Contents

Introduction ........................................................................................................................................... 2
Key points ................................................................................................................................................ 3
Results and Commentary ....................................................................................................................... 4
  Hospital Activity .................................................................................................................................. 4
  Incidence ............................................................................................................................................ 8
  Operations .......................................................................................................................................... 9
  Survival ............................................................................................................................................. 10
  Mortality .......................................................................................................................................... 11
  Deprivation ...................................................................................................................................... 16
  Cardiovascular Prescribing ............................................................................................................. 19
  Primary Care Activity ..................................................................................................................... 21
  Ambulance Service Activity ........................................................................................................... 22
Glossary ................................................................................................................................................. 23
List of Tables ....................................................................................................................................... 27
Contact ................................................................................................................................................ 29
Further Information ............................................................................................................................ 29
Rate this publication ............................................................................................................................ 29
Appendix ............................................................................................................................................... 30
  A1.1 – Impact of Health Board boundary changes ......................................................................... 30
  A1.2 – Community Health Partnerships .......................................................................................... 31
  A2 – Background Information ....................................................................................................... 32
  A3 – Publication Metadata (including revisions details) ................................................................. 36
  A4 – Early Access details (including Pre-Release Access) .............................................................. 41
  A5 – ISD and Official Statistics ....................................................................................................... 42
Introduction

Cerebrovascular disease (CVD) is a condition that develops as a result of problems with the blood vessels supplying the brain. Although it is largely a preventable disease, there were 4,124 deaths in Scotland in 2014 where CVD is the underlying cause.

One of the common types of CVD is stroke. A stroke occurs when the blood supply to part of the brain is interrupted and brain cells are starved of oxygen. This usually occurs because a blood vessel becomes blocked by fatty deposits or a blood clot. Stroke is more common in older people over the age of 65.

Scotland has a high prevalence of the risk factors associated with CVD such as smoking, high blood pressure, poor diet, lack of exercise and alcohol consumption above recommended limits. Treating and preventing stroke continues to be a national clinical priority for Scotland. ¹

In the Scottish Health Survey 2014, 3.3% of men and 3.1% of women reported that they had experienced a stroke.

This ‘Stroke Statistics Update’ is produced annually to provide information on a range of cerebrovascular diseases in Scotland including:

- All CVD;
- Stroke;
- Transient ischaemic attack (TIA): a temporary form of stroke, sometimes referred to as a ‘mini-stroke’;
- Subarachnoid haemorrhage: a leak of blood caused by the rupture of a blood vessel beneath the membrane covering the brain;

and one of the main procedures used to treat CVD and stroke:

- Carotid endarterectomy: a procedure which removes blockage in the artery in the neck to improve blood flow to the brain

This update contains information on hospital activity, incidence, operations, 30 day survival following first emergency admission, GP prescribing and ambulance service activity up to the period 1 April 2014 - 31 March 2015, and mortality up to the period 1st January - 31st December 2015. The update also includes Quality Outcomes Framework (QOF) data from general practices.

Information is presented at NHS Board level with some tables (activity and mortality) also available at Local Council Area level.

¹ Better Heart Disease and Stroke Care Action Plan, June 2009; Stroke Improvement Plan, August 2014
Key points

- Cerebrovascular disease develops as a result of problems with the blood vessels supplying the brain. The incidence rate for cerebrovascular disease decreased over the last decade by 15.6%. Incidence rates were consistently higher in males than females.

- In the last decade, the mortality rate for stroke decreased by 39.0% (adjusted for age and sex). For the last four years, the stroke mortality rate for women was slightly higher than that for men.

- The percentage of people surviving 30 days or more following their first emergency admission to hospital with a stroke improved slightly over the last ten years from 81.6% in 2005/06 to 84.9% in 2014/15.

- The number of prescriptions for drugs to treat diseases of the circulation, including cerebrovascular and coronary heart disease, increased by 10.5% in the last ten years, although the trend has levelled off over the last six years. Despite this increase, the cost of prescriptions dispensed for these drugs has halved over the last ten years to £109.5 million in 2014/15.
Results and Commentary

Hospital Activity

Discharges

This section of the report examines the number of discharges from hospital with a specific cerebrovascular disease. Note that one patient can have more than one discharge from hospital within a given time period.

Figures on discharges provide an indication of hospital usage for the diagnosis and treatment of cerebrovascular disease in either an inpatient or day case setting but exclude activity relating to outpatients. Age and sex standardised discharge rates are presented here. Further information is available in Appendix A2.

Cerebrovascular Disease (CVD)

Cerebrovascular disease develops as a result of problems with blood vessels supplying the brain. This can cause a stroke, a transient ischaemic attack (TIA) or a subarachnoid haemorrhage.

Figure 1: Discharges from hospital with cerebrovascular disease; age and sex standardised discharge rates per 100,000 population

Notes: 1. Analysis includes ICD-10 codes I60-I69, G45.
2. Rates are directly standardised to the 2013 European standard population.
   Data are provisional for 2014/15 and are subject to change in future analyses.
   Data Source: ISD SMR01 - discharges; National Records Scotland – population estimates.

---

2 See Appendix A2 for details of completeness of hospital activity figures derived from SMR01 records.
Although there were more CVD hospital discharges for women than men (15,661 women compared to 14,743 men in 2014/15) the age and sex standardised rates were higher for men. This is because CVD is more common in older people and men have a higher risk of stroke. A larger proportion of the older male population have an admission due to CVD compared to women as there are more women in the older population than men. Men therefore have a higher standardised discharge rate than women. This is true for all age groups included in this report (see Table AS1 and figure 1).

The age and sex standardised discharge rate has increased gradually over the last ten years. The rate has increased by 12.0% from 546 per 100,000 population in 2005/06 to 612 in 2014/15. The rate has increased more for women over the last 10 years (13.8%) than for men (10.5%) (see Tables AS1 and AS4).

**Stroke**

There were similar numbers of hospital discharges for stroke for women and men in 2014/15 (10,306 and 10,310 respectively) but the age and sex standardised discharge rate for men was higher (472 per 100,000 population for men compared to 360 per 100,000 population for women in 2014/15).

In the last decade, the pattern for the age and sex standardised discharge rate for stroke was similar to that for CVD. The rate increased by 12.0% from 371 per 100,000 population in 2005/06 to 416 in 2014/15 (Figure 2). The trend was similar in both men and women, but there has been a slightly larger increase in the rate for men (13.4%) than for women (10.2%).

*Figure 2: Discharges from hospital with stroke*¹; *age and sex standardised discharge rates per 100,000 population*²

**Notes:**
1. Analysis includes ICD-10 codes I61, I63 and I64.
2. Rates are directly standardised to the 2013 European standard population.
3. Data are provisional for 2014/15 and are subject to change in future analyses.

Data Source: ISD SMR01 - discharges; National Records Scotland – population estimates.
The increase in the standardised rates for stroke over the last decade was smaller in the over-75 age group (10.3%) compared with the under-75 group (14.2%).

Comparing mainland NHS Boards, in 2014/15 the standardised discharge rate was lowest in NHS Grampian (287 per 100,000 population) and highest in NHS Greater Glasgow & Clyde (506 per 100,000 population).

Tables AS1 and AS4 provide more detail at Health Board and Council level.

**Transient Ischaemic Attack (TIA)**

A TIA is similar to a stroke but the interruption of the blood supply to the brain is temporary, and the symptoms only last up to 24 hours. However having a TIA is a risk factor for having a later stroke.

There was an increase of 24.1% in the age and sex standardised rate for a diagnosis of TIA in the last decade: from 61 per 100,000 population in 2005/06 to 76 per 100,000 population in 2014/15 (see Tables AS1, AS4 and Figure 3).

**Figure 3: Discharges from hospital with transient ischaemic attack\(^1\); age and sex standardised discharge rates per 100,000 population\(^2\)**

Notes:
1. Analysis includes ICD-10 code G45.
2. Rates are directly standardised to the 2013 European standard population.
   Data are provisional for 2014/15 and are subject to change in future analyses.
   Data Source: ISD SMR01 - discharges; National Records Scotland – population estimates.
**Subarachnoid Haemorrhage**

A subarachnoid haemorrhage is a leak of blood caused by the rupture of one of the blood vessels beneath one of the layers of membrane covering the brain.

The age and sex standardised rate for a diagnosis of subarachnoid haemorrhage increased by 24.5% from 29 per 100,000 population in 2005/06 to 36 per 100,000 population in 2014/15 (see Tables AS1, AS4 and figure 4). The rate for females was almost double that of males (48 and 25 per 100,000 population respectively).

**Figure 4: Discharges from hospital with subarachnoid haemorrhage**; age and sex standardised discharge rates per 100,000 population

Notes: 1. Analysis includes ICD-10 code I60.
2. Rates are directly standardised to the 2013 European standard population.
Data are provisional for 2014/15 and are subject to change in future analyses.

Data Source: ISD SMR01 - discharges; National Records Scotland – population estimates.

Further details of hospital activity for CVD, stroke, TIA and subarachnoid haemorrhage by age, gender, type of admission and NHS board area are given in Table AS1. Corresponding information by local authority area can be found in Table AS4.
Incidence

Incidence is the number of new cases of a specific condition in a population during a defined time period. It is presented here as the number of people with a first hospital admission for CVD (or death from CVD without a prior admission to hospital). Further information is available in the glossary.

The age and sex standardised incidence rate for CVD decreased by 15.6% from 309 cases per 100,000 population in 2005/06 to 261 per 100,000 in 2014/15 (see Table IS1 and Figure 5).

![Figure 5: Cerebrovascular Disease; age and sex standardised incidence rates per 100,000 population](image)

Notes:
1. Analysis includes ICD-10 codes I60-I69 and G45.
2. Rates are directly standardised to the 2013 European standard population.
3. Data are provisional for 2014/15 and are subject to change in future analyses.
Data Source: ISD SMR01 - discharges; National Records Scotland – Population

Incidence is strongly related to age. The age and sex standardised rate for the under 75s in 2014/15 was 126 per 100,000 population and for those aged 75 and over for the same period it was 1,625 per 100,000 population. However the rate has fallen more steeply in the over 75 age group (down 20.0% in the last 10 years) than in the under 75s (down 9.3% in the same period) (see Table IS1).

Comparing mainland NHS boards, in 2014/15 the standardised incidence rate was lowest in NHS Grampian (219 per 100,000 population) and highest in NHS Greater Glasgow & Clyde (291 per 100,000 population) (Table IS1).
Operations

*Carotid Endarterectomy*

Carotid endarterectomy is a common operation used to deal with a blocked artery in the neck that may lead to a stroke. It involves clearing the blocked artery to improve the flow of blood through the artery to the brain.

The age and sex standardised hospital discharge rate had an overall downward trend over the last 10 years (see Table OS1 and Figure 6). The rate decreased by 16% from 11 per 100,000 in 2005/06 to 9 per 100,000 in 2014/15.

Figure 6: Carotid Endarterectomies

![Graph showing the age and sex standardised discharge rates per 100,000 population from 2005/06 to 2014/15 for males, females, and both sexes.]

Notes:
1. Analysis includes OPCS4 codes L294 or L295 (in any position).
2. Rates are directly standardised to the 2013 European standard population.

Data Source: ISD SMR01 - discharges; National Records Scotland – Population

The rate for males was more than twice the rate for females in most of the last 10 years (13 per 100,000 population for males compared to 6 for females in 2014/15).
Survival

Thirty day survival is widely used as a measure of the outcome of hospital admission and reflects the severity of disease as well as the quality of care.

Stroke

The percentage of people surviving 30 days or more following their first emergency admission to hospital with a stroke improved slightly over the last 10 years from 81.6% in 2005/06 to 84.9% in 2014/15 (Table S2 and Figure 7).

For those aged 75 and over, 30 day survival was 74.7% in 2005/06, rising to 78.6% in 2014/15.

Figure 7: Stroke\(^1\);
Percentage of patients surviving 30 days or more after first emergency admission

Notes:
1. Analysis includes ICD-10 codes I61, I63 and I64.
2. y-axis (percentage surviving 30 days) starts at 70% to enable clear comparison between sexes.

Data Source: ISD SMR01 - discharges; National Records Scotland – Population
Mortality\(^3\)

*Cerebrovascular Disease (CVD)*

This section provides information on the number of deaths from CVD, as well as the common types of CVD, i.e. stroke, TIA and subarachnoid haemorrhage separately.

As in the rest of Europe, there was a continuing downward trend in mortality from CVD (including stroke) in Scotland and the absolute gap in mortality has narrowed relative to both the UK and to the EU as a whole. For the most recent 2 years available, the Scottish rate has been slightly below the EU rate (see Figure 8).\(^4\)

**Figure 8: Cerebrovascular disease\(^1\): mortality in Scotland, UK and EU; age and sex standardised mortality rates per 100,000 population\(^2\)**

Notes:  
1. Analysis includes ICD-10 codes I60-I69 and G45.  
2. Rates are directly standardised to the 1976 European standard population.  
Data Source: WHO/Europe and ScotPHO, Scotland and European HFA Database 2012.

In Scotland, the age and sex standardised mortality rate for CVD decreased by 40.9% in the last ten years from 147 per 100,000 population in 2005 to 87 in 2014 (Table MS1 and Figure 9).

---

\(^3\) The figures included in this section refer to calendar years

Figure 9: Cerebrovascular disease\(^1\): all ages by sex 2005-2014; age and sex standardised mortality rates per 100,000 population\(^2\)

![Graph showing cerebrovascular disease mortality rates](image)

Notes:  
1. Analysis includes ICD-10 codes I60-I69 and G45.  
2. Rates are directly standardised to the 2013 European standard population.

Data Source: National Records Scotland - Deaths and Population

**Stroke**

The age and sex standardised mortality rate for stroke decreased by 39.0% over the last ten years, from 79 per 100,000 population in 2005 to 48 per in 2014 (Table MS1).

Between 2005 and 2014, the fall in age and sex standardised mortality rates for stroke was slightly larger for males (40.7%) than females (37.4%). For the last four years, the standardised mortality rate was slightly higher for women (Table MS1).

Of the mainland NHS Boards, NHS Highland had both the highest age standardised mortality rate in 2014 (60 per 100,000 population) and the lowest percentage decrease in the mortality rate between 2005 and 2014 (24.6%). NHS Fife had the lowest age standardised mortality rate (40 per 100,000 population) among the mainland Boards and also the highest percentage decrease in mortality rate between 2005 and 2014 (51.6%) (Table MS1 and Figure 10).
Figure 10: Stroke\textsuperscript{1}: all ages by sex 2005-2014; age and sex standardised mortality rates per 100,000 population\textsuperscript{2}

Notes:  
1. Analysis includes ICD-10 codes I61, I63 and I64.  
2. Rates are directly standardised to the 2013 European standard population.

Data Source: National Records Scotland - Deaths and Population

The British Heart Foundation also publish comparisons of stroke mortality rates within the UK (figure 11). The mortality rates in Scotland were higher than England, Wales and Northern Ireland for most of the last 40 years. However, as in figure 8, the absolute gap in mortality rates narrowed over this time.
Figure 11: Stroke mortality in United Kingdom, England, Wales, Scotland and Northern Ireland

Age-standardised mortality rates per 100,000 population

Notes: 1. Rates are directly standardised to the 2013 European standard population
**Subarachnoid Haemorrhage**

The age and sex standardised mortality rate for subarachnoid haemorrhage decreased from 4 per 100,000 population in 2005 to 3 per 100,000 population in 2014, a fall of 22.5% over ten years (**Table MS1** and Figure 12).

**Figure 12: Subarachnoid haemorrhage**: all ages by sex 2005-2014; age and sex standardised mortality rates per 100,000 population

Notes:
1. Analysis includes ICD-10 code I60.
2. Rates are directly standardised to the 2013 European standard population.

Data Source: National Records Scotland - Deaths and Population

Further details of mortality from CVD, stroke and subarachnoid haemorrhage by age, gender and NHS board area are given in **Table MS1**. Corresponding information by local authority area can be found in **Table MS4**.
Deprivation

Rates of CVD mortality vary between areas of greater or less material deprivation. In Scotland, the Scottish Index of Multiple Deprivation (SIMD) is used to measure area deprivation. It is a measurement of multiple deprivation which combines information on income, employment, education, housing, health, crime and geographical access. More information is provided in the glossary and on the Scottish Government website.

Cerebrovascular Disease Mortality by Deprivation Deciles

For this section, areas in Scotland were divided into 10 equal groups (deciles) where decile 1 is most deprived and decile 10 is least deprived. The information is presented using age standardised mortality ratios (SMRs). SMRs are the ratio of actual deaths to expected deaths (calculated using the average Scottish mortality rate). It adjusts for the age and sex of the population being examined. If the actual mortality rate was the same as the expected mortality rate, the SMR would have a value of 100.

Figure 13 shows that the association between mortality and deprivation was stronger in the under 65 age category than in the over 65 category. In the under-65s, there is a clear pattern between SMR and deprivation decile. The SMR in the under-65 age category was 86% above the Scottish average in the most deprived 10% of the population, whereas the SMR in the under-65 age category in the least deprived 10% of the population was 60% below the Scottish average (see Table DS1 and Figure 13).

Figure 13: Cerebrovascular Disease Standardised Mortality Ratios\(^1\)
by broad age grouping and SIMD decile; 2010-2014

Notes: 1. Scotland is used as the ’standard population’.
Data Source: National Records Scotland (NRS) deaths data 2010-2014
**Carotid Endarterectomy by Deprivation Quintiles**

Over the last ten years, there was a decrease in the standardised discharge rate for carotid endarterectomy in all deprivation quintiles, with the exception of the least deprived quintile, in which the rate increased by 26.0%. The rate in the most deprived quintile decreased by 15.9% over the same period.

The absolute difference in the rate between the most deprived and least deprived quintiles decreased from 8 to 4 (Table DS3 and Figure 14).

![Figure 14: Carotid Endarterectomy by Deprivation (SIMD) Quintile](image)

**Notes:**
1. Analysis includes OPCS4 codes L294 or L295 (in any position).
2. Uses 2012 version of SIMD
3. Rates are directly standardised to the 2013 European standard population.

Data Source: ISD SMR01 - discharges; National Records Scotland – Population

**Stroke Hospital Activity by Deprivation Quintiles**

Over the last ten years, there was an increase in the standardised discharge rate for stroke in all deprivation quintiles. The rate in the most deprived quintile increased by 19.2% compared to 17.4% in the least deprived quintile (Table DS4 and figure 15).
Figure 15: Stroke Hospital Activity by Deprivation (SIMD) Quintile\(^2\) age and sex standardised discharge rates per 100,000 population\(^3\)

Notes:  
1. Analysis includes ICD-10 codes I61, I63 and I64.  
2. Uses 2012 version of SIMD  
3. Rates are directly standardised to the 2013 European standard population.

Data Source: ISD SMR01 - discharges; National Records Scotland – Population
Cardiovascular Prescribing

Cardiovascular disease covers a range of conditions including heart disease, strokes and diseases of the arteries and veins. This section describes statistics on drugs prescribed for the treatment of cardiovascular disease.

Of the prescriptions dispensed in the community, GPs write the vast majority. The remainder are written by nurses, dentists or are written in hospital to be dispensed in the community. Information on those NHS prescriptions is compiled by ISD's Prescribing Team from data provided by Practitioner Services Division (PSD) of NHS National Services Scotland. PSD is responsible for the processing and pricing of all prescriptions dispensed in the community in Scotland. Note that these data exclude drugs dispensed within hospitals.

The overall cost of cardiovascular drugs reduced over the last ten years, whilst the number of prescriptions gradually increased up to 2009/10 before levelling off. The changing price of statin drugs (used to prevent heart disease) partly explains this. Simvastatin, pravastatin and atorvastatin, three of the most widely used drugs, have come out of patent during this time, allowing equivalent lower cost non-branded (generic) drugs to be made available. Since then, the prices of these drugs have continued to decline, resulting in reduced overall costs, despite growth in the total volume prescribed. The increase in cost in 2014/15 has been mainly due to the increased use of direct oral anti-coagulant drugs (DOACs).

In addition, lower prices have now been set for the non-branded drugs, resulting in further reduction in costs. The introduction of targets for quality improvement in General Practice, as part of the Quality and Outcomes Framework (QOF), is likely to have added to the growth in prescribing volume of statins by providing incentives to identify and treat those at high risk of cardiovascular disease.

The data presented here are identical to those in the prescribing section of the Heart Disease Statistics publication. This is because many drugs can be used for the treatment of both stroke and heart disease and it is not possible from available data to distinguish whether a drug was used to treat stroke or heart disease.

Prescriptions Dispensed

Over the decade 2005/06 - 2014/15, the numbers of prescriptions dispensed for cardiovascular related drugs rose from 22,401,103 items to 24,760,695 items prescribed, an increase of 10.5%. However since 2009/10 the numbers have remained fairly constant (Table G1 and figure 16).
Gross Ingredient Costs

Gross ingredient cost indicates the total cost of a prescription drug. The overall cost of prescriptions dispensed for cardiovascular-related drugs increased by 6.4% between 2013/14 and 2014/15, the first increase in cost over the last ten years. As mentioned above, this increase in cost is mainly due to the increased use of direct oral anti-coagulant drugs (DOACs). Over the last ten years, the gross ingredient cost has halved (reduction of 50.3%).

Cardiovascular related drugs form approximately 10.8% of the total gross ingredient cost in Scotland (see Prescription Cost Analysis 2014/15).

The GP Prescribing topic area of the stroke web pages provides links to detailed tables relating to cardiovascular prescribing.
Primary Care Activity

At present, there is one main source of data relating to primary care activity for cerebrovascular disease. This is an estimate of the prevalence of stroke and TIA (transient ischaemic attack) taken from Quality & Outcomes Framework (QOF) data recorded by practices in the form of disease registers.

The QOF measures a general practice’s achievement against a set of evidence-based indicators designed to promote good practice. Payments are made to each general practice on the basis of their level of achievement against those indicators. One of the features of QOF is the collection of prevalence data in the form of practice “registers”. A QOF register may count patients with one specific disease or condition, or it may include multiple conditions. There may also be other criteria for inclusion on a QOF register, such as age or date of diagnosis. More details are available on the ISD website.

Prevalence data is recorded as part of QOF for stroke and TIA. The prevalence estimates are available for Scotland, NHS Board, CHP and practice. Table 1 shows the number of patients on the register for Scotland and the raw prevalence rate per 100 patients in 2014/15. There were 121,109 patients on the stroke/TIA QOF register in 2014/15. The raw prevalence rate was 2.2% of the number of patients registered with a practice in Scotland. A more detailed table can be found on the ISD website.

Table 1. Estimated Scottish prevalence of stroke/TIA reported from the QOF register\(^1\); 2014/15.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Patients on QOF register</th>
<th>Raw prevalence rate (per 100 patients)(^2,3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke/TIA</td>
<td>121,109</td>
<td>2.2</td>
</tr>
</tbody>
</table>

\(^1\) Although the QOF is part of the new General Medical Services (GMS), practices with other contract types (17C or 2C) may also choose to use the QOF. These figures include data from practices of any contract type, and are therefore based on larger numbers of practices than tables based on GMS practices alone.

\(^2\) Prevalence = number of patients on the specified QOF register, divided by list size, multiplied by 100.

\(^3\) List size is the total number of patients registered to the practice. This information is as at 1st January in the given financial year.

A further table in the QOF webpages of the ISD website provides trends in the raw prevalence rates. The prevalence for stroke/TIA has risen slightly over the last ten years from 1.9% in 2005/06 to 2.2% in 2014/15.

In future, it is anticipated that further detailed information for stroke will be available from the Scottish Primary Care Information Resource (SPIRE). This will supersede the Practice Team Information (PTI) programme which collected data on stroke from a sample of practices on number of consultations with GP or practice nurse up to 2012/13. SPIRE is presently in development and will build on the data collected for PTI by including richer data from a greater number of practices and will help to inform public health surveillance, research and data linkage.
Ambulance Service Activity

Information on Scottish Ambulance Service (SAS) activity has been collected for (a) incidents where a SAS resource attended and (b) conveyances where a patient was conveyed to hospital. More details are included in the glossary and in the definitions for Table SS1. The SAS activity data gives an indication of demand on unscheduled care services (also including NHS24 and A&E) for people with a suspected stroke.

The data presented in Table SS1 are for the last six years and by NHS board of the location of the incident. As the numbers for each age group were too small to be published, the information is presented for all ages.

SAS Diagnosis - Stroke

The full list of conditions included in the stroke diagnosis group is given in Table SS1. They include stroke history, numbness, paralysis and speech/movement/vision problems. Note that the final diagnosis codes used here are not compatible with ICD10 diagnosis codes used elsewhere in this publication.

In the last six years, the number of incidents increased overall by 20.9% from 9,866 to 11,926 and the number of conveyances increased by a similar amount of 19.9% from 9,417 to 11,294 (Table SS1 and Figure 17).

Figure 17: Scottish Ambulance Service incidents and conveyances with a stroke diagnosis

Data Source: SAS Data Warehouse

The increase in numbers reflects the increased overall demand experienced by the Scottish Ambulance Service. However, it should be noted that better recording of the diagnosis over time may also be responsible for some of the increase.
## Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute Hospital</strong></td>
<td>Acute Hospital Care/Activity includes services such as: consultation with specialist clinicians; emergency treatment; routine, complex and life saving surgery; specialist diagnostic procedures; close observation and short-term care of patients. 'Acute' hospital care includes activity occurring in major teaching hospitals, district general hospitals and community hospitals but excludes obstetric, psychiatric and long stay care services.</td>
</tr>
<tr>
<td><strong>Carotid Endarterectomy</strong></td>
<td>An operation to remove a blockage in the carotid artery in the neck.</td>
</tr>
<tr>
<td><strong>Cerebrovascular disease (CVD)</strong></td>
<td>Cerebrovascular Disease is a condition that develops as a result of problems with the blood vessels supplying the brain. It includes subarachnoid haemorrhage, stroke (non-traumatic intracerebral haemorrhage and cerebral infarction) and transient ischaemic attacks (TIAs).</td>
</tr>
<tr>
<td><strong>Cardiovascular disease</strong></td>
<td>Includes diseases which affect the heart and the blood vessels, including coronary heart disease, stroke and other cerebrovascular diseases.</td>
</tr>
<tr>
<td><strong>Conveyance</strong></td>
<td>A SAS resource has recorded an at hospital time, indicating the patient was conveyed to hospital.</td>
</tr>
<tr>
<td><strong>Datazone</strong></td>
<td>A small geographical area with a population between 500-1,000 household residents. They are based on groups of 2001 Census output areas.</td>
</tr>
<tr>
<td><strong>Day case</strong></td>
<td>This is when a patient makes a planned attendance to a specialty for clinical care, and requires the use of a bed or trolley in lieu of a bed.</td>
</tr>
<tr>
<td><strong>Deciles</strong></td>
<td>Deprivation deciles each contain 10% of the total population in Scotland. Deprivation decile 1 contains the 10% of the population living in the most deprived datazones, while decile 10 contains the 10% of the population living in the least deprived datazones.</td>
</tr>
<tr>
<td><strong>Discharge</strong></td>
<td>A discharge marks the end of an episode of care. Discharges include deaths and transfers to other specialties/significant facilities and hospitals as well as routine discharges home.</td>
</tr>
<tr>
<td><strong>Emergency</strong></td>
<td>An emergency admission occurs when, for clinical reasons, a patient is admitted at the earliest possible time after seeing a doctor.</td>
</tr>
<tr>
<td><strong>ePRF</strong></td>
<td>Electronic patient record form used by ambulance crews to record important patient information, including diagnostic data and treatment provided. This information can be accessed electronically by hospital staff.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td>European age-standardised rate</td>
<td>The rate that would have been found if the population in Scotland had the same age-composition as the hypothetical standard European population. The 2013 European Standard Population (ESP2013) has been used to calculate EASRs within this publication. The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Reports published before 2015 used ESP1976 to calculate EASRs. Figures using ESP1976 and ESP2013 are not comparable.</td>
</tr>
<tr>
<td>Final diagnostic code (SAS)</td>
<td>Diagnosis codes recorded by SAS resource after treating the patient.</td>
</tr>
<tr>
<td>Generic drugs</td>
<td>When the patent expires on a branded drug, the manufacturer loses exclusive rights to produce it. Generic drugs are non-branded versions produced by different manufacturers that produce equivalent clinical effects. Normally, the differences in formulation, and the small variation in the amount of drugs absorbed, make no difference clinically. Generic drugs are generally cheaper than their branded equivalents.</td>
</tr>
<tr>
<td>Gross Ingredient Cost (GIC)</td>
<td>Cost of drugs and appliances reimbursed before deduction of any dispenser discount (note: this definition differs from other parts of the UK).</td>
</tr>
<tr>
<td>Incidence</td>
<td>Incidence refers to the number of new cases of a condition in a defined population during a defined period and is typically expressed as the number of new cases per 100,000 population per year (or other suitable units). In this publication, an incident case is defined as the first admission to hospital (or death without a hospital admission). A first admission is defined as an admission where there has been no admission for the same condition in the previous 10 years. For example, a patient might be admitted with CVD in 2004 and again in 2005 for the same diagnosis. For the purpose of counting incidence, only the hospital episode in 2004 would be counted. The 2005 episode would not be counted because the previous episode occurred less than 10 years previously. First hospital admission is a reasonable measure of incidence for CVD since most cases are treated in hospital.</td>
</tr>
<tr>
<td>Incident</td>
<td>An incident where a SAS resource attends and record an at scene time.</td>
</tr>
<tr>
<td>Inpatient</td>
<td>This is when a patient occupies an available staffed bed in a hospital and either remains overnight whatever the original intention or is expected to remain overnight but is discharged earlier.</td>
</tr>
<tr>
<td>Items prescribed</td>
<td>Prescription items are prescribed and dispensed in the community. GPs write the vast majority of these prescriptions, with the remainder written mainly by nurses and dentists. The totals for items prescribed include prescriptions written in hospitals and dispensed in the community, but exclude drugs dispensed within hospitals.</td>
</tr>
</tbody>
</table>
Mainland Health Boards Health Boards in Scotland excluding the three Island Health Boards (Orkney, Shetland and Western Isles)

Mortality rate The number of deaths as a rate per 100,000 population per year.

Outpatient A patient who attends (outpatient attendance) a consultant or other medical clinic or has an arranged meeting with a consultant or a senior member of their team out with a clinic session.

Prevalence rate The proportion of people with a given condition over a period of time (e.g. a year).

PTI Practice Team Information (PTI) collects information from a 6% sample of Scottish general practices (60 practices in 2012/13). The population in the sample is a reasonable reflection of the Scottish population with regard to age, gender and deprivation. The information collected is on face-to-face consultations between patients and a GP or practice nurse. 2012/13 was the last year PTI data was collected since it is being superseded by SPIRE (see below).

QOF The Quality & Outcomes Framework (QOF) represents one of the main sources of potential income for general practices (GP surgeries) across the UK. It is a major part of the new General Medical Services (GMS) contract, introduced on 1st April 2004. Participation by general practices in the QOF is voluntary. For those that do participate, the QOF measures achievement against a range of evidence-based indicators, with points and payments awarded according to the level of achievement.

SAS The Scottish Ambulance Service.

SIMD Deprivation for individuals is estimated from aggregate data derived from the census and other routine sources. These are used to estimate the level of material deprivation in small geographical areas. The Scottish Index of Multiple Deprivation (SIMD) has seven domains (income, employment, education, housing, health, crime, and geographical access) at datazone level, which have been combined into an overall index to pick out area concentrations of multiple deprivation. See notes in tables as to which version of SIMD is used.

SMR01 An SMR01 episode is generated when a patient is discharged from hospital but also when a patient is transferred between hospitals, significant facilities, specialties or to the care of a different consultant.

SPIRE Scottish Primary Care Information Resource (SPIRE) is a national GP information service being developed. It is open to all consenting GP practices in Scotland and will create a dataset to provide a national analysis.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardised Mortality Ratio</td>
<td>The ratio of actual deaths to expected deaths based on indirect standardisation. Expected deaths are the number of deaths that would be expected in each deprivation decile given the age-sex distribution of the underlying populations and the death rates in the reference population (in this case the whole Scottish population).</td>
</tr>
<tr>
<td>Stroke</td>
<td>A stroke occurs when an area of the brain is deprived of its blood supply because of a blockage of a blood vessel supplying the brain.</td>
</tr>
<tr>
<td>Subarachnoid haemorrhage</td>
<td>A leak of blood as a result of the rupture of one of the blood vessels beneath one of the layers of membrane that covers the brain.</td>
</tr>
<tr>
<td>30 day survival</td>
<td>Number of people who survived 30 days following a first emergency admission to hospital for a specific condition.</td>
</tr>
<tr>
<td>TIA</td>
<td>Transient ischaemic attack. A transient ischemic attack is a temporary disruption to the blood supply to the brain as a result of a blockage of a blood vessel supplying the brain.</td>
</tr>
</tbody>
</table>
## List of Tables

<table>
<thead>
<tr>
<th>Table No.</th>
<th>Name</th>
<th>Time period</th>
<th>File &amp; size</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS1</td>
<td>Cerebrovascular Disease discharges – by diagnosis (Cerebrovascular Disease, Stroke, Subarachnoid Haemorrhage, Transient Ischaemic Attack and related syndromes), health board, admission type, age group and sex for financial years 2005/16-2014/15; numbers, crude rates and age standardised rates (direct to Europe)</td>
<td>2005/06-2014/15</td>
<td>Excel [2,175kb]</td>
</tr>
<tr>
<td>AS4</td>
<td>Cerebrovascular Disease discharges – by diagnosis (Cerebrovascular Disease, Stroke, Subarachnoid Haemorrhage, Transient Ischaemic Attack and related syndromes), council area, admission type, age group and sex for financial years 2005/06-2014/15; numbers, crude rates and age standardised rates (direct to Europe)</td>
<td>2005/06-2014/15</td>
<td>Excel [11,060kb]</td>
</tr>
<tr>
<td>IS1</td>
<td>Cerebrovascular Disease (CVD) incidence by health board, age group and sex for financial years 2005/06-2014/15; numbers, crude rates and age-sex standardised rates (direct to Europe)</td>
<td>2005/06-2014/15</td>
<td>Excel [167kb]</td>
</tr>
<tr>
<td>OS1</td>
<td>Numbers of Carotid Endarterectomies, with crude and age-sex standardised discharge rates, by health board, age, sex and year, 2005/06 – 2014/15.</td>
<td>2005/06-2014/15</td>
<td>Excel [343kb]</td>
</tr>
<tr>
<td>S2</td>
<td>Survival after first emergency admission for stroke ; numbers of patients treated and % surviving 30 days for financial years 2005/06-2014/15.</td>
<td>2005/06-2014/15</td>
<td>Excel [54kb]</td>
</tr>
<tr>
<td>MS1</td>
<td>Cerebrovascular Disease mortality - by cause (Cerebrovascular Disease, Stroke, Subarachnoid Haemorrhage), health board, age group and sex for calendar years of death registration 2005-2014; numbers, crude rates and age-sex standardised rates (direct to Europe)</td>
<td>2005-2014</td>
<td>Excel [785kb]</td>
</tr>
<tr>
<td>MS4</td>
<td>Cerebrovascular Disease mortality - by cause (Cerebrovascular Disease, Stroke, Subarachnoid Haemorrhage), year of death registration, council area, age group and sex for calendar years 2005-2014; numbers, crude rates and age-sex standardised rates (direct to Europe)</td>
<td>2005-2014</td>
<td>Excel [1,672kb]</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Period</td>
<td>Format</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>DS1</td>
<td>Cerebrovascular Disease and Deprivation; mortality crude rates and standardised mortality ratios (SMR) by age group and SIMD deciles; 2010-2014.</td>
<td>2010-2014</td>
<td>Excel [71kb]</td>
</tr>
<tr>
<td>DS3</td>
<td>Trends in carotid endarterectomies by SIMD quintile; 2005/06 to 2014/15</td>
<td>2005/06-2014/15</td>
<td>Excel [kb]</td>
</tr>
<tr>
<td>DS4</td>
<td>Trends in stroke hospital activity by SIMD quintile; 2005/06 to 2014/15</td>
<td>2005/06-2014/15</td>
<td>Excel [kb]</td>
</tr>
<tr>
<td>G1</td>
<td>Cardiovascular prescribing (costs and number of prescriptions) for financial years ending 2005/06-2014/15.</td>
<td>2005/06-2014/15</td>
<td>Excel [78kb]</td>
</tr>
<tr>
<td>G2</td>
<td>Cardiovascular prescribing (costs, defined daily doses and numbers per 1000 population) by drug group and Health Board for year 2014/15.</td>
<td>2014/15</td>
<td>Excel [146kb]</td>
</tr>
<tr>
<td>SS1</td>
<td>Stroke – number of SAS incidents and conveyances by health board and sex for financial years 2009/10 to 2014/15.</td>
<td>2009/10-2014/15</td>
<td>Excel [336kb]</td>
</tr>
</tbody>
</table>
Contact
Andrew Deas
Principal Information Analyst
andrew.deas@nhs.net
0131 275 7030

Charles Guthrie
Senior Information Analyst
charles.guthrie@nhs.net
0131 275 6340

Alex Henriquez
Information Analyst
ahenriquez@nhs.net
0131 275 7999

Heart Disease and Stroke Mailbox
nss.ishdstroke@nhs.net

Further Information
The Information Services Division publishes a range of stroke and cerebrovascular disease-related information. You can find all our information on stroke area of the website. Information is also available on the Scottish Stroke Care Audit on the website.

Corresponding information on heart disease can be found on the heart disease area of the ISD website.

The Scottish Public Health Observatory also provides further information on stroke on their website.

Rate this publication
Please provide feedback on this publication to help us improve our services.
Appendix

A1.1 – Impact of Health Board boundary changes

On 1\textsuperscript{st} April 2014, Scottish NHS Board boundaries were changed to align with those of local authorities. The purpose of this change was to help NHS Boards and local authorities to work closer together in the provision of care in the community. More information on the background to this change can be found on the Scottish Government website. The Boards most affected were NHS Greater Glasgow and Clyde and NHS Lanarkshire. Over 72,000 people were transferred from NHS Greater Glasgow and Clyde to NHS Lanarkshire. There were also over 16,000 people transferred from NHS Lanarkshire to NHS Greater Glasgow and Clyde. The new boundaries are used within this publication for the first time.

As expected, due to the changes in the populations of NHS Greater Glasgow and Clyde and NHS Lanarkshire, there are also some changes in the stroke statistics. Tables A1.1 and A1.2 show how the number of discharges from hospital for cerebrovascular disease and EASRs differ between the 2006 NHS Board boundaries (which were used in previous editions of this publication) and the new 2014 NHS Board boundaries.

Table A1.1. NHS Greater Glasgow & Clyde. Comparison of the number of discharges from hospital with cerebrovascular disease and European Age-Sex Standardised Rates (EASRs) 2009-2013.

<table>
<thead>
<tr>
<th>Year</th>
<th>2009/10</th>
<th>2010/11</th>
<th>2011/12</th>
<th>2012/13</th>
<th>2013/14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of discharges</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006 configuration</td>
<td>5,795</td>
<td>5,918</td>
<td>5,775</td>
<td>6,353</td>
<td>7,639</td>
</tr>
<tr>
<td>2014 configuration</td>
<td>5,465</td>
<td>5,607</td>
<td>5,450</td>
<td>5,992</td>
<td>7,133</td>
</tr>
<tr>
<td>EASR per 100,000 population</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006 configuration</td>
<td>584.2</td>
<td>590.3</td>
<td>566.1</td>
<td>619.1</td>
<td>721.0</td>
</tr>
<tr>
<td>2014 configuration</td>
<td>587.3</td>
<td>595.1</td>
<td>570.4</td>
<td>624.3</td>
<td>719.6</td>
</tr>
</tbody>
</table>

Source: National Records of Scotland

Table A1.2. NHS Lanarkshire. Comparison of the number of discharges from hospital with cerebrovascular disease and European Age-Sex Standardised Rates (EASRs) 2009-2013.

<table>
<thead>
<tr>
<th>Year</th>
<th>2009/10</th>
<th>2010/11</th>
<th>2011/12</th>
<th>2012/13</th>
<th>2013/14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of discharges</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006 configuration</td>
<td>5,795</td>
<td>5,918</td>
<td>5,775</td>
<td>6,353</td>
<td>7,639</td>
</tr>
<tr>
<td>2014 configuration</td>
<td>5,465</td>
<td>5,607</td>
<td>5,450</td>
<td>5,992</td>
<td>7,133</td>
</tr>
<tr>
<td>EASR per 100,000 population</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006 configuration</td>
<td>584.2</td>
<td>590.3</td>
<td>566.1</td>
<td>619.1</td>
<td>721.0</td>
</tr>
<tr>
<td>2014 configuration</td>
<td>587.3</td>
<td>595.1</td>
<td>570.4</td>
<td>624.3</td>
<td>719.6</td>
</tr>
</tbody>
</table>

Source: National Records of Scotland

For NHS Greater and Glasgow and Clyde (Table A1.1), the number of discharges for CVD is smaller for the 2014 NHS Board configuration in comparison to the 2006 NHS Board configuration. The EASRs are generally similar between the two configurations. For NHS Lanarkshire (Table A1.2), the number of discharges for CVD is larger for the 2014 NHS Board configuration and the EASRs are generally smaller.
A1.2 – Community Health Partnerships

Community Health Partnerships (CHPs) ceased to exist on 1 April 2015, following recommendations in the Public Bodies (Joint Working) (Scotland) Act 2014. CHPs have been replaced by Health and Social Care Partnerships (HSCPs), which share the same boundaries as local authorities. Information that was previously available by CHP in the accompanying data tables has now been replaced by local authority information, where available.
A2 – Background Information

**Stroke**

Cerebrovascular Disease includes cerebrovascular accident (stroke) and transient ischaemic attack (TIA). A stroke or TIA happens when narrowing of the arteries that supply the brain interrupts the blood supply to part of the brain and brain cells are starved of oxygen. Stroke is more common in older people.

**Clarification of Terminology**

Different terms can be used when talking about cerebrovascular disease conditions and operations and sometimes these are interchangeable. For consistency the following terms will be used throughout this report.

<table>
<thead>
<tr>
<th>Term used in report</th>
<th>Also known as</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>Cerebrovascular accident</td>
<td>A stroke occurs when an area of the brain is deprived of its blood supply because of a blockage of a blood vessel supplying the brain.</td>
</tr>
<tr>
<td>Transient ischaemic attack (TIA)</td>
<td>“mini-stroke”</td>
<td>A temporary disruption to the blood supply to the brain as a result of a blockage of a blood vessel supplying the brain.</td>
</tr>
</tbody>
</table>

**Standardisation**

Apparent differences in disease rates between areas or deprivation groups may be partially or entirely due to the fact that one population is different from the other in age structure. For example, areas with a larger proportion of younger people are unlikely to have as high levels of mortality as areas with larger proportions of older people. Therefore, if we don’t adjust for these differences, we may draw the wrong conclusion about the health of an area simply because of the age-structure of the population.

Information in this publication has been ‘standardised’ using the 2013 European standard population to calculate the European Age Standardised Rates (EASRs). EASRs make allowances for differences in the age and sex structure of the population between areas or time periods and allow fairer comparisons to be made.

**Risk factors associated with CVD & stroke**

The main preventable risk factors for stroke are smoking, high blood pressure, lack of exercise and a poor diet. Research also indicates a strong relationship between social deprivation and these risk factors.

Detailed information on the prevalence of these risk factors is available from the Scottish Health Survey, the latest available survey being from 2013. The 2003 survey included a specific report on Cardiovascular Disease. The Scottish Health Survey is now operating as a rolling survey running continuously from 2008-2015.
The results of the Scottish Health survey can be found on the Scottish Government website.

**Policy Context**

NHSScotland service provision for patients with stroke operates within the framework of the Scottish Government policy. A chronology of policy documents that steer service provision for stroke patients is outlined below.

- **Coronary Heart Disease & Stroke Task Force** (2001)
- **Coronary Heart Disease & Stroke Strategy for Scotland** (2002)
- **Delivering for Health** (2005) (Scottish Government response to the "Kerr" report "Building a health service fit for the future")
- **Better health, better care - action plan** (2007)
- **Better heart disease & stroke care action plan** (2009)
- **Stroke improvement plan** (2014)

**Data Collection**

1. **Hospital Activity data**

   Hospital activity data are collected across NHSScotland and are based on nationally available information routinely drawn from hospital administrative systems across the country. Hospital activity data includes inpatient and day case activity occurring in major teaching hospitals, district general hospitals and community hospitals but excludes obstetric and psychiatric services. This data collection is known as SMR01.

2. **Prescribing data**

   Practitioner Services (PSD), a division of NHS National Services Scotland, processes all NHS prescriptions for payment of pharmacists, dispensing doctors and appliance suppliers. Hospital dispensed prescriptions are NOT included in the figures.

   Information on NHS prescriptions dispensed in the community in Scotland is compiled by ISD's Prescribing Team from data provided by Practitioner Services Division (PSD). PSD are responsible for the processing and pricing of all prescriptions dispensed in Scotland.

3. **Deaths data**

   Information on the quality of National Records of Data on Deaths can be found on the National Records of Scotland website.
**Data Completeness**

The hospital activity figures are sourced from SMR01 records and the levels of completeness of the SMR01 data are deemed to be fit for publication (98% of the expected figure at the time of extraction).

Information on SMR01 data completeness can be found on the Hospital Records Data Monitoring [SMR Completeness](#) web page, while information on the timeliness of SMR01 data submissions can be found on the [SMR Timeliness](#) web page. Details on completeness can also be found within the excel data files.

ISD are working with NHS Boards to resolve ongoing data submission issues. The majority of these issues have resulted from implementation of the new PMS TrakCare system and other existing system issues.

**Data Quality**

The ISD [Data Quality Assurance](#) (DQA) team is responsible for evaluating and ensuring SMR datasets are accurate, consistent and comparable across time and between sources.

The DQA team’s [previous projects](#) web page contains details of past Data Quality Assurance Assessments, including final reports and findings.

The most recent report “Assessment of SMR01 Data 2010-2011” [350kb] was published in May 2012. This report includes feedback on clinical coding accuracy, sensitivity and completeness within defined groups and includes commonly encountered conditions including Ischaemic Heart Disease, Cerebrovascular Disease and Myocardial Infarction.

An earlier report, “Towards Better Data from Scottish Hospitals: An Assessment of SMR01 and Associated Data 2004-2006” [1.77Mb], contains sub-sections on specific conditions and interventions, including some related to CHD and stroke.

In hospital discharge data, clinical information for diagnoses and operations/interventions is currently recorded using ICD10 (the International Classification of Diseases 10th Revision maintained by the World Health Organization) and OPCS4 (the Office of Population Censuses & Surveys 4th Revision Classification of Surgical Operations and Procedures maintained by NHS Connecting for Health (CfH)).


**Supporting information from ISD Scotland**

Further information relating to heart disease and stroke is published by ISD Scotland:

1. ScotPHO – the [Health and Well Being Profiles](#) produce charts at NHS Board and Local Authority on premature mortality from CHD and CVD and patients hospitalised with CHD and CVD.
2. The Hospital Standardised Mortality Ratios updated quarterly produce information on deaths in hospitals participating in the Scottish Patient Safety Programme. Deaths will include those dying from heart disease and stroke.

3. Detailed tables on number/incidence of hospital episodes by diagnosis, including diseases of the circulatory system and number of procedures in main hospitals, including those associated with heart disease and stroke. This is available as part of the Hospital Care topic on the ISD website.

4. The Scottish Stroke Care Audit reports on stroke services in Scottish hospitals

**Independent & voluntary sector**

Although there are a number of independent & voluntary sector organisations involved in the provision of information and services to CHD & stroke patients, three of the main ones, with links to NHSScotland, are the Stroke Association, Chest, Heart & Stroke Scotland (CHSS) and British Heart Foundation (BHF). Each organisation is involved in the funding of research and provides extensive information for patients and carers on their respective web sites at [http://www.stroke.org.uk](http://www.stroke.org.uk), [http://www.chss.org.uk/](http://www.chss.org.uk/) and [http://www.bhf.org.uk/](http://www.bhf.org.uk/)

**Comparisons**

1. **UK comparisons**

Hospital activity data relating to cerebrovascular disease in England, Wales and Northern Ireland are available separately. Please note that these figures are sometimes not directly comparable with published data from Scotland due to differences in recording and definitions. Prior to making comparisons, please check the definitions carefully for each of the sources. In particular, the ICD-10 codes used to define cerebrovascular disease may vary between sources. Scotland includes code G45 (Transient Ischaemic Attack and related syndromes) while other areas may not include this code.

England: NHS Hospital Episode Statistics (HES)

Wales: [Health and care statistics](http://www.ons.gov.uk)

Northern Ireland: [Hospital Statistics & Research](http://www.hseni.gov.uk)

Mortality from specific causes, including cerebrovascular disease, in England and Wales is available from the [Office for National Statistics](http://www.ons.gov.uk).

2. **International comparisons**

The [Scotland and European Health for All database](http://www.isd.scot.nhs.uk) allows users to make comparisons of trends in mortality in Scotland with countries in the rest of Europe. These include standardised death rates and hospital discharges for CVD. European comparisons indicate that while CVD mortality rates have fallen, Scotland still compares unfavourably with most other European countries.

**Further Information**

Our [Links to other sources](http://www.isd.scot.nhs.uk) section offers a few examples of other information sources.
A3 – Publication Metadata (including revisions details)

<table>
<thead>
<tr>
<th>Metadata Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication title</td>
<td>Stroke Statistics</td>
</tr>
<tr>
<td>Description</td>
<td>Annual update of stroke statistics. Update including hospital activity, incidence, operations, 30 days survival, mortality, deprivation, prescribing, primary care and ambulance service activity.</td>
</tr>
<tr>
<td>Theme</td>
<td>Health and Social Care</td>
</tr>
<tr>
<td>Topic</td>
<td>Conditions and Diseases</td>
</tr>
<tr>
<td>Format</td>
<td>Excel workbooks</td>
</tr>
<tr>
<td>Data source(s)</td>
<td>Scottish Morbidity Record 01 (SMR01), National Records of Scotland (NRS) Death Registrations, Prescribing Information System (PIS), Scottish Index of Multiple Deprivation (Scottish Government), SAS Data Warehouse, Quality Outcomes Framework (QOF).</td>
</tr>
<tr>
<td>Date that data are acquired</td>
<td>September 2015</td>
</tr>
<tr>
<td>Release date</td>
<td>26 January 2016</td>
</tr>
<tr>
<td>Frequency</td>
<td>Annual</td>
</tr>
<tr>
<td>Timeframe of data and timeliness</td>
<td>10 years annual data up to 31-Mar-2015 (hospital activity, operations, prescribing, incidence, survival), 31-Dec-2014 (mortality). 6 years annual data up to 31-Mar-2015 (ambulance service).</td>
</tr>
<tr>
<td>Continuity of data</td>
<td>Mortality data: Reports data since 2005. There was a change to the coding of causes of death by National Records of Scotland between 2010 and 2011. The overall scale of change was small. For full details, please consult the NRS website: <a href="http://www.nrscotland.gov.uk/files/statistics/vital-events/changes-to-coding-of-causes-of-death-between-2010-2011.pdf">http://www.nrscotland.gov.uk/files/statistics/vital-events/changes-to-coding-of-causes-of-death-between-2010-2011.pdf</a>. Prescribing data: The definition of the main measures such as gross ingredient cost and number of items are unchanged over this period. Types and value of dispensing fees are agreed the Scottish Government and set annually. Details can be found in the Scottish Drug Tariff and in Primary Care circulars issued by the Government. Drug products are first licensed as proprietary medicines but generic versions often appear once the original patent expires. This can affect the price and uptake of these drugs. The Scottish Government sets the reimbursement price of generic drug products via the Scottish Drug Tariff which is updated and issued quarterly.</td>
</tr>
<tr>
<td>Revisions statement</td>
<td>This publication contains planned revisions. More details</td>
</tr>
</tbody>
</table>
On 1 April 2014, NHS board boundaries were changed to align with those of local authorities. More details are available in Appendix A1. These new boundaries are used within this publication for the first time. New tables on deprivation have also been added to the publication. These are Table DS3 (operations by SIMD quintile) and Table DS4 (hospital activity by SIMD quintile).

### Concepts and definitions

See Glossary and Appendix A2 contained within this report.

### Relevance and key uses of the statistics

Uses of the data include:

- To allow NHS Boards and the Scottish Government to compare activity levels nationally;
- To provide health intelligence and performance information for NHS Boards and the Scottish Government;
- To provide information to support answers to Parliamentary Questions;
- To support the information requirements of voluntary sector organisations such as Chest, Heart and Stroke Scotland (CHSS), including research and media activity;
- To allow members of the public to readily access information on cerebrovascular disease;
- To respond to information requests for a variety of customers e.g. researchers, charities, public companies, Freedom of Information requests;
- To assist students and universities conducting studies on topics such as cerebrovascular disease;
- To assist private companies interested in cerebrovascular disease information in Scotland, such as pharmaceutical companies and consultancy companies.

### Accuracy

**Mortality:** For coding of deaths see the website of the National Records of Scotland. Reported data are compared to previous years' figures and to expected trends.

Prescribing: The data is sourced from a payment system and routine monthly checks are carried out by PSD on a random sample of approximately 5% of prescription payments. These check all data captured for payment and the accuracy of the payment calculation and have a target accuracy of 98% which is routinely met. Data that is captured but is not mandatory for payment purposes can be of lower quality; principally this includes the prescriber code which links a prescription back to the individual prescriber e.g. GP and their organisation including NHS Board. Routine monitoring of unallocated prescriptions is carried out and correct codes are applied before publication. This ensures that unallocated prescriptions account for under
2% of all prescriptions. For remaining unallocated prescriptions, the prescribing NHS Board is assumed to be the same as the dispensing NHS Board.

Hospital Activity: SMR01 data are subjected to validation on submission. The figures are compared to previous years’ figures and to expected trends. The SMR01 data are also assessed for accuracy by ISD’s Data Quality Assurance team – see Appendix A2.

### Completeness

Mortality: Death registrations are deemed to be complete and finalised.

Prescribing: The Prescribing Information System holds information on 100% of NHS Scotland prescriptions dispensed within the community and claimed for payment by a pharmacy contractor (i.e. pharmacy, dispensing doctor or appliance supplier). It does not include data on prescriptions dispensed but not claimed (likely to be very small) or prescriptions prescribed but not submitted for dispensing by a patient. Some research has estimated these latter prescriptions to account for around 6% of all prescriptions issued to patients. It is not possible to determine from payment data how much of the medicine dispensed to patients is actually taken in accordance with dosage instructions.

Hospital Activity: Levels of SMR01 submission are deemed to be 98% complete compared to expected levels of submission at time of extraction.

### Comparability

Prescribing: The main measures of drug ingredient cost and volumes of items dispensed in the community are comparable across the UK countries. However it should be noted that the Gross Ingredient Cost (GIC) within Scotland is equivalent to the Net Ingredient Cost (NIC) in England, i.e. the reimbursement cost of drugs before any pharmacy discounts are applied. Also each country determines its own dispensing fees based on separate contractual arrangements with dispensing contractors in each country. A common formulary called the British National Formulary (BNF) is used to classify drugs based on therapeutic use.

Hospital activity data relating to cerebrovascular disease in England, Wales and Northern Ireland are available separately. Please note that these figures are sometimes not directly comparable with published data from Scotland due to differences in recording and definitions. Prior to making comparisons, please check the definitions carefully for each of the sources. In particular, the ICD-10 codes used to define cerebrovascular disease may vary between sources. Scotland includes code G45 (Transient Ischaemic...
<table>
<thead>
<tr>
<th>Topic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attack and related syndromes</strong></td>
<td>while other areas may not include this code.</td>
</tr>
<tr>
<td><strong>England</strong></td>
<td><strong>NHS Hospital Episode Statistics (HES)</strong></td>
</tr>
<tr>
<td><strong>Wales</strong></td>
<td><strong>Health and care statistics</strong></td>
</tr>
<tr>
<td><strong>Northern Ireland</strong></td>
<td><strong>Hospital Statistics &amp; Research</strong></td>
</tr>
</tbody>
</table>

Mortality: Deaths from specific causes, including cerebrovascular disease, in England and Wales is available from the [Office for National Statistics](https://www.ons.gov.uk). The ICD-10 codes used to define cerebrovascular disease may vary between sources. Scotland includes code G45 (Transient Ischaemic Attack and related syndromes) while other areas may not include this code.

**Accessibility**

It is the policy of ISD Scotland to make its web sites and products accessible according to [published guidelines](https://www.isd.scot).

**Coherence and clarity**

Relevant key statistics are presented on each [Topic Area](https://www.isd.scot) page. Statistics are presented within Excel spreadsheets. Geographical areas and national figures are presented using drop down menus. Further features to aid clarity:

1. Tables use drop down menus to display data by Age Band, Diagnostic and other Groupings.
2. Key data presented graphically.
3. Each Excel workbook contains a notes page.

**Value type and unit of measurement**

The number of deaths in a given year is based on the date of registration. Rates are expressed as both a crude rate per 100,000 population and directly standardised for age only or both age and sex as detailed on the notes pages of the relevant Excel table.

The main units of measure of drug reimbursement costs are Gross Ingredient Cost (GIC) and Net ingredient cost (NIC) quantity. The latter takes account of pharmacy discounts, the rates for which are set by the Scottish Government in the Scottish Drug Tariff. There are a large number of individual dispensing remuneration fees paid to dispensing contractors details of which can be found in the Scottish Drug Tariff. The main measures of drug volume are items (the number of individual drug items on a prescription form), quantity (the total number of tablets, capsules etc), and defined daily doses (DDDs - estimated average daily maintenance doses for a total quantity of prescribed).

Hospital activity is based on hospital episodes, which if based on the date of discharge. Rates are expressed as both a crude rate per 100,000 population and directly standardised for age only or both age and sex as detailed on the notes page of the relevant Excel tables.

**Disclosure**

The [ISD protocol on Statistical Disclosure Protocol](https://www.isd.scot) is...
<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Services Division</td>
<td></td>
</tr>
<tr>
<td>followed.</td>
<td></td>
</tr>
<tr>
<td>Official Statistics designation</td>
<td>National Statistics</td>
</tr>
<tr>
<td>UK Statistics Authority Assessment</td>
<td>April 2013</td>
</tr>
<tr>
<td>Last published</td>
<td>27 January 2015</td>
</tr>
<tr>
<td>Next published</td>
<td>January 2017</td>
</tr>
<tr>
<td>Date of first publication</td>
<td>22 February 2011 (in current format)</td>
</tr>
<tr>
<td>Help email</td>
<td><a href="mailto:andrew.deas@nhs.net">andrew.deas@nhs.net</a></td>
</tr>
<tr>
<td>Date form completed</td>
<td>15 December 2015</td>
</tr>
</tbody>
</table>
Pre-Release Access
Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", ISD are obliged to publish information on those receiving Pre-Release Access ("Pre-Release Access" refers to statistics in their final form prior to publication). The standard maximum Pre-Release Access is five working days. Shown below are details of those receiving standard Pre-Release Access.

Standard Pre-Release Access:
- Scottish Government Health Department
- NHS Board Chief Executives
- NHS Board Communication leads
A5 – ISD and Official Statistics

About ISD
Scotland has some of the best health service data in the world combining high quality, consistency, national coverage and the ability to link data to allow patient based analysis and follow up.

Information Services Division (ISD) is a business operating unit of NHS National Services Scotland and has been in existence for over 40 years. We are an essential support service to NHSScotland and the Scottish Government and others, responsive to the needs of NHSScotland as the delivery of health and social care evolves.

Purpose: To deliver effective national and specialist intelligence services to improve the health and wellbeing of people in Scotland.

Mission: Better Information, Better Decisions, Better Health

Vision: To be a valued partner in improving health and wellbeing in Scotland by providing a world class intelligence service.

Official Statistics
Information Services Division (ISD) is the principal and authoritative source of statistics on health and care services in Scotland. ISD is designated by legislation as a producer of ‘Official Statistics’. Our official statistics publications are produced to a high professional standard and comply with the Code of Practice for Official Statistics. The Code of Practice is produced and monitored by the UK Statistics Authority which is independent of Government. Under the Code of Practice, the format, content and timing of statistics publications are the responsibility of professional staff working within ISD.

ISD’s statistical publications are currently classified as one of the following:

- National Statistics (ie assessed by the UK Statistics Authority as complying with the Code of Practice)
- National Statistics (ie legacy, still to be assessed by the UK Statistics Authority)
- Official Statistics (ie still to be assessed by the UK Statistics Authority)
- other (not Official Statistics)

Further information on ISD’s statistics, including compliance with the Code of Practice for Official Statistics, and on the UK Statistics Authority, is available on the ISD website.

The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics. Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs;
- are well explained and readily accessible;
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.