg iron) and epoetin, and the efficiency of the dialysis treatment itself.

Further information about the Scottish Renal Registry, including other reports, is available on its website: www.show.scot.nhs.uk/srr

Scottish Renal Registry, Walton Building, Glasgow Royal Infirmary, Glasgow, G4 0SF. Tel: 0141 211 5171. Fax: 0141 211 4843

2.8 Ovarian Cancer

Background

- Ovarian cancer is the fourth most common cancer among women in Scotland. In 1999, almost 600 women were newly diagnosed with ovarian cancer.
- The incidence rate of ovarian cancer in Scotland is among the highest in Europe. It has increased steadily over the last 30 years and is expected to continue to do so. The mortality rate from ovarian cancer in Scotland is also among the highest in Europe.
- The *Clinical Standards for Gynaecological (Ovarian) Cancer*, available from NHS Quality Improvement Scotland, give guidance on providing clinical services in hospital and community settings.
- This section includes a number of indicators in relation to women diagnosed with ovarian cancer between 1997 and 1999. Further background information about ovarian cancer is also presented.

Key Findings

- In all health board areas, the mortality rate from ovarian cancer did not significantly differ from the Scottish national rate.
- In all health board areas, levels of cause-specific survival at 3 years after diagnosis did not significantly differ from the Scottish national rate.
- There was no statistically significant variation between health boards in the proportion of new patients who received some form of active treatment. 83.5% of Scottish women diagnosed with ovarian cancer received some form of active treatment within 6 months of first attendance at hospital (it is not expected that all women should receive active treatment). 72.5% of women received surgery and 51.6% received chemotherapy. The median waiting time from first attendance at hospital to treatment was 11 days.
- Throughout Scotland, 12.2% of women diagnosed with ovarian cancer were recruited to participate in clinical trials. This rate varied widely between health boards - from 2.9% to 26.8%.

Introduction

Ovarian cancer is the fourth most common malignancy among women in Scotland, with almost 600 newly diagnosed cases in 1999[1]. These represent 4-5% of all cancers in women (excluding non-melanoma skin cancers). Ovarian cancer rates increase with increasing age, and the incidence of the disease in Scotland has been increasing over the past 30 years. Survival decreases with increasing age at diagnosis. Survival from ovarian cancer is poor with 5-year survival of around 30%. This is lower than the survival reported by some other European countries/cancer registries.

The indicators in this section are derived from Scottish Cancer Registry records held at the Information and Statistics Division of NHSScotland (ISD). The use of 1991 Census data, and population and death data, is by permission of the Registrar General for Scotland.

This section contains some background data about ovarian cancer (Figures 1-6, Tables 1-3) as well as a series of indicators.

Data and Methods

Criteria for inclusion in survival analysis

The criteria for inclusion in the survival analysis are shown in Box 1. Patients diagnosed with ovarian cancer between 1997-99 were included in the analysis. Patients diagnosed pre-1997 were not included as the ICD coding system changed over this period making the pre-1997 data not directly comparable with the post-1997 data. Date of diagnosis is defined essentially as the date of first hospital contact relating to the cancer. Patients aged over 99 years were excluded, as the quality and completeness of cancer registration data are poorer in this age group than for younger cases. Individuals with more than one primary malignant tumour were included only once, from the date of the diagnosis of the first tumour. A small number of registrations which could not be traced through the National Health Service Central Register, or who were not resident in Scotland, were also excluded. Cases registered only from death certificates and for whom no information was traced on the diagnosis of cancer during life (death certificate only, or DCO registrations) were excluded: It has been recognised that the validity of the diagnosis is lower in such cases. DCOs are more likely to arise in older age groups and, since these cases tend to have poorer prognosis, their inclusion in survival analysis may reduce the survival estimates[2,3]. There were 6 DCO cases excluded out of the 1863 cases (0.32%). The percentage of DCO cases in every health board was less than 1%.

1. Scottish Health Statistics: The Website of ISD Scotland. www.isdscotland.org (select 'Information and Statistics' then 'Health and Care' then 'Cancer')
2. Pollock AM & Vickers N. The Impact on Colorectal Cancer Survival of Cases Registered by "Death Certificate Only": Implications for National Survival Rates. *British Journal of Cancer* (1994) 70: 1229-31.
3. Wilson S, Prior P & Woodman CBJ. Use of Cancer Surveillance Data for Comparative Analyses. *Journal of Public Health Medicine* (1992) 14: 151-5.

Box 1. Ovarian cancer: summary of criteria for inclusion in survival analysis.

- Ovarian cancer registrations during 1997-1999 defined as a diagnosis of ICD-10 C56.
- Ages 15 to 99 at diagnosis.
- Individuals resident in Scotland with known health board area of residence and known Carstairs' deprivation quintiles.
- Cases registered by death certificate only (DCO) were excluded.
- Follow-up complete to 31 December 2001.

Causes of death regarded as being indicative of death from ovarian cancer

Causes of death regarded as ovarian cancer deaths were malignant neoplasm of the ovary and less specific causes of death, such as disseminated malignancy, without any mention of primary site. These were also selected so as to avoid the omission of some deaths from ovarian cancer which were recorded as less specific causes of death. This decision reflects concerns about the reliability of death certification[4]. The analysis is based on deaths from the following selected causes (ICD-9 and ICD-10 codes in parentheses):

- Malignant neoplasm of ovary and other uterine adnexa (ICD-9 183; ICD-10 C56, C57.0-C57.4)
- Malignant neoplasm of unspecified female genitourinary tract not otherwise specified (ICD-9 184.9; ICD-10 C57.9)
- Malignant neoplasm of abdomen (ICD-9 195.2; ICD-10 C76.2) (single case with a registration for ovarian cancer)
- Malignant neoplasm of pelvis (ICD-9 195.3; ICD-10 C76.3)
- Secondary malignant neoplasm (ICD-9 196-198; ICD-10 C77-C79)
- Malignant neoplasm without specification of site (ICD-9 199; ICD-10 C80)
- Neoplasm of uncertain behaviour of ovary (ICD-9 236.2; ICD-10 D39.1)
- Neoplasm of uncertain behaviour of other and unspecified female genital organs (ICD-9 236.3; ICD-10 D39.7, D39.9)
- Neoplasm of uncertain behaviour, site unspecified (ICD-9 238.9; ICD-10 C48.9)

4. Maudsley G & Williams EM. Death Certification by House Officers and General Practitioners - Practice and Performance. *Journal of Public Health Medicine* (1993) 15: 192-201.

- Neoplasm of unspecified nature of other genitourinary organs (ICD-9 239.5; ICD-10 D39.7, D39.9)
- Neoplasm of unspecified nature, site unspecified (ICD-9 239.9; ICD-10 D48.9)

Follow up for death was complete to 31 December 2001. Any cases still alive at this date or with a date of death after 31 December 2001 were censored (information relating to them is no longer included) at 31 December 2001. Causes of death other than those listed above were also censored at time of death.

Confidence intervals

Since the proportions and survival rates are estimates (actually of the probability rather than the 'rate' of survival) and their accuracy is related to the number of patients included in each analysis, confidence intervals for the proportions have been presented. Where the Scottish proportion or survival rate lies outside the confidence interval for a particular health board this means that there is a strong possibility that the deviation is due to factors other than random variation in the data. However, it should be noted that the application of multiple tests of statistical significance increases the likelihood of an apparently significant difference arising simply through chance.

Results and Discussion

Incidence and mortality

Age specific incidence rates for ovarian cancer in Scotland are shown in Figure 1. There is a clear increase in rates with increasing age. Incidence peaks in women aged 75-79 and decreases thereafter. Mortality rates also increase with increasing age (Figure 2). However, mortality is minimal prior to 40 years of age.

Ovarian cancer incidence has been increasing over the past 30 years (Figure 3). Mortality has increased at a slower rate than incidence over this period and there is some evidence of a recent decrease in mortality. These trends may be modified by future changes in the prevalence of risk factors and by health service interventions[5]. The number of predicted cases may decrease if the maximum benefits of oral contraceptive use are seen, and mortality may be reduced by re-organisation of services and improvements in treatment. However, if these changes do not occur, incidence will continue to rise to an estimated level of 640 cases per year by 2010-2014. Figure 4 shows the projected number of cases.

5. Scottish Executive Health Department. Cancer Scenarios: An Aid to Planning Cancer Services in Scotland in the Next Decade. Edinburgh: The Scottish Executive (2001).

Figure 1. Ovarian cancer: age-specific incidence rates: Scotland 1997-99.

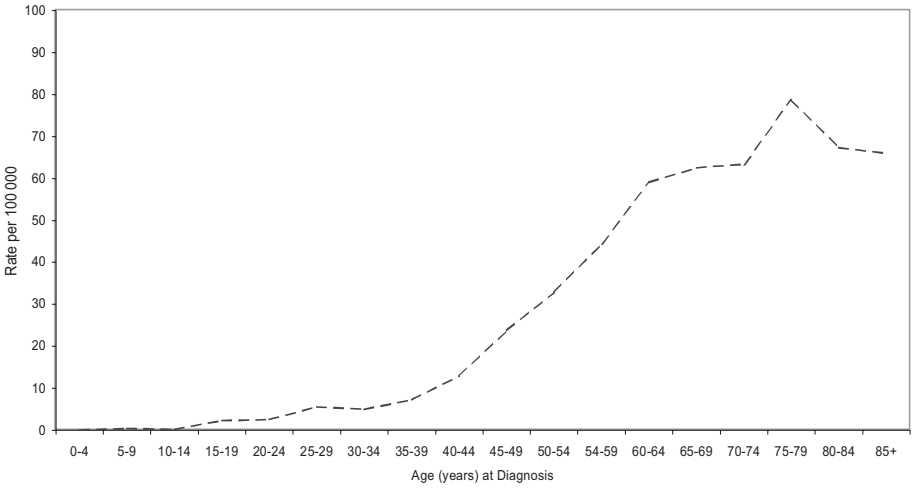


Figure 2. Ovarian cancer: age-specific mortality rates: Scotland 1997-2001.

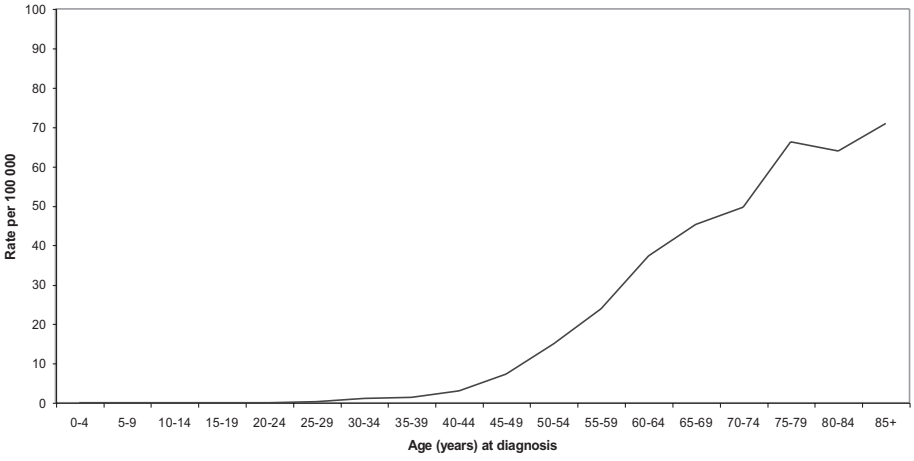


Figure 3. Ovarian cancer: age-standardised incidence and mortality rates, standardised to the European Standard Population: Scotland incidence 1970-1999, and mortality 1970-2001.

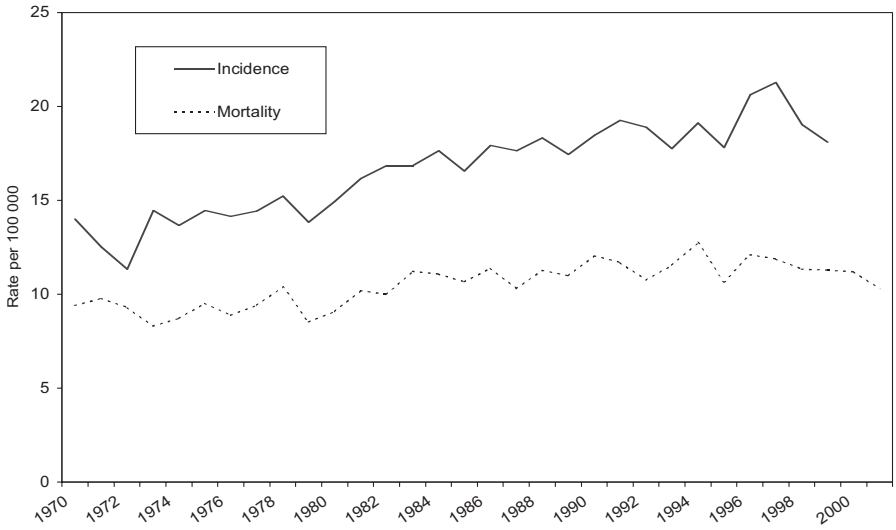
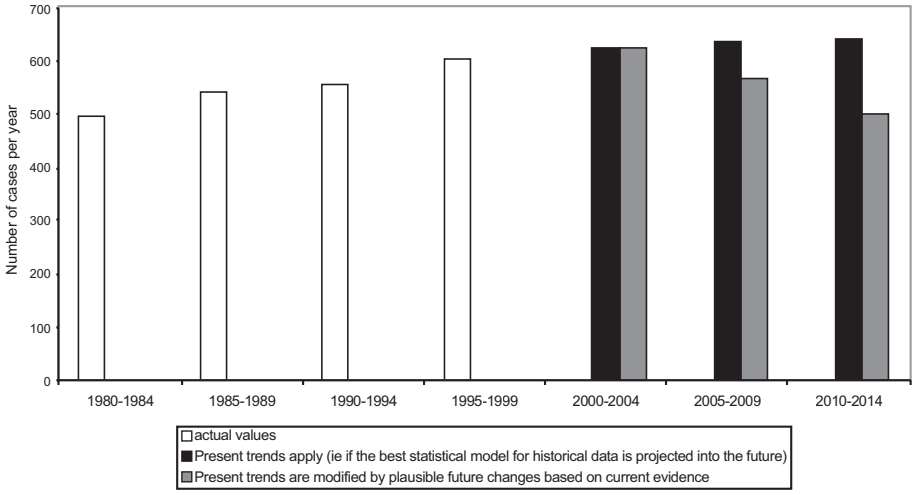


Figure 4. Projected number of ovarian cancer cases in Scotland for 2000-2014.



The most recent international comparisons of cancer incidence and mortality are from the late 1990s (See Table 1)[6]. Scotland has a slightly higher incidence in comparison with other European countries. There was a two-fold variation in incidence within Europe. The often late stage of diagnosis and relatively poor prognosis of ovarian cancer means that international patterns of mortality rates are not dissimilar to incidence. Scotland has the highest incidence but only the third highest mortality rate.

Table 1. Ovarian cancer: international comparisons of incidence and mortality rates, standardised to the World Standard Population: 1997.

Incidence		Mortality	
	Rate per 100 000		Rate per 100 000
Scotland (ISD)	15.8	Ireland	10.2
Sweden	15.4	Denmark	9.4
Ireland	14.5	UK	8.0
UK	13.8	Scotland (ISD)	8.0
Denmark	13.2	Belgium	7.4
USA (1995-99 SEER)	12.5	Luxembourg	7.1
Belgium	12.2	Germany	6.9
Austria	12.2	Sweden	6.8
Finland	11.7	The Netherlands	6.5
The Netherlands	11.7	Austria	6.5
Luxembourg	11.0	Finland	6.3
Germany	10.9	European Union	6.1
European Union	10.6	USA (1995-99 SEER)	5.8
Spain	10.0	France	5.5
France	9.2	Italy	4.7
Italy	8.1	Spain	4.2
Portugal	7.4	Greece	3.9
Greece	7.4	Portugal	3.8

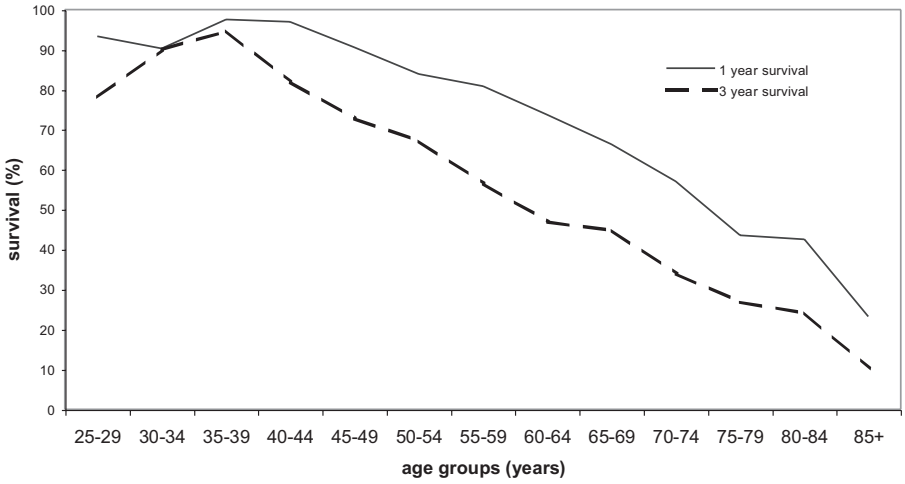
Source: Ferlay *et al* (1999) EUCAN CD-ROM (exceptions are in brackets)

Survival

Cause-specific survival at one and three years after diagnosis of ovarian cancer by age group is shown in Figure 5. Survival decreases with increasing age at both one and three years . The calculation of cause-specific survival involves the censoring of non-ovarian cancer deaths (see data and methods to this section for details) and it therefore should reflect mortality related to ovarian cancer alone.

6. Ferlay J, Bray F, Sankila R & Parkin DM. Cancer Incidence, Mortality and Prevalence in the European Union. EUCAN CD ROM. IARC Press, Lyon (1999).

Figure 5. Ovarian cancer: cause specific survival at one and three years by age group: Scotland 1997-99.



Selected results from the EUROCARE II study[7] are presented in Table 2. The relative survival method used in these analyses takes account of deaths from all causes and is the ratio of the observed survival to that expected for a group of people in the general population similar to the patient group with respect to race, sex, age and calendar period of observation[8]. Relative survival is useful for comparing survival from cancer across countries, adjusting for underlying mortality in each country. Marked differences in relative survival from ovarian cancer were reported between countries. Scottish rates at one and five years after diagnosis ranked below average compared to Europe. Some of the reported differences between countries could be due to variations in data quality, particularly in relation to completeness of coverage, where the areas covered by registries may not be representative of the whole country, and completeness of follow-up.

7. Berrino F, Capocaccia R, Estève J *et al*., eds. Survival of Cancer Patients in Europe: the EUROCARE-2 Study. IARC Scientific Publications No. 151. Lyon: International Agency for Research on Cancer (1999).
8. Hakulinen T. Cancer Survival Corrected for Heterogeneity in Patient Withdrawal. *Biometrics* (1982) 38: 933-42.

Table 2. Ovarian cancer: international comparisons of 1-year and 5-year relative survival (%): 1987-89.

	1 year relative survival 95% CI			5 year relative survival 95% CI		
Country	Estimate	Lower	Upper	Estimate	Lower	Upper
Europe	64.1	61.9	66.3	34.1	31.7	36.6
Switzerland	72.5	63.2	80.4	41.9	32.2	52.7
Netherlands	70.2	62.4	77.1	35.9	28.3	44.4
France	77.1	70.2	82.8	41.7	33.5	50.6
Finland*	67.8	64.9	70.5	38.7	35.7	41.9
Italy	68.2	61.8	74.0	33.4	27.3	40.3
Sweden	73.7	69.7	77.5	45.1	40.4	49.8
Germany	60.1	53.7	66.3	30.6	24.1	38.3
Estonia*	55.1	50.3	59.8	25.8	21.6	30.6
Poland	56.6	49.4	63.5	31.7	25.1	39.3
Denmark*	62.9	60.6	65.3	32.1	29.7	34.5
Scotland*	54.7	52.7	57.3	29.7	27.2	32.3
England	55.7	54.4	56.9	31.3	30.0	32.5

Source: EUROCARE II
*100% coverage of national population

Standardised incidence ratio and standardised mortality ratio

Results are presented for Scotland as a whole and for each health board. Orkney, Shetland and Western Isles have been combined and presented as 'Islands' due to the small numbers of cases involved. It should be noted that in some cases the health board of residence may not be the same as the health board of treatment. Indeed, some patients may be treated in more than one health board area.

The Standardised Incidence Ratio (SIR) for a health board is the ratio of the observed number of cancer registrations in residents of the health board to the number of registrations expected. The expected number of registrations is standardised by age and is based on the Scottish rates for the most recent 3-year time period for which data are available (1997-99).

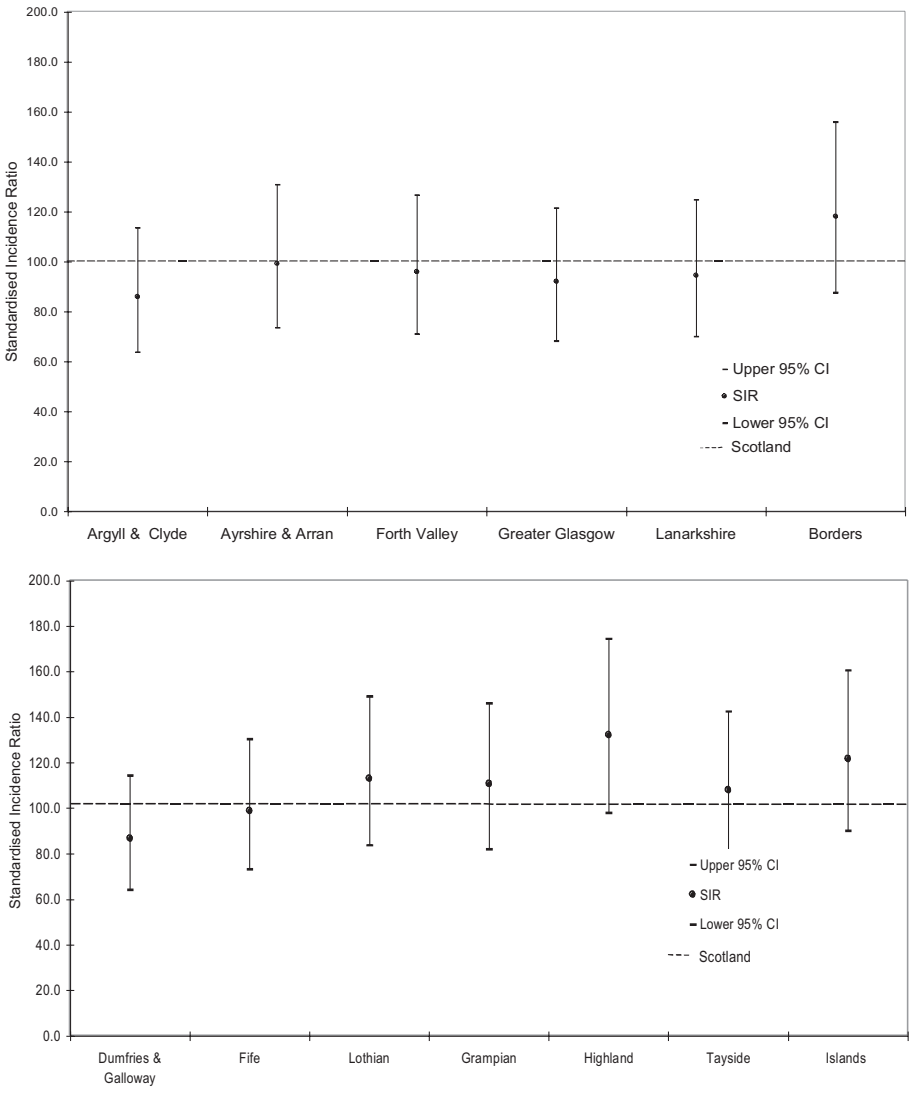
The Standardised Mortality Ratio (SMR) for a health board is the ratio of the observed number of deaths in residents of the health board to the number of deaths expected. The expected number of deaths is standardised by age and is based on the Scottish rates for the most recent 3-year time period for which data are available (1999-2001).

The incidence and mortality for all of Scotland in the latest time period are set as the standard for comparison (SIR and SMR values of 100). This technique allows comparison between a health board rate and the

national rate but not between individual health boards. An estimate of the statistical significance of the SIR and SMR can be obtained from the confidence interval; if this does not encompass the value 100, then the difference in incidence or mortality in a particular population compared with the standard population can be said to be 'statistically significant'.

All of the health board SIRs for ovarian cancer had confidence intervals which included 100 (Figure 6 & Table 3). Therefore, there is no statistically significant difference between any health board and the national rate.

Figure 6. Ovarian cancer: standardised incidence ratios, standardised (to Scotland 1997-1999) for age: by health board for 1997-99.



Islands include Orkney, Shetland and the Western Isles

Table 3. Ovarian cancer: standardised incidence ratios (with 95% CI), standardised (to Scotland 1997-1999) for age: by health board for 1997-99.

Health Board	Registrations	Standardised Incidence Ratio	95% CI Lower	95% CI Upper
Argyll & Clyde	134	86.0	63.8	113.5
Ayrshire & Arran	140	99.2	73.6	131.0
Forth Valley	95	96.0	71.2	126.7
Greater Glasgow	295	92.1	68.3	121.6
Lanarkshire	179	94.5	70.1	124.8
Borders	52	118.1	87.7	156.0
Dumfries & Galloway	52	86.7	64.4	114.5
Fife	125	98.9	73.4	130.5
Lothian	299	113.1	83.9	149.2
Grampian	198	110.7	82.1	146.1
Highland	102	132.2	98.1	174.5
Tayside	162	108.1	80.2	142.6
Islands [1]	31	121.7	90.3	160.6
Scotland	1863	100		

[1] Islands include Orkney, Shetland and the Western Isles

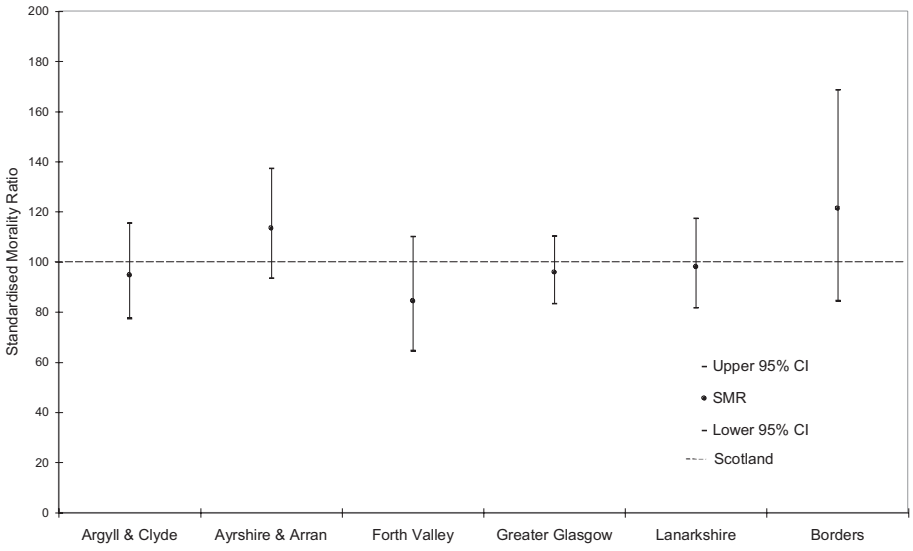
Most of the health board SMRs for ovarian cancer had confidence intervals which included 100 (Figure 7 & Table 4). However, Dumfries & Galloway had a significantly lower mortality rate than the national average.

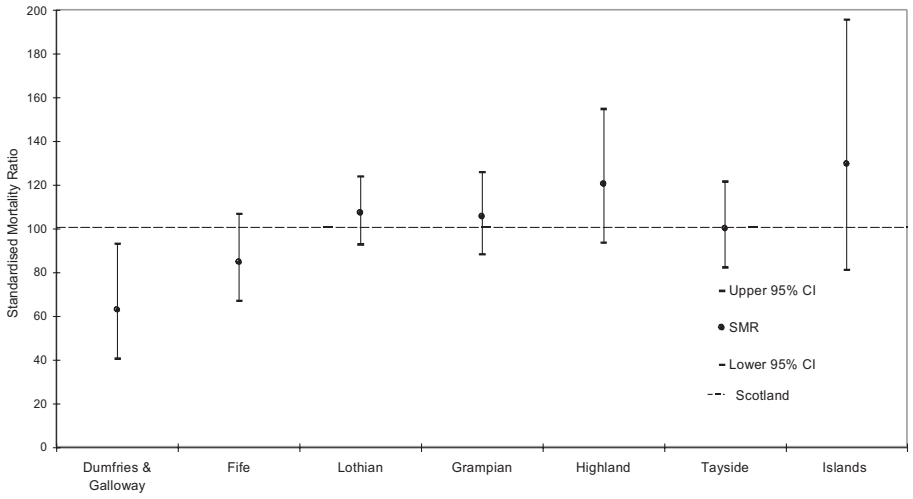
Table 4. Ovarian cancer: standardised mortality ratios (with 95% CI), standardised (to Scotland 1999-2001) for age: by health board for 1999-2001.

Health Board	Deaths	Standardised Mortality Ratio	95% CI Lower	95% CI Upper
Argyll & Clyde	96	94.7	77.5	115.7
Ayrshire & Arran	105	113.5	93.7	137.4
Forth Valley	54	84.5	64.7	110.3
Greater Glasgow	196	95.9	83.4	110.4
Lanarkshire	118	98.0	81.9	117.4
Borders	35	121.4	84.6	168.7
Dumfries & Galloway	25	63.0	40.8	93.3
Fife	71	84.8	67.2	107.1
Lothian	184	107.4	92.9	124.0
Grampian	122	105.6	88.4	126.1
Highland	61	120.5	93.8	154.9
Tayside	101	100.2	82.4	121.8
Islands [1]	22	129.7	81.3	195.9
Scotland	1190	100		

[1] Islands include Orkney, Shetland and Western Isles.

Figure 7. Ovarian cancer: standardised mortality ratios, standardised (to Scotland 1999-2001) for age: by health board for 1999-2001.





Islands include Orkney, Shetland and the Western Isles

Survival at health board level

Cause-specific survival at one and three years was studied in patients diagnosed in 1997-1999 (Figure 8). The wide confidence intervals reflect substantial variability in survival estimates due to small numbers (Table 5). **It is important to note that variations in survival between health boards may reflect differences in case-mix that it has not been possible to adjust for in the analysis, including stage of disease at diagnosis.**

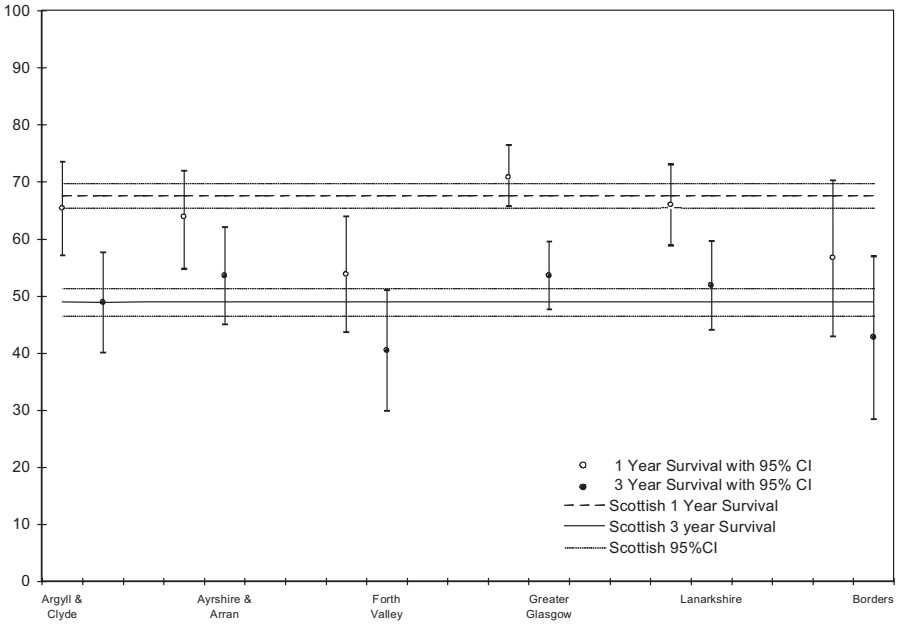
Table 5. Ovarian cancer: cause-specific survival (with 95% CI) at 1 and 3 years: Scotland by health board for period of diagnosis* 1997-99.

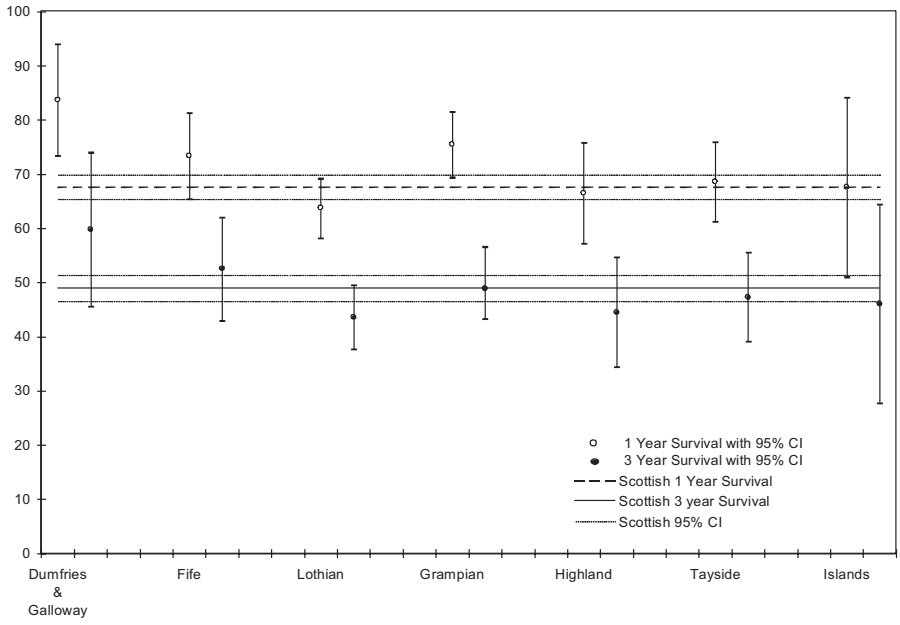
Health Board	Registrations	Number in analysis	1 year survival (%)	1 year survival Lower 95% CI	1 year survival Upper 95% CI	3 year survival (%)	3 year survival Lower 95% CI	3 year survival Upper 95% CI
Argyll & Clyde	134	132	65.4	57.2	73.6	48.9	40.1	57.7
Ayrshire & Arran	140	140	63.9	54.8	72.0	53.6	45.1	62.1
Forth Valley	95	95	53.8	43.7	64.0	40.5	29.9	51.1
Greater Glasgow	295	285	70.8	65.8	76.5	53.6	47.7	59.6
Lanarkshire	179	173	66.0	58.9	73.1	51.9	44.1	59.7
Borders	52	51	56.7	43.0	70.3	42.8	28.5	57.0
Dumfries & Galloway	52	50	83.7	73.4	94.0	59.8	45.6	74.0
Fife	125	125	73.4	65.4	81.3	52.6	43.0	62.0
Lothian	299	296	63.8	58.2	69.2	43.6	37.7	49.5
Grampian	198	196	75.5	69.4	81.5	48.9	43.3	56.6
Highland	102	100	66.5	57.2	75.8	44.5	34.4	54.7
Tayside	162	162	68.6	61.2	75.9	47.3	39.1	55.6
Islands [1]	31	30	67.6	51.0	84.1	46.1	27.7	64.4
Scotland	1863	1808	67.6	65.4	69.8	48.9	46.5	51.3

[1] Islands include Orkney, Shetland and the Western Isles

* The date of diagnosis is defined essentially as the date of first hospital contact relating to the cancer.

Figure 8. Ovarian cancer: cause-specific survival (with 95% CI) at 1 and 3 years: Scotland by health board: period of diagnosis* 1997-99.





Islands include Orkney, Shetland and the Western Isles

* The date of diagnosis is defined essentially as the date of first hospital contact relating to the cancer.

Treatment patterns in health board areas in Scotland

This section contains indicators of process using 1997-99 cancer registration data. In future, more timely, precise and meaningful indicators should become available from cancer audit data collected prospectively. The main modalities of treatment for ovarian cancer are surgery and chemotherapy. Due to limited radiosensitivity, radiotherapy is used rarely in the management of this disease. Obviously, the decision to pursue active treatment and the choice of therapy in an individual depend on a range of factors. Therefore, not all women diagnosed with ovarian cancer will receive active treatment and the percentage of patients receiving active treatment would never be expected to reach 100%.

Table 6 shows the number and percentage of patients receiving surgery within 6 months of first hospital contact. Overall 72.5% of those diagnosed with ovarian cancer in 1997-99 received surgery within 6 months. The proportion receiving surgery within 6 months by health board was significantly higher in Fife compared to Scotland as a whole.

Table 6. Ovarian cancer: total number of patients, and the number and percentage (with 95% CI) who received surgery within 6 months of first hospital contact by health board: Scotland 1997-99.

		Treated		95% CI	
Health Board	Patients	N	%	Lower	Upper
Argyll & Clyde	133	88	66.2	58.0	74.4
Ayrshire & Arran	140	97	69.3	61.5	77.1
Forth Valley	95	60	63.2	53.3	73.1
Greater Glasgow	295	210	71.2	65.9	76.5
Lanarkshire	179	125	69.8	63.0	76.7
Borders	52	36	69.2	56.4	82.0
Dumfries & Galloway	52	43	82.7	72.2	93.2
Fife	125	103	82.4	75.6	89.2
Lothian	299	233	77.9	73.1	82.7
Grampian	198	144	72.7	66.4	79.1
Highland	102	82	80.4	72.5	88.3
Tayside	162	107	66.0	58.6	73.5
Islands [1]	31	23	74.0	58.5	89.9
Scotland	1863	1351	72.5	70.5	74.5

[1] Islands include Orkney, Shetland and the Western Isles

Table 7 shows the number and percentage of patients receiving chemotherapy within 6 months of first hospital contact. Overall 51.6% of those diagnosed with ovarian cancer in 1997-99 received chemotherapy within 6 months. The proportion receiving chemotherapy within 6 months by health board was significantly higher in Dumfries & Galloway compared to Scotland as a whole.

Table 7. Ovarian cancer: number and percentage (with 95% CI) of patients who received chemotherapy within 6 months of first hospital contact by health board: Scotland 1997-99.

		Treated		95% CI	
Health Board	Patients	N	%	Lower	Upper
Argyll & Clyde	133	70	52.6	44.0	61.3
Ayrshire & Arran	140	60	42.9	34.5	51.2
Forth Valley	95	44	46.3	36.1	56.5
Greater Glasgow	295	151	51.2	45.4	57.0
Lanarkshire	179	82	45.8	38.4	53.3
Borders	52	24	46.2	32.3	60.0
Dumfries & Galloway	52	35	67.3	54.3	80.3
Fife	125	62	49.6	40.7	58.5
Lothian	299	153	51.2	45.5	56.8
Grampian	198	114	57.6	50.6	64.6
Highland	102	64	62.7	53.2	72.3
Tayside	162	87	53.7	45.9	61.5
Islands [1]	31	16	51.6	33.7	69.6
Scotland	1863	962	51.6	49.3	53.9

[1] Islands include Orkney, Shetland and the Western Isles

Table 8 summarises the number and percentage of patients receiving any major treatment modality within 6 months of first hospital contact. There was no significant difference between the percentage receiving any treatment by health board and the percentage receiving treatment in Scotland as a whole. Obviously active treatment is not appropriate in every circumstance, for example, in the presence of serious co-morbidity.

Table 8. Ovarian cancer: number and percentage (with 95% CI) of patients who received surgery, radiotherapy or chemotherapy within 6 months of first hospital contact by health board: Scotland 1997-99.

		Treated		95% CI	
Health Board	Patients	N	%	Lower	Upper
Argyll & Clyde	133	113	85.0	78.8	91.2
Ayrshire & Arran	140	111	79.3	72.4	86.1
Forth Valley	95	74	77.9	69.4	86.4
Greater Glasgow	295	253	85.8	81.7	89.8
Lanarkshire	179	143	79.9	73.9	85.9
Borders	52	42	80.8	69.8	91.7
Dumfries & Galloway	52	47	90.4	82.2	98.6
Fife	125	112	89.6	84.1	95.1
Lothian	299	249	83.3	79.0	87.6
Grampian	198	168	84.8	79.8	89.9
Highland	102	88	86.3	79.5	93.1
Tayside	162	129	79.6	73.3	86.0
Islands [1]	31	27	87.1	75.1	99.1
Scotland	1863	1556	83.5	82.0	85.4

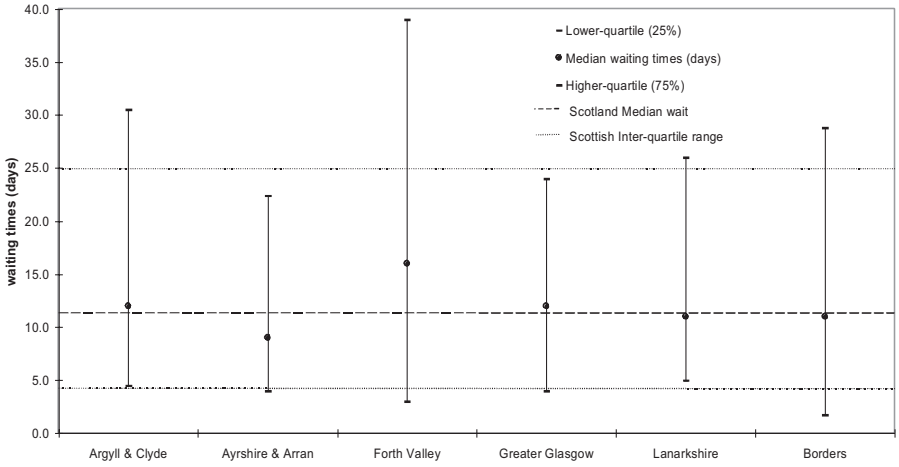
[1] Islands include Orkney, Shetland and the Western Isles

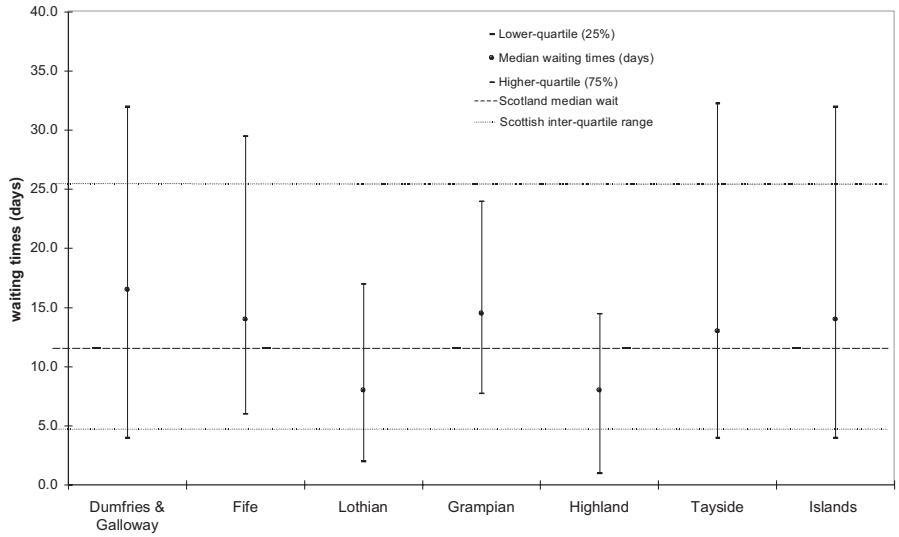
Waiting times from first hospital contact to first modality of treatment

The median waiting time in Scotland was 11 days. All health boards had median waiting times similar to this, with Dumfries & Galloway having the highest at 16.5 days and Lothian and Highland both having the lowest at 8 days from first hospital contact to treatment (Figure 9 & Table 9).

The Scottish Executive has a target for the maximum wait between urgent referral and treatment to be two months or less by 2005. This will be assessed using clinical audit data collected prospectively.

Figure 9. Ovarian cancer: median waiting times and inter-quartile ranges (days) from first hospital contact to first modality of treatment by health board: Scotland 1997-99.





Islands include Orkney, Shetland and the Western Isles

Table 9. Ovarian cancer: median waiting times (days) and inter-quartile ranges from first hospital contact to first modality of treatment by health board: Scotland 1997-1999.

				Inter-quartile range	
Health Board	Registrations	N	Median	Q1	Q3
Argyll & Clyde	133	113	12.0	4.5	30.5
Ayrshire & Arran	140	112	9.0	4.0	22.4
Forth Valley	95	76	16.0	3.0	39.0
Greater Glasgow	295	257	12.0	4.0	24.0
Lanarkshire	179	147	11.0	5.0	26.0
Borders	52	42	11.0	1.8	28.8
Dumfries & Galloway	52	48	16.5	4.0	32.0
Fife	125	113	14.0	6.0	29.5
Lothian	299	252	8.0	2.0	17.0
Grampian	198	174	14.5	7.8	24.0
Highland	102	89	8.0	1.0	14.5
Tayside	162	130	13.0	4.0	32.3
Islands [1]	31	27	14.0	4.0	32.0
Scotland	1863	1580	11.0	4.0	25.0

[1] Islands include Orkney, Shetland and the Western Isles
N Number of patients receiving treatment within 6 months of diagnosis
Q1, Q3 25th & 75th percentiles respectively
Treatment= Surgery, Chemotherapy or Radiotherapy, within 6 months of diagnosis

Recruitment to clinical trials

The importance of recruiting patients to participate in clinical trials is highlighted in the *Clinical Standards for Gynaecological (Ovarian) Cancer* [9]. It has been shown that patients recruited to clinical trials have a more favourable prognosis, regardless of the arm of the trial to which the patient is assigned.

Table 10 details the number and percentages of newly diagnosed ovarian cancer patients recruited to clinical trials within 6 months of diagnosis during 1997-99. Overall, 12.2% of patients were recruited to clinical trials. The proportion of patients recruited to clinical trials is highly variable between health boards. There was a significantly higher proportion of patients recruited in clinical trials in Grampian compared to Scotland as a whole. The proportion recruited to clinical trials was significantly lower for Highland and Tayside compared to the Scottish average. However, it should be noted that these data are likely to underestimate clinical trial recruitment, especially to trials of palliative therapy, because they are restricted to the first 6 months following diagnosis.

Table 10. Ovarian cancer: number and percentage of patients (with 95% CI) recruited to clinical trials within 6 months of diagnosis* by health board: 1997-1999.

		Recruited to trial		95% CI	
Health Board	Patients	N	%	Lower	Upper
Argyll & Clyde	133	20	15.0	8.8	21.2
Ayrshire & Arran	140	10	7.1	2.8	11.5
Forth Valley	95	12	12.6	5.8	19.4
Greater Glasgow	295	28	9.5	6.1	12.9
Lanarkshire	179	25	14.0	8.8	19.1
Borders	52	4	7.7	0.3	15.1
Dumfries & Galloway	52	5	9.6	1.4	17.8
Fife	125	17	13.6	7.5	19.7
Lothian	299	38	12.7	8.9	16.6
Grampian	198	53	26.8	20.5	33.1
Highland	102	3	2.9	0.0	6.3
Tayside	162	10	6.2	2.4	10.0
Islands[1]	31	3	9.7	0.0	20.3
Scotland	1863	228	12.2	10.7	13.8

[1] Islands include Orkney, Shetland and the Western Isles
* The date of diagnosis is defined essentially as the date of first hospital contact relating to the cancer.

9. Clinical Standards Board for Scotland. Clinical Standards for Gynaecological (Ovarian) Cancer. Edinburgh: Clinical Standards Board for Scotland (2001). www.nhshealthquality.org

2.9 Emergency Readmission to Hospital Following Surgery

Background

- Rates of emergency readmission to hospital within a given period after discharge can provide a partial guide to the success of the original treatment or care.
- Previous clinical indicators reports have included data on emergency readmission rates following discharge from both medical and surgical specialties, and also after individual surgical procedures.
- Trends in emergency readmission rates within 28 days of discharge following selected abdominal and pelvic surgery, and following lower limb arthroplasties (joint replacements) are presented here, for acute hospital trusts and for Scotland.

Key Findings

- When interpreting readmission rates, it is important to consider trends over a period of time rather than look at isolated rates for a single year. In particular, variations between the Scotland-wide rates and those for individual organisations are more likely to be reliable differences if they are larger and/or persist over time, compared with those variations which are smaller and/or transitory.
- For abdominal and pelvic surgery, the Scotland-wide emergency readmission rate rose slightly, from 5.2% in 1997-1998 to 5.7% in 2001-2002.
- For lower limb arthroplasties, the national emergency readmission rate was fairly constant, at around 7%, over this five year period.

Introduction

Within this section, two sets of 28 day emergency readmission rates are presented for acute hospital trusts:

i) emergency readmission rates within 28 days of discharge from hospital following selected abdominal and pelvic surgery; and

ii) emergency readmission rates within 28 days of discharge from hospital following selected lower limb arthroplasties (an arthroplasty is a partial or total replacement of a joint, such as a knee or hip).

Previous reports in this series have presented readmissions data following discharge from a medical specialty (1994, 1995, 2002 reports)[1,2,3], following discharge after individual surgical procedures (1996 report)[4], and following discharge from a surgical specialty (2002 report)[5]. The inclusion of further such data in this current report is intended to provide a broad overview of the pattern and trend of emergency readmission rates in groups of surgical patients in Scottish hospitals. It is hoped that these will provide a useful foundation for more detailed investigation where appropriate.

Although they have the potential to shed useful light on aspects of the quality of care, it must be recognised that emergency readmission rates of the kind presented here are relatively blunt instruments. They are likely to mean different things in different contexts. The difficulties in interpreting emergency readmission rates have been confirmed by studies carried out in response to previous Clinical Outcome Indicators reports[5,6,7].

The broad brush nature of the readmission rates presented makes it all the more necessary to repeat the caveat expressed in earlier reports. **No direct inferences about quality of care should be drawn from these indicators. They are intended, rather, to highlight issues which may require further investigation.**

1. Clinical Resource and Audit Group. Clinical Outcome Indicators. Edinburgh: Scottish Office (1994).
2. Clinical Resource and Audit Group. Clinical Outcome Indicators. Edinburgh: Scottish Office (1995).
3. Clinical Resource and Audit Group. Clinical Outcome Indicators. Edinburgh: Scottish Executive (2002). www.nhshealthquality.org and www.show.scot.nhs.uk/indicators
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5. Bisset AF. The Case for Clinical Audit of Emergency Readmissions After Appendicectomy. *Journal of the Royal College of Surgeons of Edinburgh* (1998) 43(4): 257-261.
6. Cox A & Simpson WAC. The Use of Readmission Rates as a Measure of Clinical Outcome Following Cataract Surgery. *Health Bulletin (Edinburgh)* (1998) 56(5) 799-802.
7. Leng GC, Walsh D, Fowkes FGR & Swainson CP. Is the Emergency Readmission Rate a Valid Outcome Indicator? *Quality in Health Care* (1999) 8: 234-238.

Data and Methods

Data source

The analysis uses the Scottish morbidity acute discharge record (SMR01) and General Registrar Office of Scotland (GRO(S)) death records within the Information and Statistics Division of NHSScotland (ISD) linked database. Please refer to section 2.1 for more information on the completeness of these data.

'Building blocks' for the analyses: hospital stays

The fundamental unit of analysis used in calculating readmission rates is the stay in hospital. In terms of data, a stay consists of one or more SMR01 episodes which relate to the same continuous stay in hospital. An SMR01 episode is generated when a patient is discharged from hospital but also when a patient is transferred between hospitals or between specialties, or even transferred to the care of a different consultant. All SMR01 records belonging to the same person have been grouped together using probability matching as part of the linked data set held at ISD. Within these 'patient record sets', episodes are grouped according to whether they form part of the same continuous stay in hospital. These stays are combinations of episodes within the same trust or across different trusts. Thus if a patient is admitted to hospital A, transferred to hospital B for surgery and transferred back to hospital A for convalescence, these all form part of the same hospital stay. A single episode of inpatient care, beginning with an admission from home and ending with discharge home, or a series of episodes of care linked by transfers or a single day case episode, all count as one stay in hospital.

Calculation and attribution of readmission rates

Readmission rates are attributed to a hospital and trust according to where the surgery was performed. For instance, if a patient was admitted to hospital A for surgery, then was transferred to hospital B for convalescence before being discharged home, the operation is included in the total for hospital A. Any readmission is also attributed to hospital A.

If a patient had more than one relevant operation (eg two knee procedures) during a continuous stay, it is the last one before discharge which is included in analysis (eg the second of two knee procedures). Additionally, an operation is only included in the readmissions calculations if no procedures of other types were performed on the patient during later episodes within their hospital stay. All hospital stays

which include a surgical procedure of interest and are counted in the readmissions analyses are termed index stays.

Time to readmission is calculated from the date the patient is finally discharged at the end of a hospital stay to the admission date of the first episode of the next stay. Patients are counted as an emergency readmission if they are admitted as an emergency to any NHSScotland hospital within 28 days of discharge from the final episode of the continuous inpatient stay. Elective (ie planned) return visits to hospital are NOT counted as readmissions in these analyses. Cases are excluded from the analysis where the patient has died in hospital or died within 28 days of discharge without having been readmitted prior to their death.

For each index stay, only the first readmission within 28 days after discharge is counted. For instance, if a patient was readmitted as an emergency twice within the 28 day period following their surgery, only the earlier one of these counts towards the readmissions rate.

Abdominal and pelvic surgery included

The operations listed in the table below, where recorded as the main surgical procedure in an episode of care, are included in the abdominal and pelvic surgery indicator.

Surgical procedure	OPCS4 Codes[8]
Colectomy	H04-H11
Cholecystectomy	J18
Hysterectomy	Q07-Q08
Herniorrhaphy	T19-T27
Prostatectomy	M61, M65

Lower limb arthroplasties included

The operations listed in the table below, where recorded as the main surgical procedure in an episode of care, are included in the lower limb arthroplasties indicator. Most of these procedures are on knees and hips, but also included in the code list are other lower limb joints, around the ankle and foot. This code list is compatible with that used to identify procedures of interest for the Scottish Arthroplasty Project[9] (although the version used here has been modified slightly to render it a little less complex).

8. Office of Population Censuses and Surveys. Tabular List of the Classification of Surgical Operations and Procedures: Fourth Revision Consolidated Version 1990. London: HMSO (1990).

9. Scottish Health Statistics: The Website of ISD Scotland. www.isdscotland.org (select 'information and statistics' then 'quality improvement', following links thereafter to national audit projects).

Surgical procedure	OPCS4 Codes[8]
Total hip replacement	W37-W39
Knee replacement	W40-W42
Other hip arthroplasty	W46-W48
Other joint replacements with pair codes indicating procedure on lower limb	W43-W45 with one of the following pair codes: Z57, Z58, Z76-Z78, Z84.3-Z84.6, Z85-Z86, Z90.2-Z90.7
Other arthroplasties with pair codes indicating procedure on lower limb	i) W52-W55 with one of the following pair codes: Z57, Z58, Z76-Z78, Z84.3-Z84.6, Z85-Z86, Z90.2-Z90.7 or ii) W56-W58 with one of the following pair codes: Z57, Z58, Z76-Z78, Z84.3-Z84.6, Z86, Z90.2-Z90.7

This list includes both primary procedures (ie the first time a replacement operation is performed on a joint) and revisions (ie when further replacement surgery is performed on a joint). However, the mix of primary and revision procedures is taken into account in the calculation of this readmission indicator (see below).

Excluded from this lower limb orthopaedic surgery indicator are patients who had a principle diagnosis of hip fracture (ICD-10 S72.0-S72.2) during the same episode of care as their operation.

Standardisation

Both sets of readmission rates are indirectly standardised in terms of the patient characteristics of age, sex and deprivation category (the latter being Carstairs' deprivation quintiles, based on the 1991 Census). In addition, the readmission rates are standardised in terms of elective and non-elective admission type.

For the abdominal and pelvic surgery indicator, rates are also standardised for broad type of procedure (eg a prostatectomy as opposed to a colectomy).

For the lower limb orthopaedic surgery indicator, rates are also standardised for whether the operation was a primary procedure or a revision procedure. Identification of operations as primaries or revisions followed, as closely as possible, the list of codes held by the Scottish Arthroplasty Project team. A full list of the OPCS-4 codes[8] used to do this is too large to provide here, but is available on request.

Standardisation is carried out using the total population of index stays (see above) of the relevant procedure group over the whole 5-year period as a reference category. Thus the annual readmission rates are in essence standardised over time for any changes in measured case mix (ie any of the items mentioned above).

Presentation

Data are presented for Scotland and acute hospital trusts, for the financial years 1997-98 to 2001-02. Financial year assignment is based on the date of the patient's final discharge at the end of a continuous inpatient stay. The minimum threshold for inclusion of a trust's data in this report is 20 readmissions observed for the most recent year (2001-02).

Please note that data will not be complete for some trusts for the most recent months included. In particular, where there are pronounced drops in the numbers of discharges for some trusts for 2001-02 compared with 2000-01, this is likely to be due, at least in part, to there being some missing data for the latest year. See section 2.1 of this report for further information on data completeness.

Results and Discussion

Emergency readmissions within 28 days of discharge following abdominal and pelvic surgery are shown at trust level in Figure 1 and Table 1. For Scotland as a whole, 28 day readmission rates following abdominal and pelvic surgery rose slightly between 1997-98 and 2001-2, from 5.2% to 5.7%.

Emergency readmissions within 28 days of discharge following selected lower limb arthroplasties are shown at trust level in Figure 2 and Table 2. It is noted again that these figures do not include patients who had a main diagnosis of hip fracture in the same episode of care as their operation. Overall readmission rates for Scotland are higher following lower limb arthroplasties than is the case for abdominal and pelvic surgery. However, the rates following lower limb arthroplasties were fairly constant over the five year period, at around 7%.

Interpretation of readmission rates presented by single year should be carried out with great caution. Statistically 'hard and fast' rules cannot be provided for such interpretation. In particular, very little should be read into data for a single year especially when this consists of a deviation from an established pattern.

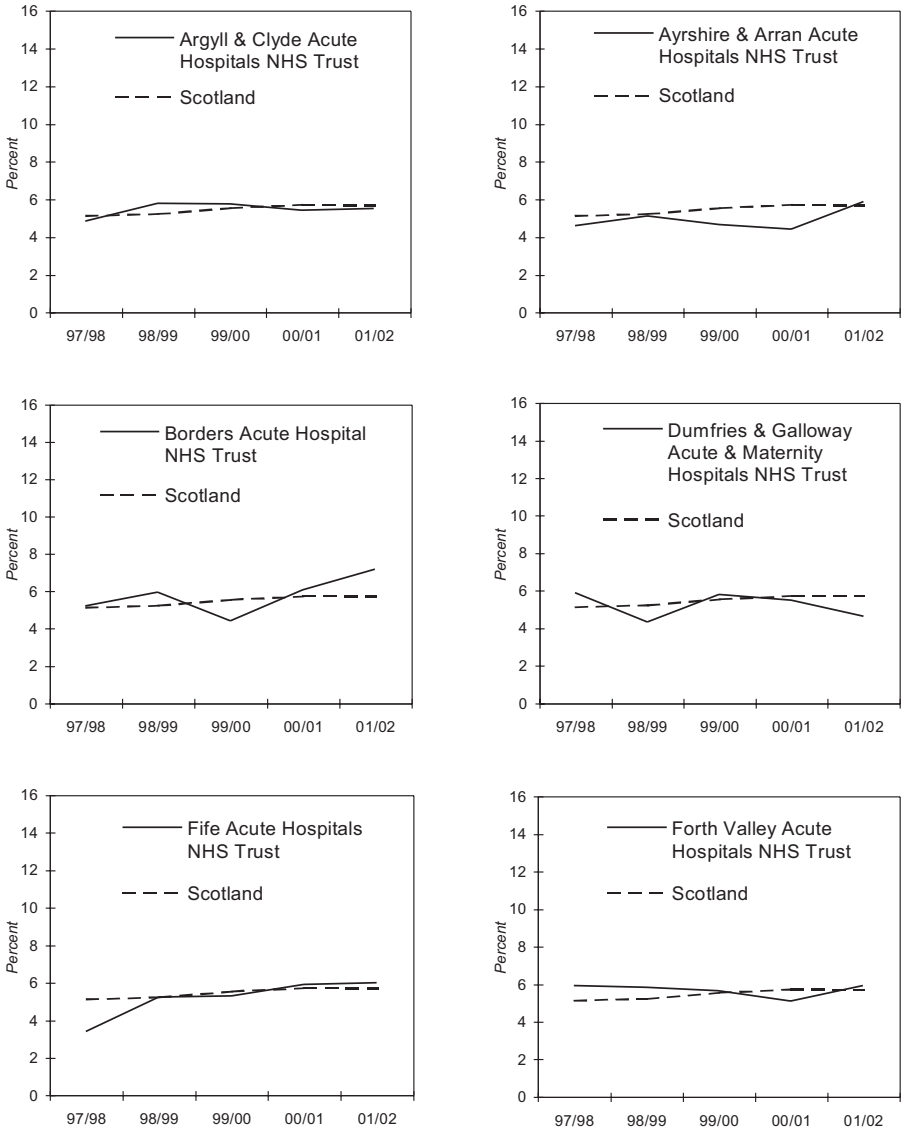
Confidence intervals for the readmission rates for individual years have not been presented. This is not only to keep the presentation simple. The main reason is that the data should not be interpreted in terms of rates for individual years but rather in terms of the longer term differences and trends which are revealed. The Clinical Outcome Indicators report of July 1999 (pp21-28) contains a detailed discussion of the kinds of inference it is legitimate to draw from patterns of apparent change or stability in the indicators (this report is available at www.show.scot.nhs.uk/indicators).

In terms of the annual trends presented here, the larger, the longer lasting and the more stable a difference between the indicator for a trust and the Scottish mean is, the more likely it is that this represents a real difference in readmission rate (rather than a chance difference reflecting random variation over time in those unmeasured characteristics of patients which are related to outcome).

Most importantly, however, even when a large, stable and long-lasting difference in readmission rate is apparent, the caveat which has been stressed throughout the publication of clinical outcome indicators applies equally here. **No direct inferences about quality of care should be drawn from these figures.** The effects of any differences between trusts in aspects of case mix for which we have been unable to standardise, such as a different diagnostic mix of patients admitted, may be just as long term as any differences in quality of care.

Figure 1a. Emergency readmissions following selected abdominal and pelvic surgery: acute hospital trusts

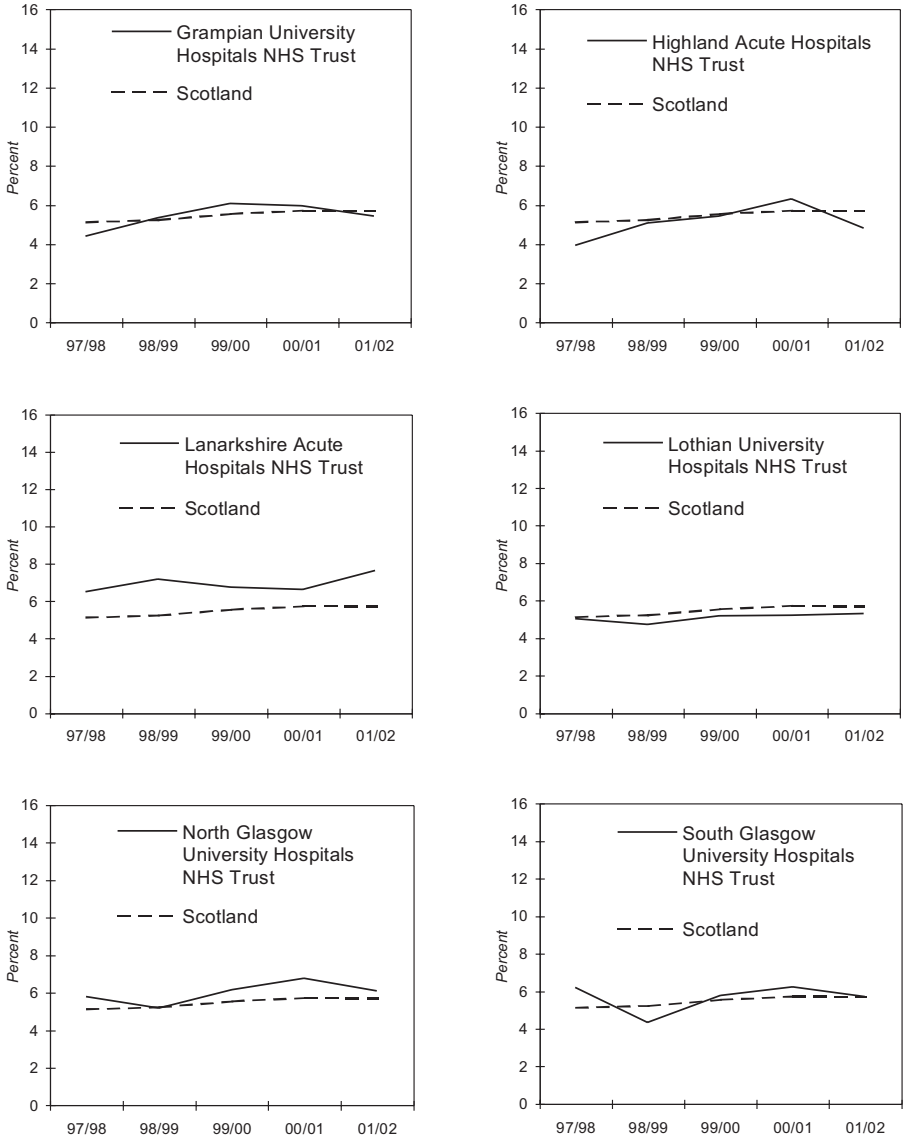
Percentage of patients readmitted within 28 days of discharge; financial years 1997-98 to 2001-2. Rates standardised for age, sex, deprivation quintile, procedure type and elective/non-elective admission status.



Figures are shown for those trusts with at least 20 emergency readmissions observed for the year 2001-2.

Figure 1b. Emergency readmissions following selected abdominal and pelvic surgery: acute hospital trusts

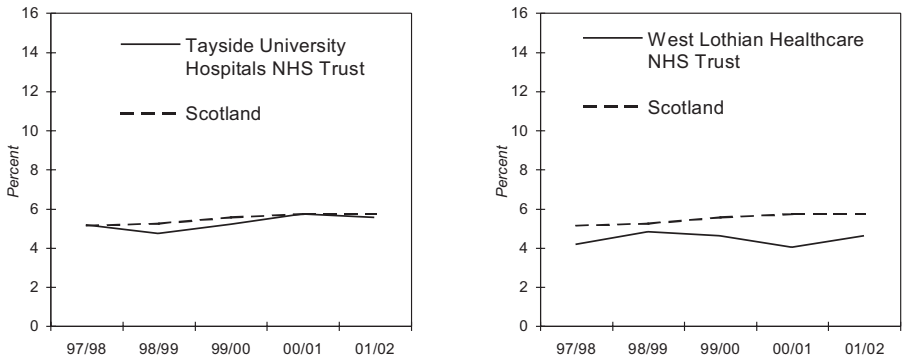
Percentage of patients readmitted within 28 days of discharge; financial years 1997-98 to 2001-2. Rates standardised for age, sex, deprivation quintile, procedure type and elective/non-elective admission status.



Figures are shown for those trusts with at least 20 emergency readmissions observed for the year 2001-2.

Figure 1c. Emergency readmissions following selected abdominal and pelvic surgery: acute hospital trusts

Percentage of patients readmitted within 28 days of discharge; financial years 1997-98 to 2001-2. Rates standardised for age, sex, deprivation quintile, procedure type and elective/non-elective admission status.



Figures are shown for those trusts with at least 20 emergency readmissions observed for the year 2001-2.

Table 1. Emergency readmissions following selected abdominal and pelvic surgery: acute hospital trusts

Percentage of patients readmitted within 28 days of discharge; financial years 1997-98 to 2001-02.
Crude rates, and rates standardised for age, sex, deprivation quintile, procedure type and elective/non-elective admission status.

		Financial year				
		97-98	98-99	99-00	00-01	01-02
Scotland	Discharges	27764	27147	25530	24921	24473
	Em. Readmissions	1442	1418	1433	1426	1389
	Crude rate (%)	5.19	5.22	5.61	5.72	5.68
	Std. rate (%)	5.15	5.25	5.57	5.74	5.73
Argyll & Clyde	Discharges	2262	2169	2136	2067	2088
Acute Hospitals NHS Trust	Em. Readmissions	114	126	125	116	113
	Crude rate (%)	5.04	5.81	5.85	5.61	5.41
	Std. rate (%)	4.84	5.78	5.72	5.40	5.50
Ayrshire & Arran	Discharges	1982	1945	1690	1692	1750
Acute Hospitals NHS Trust	Em. Readmissions	91	95	77	71	102
	Crude rate (%)	4.59	4.88	4.56	4.20	5.83
	Std. rate (%)	4.60	5.09	4.65	4.42	5.86
Borders	Discharges	628	593	496	555	543
Acute Hospital NHS Trust	Em. Readmissions	31	33	20	30	35
	Crude rate (%)	4.94	5.56	4.03	5.41	6.45
	Std. rate (%)	5.19	5.94	4.39	6.04	7.15
Dumfries & Galloway	Discharges	963	833	815	807	660
Acute & Maternity Hospitals	Em. Readmissions	53	35	44	42	30
NHS Trust	Crude rate (%)	5.50	4.20	5.40	5.20	4.55
	Std. rate (%)	5.87	4.32	5.78	5.46	4.63
Fife	Discharges	1421	1552	1337	1587	1426
Acute Hospitals NHS Trust	Em. Readmissions	50	82	71	97	87
	Crude rate (%)	3.52	5.28	5.31	6.11	6.10
	Std. rate (%)	3.39	5.22	5.28	5.90	5.97
Forth Valley	Discharges	1331	1473	1369	1288	1410
Acute Hospitals NHS Trust	Em. Readmissions	79	83	73	63	79
	Crude rate (%)	5.94	5.63	5.33	4.89	5.60
	Std. rate (%)	5.91	5.82	5.63	5.07	5.91
Grampian	Discharges	2911	2755	2728	2470	2516
University Hospitals NHS Trust	Em. Readmissions	124	139	161	144	131
	Crude rate (%)	4.26	5.05	5.90	5.83	5.21
	Std. rate (%)	4.39	5.31	6.04	5.94	5.40
Highland	Discharges	1270	1201	1164	1174	1185
Acute Hospitals NHS Trust	Em. Readmissions	49	60	58	73	54
	Crude rate (%)	3.86	5.00	4.98	6.22	4.56
	Std. rate (%)	3.92	5.07	5.39	6.28	4.80
Lanarkshire	Discharges	2386	2289	2175	1970	2052
Acute Hospitals NHS Trust	Em. Readmissions	162	168	152	137	162
	Crude rate (%)	6.79	7.34	6.99	6.95	7.89
	Std. rate (%)	6.48	7.15	6.73	6.58	7.62
Lothian	Discharges	2617	3097	2936	2861	2838
University Hospitals NHS Trust	Em. Readmissions	128	146	154	144	154
	Crude rate (%)	4.89	4.71	5.25	5.03	5.43
	Std. rate (%)	5.02	4.70	5.16	5.20	5.27

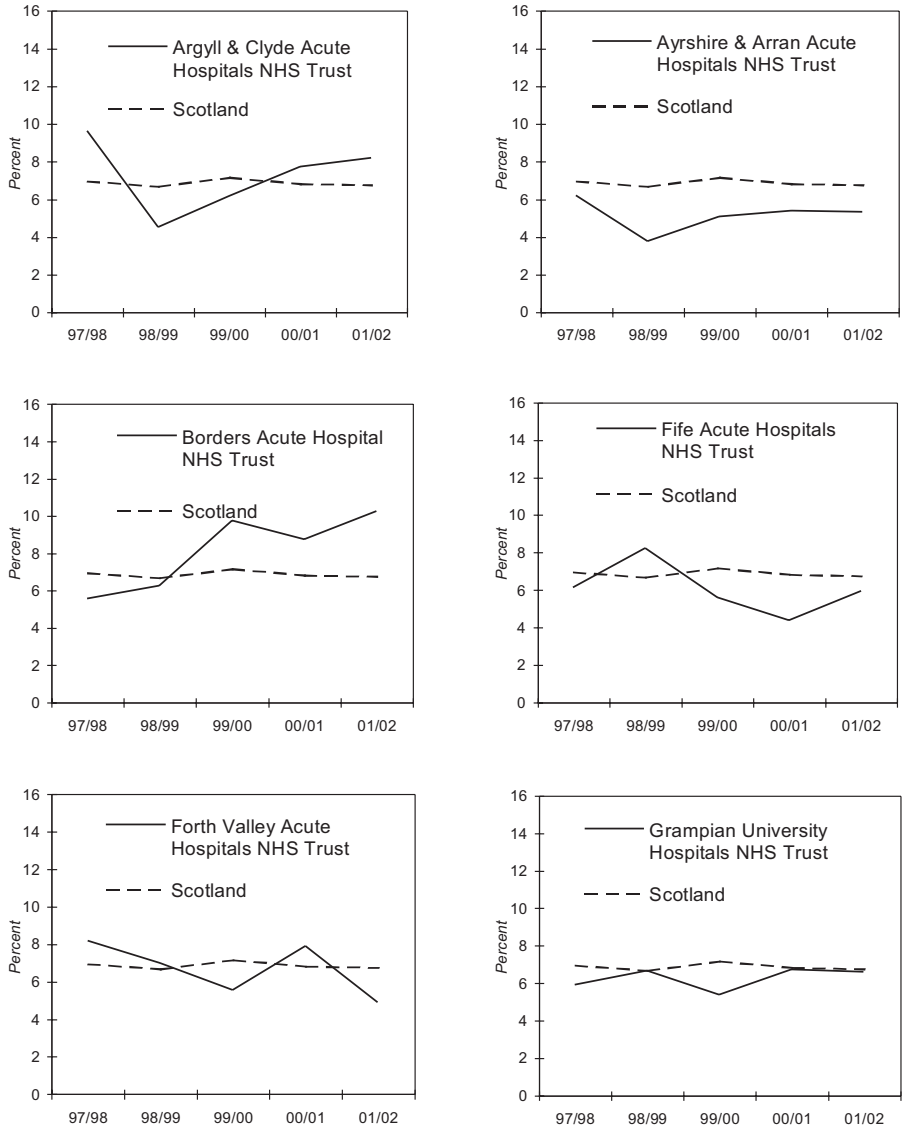
Table 1 (cont). Emergency readmissions following selected abdominal and pelvic surgery: acute hospital trusts

Percentage of patients readmitted within 28 days of discharge; financial years 1997-98 to 2001-02.
Crude rates, and rates standardised for age, sex, deprivation quintile, procedure type and elective/non-elective admission status.

		Financial year				
		97-98	98-99	99-00	00-01	01-02
Scotland	Discharges	27764	27147	25530	24921	24473
	Em. Readmissions	1442	1418	1433	1426	1389
	Crude rate (%)	5.19	5.22	5.61	5.72	5.68
	Std. rate (%)	5.15	5.25	5.57	5.74	5.73
North Glasgow	Discharges	3142	3313	2982	2921	2642
University Hospitals NHS Trust	Em. Readmissions	206	185	207	215	171
	Crude rate (%)	6.56	5.58	6.94	7.36	6.47
	Std. rate (%)	5.75	5.16	6.12	6.73	6.09
South Glasgow	Discharges	1754	1601	1626	1362	1274
University Hospitals NHS Trust	Em. Readmissions	119	74	103	91	77
	Crude rate (%)	6.78	4.62	6.33	6.68	6.04
	Std. rate (%)	6.19	4.31	5.76	6.21	5.68
Tayside	Discharges	2480	2226	2184	2268	2207
University Hospitals NHS Trust	Em. Readmissions	124	106	116	128	120
	Crude rate (%)	5.00	4.76	5.31	5.64	5.44
	Std. rate (%)	5.13	4.69	5.18	5.71	5.54
West Lothian	Discharges	859	990	938	929	906
Healthcare NHS Trust	Em. Readmissions	37	49	43	38	41
	Crude rate (%)	4.31	4.95	4.58	4.09	4.53
	Std. rate (%)	4.14	4.79	4.59	3.99	4.60

Figure 2a. Emergency readmissions following selected lower limb arthroplasties: acute hospital trusts

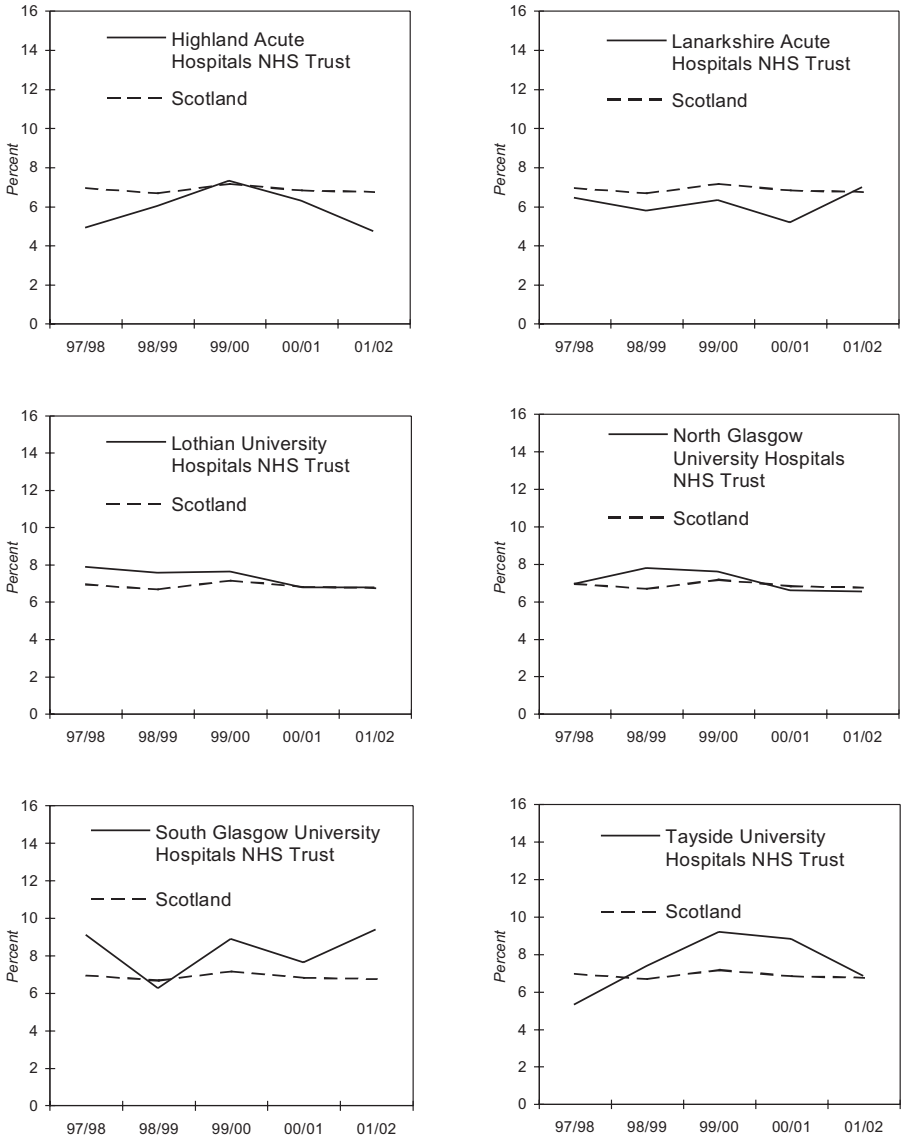
Percentage of patients readmitted within 28 days of discharge; financial years 1997-98 to 2001-2. Rates standardised for age, sex, deprivation quintile, whether the surgery was a primary procedure or a revision, and elective/non-elective admission status.



Figures are shown for those trusts with at least 20 emergency readmissions observed for the year 2001-2.

Figure 2b. Emergency readmissions following selected lower limb arthroplasties: acute hospital trusts

Percentage of patients readmitted within 28 days of discharge; financial years 1997-98 to 2001-2. Rates standardised for age, sex, deprivation quintile, whether the surgery was a primary procedure or a revision, and elective/non-elective admission status.



Figures are shown for those trusts with at least 20 emergency readmissions observed for the year 2001-2.

Table 2. Emergency readmissions following selected lower limb arthroplasties: acute hospital trusts

Percentage of patients readmitted within 28 days of discharge; financial years 1997-98 to 2001-02.
Crude rates, and rates standardised for age, sex, deprivation quintile, whether the surgery was a primary procedure or a revision, and elective/non-elective admission status.

		Financial year				
		97-98	98-99	99-00	00-01	01-02
Scotland	Discharges	7587	8349	8183	8394	8374
	Em. Readmissions	533	550	591	573	566
	Crude rate (%)	7.03	6.59	7.22	6.83	6.76
	Std. rate (%)	6.96	6.69	7.17	6.83	6.76
Argyll & Clyde	Discharges	357	446	401	433	460
Acute Hospitals NHS Trust	Em. Readmissions	33	19	24	32	36
	Crude rate (%)	9.24	4.26	5.99	7.39	7.83
	Std. rate (%)	9.60	4.49	6.14	7.71	8.19
Ayrshire & Arran	Discharges	616	628	593	633	612
Acute Hospitals NHS Trust	Em. Readmissions	37	23	28	32	32
	Crude rate (%)	6.01	3.66	4.72	5.06	5.23
	Std. rate (%)	6.19	3.74	5.07	5.38	5.30
Borders	Discharges	198	245	243	248	260
Acute Hospital NHS Trust	Em. Readmissions	10	15	23	22	27
	Crude rate (%)	5.05	6.12	9.47	8.87	10.38
	Std. rate (%)	5.43	6.24	9.75	8.73	10.24
Fife	Discharges	482	545	526	624	625
Acute Hospitals NHS Trust	Em. Readmissions	28	42	29	29	39
	Crude rate (%)	5.81	7.71	5.51	4.65	6.24
	Std. rate (%)	6.13	8.21	5.59	4.35	5.93
Forth Valley	Discharges	354	390	359	428	396
Acute Hospitals NHS Trust	Em. Readmissions	28	26	20	32	19
	Crude rate (%)	7.91	6.67	5.57	7.48	4.80
	Std. rate (%)	8.15	6.97	5.54	7.90	4.89
Grampian	Discharges	899	973	979	949	983
University Hospitals NHS Trust	Em. Readmissions	49	60	49	61	61
	Crude rate (%)	5.45	6.17	5.01	6.43	6.21
	Std. rate (%)	5.91	6.66	5.37	6.71	6.57
Highland	Discharges	356	367	439	477	474
Acute Hospitals NHS Trust	Em. Readmissions	17	21	31	28	21
	Crude rate (%)	4.78	5.72	7.06	5.87	4.43
	Std. rate (%)	4.90	5.99	7.28	6.26	4.70
Lanarkshire	Discharges	559	573	527	522	665
Acute Hospitals NHS Trust	Em. Readmissions	36	31	31	25	43
	Crude rate (%)	6.44	5.41	5.88	4.79	6.47
	Std. rate (%)	6.41	5.75	6.32	5.16	6.96
Lothian	Discharges	1153	1171	1194	1295	1123
University Hospitals NHS Trust	Em. Readmissions	100	90	90	89	77
	Crude rate (%)	8.67	7.69	7.54	6.87	6.86
	Std. rate (%)	7.86	7.53	7.59	6.74	6.76
North Glasgow	Discharges	878	1022	949	883	985
University Hospitals NHS Trust	Em. Readmissions	62	82	70	60	65
	Crude rate (%)	7.06	8.02	7.38	6.80	6.60
	Std. rate (%)	6.90	7.75	7.56	6.57	6.49

Table 2 (cont). Emergency readmissions following selected lower limb arthroplasties: acute hospital trusts

Percentage of patients readmitted within 28 days of discharge; financial years 1997-98 to 2001-02.
Crude rates, and rates standardised for age, sex, deprivation quintile, whether the surgery was a primary procedure or a revision, and elective/non-elective admission status.

		Financial year				
		97-98	98-99	99-00	00-01	01-02
Scotland	Discharges	7587	8349	8183	8394	8374
	Em. Readmissions	533	550	591	573	566
	Crude rate (%)	7.03	6.59	7.22	6.83	6.76
	Std. rate (%)	6.96	6.69	7.17	6.83	6.76
South Glasgow University Hospitals NHS Trust	Discharges	641	757	770	767	632
	Em. Readmissions	66	50	87	65	65
	Crude rate (%)	10.30	6.61	11.30	8.47	10.28
	Std. rate (%)	9.08	6.22	8.86	7.61	9.35
Tayside University Hospitals NHS Trust	Discharges	783	939	941	883	916
	Em. Readmissions	39	67	87	76	61
	Crude rate (%)	4.98	7.14	9.25	8.61	6.66
	Std. rate (%)	5.29	7.35	9.16	8.78	6.81

2.10 Presentation of Outcomes Data: A Comparison of Traditional Methods with an Approach Using Shewhart Charts

Background

- Shewhart control charts provide an alternative to the traditional methods of presenting outcomes data.
- The main advantage of Shewhart control charts is their simplicity. They are relatively easy to interpret, and are designed to identify any unusual variation in a process (eg clinical outcomes).
- Using 30 day survival following acute myocardial infarction (or heart attack) as an illustrative example, this section compares traditional methods of presenting outcomes data with a new approach using Shewhart charts.

Key Findings

- For this data set, the approach using Shewhart charts gave similar results to traditional methods.
- The approach using Shewhart charts described here is new. This method of presenting outcomes data will be explored further, and considered for use in future Clinical Outcome Indicators reports.

Introduction

In recent years, there has been much discussion as to the pros and cons of the 'league table' approach to outcomes analysis. In their paper of 2002[1] published in the British Medical Journal, Adab et al advocated the use of Shewhart control charts for this type of analysis. This section represents a pilot exercise carried out to explore how the methods described by Adab et al could be applied to an established outcome indicator.

Control charts are a simple, graphical way to display data and outcomes. They were first introduced by Walter Shewhart in 1924. The main advantage of Shewhart control charts is their simplicity – they are relatively easy both to construct and to interpret, and have been designed to identify any unusual variation in a process.

All processes, whether industrial production lines or health care systems, have inherent random variability – known as 'common cause' variation. A system which displays only common cause variation is said to be 'in control'.

An unplanned situation or unexpected event can result in 'special cause' variation. A system with 'special cause' variation is said to be 'out of control'.

In a control chart, the outcomes for different units are plotted on a chart along with a mean line. Control limits are plotted at 3 standard deviations above and below the mean line. When a unit falls outside the control limits, it is said to be 'out of control' and a reason for the special cause variation can be sought. There is a 3 in 1000 chance of a unit falling outside the control limits when it is, in fact, in control.

The convention of using three standard deviations for calculating the control limits has been established through many years of experience with this method in industrial settings. This positioning of control limits is considered to be a good balance between the false negative of failing to investigate something which is truly unusual, and the false positive of needlessly investigating observations which do not really exhibit special cause variation. However, control charts can be extended to include 'warning limits', which are plotted at 2 standard deviations above and below the mean line. On a longitudinal chart, a unit is considered to be 'out of control' if it falls outside the same warning limit on two consecutive occasions.

1. Adab P, Rouse AM, Mohammed MA & Marshall T. Performance League Tables: the NHS Deserves Better. *British Medical Journal* (2002) 324: 95-98.

This section aims to illustrate how this technique can be applied to the presentation of data on 30-day survival following acute myocardial infarction (AMI, or heart attack), and to compare the resulting charts with the charts produced using traditional methods of presentation. It should be noted that the focus of this section is on the methodology of presenting outcomes data. AMI data are used simply to illustrate the methods.

The charts presented here are only one example of the range of Shewhart charts that can be produced. Further details about these charts can be found on the website of the Clinical Indicators Support Team (www.show.scot.nhs.uk/indicators). A tool for producing control charts in EXCEL may also be downloaded from this website.

Data and Methods

Indicator

Percentage of patients surviving for 30 days after emergency admission with principal diagnosis of AMI.

Data sources

Emergency admissions for AMI are identified from SMR01 records. Deaths within 30 days are identified using the linkage between SMR01 records and Registrar General death records in the main linked database at the Information and Statistics Division of NHSScotland (ISD).

Period of coverage

Data are presented for patients admitted in the single year periods from 1 April 1997 to 31 March 2002.

Criteria for inclusion

The indicator is for patients admitted as an emergency with a principal diagnosis of AMI. The codes taken as AMI are as follows:

ICD10 codes I21, I22

I21 Acute myocardial infarction

I22 Subsequent myocardial infarction (Includes: recurrent myocardial infarction. Excludes: specified as chronic (duration >28 days))

Patient basis of the indicator

Each patient admitted with an AMI is counted once within each year no matter how many times the patient is admitted for AMI within that period. The aim is to avoid any double counting of the same AMI that might occur, for example, when a patient is transferred, thus generating a new SMR01 record.

Definition of outcome

The outcome is defined as survival for at least 30 days after admission. It should be remembered that establishment of survival for at least 30 days is based upon linkage to Registrar General's death records and thus takes account of any deaths occurring after discharge from hospital.

Standardisation

Results are indirectly standardised for age, sex and deprivation category. The reference population in terms of which the rates are standardised is the total for Scotland over the entire period. The rates are thus standardised over time as well as between trusts. A full description of the standardisation used in the outcome indicators was included as Annexe 7 of the 2002 Clinical Outcome Indicators report and can be found on the web[2].

Presentation at trust level

The indicator is presented for trusts as they are defined following the reorganisation of health services in Scotland in April 1999.

Trusts have been included if they had at least 100 emergency admissions for AMI in each of the 5 years being considered.

Traditional method of presentation

The data are presented as a series of mini-graphs (as in the 1999 Clinical Outcome Indicators report[3]), one for each trust. Each mini-graph shows the standardised rate for a given trust for each of the five single year time periods along with its 95% confidence interval. As a reference, the crude rate for Scotland as a whole is shown in each mini-graph.

Presentation using Shewhart charts

Control charts have been produced for age/sex/deprivation adjusted 30-day survival rates following an emergency admission for AMI. The results have been presented as a series of mini-charts, one for each trust.

2. Clinical Resource and Audit Group. Clinical Outcome Indicators. Edinburgh: Scottish Executive (2002). www.nhshealthquality.org and www.show.scot.nhs.uk/indicators

3. Clinical Resource and Audit Group. Clinical Outcome Indicators. Edinburgh: Scottish Executive (1999). **www.nhshealthquality.org** and **www.show.scot.nhs.uk/indicators**

Each chart shows the adjusted survival rate for the trust, for each of the five single year time periods. The chart also shows the Scottish mortality rate, the upper and lower control limits, and the upper and lower warning limits around the Scottish rate.

The lower control limit is calculated as the Scottish rate minus three standard deviations and the upper control limit is calculated as the Scottish rate plus three standard deviations. The lower warning limit is calculated as the Scottish rate minus two standard deviations and the upper warning limit is calculated as the Scottish rate plus two standard deviations.

It can be assumed that the number of patients surviving in each trust follows a Binomial distribution, and so the standard deviation can be calculated using the standard formula of $\sqrt{n \times p \times (1 - p)}$, which in this example is $\sqrt{\text{Patients admitted} \times \text{Scottish rate} \times (1 - \text{Scottish rate})}$. The number of patients admitted relates to the trust, so the control limits are placed appropriately for trusts with varying numbers of patients having emergency admissions for AMI. The control limits give an indication of the range of variability that is reasonable for a trust with that number of patients being admitted.

Any trust whose survival falls below the lower control limit or above the upper control limit is considered to have special cause variation and be worthy of further investigation.

Results and Discussion

The data are presented using the traditional method in figures 1a, 2a and 3a.

Control charts are presented in figures 1b, 2b and 3b.

Specific points for interpretation

The main difference between the two methods of presentation is in the way the ranges are calculated. In the traditional presentation, the confidence interval is calculated for the trust mortality rate and then the interval is examined to see whether the Scottish rate lies outside this range. In the control chart, control limits are calculated around the Scottish rate and then the trust rates are examined to see whether they fall between the two control limits or not.

In this example, the only points falling outside the control limits are for Lanarkshire Acute Hospitals NHS Trust in the years 1997-98 and 2000-01. This trust would therefore be considered to be exhibiting special cause variation and should be examined in order to identify the cause.

In the traditional graphs, the confidence intervals for Lanarkshire Acute Hospitals NHS Trust in 1997-98 and 2000-01 do not contain the Scottish rate. Other confidence intervals not containing the Scottish rate are for South Glasgow University Hospitals NHS Trust in the year 2000-01 and Forth Valley Acute Hospitals NHS Trust in the year 2001-02, but the confidence intervals for these trusts are very close to including the Scottish rate.

Shewhart charts make more allowance for random fluctuations, and are more cautious than the traditional approach in indicating that a unit is worthy of investigation.

In control charts there is less temptation to 'over-interpret' any fluctuations in the rate for an individual trust from year to year as they show when a trust rate is simply varying in a random fashion, within a plausible range.

Percentage of patients surviving for 30 days following emergency admission for AMI

Figure 1a: Presentation of outcome using the traditional method of 95% confidence intervals around the trust rate

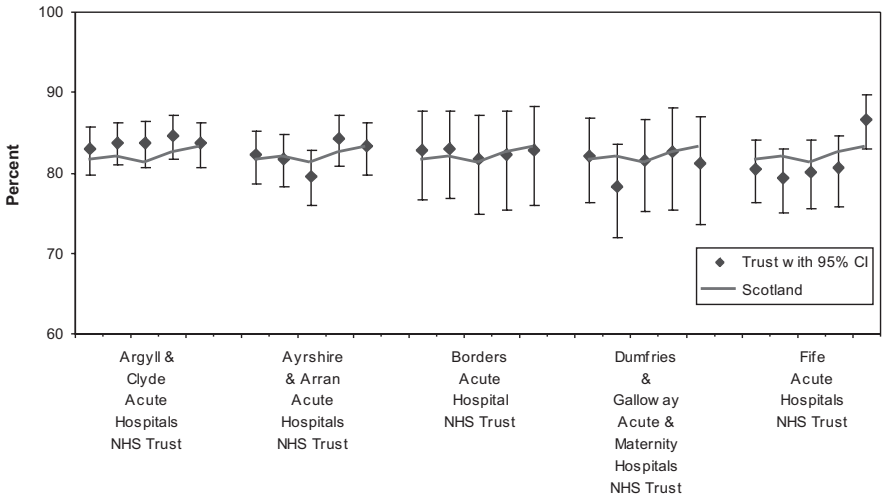
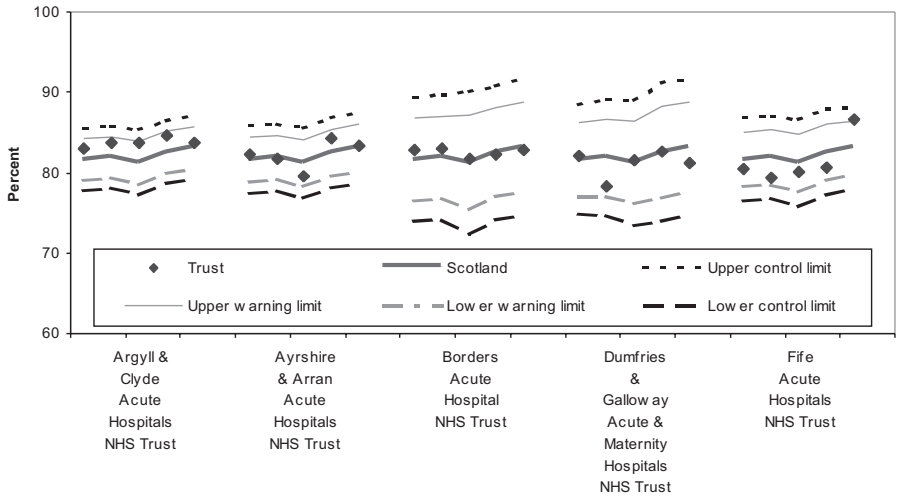


Figure 1b: Presentation of outcome using the Shewhart approach of 3 sigma control limits around the Scottish rate



Percentage of patients surviving for 30 days following emergency admission for AMI

Figure 2a: Presentation of outcome using the traditional method of 95% confidence intervals around the trust rate

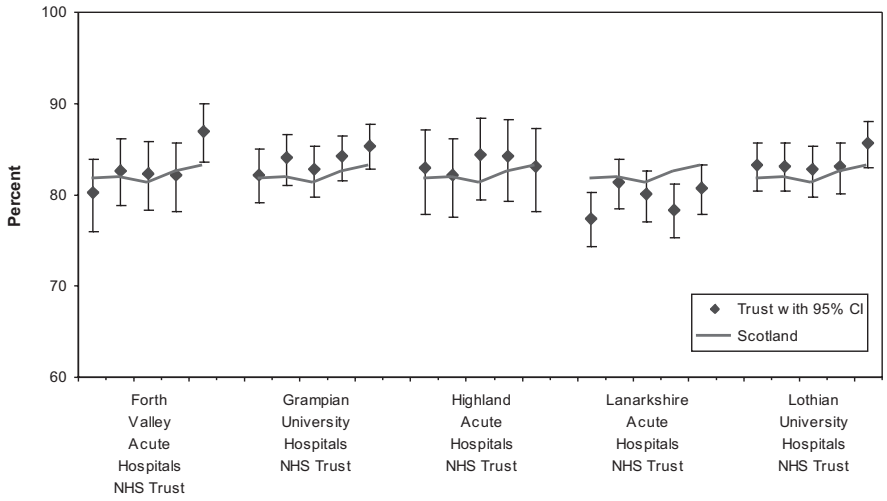
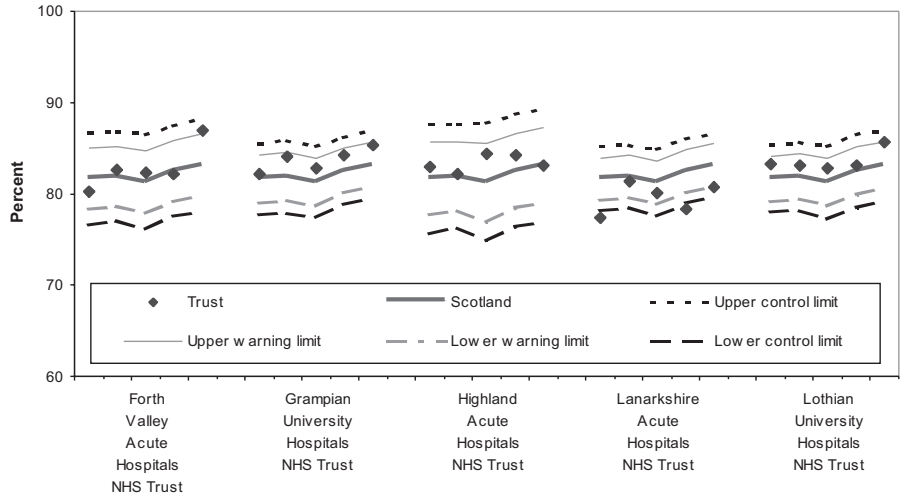


Figure 2b: Presentation of outcome using the Shewhart approach of 3 sigma control limits around the Scottish rate



Percentage of patients surviving for 30 days following emergency admission for AMI

Figure 3a: Presentation of outcome using the traditional method of 95% confidence intervals around the trust rate

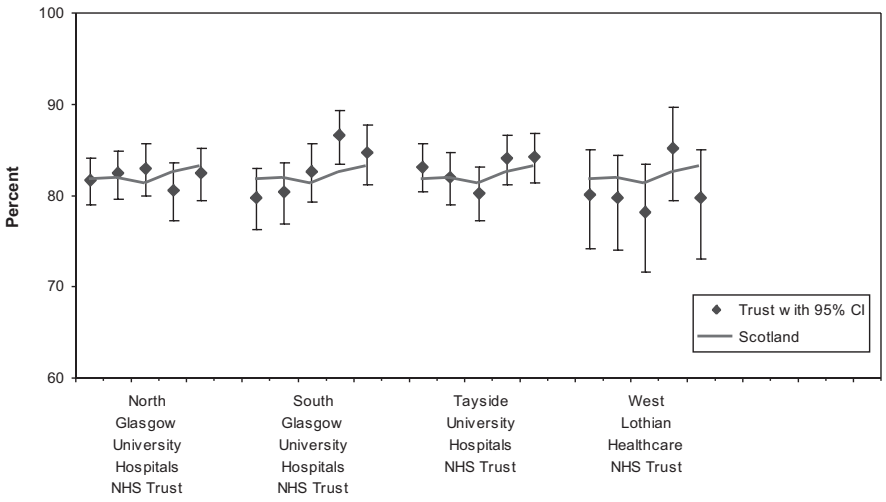
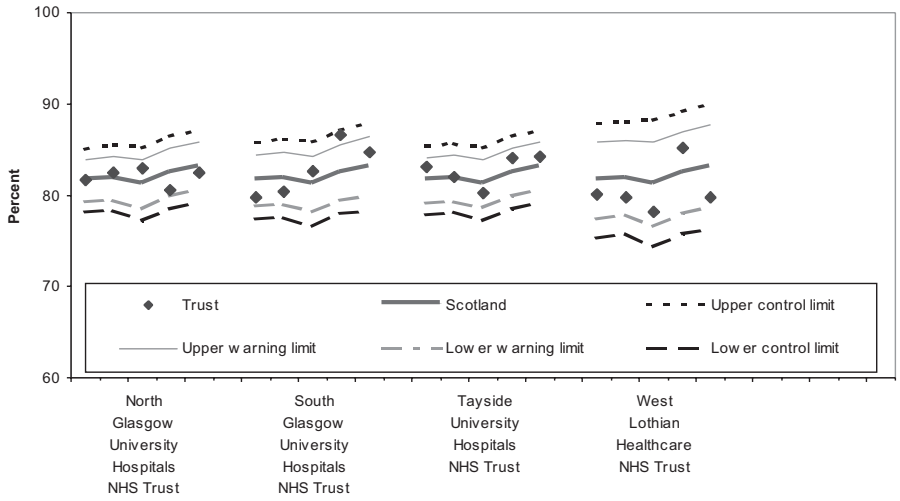


Figure 3b: Presentation of outcome using the Shewhart approach of 3 sigma control limits around the Scottish rate



3. Further Indicators Considered

Each year, the Clinical Outcomes Group considers a range of potential indicators for inclusion in this series of reports. Not all of them are ultimately published. This may be due to lack of good quality data to produce robust measures, or because the results are particularly difficult to interpret.

This section includes further information about these topics, explaining the main reasons for not publishing indicators at this stage and also highlighting efforts being made to develop indicators for future publication.

Mental health

Mental health, together with 'physical' health conditions such as cancer and coronary heart disease, is a leading clinical priority for the health service in Scotland. Despite this, while the nationally consistent information about 'physical' health is relatively well advanced in Scotland, the information gathered about mental health is generally fragmented and poorly developed.

To date it has proved difficult to collect information on the quality of care provided by mental health services, and which can be used to produce robust measures of the type included in this report. A discussion of issues relating to the production of outcome measures in mental health is included in the 2000 report, and is not repeated here.

Efforts are being made to improve the quality of information available about mental health, including data gathered about the quality and outcomes of care. For example, one intervention on which data have already been collected nationally is electroconvulsive therapy (see the website of the Scottish ECT Audit Network, www.sean.org.uk). However, more work is needed to develop sustainable approaches to routine data collection that can support clinical audit and the measurement of outcome.

In order to support the multiple changes needed to improve the collection and use of clinical information in mental health, the Information and Statistics Division of NHSScotland (ISD) set up the Improving Mental Health Information Programme in 2001. Within the scoping phase of this project, a report was commissioned to examine both the type of data currently available, and the information that can be derived from these data.

This report, titled *Mental Health in Scotland: Information Sources and Selected Insights*, highlights the need for better information about mental health generally, including information on the quality and outcomes of care. In particular, while some nationally consistent information is available about inpatient services, there is a real lack of information about the care being delivered in the community. This is despite the strategic emphasis in Scotland on shifting the balance of services towards the community.

More information about the activities of the Improving Mental Health Information Programme, including the above report, can be found on Scottish Health Statistics, the website of ISD (www.isdscotland.org).

In addition, NHS Quality Improvement Scotland is currently carrying out the second part of a nationwide review of services in relation to the *Clinical Standards for Schizophrenia*. This work also encourages developments in routine documentation and data collection in mental health. The findings from the first part of the review (available on www.nhshealthquality.org) highlighted that problems with data collection result in part from the data systems in use, as documentation systems have not changed significantly over the last 40 years.

The Clinical Outcomes Group will continue to monitor the availability of robust data that will allow the development of indicators in mental health.

Nutrition of elderly people in long-term care

For the well-being of all patients in all hospitals, it is important that the food provided for them reflects their own nutritional requirements, and eating and drinking preferences. Despite this, the clinical importance of nutrition is often overlooked. For example, *The Nutrition of Elderly People and Nutritional Aspects of Their Care in Long-Term Care Settings*, published by CRAG in 2000, revealed that 21% of older people in Scotland's long-term care establishments, including NHS and non-NHS sectors, are undernourished.

Reliable information about the nutritional status of patients is needed in order to allow improvements in the food and nutritional care provided in hospitals. As explained in the previous two reports, the development of an indicator on the nutrition of elderly people in long-term care has been explored. It is likely that such an indicator will be based on body mass index - a simple measure, calculated by dividing a person's weight in

kilograms by their height in metres squared, which can be used to identify a person's nutritional status (eg undernourished, obese).

Since publication of last year's report, ISD has developed and piloted a method to systematically collect body mass index data from NHS long-stay facilities. These data were collected nationally, together with the Scottish Health Resource Utilisation Groups (SHRUGs) data which are gathered annually by ISD.

While ISD has already obtained some provisional Scotland-wide data on body mass index, it is aware there are limitations in the practicality of the method used, and hence the usefulness of the results obtained. For example, collecting body mass index data on an annual basis limits the opportunity for using such information to monitor on-going changes in individual patients. Although it may be practical for ISD to continue collecting body mass index data in this way, the value in doing so is under consideration.

Nutrition is the focus of a number of NHS Quality Improvement Scotland projects. For example, best practice statements on nutrition have been published, covering both physically frail older people, and assessment and referral for adults in hospital. Standards for the food and nutritional care provided in hospitals have also been published. The usefulness of the body mass index measure in providing care for patients is covered by these projects.

The possibility of developing an indicator for this topic will be explored within the wider context of the work described above, ie the NHS Quality Improvement Scotland and ISD projects on nutrition.

Smoking cessation - prescribing rates

Tackling cigarette smoking is important for improving the health of the Scottish people. Effective aids to smoking cessation include nicotine replacement therapy and bupropion. Nicotine products - which come in the form of tablets, chewing gum, patches, nasal sprays and inhaler devices - were not generally available on NHS prescription until April 2001. Bupropion, taken as a tablet and which reduces the craving for nicotine, became available on prescription from 1 June 2000.

The Clinical Outcomes Group explored the possibility of publishing an indicator on prescribing rates for nicotine replacement therapy and bupropion. ISD collected data about the number of prescriptions,

presented as defined daily doses, dispensed in the community between April 2000 and December 2002.

However there were some concerns about the quality and usefulness of the data gathered. Nicotine replacement products are available over the counter in addition to on prescription, and the data required about over the counter sales are not currently available. Furthermore, in order to interpret the prescribing rates, information about the number of people who smoke in different areas of Scotland is needed. Again, this information is not available at present although efforts are being made to capture this data at postcode sector level.

An indicator on prescribing rates for nicotine replacement therapy and bupropion is not therefore included in this report. The availability of the additional data needed to produce this indicator will be monitored.

Admission to hospital of children for dental care

The most common reason that children under 15 years of age are admitted to hospital is for dental treatment, and ISD investigated the production of an indicator for this topic. As summarised below, a number of data recording issues need to be resolved before this indicator can be published.

The SMR01 returns (see section 2.1) are a source of information about the extraction of teeth for children aged under 15 years. Very large variations, both between and within NHS Boards, were observed in the preliminary data collected by the SMR01 form. This is indicative of different data recording practices being used throughout Scotland.

In addition, data recorded on SMR01 are only a part of the information required to produce an indicator - information about dental care is also recorded on the community dental service (SMR13) and the general dental service returns.

In order to produce an accurate picture of dental treatment by NHS Board, data from these separate returns need to be combined, and work on this is underway.

Acute myocardial infarction

Coronary heart disease is one of the national clinical priorities, and the Clinical Outcomes Group therefore considered publishing an indicator on deaths from acute myocardial infarction (AMI) - or heart attack.

The indicator examined was the percentage of patients, registered with a general practitioner, who died before 75 years of age with a primary cause of death from AMI (ICD10 codes I21 and I22). The number of patients who died in the three year period from April 1999 to March 2002 was identified from the Registrar General death records. The number of patients registered with a general practitioner was based on Community Health Index registrations at 15 October 2000.

The overall data for Scotland indicated that there were 2,845 deaths for a population of 4,967,378 people aged under 75 years (57 deaths per 100,000 population). The intention was to present the data at the level of each local health care co-operative (essentially grouping of general practices). However, when the data were examined at this level it became clear that it is difficult to interpret the information (eg for many local health care co-operatives there were very few deaths from AMI).

In addition, there were concerns about the reliability of coding of AMI as a cause of death. Evidence suggests that AMI is often given as the cause of death for elderly patients for whom a post mortem is not carried out.

Given these concerns with the collection and interpretation of the data, the Clinical Outcomes Group decided not to publish this indicator.

APPENDIX A Membership of Clinical Outcomes Group

The Chairman of the Clinical Outcomes Group is **Dr Dorothy Moir** (Director of Public Health, NHS Lanarkshire). Membership of the group from May 2002 is given below:

Mr Marc Bransby-Zachary
Consultant Orthopaedic Surgeon, South Glasgow University Hospitals NHS Trust

Professor Tom Fahey
Professor of Primary Care Medicine, Tayside Centre for General Practice (from July 2003)

Dr Allan Gunning
Chief Executive, Ayrshire & Arran Primary Care NHS Trust

Mr Douglas Harper
Consultant Surgeon, Grampian University Hospitals NHS Trust

Dr John Loudon
Consultant Psychiatrist, Lothian Primary Care NHS Trust/Principal Medical Officer, Scottish Executive Health Department (until July 2003)

Professor Gordon Lowe
Professor of Vascular Medicine/Consultant Physician, North Glasgow University Hospitals NHS Trust/Chairman, Scottish Intercollegiate Guidelines Network

Dr Catriona MacDonald
Consultant in Public Health Medicine, NHS Argyll & Clyde

Dr Hilary MacPherson
Consultant Obstetrician and Gynaecologist, Lothian University Hospitals NHS Trust

Dr James Paton
Reader in Paediatric Respiratory Disease, Yorkhill NHS Trust

Dr Jim Shimmins
Scottish Association of Health Councils

Ms Jacqui Simpson
Director of Healthcare Planning, NHS Lothian

Information and Statistics Division for NHSScotland

Ms Fiona Campbell
Principal Statistician

Dr Julie Kidd
Senior Analyst

Dr Margaret MacLeod
Senior Statistician

Mr Graham Mitchell
Head of Clinical Governance Programme

Mr Matt Sutton
Senior Research Fellow

Scottish Executive Health Department

Dr Doreen Campbell
Senior Medical Officer

Dr Alison Spaull
Director, Chief Scientist Office (until May 2003)

Mrs Pamela Warrington
Deputy Chief Pharmacist

Ms Jennifer Waterton
Research Manager, Chief Scientist Office (from June 2003)

NHS Quality Improvement Scotland/Clinical Resource and Audit Group

Dr Alison Bramley
Head of Clinical Resource and Audit Group (until December 2002)

Dr Denise Coia
Consultant Psychiatrist, Greater Glasgow Primary Care NHS Trust/NHS Quality Improvement Scotland Board Member (from June 2003)

Ms Pauline Donald
Appraisals Team Secretary, NHS Quality Improvement Scotland (from May 2003)

Professor Karen Facey
Interim Director, Health Technology Assessment, NHS Quality Improvement Scotland (from January 2003)

Dr Phil Grigor
Clinical Effectiveness Co-ordinator, Clinical Resource and Audit Group/NHS Quality Improvement Scotland (until March 2003)

Mrs Leanne Hamilton
Clinical Effectiveness Support Officer, Clinical Resource and Audit Group/NHS Quality Improvement Scotland

Ms Rhona Hotchkiss
Interim Director, Practice Development and Clinical Effectiveness Support, NHS Quality Improvement Scotland (from January 2003)

Dr Donald Morrison
Clinical Effectiveness Co-ordinator, NHS Quality Improvement Scotland (from May 2003)

Mr Jim Slattery
Principal Epidemiologist, NHS Quality Improvement Scotland (from January 2003)

APPENDIX B Glossary of Abbreviations

A & E	Accident and Emergency
AMI	Acute Myocardial Infarction
BMI	Body Mass Index
CHI	Community Health Index
CHSP	Child Health Surveillance Programme
CI	Confidence Interval
CRAG	Clinical Resource and Audit Group
CSBS	Clinical Standards Board for Scotland
DCO	Death Certificate Only (in cancer registration)
HTBS	Health Technology Board for Scotland
ICD	International Classification of Diseases
ISD	Information and Statistics Division, Common Services Agency for NHSScotland
LHCC	Local Health Care Co-operative
NHS QIS	NHS Quality Improvement Scotland
NMPDU	Nursing and Midwifery Practice Development Unit
OPCS	Office of Population, Censuses and Surveys
PAF	Performance Assessment Framework
SHAS	Scottish Health Advisory Service
SIGN	Scottish Intercollegiate Guidelines Network
SIR	Standardised Incidence Ratio
SMR	Scottish Morbidity Record (also used in section 2.8 for Standardised Mortality Ratio)
SRA	Scottish Renal Association
SRR	Scottish Renal Registry

APPENDIX C Clinical Outcome Indicators Reports 1993-2003

	Indicator	1993	1994	1995	1996	1998	1999	2000	2002	2003
1	Pregnancy under the age of 16		B	B					B	
2	Therapeutic abortion rates (▲)		B	B						
3	Childhood incidence of measles		B							
4	Cervical cancer mortality		B	B		B				
5	Suicide rate		B	B			B			
6	Rate of emergency admission for diabetic ketoacidosis		B	B						
7	Longer in-patient stays for children with asthma		B	B						
8	30 day survival after admission for hip fracture (W)	B	T	T			T		T	
9	Discharge home within 56 days of admission with hip fracture	B	T	T						
10	30 day survival after admission for acute myocardial infarction (W)	B	T	T			T		T	
11	Re-operation within 1 year of transurethral prostatectomy	B	T	T						
12	Emergency re-admission within 28 days of discharge from medical specialty	B	T	T						
13	30 day survival after admission for stroke (W)		T	T			T		T	
14	Discharge home within 56 days of admission for stroke		T	T						
15	Psychiatric inpatients: death within 1 year of discharge		H	H						
16	Psychiatric inpatients aged 65+: death within 1 year of discharge		H	H						
17	Psychiatric inpatients: suicide within 1 year of discharge		H	H						
18	Proportion of first births by caesarean section				H			H		
19	Vaginal delivery after caesarean section				H			H		
20	Babies admitted to a neonatal unit (▲)				H			H		
21	28 day emergency re-admission: removal of tonsils/adenoids				T					
22	D & C rates in women under 40				T			T		
23	Use of medical methods for early termination of pregnancy				B			B		
24	Survival with cancer of the trachea, bronchus and lung				B				B	
25	Survival with cancer of the large bowel				B					
26	Breast cancer (▲)				B		B			
27	Survival with cancer of the ovary				B					B
28	28 day emergency re-admission: elective operation for cataract				T					
29	28 day emergency re-admission: emergency appendectomy				T					
30	28 day emergency re-admission: elective prostatectomy				T					
31	28 day emergency re-admission: elective hysterectomy				T					
32	28 day emergency re-admission: elective total hip replacement				T					
33	Survival with cancer of the stomach					B				
34	Survival with cancer of the cervix uteri					B				
35	Cardiac procedures - standardised procedure ratios for coronary angiography, angioplasty and CABG (▲)					B				
36	Breast feeding							B		B
37	Smoking during pregnancy							B		B
38	Registration with general dental practitioner (▲)							B		
39	Decayed, missing and filled teeth in children age 5 years (▲)							B		
40	Colorectal cancer (▲)							B		
41	Emergency admissions (▲)							B		L
42	Primary care indicators: prescribing and immunisation rates (▲)								B	
43	Mortality within 30 days of elective surgery (W)								T	
44	Emergency readmission rates within 7 and 28 days of discharge								T	
45	Alcohol problems (▲)								B	
46	120 day survival after admission for hip fracture (W)								T	
47	Completeness of SMR01 data									T
48	Obesity in children									S
49	Kidney disease: treatment of anaemia in patients on haemodialysis									H
50	Ovarian cancer (▲)									B
51	28 day emergency re-admission: abdominal and pelvic surgery									T
52	28 day emergency re-admission: lower limb arthroplasties									T

Level of presentation

S = Scotland
H = Hospital
T = NHS Trust
B = NHS Board
L = Local health care co-operative

Key to other symbols

▲ = multiple indicators
W = web-based indicators

The first indicators report, published in December 1992, considered the nature and potential of outcome measures, but did not include any specific data.

Some of the indicators published since 1993 (see table above) include two or more presentations of the same or related data. As a result, there is a potentially confusing picture in terms of the number of indicators published. The figure of 52 indicators, presented above, includes several indicators each of which comprises multiple measures (denoted ▲).

As explained in section 2.2, a number of indicators (denoted 'W' in the table above) are now available on the web.

APPENDIX D Performance Assessment Framework

New performance management and accountability arrangements for NHSScotland were introduced by the Scottish Executive Health Department in 2001, in order to:

- support sustained improvement in the performance of NHSScotland, by focusing on key measures in relation to health priorities; and
- enable NHSScotland to account systematically for its performance.

The Performance Assessment Framework is a key part of these new arrangements, and forms the mandatory core framework for assessing the performance of NHSScotland.

The Performance Assessment Framework consists of a set of performance indicators, measures and assessments that provide an aggregate picture of the performance of a local NHS system.

As explained in last year's report, there is a degree of consistency between the measures included in the Performance Assessment Framework and those published in this series of reports. For example, two measures included in this report and in the Performance Assessment Framework are i) the proportion of pregnant women who smoke at the time of booking for their first antenatal visit, and ii) the survival rate following diagnosis with ovarian cancer.

Further information about the Performance Assessment Framework is available on the internet, at www.paf.scot.nhs.uk/paf

Our Commitment

Our work will be undertaken in line with the following values:

- **patient and public focus**
  - promoting a patient-focused NHS that is responsive to the views of the public

- **independence**
  - reaching our own conclusions and communicating what we find

- **partnership**
  - involving patients, carers and the public in all parts of our work
  - working with and supporting NHS staff in improving quality
  - collaborating with other organisations such as public bodies, voluntary organisations and manufacturers to avoid duplication of effort

- **evidence-based**
  - basing conclusions and recommendations on the best evidence available

- **openness and transparency**
  - promoting understanding of our work
  - explaining the rationale for our recommendations and conclusions
  - communicating in language and formats that are easily accessible

- **quality assurance**
  - aiming to focus our work on areas where significant improvements can be made
  - ensuring that our work is subject to internal and external quality assurance and evaluation

- **professionalism**
  - promoting excellence individually and as teams and ensuring value for money in the use of public resources (human and financial)

- **sensitivity**
  - recognising the needs, opinions and beliefs of individuals and organisations and respecting and encouraging diversity

This document can be viewed on the NHS Quality Improvement Scotland website. It is also available, on request, from NHS Quality Improvement Scotland in the following formats:

- Electronic
- Audio cassette
- Large print

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