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Map of Scotland showing all hospitals in Health Boards contributing to the Scottish Stroke Care Audit
1 Introduction

“Our Better Heart Disease and Stroke Care Action Plan, launched in 2009, sets out a comprehensive programme of work aimed at further improving stroke care. This year’s Scottish Stroke Care Audit is a vital tool in helping us to assess the overall success of this strategy.

In the 15 years to 2010, NHSScotland helped cut the number of deaths from stroke among under 75s, by 60% - far exceeding our original 50 per cent target. However, I am delighted that we are seeing ongoing reductions in the number of premature deaths – with a further 5.7% fall between 2010 and 2011. I would like to take this opportunity to congratulate all of the NHSScotland staff who have helped make this possible.

This year’s Audit shows that NHSScotland is making sustained improvements across the full range of indicators for acute stroke care. More people than ever before are getting early access to specialist neurovascular clinics, brain scanning and medication.

These improvements have in part been driven by our target which aims to ensure people with stroke get promptly admitted to a Stroke Unit. This will continue to be a priority. We are committed to closely monitoring services performance in relation to access to Stroke Units to ensure they continue to work toward the standards set.

The Scottish Stroke Care Standards updated in January this year along with information contained in this Scottish Stroke Care Audit report represent a powerful tool for NHS Boards and their stroke Managed Clinical Networks. I know that they will continue to use these tools to deliver improvements in care that will benefit all people living with stroke.”

Mr Alex Neil,
Cabinet Secretary for Health, Wellbeing
May 2013

Stroke is a key health issue for the people of Scotland and the Scottish NHS. It is the third commonest cause of death in Scotland and the most common cause of severe physical disability amongst Scottish adults. About 13,000 people in Scotland have a stroke each year and more than 3,000 of them are under 65 years of age. Stroke patients occupy 7% of all NHS beds and their health care costs at least £100million per year – around 5% of the entire Scottish NHS budget.
The economic cost of stroke to Scotland in terms of lost employment and the cost of support in the community are significant, whilst the impact on family members or friends who care for stroke survivors is huge.

The evidence for the benefits of organised specialist stroke care in improving outcomes is clear. The Scottish Stroke Care Audit (SSCA) has been collecting information about stroke care since 2002 and includes all hospitals managing acute stroke in Scotland. Since its inception the SSCA has helped to drive evidence-based improvements in stroke care which have contributed to falling mortality rates and improved outcomes for Scottish stroke patients.

The first report containing SSCA data was published in 2005. Previous reports have indicated marked improvements since then in the number of patients admitted to a Stroke Unit at any time during their admission, an increase from 71% to 90%.

There were also improvements against the NHS Quality Improvement Scotland (QIS)* standard for Stroke Unit admission between 2005 and 2010 prior to the introduction of the HEAT Target.

- The percentage of stroke patients admitted to a Stroke Unit on day of admission increased from 28% to 39%.
- The percentage of stroke patients admitted to a Stroke Unit by the day following admission increased from 49% to 63%.

The HEAT Target introduced in 2011, which was financial year based and focused on patients who remained in hospital for more than one day, demonstrated an improvement. For further information regarding the HEAT Target definition please refer to section 1.2.3.

The percentage of stroke patients admitted to a Stroke Unit by the day following admission increased from 71% in 2010/11 (pre-HEAT - HEAT commenced April 2011) to 80% in 2012/13 (post-HEAT - HEAT finished March 2013).

There were also marked improvements against other NHS QIS standards between 2005 and 2012:

- The percentage of stroke patients who had brain imaging on day of admission increased from 27% to 59%.
- The percentage of stroke patients who had a swallow screen on day of admission increased from 47% to 68%.
- The percentage of patients who had an ischaemic stroke who were prescribed aspirin by one day after admission increased from 41% to 76%.
- The percentage of patients who were seen within 7 days from referral at a specialist neurovascular clinic increased from 30% to 91%.

In other areas it is clear that significant work still needs to be done. Whilst there have been important increases in the number of patients receiving thrombolysis within 1 hour of hospital admission (29% in 2012, compared to 18% in 2010), this is some distance from meeting the standard of 80%.

*NB: Healthcare Improvement Scotland (HIS) took over responsibilities of NHS QIS on 1st April 2011.

The Scottish Government recognises the key role of the SSCA in measuring performance against the national stroke care standards and monitoring Health Boards’ progress against the 2009 Better Heart Disease and Stroke Care Action Plan’s aims. The SSCA publishes an Annual National Report which is sent to Health Boards, Healthcare Improvement Scotland (HIS) and the Scottish
Government Health Department as well as being made publicly available on the SSCA website (http://www.strokeaudit.scot.nhs.uk/reports.html). In 2010 the SSCA started producing monthly reports for Stroke Managed Clinical Networks (MCNs) in Health Boards and individual hospitals to ensure awareness of the stroke standards and facilitate timely review of local performance.

In April 2011 a government HEAT target for stroke was initiated: “By March 2013 90% of patients admitted with acute stroke should be in a Stroke Unit by the day after hospital admission”; there was an interim target of 80% by March 2012. The SSCA monitored Boards’ progress towards meeting the HEAT target, with quarterly reports to each Board. The SSCA data show a steady improvement in performance in some areas towards this target, much of which has been achieved by local redesign of services with considerable work by all the teams involved. However there are a number of Health Boards who still have some work to do to achieve the HEAT Target (see chart 1a on page 7).

The SSCA will continue to work with all Health Boards to monitor stroke service performance, develop new audit fields as treatment changes and progresses, and help NHS Scotland provide the best care possible for people who have had a stroke.

The purpose of this report is to summarise the SSCA data for 2012 in the context of both previous performance and national standards, and help drive further improvements in service provision.

We hope you find the report interesting and informative.

Contributions to this report
This year’s report has been written by members of the SSCA Report Writing Sub-Group of the Steering Committee with contributions from colleagues within Health Boards across Scotland. In appendix A we present comments from Health Board Chief Executives in relation to delivery of stroke care in their local areas and their performance against the HEAT Target and NHS QIS stroke care standards.

Each Health Board has a Stroke MCN and the audit helps the MCNs plan the work required to improve their local stroke services. All the Stroke MCNs have active involvement from people who have had a stroke and from their families and friends; stroke survivors and their carers are encouraged to look at the audit information and comment on it. There is also lay and voluntary organisation representation on the SSCA Steering Committee and feedback from service users is very welcome.

1.1  Organisational structure of the Scottish Stroke Care Audit

The Scottish Stroke Care Audit is a national audit within the Scottish Healthcare Audits of the National Intelligence & Information Department (NI&I) at the Information Services Division (ISD) of NHS National Services Scotland (NSS). The audit has its own Steering Committee reporting directly to the National Advisory Committee for Stroke (NACS) at the Scottish Government and providing strategic direction and clinical input to the audit team, optimising the use of the data. See the SSCA website (http://www.strokeaudit.scot.nhs.uk/about/SteerGp.htm) for details of the Steering Committee.

The organisational structure of the SSCA is:

Professor Martin Dennis  Chairman of the Steering Committee/ Lead Clinician
Robin Flaig (formerly Quality Assurance Manager) left the SSCA in August 2012 to take up a new position at the University of Edinburgh. The SSCA team and the wider stroke community would like to take this opportunity to thank Robin for her contribution to the development of the SSCA over recent years and wish her well in her new ventures.

Funding of £117k for the central coordination of the SSCA for 2013/14 has been provided by NACS. Funding for the SSCA data collection has been included in each Health Board’s general allocation. Each Health Board is expected to continue to collect the audit data. Audit staff are employed in each Health Board and are supported by their Stroke MCN. Staffing levels vary widely between hospitals. Audit staff responsibilities include case ascertainment, data collection, completion of forms and data entry. Since June 2012 all Health Boards have entered data into the new web-based IT system (eSSCA). Prior to this all Health Boards data were entered into the Scottish Stroke Care Audit System (SSCAS) other than NHS Lanarkshire. In NHS Lanarkshire a locally developed system (Stroke Audit In Lanarkshire (SAIL)) was used to collect inpatient and outpatient data. Data from SAIL (up to June 2012) were sent directly to ISD on a monthly basis and are included in National Reporting. Data validation is built into the computer systems, with additional local validation at point of data entry and centrally during analysis.

The information presented in this report highlights the variation in the quality of stroke services across Scotland.

1.2 This report

This year’s report includes data for 2012 for Scotland overall and for each individual hospital managing acute stroke patients in Scotland. The data presented in this report unless otherwise stated are based on final diagnosis of stroke and not initial diagnosis as in the routine Monthly Reports.

An overview of initial and final diagnosis of stroke is included in the web tables from the SSCA data (for NHS Lanarkshire Jul-Dec 2012 data). In summary, of the 8,887 patients admitted during 2012 with a diagnosis of stroke (initial or final), 6,680 (75%) of these had an initial diagnosis of stroke which was then confirmed. 1,313 (15%) were admitted with an initial diagnosis of stroke which was not confirmed; 894 (10%) were not initially diagnosed as a stroke but had a final diagnosis of stroke.

Throughout 2012 the SSCA team continued to review the analysis of the data collected and modified definitions when necessary, therefore calculations in this year’s report may not match exactly those presented in previous reports. Individual hospitals’ data are displayed in charts. Supplemental detailed charts and tables for this report are available on the SSCA website (http://www.strokeaudit.scot.nhs.uk/reports.html).

There were issues with data collection in some Boards for various reasons during 2012. Details of incomplete/missing data accompany each of the charts.
In addition to this main report a Public Summary of the National Report suitable for members of the public will be distributed to Health Boards and other interested organisations. It will also be available on the SSCA website.

1.2.1 NHS QIS standards (2009)
The NHS QIS standards for stroke care were revised in June 2009. The analyses contained in this report assess performance against these standards.

<table>
<thead>
<tr>
<th>Topic</th>
<th>NHS QIS standards for stroke care, June 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Stroke Unit services</td>
<td>90% within 1 day of admission (Day 1) (60% on day of admission (Day 0) - not reported)</td>
</tr>
<tr>
<td>Brain imaging</td>
<td>80% on day of admission (Day 0)</td>
</tr>
<tr>
<td>Swallow screen</td>
<td>100% on day of admission (Day 0)</td>
</tr>
<tr>
<td>Aspirin administration</td>
<td>100% of ischaemic strokes within 1 day of admission (Days 0 and 1)</td>
</tr>
<tr>
<td>Delay from receipt of referral to specialist neurovascular clinic</td>
<td>80% are examined within 7 days of receipt of referral</td>
</tr>
<tr>
<td>Thrombolysis</td>
<td>5 patients treated per 100,000 population per year</td>
</tr>
<tr>
<td>Carotid Intervention (not collected/ reported in 2011. Data collection commenced July 2012.)</td>
<td>80% undergoing carotid endarterectomy for symptomatic carotid stenosis have the operation within 14 days of the most recent stroke event</td>
</tr>
</tbody>
</table>

1.2.2 Scottish Stroke Care Standards (2013)
A review of the NHS QIS standards for stroke care took place in 2012. This review was undertaken by the SSCA Steering Committee in collaboration with Stroke MCNs and Healthcare Improvement Scotland. The revised standards were endorsed by the National Advisory Committee for Stroke at the Scottish Government.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Scottish Stroke Care Standards, Jan 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Stroke Unit services</td>
<td>90% within 1 day of admission (Day 1)</td>
</tr>
<tr>
<td>Brain imaging</td>
<td>90% within 24 hours of admission</td>
</tr>
<tr>
<td>Swallow screen</td>
<td>90% on day of admission (Day 0)</td>
</tr>
<tr>
<td>Aspirin administration</td>
<td>100% of ischaemic strokes within 1 day of admission (Days 0 and 1)</td>
</tr>
<tr>
<td>Delay from receipt of referral to specialist neurovascular clinic</td>
<td>80% are examined within 4 days of receipt of referral</td>
</tr>
<tr>
<td>Thrombolysis</td>
<td>80% receive the bolus within one hour of arrival at hospital</td>
</tr>
<tr>
<td>Carotid Intervention</td>
<td>80% undergoing carotid endarterectomy for symptomatic carotid stenosis have the operation within 14 days of the most recent stroke event</td>
</tr>
</tbody>
</table>

For further information relating to the changes to the stroke care standards please refer to the SSCA website (http://www.strokeaudit.scot.nhs.uk/Quality/Scottish_Stroke_Care_Standards.html)

These standards continue to focus on those parameters which have the best evidence for having an effect on patient outcomes. The 2014 SSCA National Report will present Health Board and hospital performance against the Scottish Stroke Care Standards (2013).
1.2.3 Stroke Care HEAT Target (2011)

The SIGN guideline 108² on the management of patients with stroke or transient ischaemic attack (TIA) emphasises the importance of getting patients to specialist stroke services quickly to allow prompt diagnosis and treatment. The Better Heart Disease and Stroke Care Action Plan¹, suggests that there are a number of ways mortality could be reduced, including getting more people into a Stroke Unit within one day of their stroke, as there is good evidence that this improves survival.

A HEAT target related to admission to Stroke Unit was implemented on 1 April 2011 as at this point none of the Health Boards had met the NHS QIS standards for admission to a Stroke Unit.

What are HEAT Targets?

HEAT targets are a core set of ministerial objectives, targets and measures for NHS Scotland. The targets are set each year after consultation with stakeholders and cover a variety of areas. Progress is measured throughout the year and Health Boards are held to account during annual review with the Scottish Government.

The key targets fall into four main areas:

Health Improvement – improving health and life expectancy;

Efficiency and Governance Improvements – continuously improving the effectiveness and efficiency of the NHS in Scotland;

Access to services – recognising patients’ need for quicker and easier use of NHS services; and

Treatment appropriate to individuals – ensuring patients receive high quality services that meet their needs.

The HEAT target relating specifically to admission to Stroke Unit reads:

“To improve stroke care, 90% of all patients admitted with a diagnosis of stroke will be admitted to a Stroke Unit on the day of admission, or the day following presentation by March 2013.”

For the purpose of this target a Stroke Unit was defined as a designated ward satisfying the following conditions:

- A defined bed area where stroke patients are preferentially admitted;
- Medical, nursing and allied health professionals in that area have undertaken specific training in stroke; and
- Patients are discussed at a multi-disciplinary meeting at least weekly.

The performance data for the HEAT Target were collected and reported via the SSCA. Health Boards were able to monitor their performance against the HEAT Target through monthly reports. Health Boards and the Scottish Government received quarterly reports presenting performance against the HEAT target.

Due to the number of beds and the small number of stroke admissions within the following hospitals: Balfour, Belford, Caithness, Galloway Community and Gilbert Bain, it is not practical for them to have a defined Stroke Unit. We are comfortable however that a defined stroke pathway is in place in these hospitals and that the HEAT criteria are established within that pathway. All staff are trained to a minimum of Stroke Training and Awareness Resources (STARS) level 1, there is a weekly multi-disciplinary team meeting and the patients are cared for by a physician with an interest in stroke.
**Chart 1a:** (Health Board) Percentage of stroke patients eligible for HEAT target and admitted to a Stroke Unit within 1 day of admission using HEAT target definition, 2010/11 & 2012/13 data (based on *initial* diagnosis)

Horizontal line reflects the HEAT target (March 2013) to admit 90% of stroke patients to a Stroke Unit within 1 day of admission.

**Notes regarding chart 1a:**
1. **The denominator for the HEAT target excludes:** in-hospital strokes, patients discharged within 1 day and transfers in from another hospital.
2. Due to the number of beds within some of the hospitals in the Health Boards indicated (*) and the small numbers of stroke admissions to these hospitals it is not practical to have a defined Stroke Unit. We have confirmed however that a defined stroke pathway is in place in these hospitals and that the HEAT criteria are established within that pathway.
3. The data included in chart 1a:
   - were extracted from eSSCA on the **19 April 2013**. Changes/ updates to the data following this date will therefore not feature in these analyses;
   - relate to patients with *initial* diagnosis of stroke;
   - are for **financial years** 2010/11 and 2012/13 (i.e. 1 April – 31 March); and
   - presents data from the year prior to the commencement of HEAT (April 2011) and the year when HEAT finished (March 2013).
4. Data for NHS Grampian is incomplete due to local data collection issues during 2012.
Chart 1b: (Hospital) Percentage of stroke patients eligible for HEAT target and admitted to a Stroke Unit within 1 day of admission using HEAT target definition, 2010/11 & 2012/13 data (based on initial diagnosis)

<table>
<thead>
<tr>
<th>Hospital</th>
<th>2012/13</th>
<th>2010/11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scotland</td>
<td>90%</td>
<td>80%</td>
</tr>
<tr>
<td>Belford</td>
<td>90%</td>
<td>80%</td>
</tr>
<tr>
<td>GCH</td>
<td>90%</td>
<td>80%</td>
</tr>
<tr>
<td>Gilber Bain*</td>
<td>90%</td>
<td>80%</td>
</tr>
<tr>
<td>Ayr</td>
<td>90%</td>
<td>80%</td>
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<tr>
<td>Western Isles</td>
<td>90%</td>
<td>80%</td>
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<tr>
<td>Hairmyres</td>
<td>90%</td>
<td>80%</td>
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<tr>
<td>Crosshouse</td>
<td>90%</td>
<td>80%</td>
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<tr>
<td>Monklands</td>
<td>90%</td>
<td>80%</td>
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<tr>
<td>Border</td>
<td>90%</td>
<td>80%</td>
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<tr>
<td>Ninewells</td>
<td>90%</td>
<td>80%</td>
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<tr>
<td>SGG</td>
<td>90%</td>
<td>80%</td>
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<tr>
<td>Queen Elizabeth</td>
<td>90%</td>
<td>80%</td>
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<tr>
<td>WGH</td>
<td>90%</td>
<td>80%</td>
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<td>RAH</td>
<td>90%</td>
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<td>PRI</td>
<td>90%</td>
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<tr>
<td>Caithness</td>
<td>90%</td>
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<td>VHK</td>
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<td>ARI</td>
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<td>WIG</td>
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<td>WGH</td>
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<td>Raigmore</td>
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<td>RHA</td>
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<td>Dr Grays</td>
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<td>L&amp;D</td>
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<tr>
<td>VG</td>
<td>90%</td>
<td>80%</td>
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<tr>
<td>Uist &amp; Barra*</td>
<td>90%</td>
<td>80%</td>
</tr>
</tbody>
</table>

Horizontal line reflects the HEAT target (March 2013) to admit 90% of stroke patients to a Stroke Unit within 1 day of admission.

Notes regarding chart 1b:
1. The denominator for the HEAT target excludes: in-hospital strokes, patients discharged within 1 day and transfers in from another hospital.
2. Due to the number of beds within some of the hospitals indicated (*) and the small numbers of stroke admissions to these hospitals it is not practical to have a defined Stroke Unit. We have confirmed however that a defined stroke pathway is in place in these hospitals and that the HEAT criteria are established within that pathway.
3. The data included in chart 1b:
   - were extracted from eSSCA on the 19 April 2013. Changes/updates to the data following this date will therefore not feature in these analyses;
   - relate to patients with initial diagnosis of stroke; and
   - are for financial years 2010/11 and 2012/13 (i.e. 1 April – 31 March).
4. The data presented for Victoria Hospital Kirkcaldy are combined with Queen Margaret Hospital data. Forth Valley Royal Hospital data include information from Stirling Community Hospital. Aberdeen Royal Infirmary data are combined with Woodend General Hospital. Glasgow Royal Infirmary data are combined with Stobhill Hospital. Royal Alexandra Hospital data are combined with Vale of Leven General Hospital.
5. Data for NHS Grampian is incomplete due to local data collection issues during 2012.

Access to Stroke Unit care has improved dramatically during the last two years. In 2011 only 71% of patients accessed a Stroke Unit by the day after admission, whilst in 2013 this figure has risen to 80%. As can be seen on chart 1a few Health Boards have exceeded the HEAT Target. Contributing to the Health Board performance, few hospitals have exceeded the HEAT target of 90%, and some of these are the small hospitals (Western Isles, Belford, Gilbert Bain and Galloway Community Hospitals) which don’t have enough patients to make a geographically defined Stroke Unit practical (chart 1b). However, of the larger hospitals, Ayr, Wishaw, Hairmyres, Crosshouse, Southern General, Monklands, Borders General and Ninewells Hospitals all met the HEAT target. The target is attainable! In others, notably the three hospitals in NHS Lothian (Royal Infirmary of Edinburgh, Western General and St John’s Hospitals) and the Western Infirmary Glasgow access to Stroke Unit care worsened over this period. Clearly concerted action is required to reverse this worrying trend which may well be affecting patient outcomes.

Chart 2 presents a ‘bundle’ analysis for patients eligible for the HEAT target, displaying percentages of patients who also received swallow screen, brain imaging and aspirin within NHS QIS standards. This compares care received by patients admitted to the Stroke Unit within one day of presentation and those admitted after this or never admitted to a Stroke Unit. These
data confirm that patients admitted to a Stroke Unit within one day of presentation achieve more standards than those admitted after this or those never admitted to a Stroke Unit.

Chart 2:  ‘Bundle’ analysis for patients eligible for HEAT target - percentages who also receive swallow screen, brain scan and aspirin within NHS QIS standards (2009), 2012/13 data (based on initial diagnosis)

Notes regarding chart 2:
1. The denominator for the HEAT target excludes: in-hospital strokes, patients discharged within 1 day and transfers in from another hospital.
2. Due to the number of beds within some of the hospitals in the Health Boards indicated (*) and the small numbers of stroke admissions to these hospitals it is not practical to have a defined Stroke Unit. We have confirmed however that a defined stroke pathway is in place in these hospitals and that the HEAT criteria are established within that pathway.
3. Balfour Hospital, NHS Orkney does not have a CT scanner but patients are airlifted to Aberdeen Royal Infirmary and a proportion arrive in sufficient time to have brain imaging on day of admission.
4. The data included in chart 2:
   - were extracted from eSSCA on the 19 April 2013. Changes/ updates to the data following this date will therefore not feature in these analyses; and
   - relate to patients with initial diagnosis of stroke.
5. The data presented for Victoria Hospital Kirkcaldy are combined with Queen Margaret Hospital data. Forth Valley Royal Hospital data include information from Stirling Community Hospital. Aberdeen Royal Infirmary data are combined with Woodend General Hospital. Glasgow Royal Infirmary data are combined with Stobhill Hospital. Royal Alexandra Hospital data are combined with Vale of Leven General Hospital.
6. Data for NHS Grampian is incomplete due to local data collection issues during 2012.
2 Future Plans

2.1 What have we achieved in 2012-2013?

The following progress has been made against the future plans described in last year’s report.

Launch of new web based IT system for collection of SSCA data (eSSCA):
eSSCA was successfully launched in June 2012 and is now used by all hospitals managing acute stroke patients across Scotland. eSSCA contains historical data from January 2010 to the present day. eSSCA has improved the quality of the data collected by incorporating robust validation. It also has an improved reporting facility allowing Health Boards to closely monitor their own performance against the stroke care standards and examine reasons why patients have breached the standards.

Launch of revised stroke care standards:
The Scottish Stroke Care Standards (originating from NHS QIS standards, 2009) were implemented in January 2013 as detailed in section 1.2.2 of this report.

Distribution of Monthly Reports/ quarterly HEAT Target Reports:
Distribution of Monthly Reports and quarterly HEAT Target Reports to Stroke MCNs reflecting activity for the previous month/ quarter and performance against standards continues. Clinicians and NHS managers use these reports to review processes of care and identify areas where improvement is required. The reports continue to be modified to maximise reliability and usefulness to the clinical teams.

Carotid Intervention data collection:
Collection of Carotid Intervention data began in July 2012. Analysis of these data is presented in section 6 of this report.

Rehabilitation Audit:
The SSCA Rehabilitation Subgroup (Dr C McAlpine (chair), K Brennan, T Jackson, M Smith and H Dodds) of the SSCA Steering Committee have progressed development of the rehabilitation dataset. The Rehabilitation Audit will be run as topical time limited sprint audits using the User Defined Fields built into eSSCA. The first set of questions is being finalised and will be piloted in a number of sites before being rolled out to all sites. A report detailing outcomes of the Rehabilitation Audit will be included in the 2014 National Report.

Organisational Audit:
The template for the Organisational Audit has been finalised and is being populated by stroke MCNs. It was agreed to collect information from acute and integrated Stroke Units in 2013 with inclusion of Stroke Rehabilitation Units in 2014. This audit will be carried out annually with an interim update during Health Board Annual Review meetings.

Pre-hospital care:
Development of a Pre-Hospital Dataset is ongoing. Work continues to marry data flows in the pre-hospital setting, i.e. Scottish Ambulance Service and NHS24. The proposal is to have a joined dataset held by ISD that can be linked to the SSCA data for further analysis of the patients’ pre-hospital journeys.
Thrombolysis pre-alerts

Over the past year it has become clear that there is variation in how pre-alert of FAST positive stroke patients is communicated to Accident & Emergency departments. Following a recent consultation with NHS24 and the Scottish Ambulance Service it was felt that a Scotland wide policy would not be particularly helpful and that the preferred option would be for stroke MCNs to develop a local pathway which meets the local need thus taking into account issues such as rurality and the set up of the local thrombolysis service.

This has been a priority action for the stroke MCNs since April 2013 and is being monitored through the ongoing review process.

Thanks to Dr Malcolm Alexander, Associate Medical Director, NHS24 and Katrina Brennan, MCN Manager, NHS Lanarkshire/ National Action Plan Coordinator, Scottish Government

2.2 What’s next in 2013-2014?

The SSCA National Meeting:
The 2013 SSCA Annual National Meeting will be held on Tuesday 3rd September 2013 at the Royal College of Physicians, Queen Street, Edinburgh. Further information can be found on the SSCA website (http://www.strokeaudit.scot.nhs.uk/Meetings/main.htm).

Stroke Care Bundles:
As noted in section 1.2.3 care bundles are an element of the Scottish Patient Safety Programme (SPSP) used as a structured way to improve processes of care and patient outcomes. As reported in the 2012 National Report some Health Boards have already developed stroke care bundles and others are working towards this.

We plan to develop a National Stroke Care Bundle in Scotland working in collaboration with the SPSP to improve the care of stroke patients in Scotland.

Rehabilitation Audit:
We will establish and continue the time limited sprint audits relating to the rehabilitation of stroke patients. We hope to provide analysis of rehabilitation data in the 2014 National Report.

Case note validation:
Case note validation will commence this year, with the Quality Assurance Manager putting in place an agreed process with Health Boards to carry out case note validation. This will allow confirmation of the accuracy of the SSCA data. Findings of case note validation will be shared in the 2014 National Report.

Pre-hospital care:
As noted in section 2.1 development of linkage of SAS, NHS24 and SSCA continues. Data are also being collected locally in relation to pre-alerts: this will be analysed and work will continue with the SAS to ensure consistency in pre-alerting across Scotland.

Ongoing redesign/ development of the SSCA:
Development of additional supporting documentation, e.g. Audit Protocol/ Training Materials.

Collaborative projects/ data linkage/ academic publications.
3 Inpatients

During 2012 data for about 8,000 patients admitted to hospital with a final diagnosis of stroke were entered into the SSCA - similar numbers to 2011.

3.1 Case ascertainment

A comparison was made between acute strokes captured in SSCA and emergency admissions with a principal diagnosis of stroke recorded in the Scottish Morbidity Record (SMR01) using ICD10 codes I61, I63 and I64.

This indicated that in some hospitals the number in SSCA exceeds that of SMR01. This could reflect a problem with routine coding, for instance if discharge summaries are not produced or do not include a clear diagnosis. However, it might reflect a problem with SSCA including patients who have not actually had a stroke. This might occur if there is insufficient local input by clinicians.

In other hospitals the number of patients with a SMR01 coded stroke exceeds those included in SSCA. This might reflect under-ascertainment in SSCA or miscoding of non strokes as strokes on the SMR01. However, even where the numbers are similar, these data do not tell us whether they are the same patients in both datasets.

Services should consider cross checking these data locally to establish the completeness of ascertainment in SSCA and the accuracy of routine coding. This process can indicate where there are problems which can then be addressed to improve the reliability of these data. For example, large differences between SSCA and SMR01 noted in the Royal Infirmary of Edinburgh have been examined. This indicated that the main cause was under ascertainment in the SSCA. This has led to improvements in the methods of ascertainment used and also regular checks against the SMR01 to ensure that ascertainment is improving.

3.2 Summary and key findings relating to inpatient data

The HEAT target encourages early admission to a Stroke Unit. The cumulative proportions of patients accessing Stroke Unit care by the day following admission (71% up to 80%) have increased in 2012/13 compared with 2010/11.

Several small hospitals perform well against this target because their only medical ward fulfils our definition of a Stroke Unit. For larger hospitals the standard is more challenging because stroke patients may be boarded and Stroke Unit beds may be filled with non stroke patients during periods of high bed demand. However, it is clear that there is considerable variation in how well hospitals manage their stroke beds.

Ayr, Crosshouse and the Southern General Hospitals have small numbers of hyper-acute stroke beds into which stroke patients are usually admitted on the day of admission. The acute stroke beds in the Southern General Hospital are in a building separate from the Emergency Department and medical beds, which offers a degree of protection from being filled by patients without stroke. The challenge in these hospitals is to discharge patients, or to move patients on to downstream Stroke Unit beds, to ensure a bed is always available. Whilst direct admission
is ideal, many hospitals do not have sufficient medical or nursing staff to make this safe out of
hours. Therefore, in many places, patients remain in medical admission units over night until the
next day. Of the larger hospitals only Ayr, Wishaw General, Hairmyres, Crosshouse, Southern
General, Monklands and Borders General Hospitals admitted >90% of stroke patients to their
Stroke Unit by the day following admission. Some larger hospitals, notably the Royal Infirmary
of Edinburgh, Royal Alexandra, Dr Gray’s Hospitals and Victoria Infirmary Glasgow fail to admit
more than 2/3 to their Stroke Units by the day following admission.

After the diagnosis of stroke has been made, a swallow assessment should be done early
to allow the patient to receive oral medication, and to take food and fluids. The result of this
assessment needs to be clearly recorded to ensure that patients who cannot swallow safely are
not put at risk by being given medication, fluids or food by mouth. The proportion of patients in
Scotland having a swallow screen on the day of admission has risen slightly, from 65% to 68%
between 2011 and 2012 (chart 3a and 4). However, no more than 50% of patients admitted to
Glasgow Royal Infirmary, Victoria Infirmary (Glasgow), Western Infirmary (Glasgow) and Royal
Alexandra Hospital had a swallow assessment documented on the day of admission. This is a
concern given the large numbers of patients involved.

An early brain scan is required to exclude alternative causes of stroke symptoms, for example,
subdural haematomas, and to distinguish strokes due to bleeding into the brain from those due
to blocked arteries. The standard in 2012 was that 80% should have a brain scan on the day
of admission. Only patients admitted to the Southern General Hospital, Glasgow and Western
Isles Hospital consistently had access to a brain scan on the day of admission (chart 3b and
5). Even though patients admitted to Ayr and Crosshouse Hospitals have very early access to
a Stroke Unit bed only a minority had a brain scan on the day of admission. Similarly Ninewells,
Monklands, Gilbert Bain, Inverclyde Royal, Crosshouse, Ayr, Royal Alexandra Hospitals and
Victoria Infirmary (Glasgow) scanned fewer than 50% on the day of admission despite having a
scanner on site.

From January 2013 the standard for brain scanning has changed to 90% within 24 hours since
exact time of admission and scan are now routinely collected. Also, hospitals have rightly argued
that scanning patients who arrive late in the evening may not always be necessary. These data
are shown in chart 6 on page 20. On the positive side it is clear that in many hospitals most
patients are scanned within 24 hours and in some hospitals most are scanned within 4 hours.

Once a brain scan has excluded a bleed into the brain, patients should receive aspirin as soon
as possible since this has been shown to improve outcomes. Exceptions are those who have
been given thrombolysis, are taking an anticoagulant or an alternative antiplatelet drug or those
who are allergic to aspirin. In 2012, 40%, 76% and 85% received aspirin on the day of admission,
the following day, or by day 2 respectively (chart 3c, 7 and 8). This is an improvement over
2011. However, in the Royal Alexandra Hospital fewer than 50% received aspirin, or any other
antiplatelet drug by day 2. In part this may be attributable to their delays in scanning patients.

There is considerable variation in performance against the individual national stroke standards
between hospitals. There is clearly scope for improving performance and the SSCA is working
with local teams to achieve this.
### 3.3 Stroke Unit Information

**Table 1: Stroke Unit Information**

<table>
<thead>
<tr>
<th>Hospital Name</th>
<th>Number of acute strokes discharged in 2012</th>
<th>Acute Stroke Unit (ASU) beds</th>
<th>Integrated Stroke Unit (ISU) beds</th>
<th>Rehab Stroke Unit (RSU) beds on acute site</th>
<th>RSU beds off acute site</th>
<th>Number of stroke bed days available per year</th>
<th>Mean length of stay (days)</th>
<th>Calculated no. stroke bed days needed per year</th>
<th>Comments (e.g. Off-site Locations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayr Hospital</td>
<td>318</td>
<td>15</td>
<td>0</td>
<td>15</td>
<td>0</td>
<td>10,980</td>
<td>22.8</td>
<td>7,261</td>
<td>All off site rehabilitation beds are at Ayrshire Central Hospital.</td>
</tr>
<tr>
<td>Crosshouse Hospital, Kilmarnock</td>
<td>310</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>15,006</td>
<td>25.5</td>
<td>7,899</td>
<td>Rehabilitation is within the community hospitals (4 of them) but not in dedicated stroke beds.</td>
</tr>
<tr>
<td>Borders General Hospital, Melrose</td>
<td>216</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>4,392</td>
<td>25.1</td>
<td>5,428</td>
<td>No designated stroke rehabilitation beds on acute site, there are 15 acute rehabilitation beds in DGRI and 24 rehabilitation beds at Galloway Community Hospital.</td>
</tr>
<tr>
<td>Dumfries &amp; Galloway Royal Infirmary (DGRI)</td>
<td>247</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3,294</td>
<td>14.5</td>
<td>3,588</td>
<td>There are 4 designated cottage hospitals which provide rehabilitation across the region. Total beds = 93, none designated for stroke.</td>
</tr>
<tr>
<td>Galloway Community Hospital (GCH)</td>
<td>61</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>366</td>
<td>22.4</td>
<td>1,369</td>
<td></td>
</tr>
<tr>
<td>Hospital Name</td>
<td>Number of acute strokes discharged in 2012</td>
<td>Acute Stroke Unit (ASU) beds</td>
<td>Integrated Stroke Unit (ISU) beds</td>
<td>Rehab Stroke Unit (RSU) beds on acute site</td>
<td>RSU beds off acute site</td>
<td>Number of stroke bed days available per year</td>
<td>Mean length of stay (days)</td>
<td>Calculated no. stroke bed days needed per year</td>
<td>Comments (e.g. Off-site Locations)</td>
</tr>
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<td>----------------------------</td>
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<td>----------------------------------</td>
</tr>
<tr>
<td>Victoria Hospital, Kirkcaldy (VHK)</td>
<td>559</td>
<td>0</td>
<td>24</td>
<td>0</td>
<td>38</td>
<td>22,692</td>
<td>28.7</td>
<td>16,032</td>
<td>QMH Ward 6 - 12 beds within 30 bedded general rehabilitation ward; QMH Ward 5 has 8 beds for slow-stream rehabilitation. Letham ward Cameron Hospital - 12 funded beds but currently operating 14 (rehabilitation for over 65) Sir George Sharp Unit (rehabilitation for under 65) 6 to 7 out of 12 beds.</td>
</tr>
<tr>
<td>Forth Valley Royal Hospital, Larbert (FVRH)</td>
<td>463</td>
<td>0</td>
<td>30</td>
<td>0</td>
<td>10</td>
<td>14,640</td>
<td>25.1</td>
<td>11,602</td>
<td>There are 10 stroke rehabilitation beds located on the Stirling Community Hospital site.</td>
</tr>
<tr>
<td>Aberdeen Royal Infirmary (ARI)</td>
<td>452</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>40</td>
<td>20,496</td>
<td>29.6</td>
<td>13,372</td>
<td>Woodend - SRU: 34 beds Fraserburgh - SRU: 6 beds</td>
</tr>
<tr>
<td>Dr Gray’s Hospital, Elgin</td>
<td>87</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>2,928</td>
<td>22.4</td>
<td>1,953</td>
<td></td>
</tr>
<tr>
<td>Glasgow Royal Infirmary (GRI)</td>
<td>545</td>
<td>38</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>18,300</td>
<td>22.5</td>
<td>12,261</td>
<td>Full range of diagnostic services, and off site beds available in Stobhill Hospital</td>
</tr>
<tr>
<td>Inverclyde Royal Hospital, Greenock (IRH)</td>
<td>214</td>
<td>0</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>6,222</td>
<td>21.3</td>
<td>4,566</td>
<td></td>
</tr>
<tr>
<td>Royal Alexandra Hospital, Paisley (RAH)</td>
<td>427</td>
<td>0</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>10,980</td>
<td>20.9</td>
<td>8,937</td>
<td></td>
</tr>
<tr>
<td>Southern General Hospital, Glasgow (SGH)</td>
<td>429</td>
<td>4</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>12,444</td>
<td>24.4</td>
<td>10,479</td>
<td></td>
</tr>
<tr>
<td>Victoria Infirmary, Glasgow</td>
<td>144</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>7,320</td>
<td>26.6</td>
<td>3,834</td>
<td></td>
</tr>
<tr>
<td>Hospital Name</td>
<td>Number of acute strokes discharged in 2012</td>
<td>Acute Stroke Unit (ASU) beds</td>
<td>Integrated Stroke Unit (ISU) beds</td>
<td>Rehab Stroke Unit (RSU) beds on acute site</td>
<td>RSU beds off acute site</td>
<td>Number of stroke bed days available per year</td>
<td>Mean length of stay (days)</td>
<td>Calculated no. stroke bed days needed per year</td>
<td>Comments (e.g. Off-site Locations)</td>
</tr>
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<td>---------------------------------------------------</td>
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<td>-----------------------------------------------</td>
<td>--------------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Western Infirmary/ Gartnavel General, Glasgow (WIG)</td>
<td>465</td>
<td>14</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>12,444</td>
<td>23.4</td>
<td>10,881</td>
<td>Full range of diagnostic emergency response services and off site beds available on GGH site</td>
</tr>
<tr>
<td>Belford Hospital, Fort William</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>22.3</td>
<td>893</td>
<td></td>
</tr>
<tr>
<td>Caithness General Hospital, Wick</td>
<td>48</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>19.5</td>
<td>935</td>
<td></td>
</tr>
<tr>
<td>Lorn &amp; Islands Hospital, Oban</td>
<td>30</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2,196</td>
<td>21.3</td>
<td>640</td>
<td></td>
</tr>
<tr>
<td>Raigmore Hospital, Inverness</td>
<td>330</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8,052</td>
<td>24.1</td>
<td>7,957</td>
<td></td>
</tr>
<tr>
<td>Hairmyres Hospital, East Kilbride</td>
<td>251</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>7,320</td>
<td>11.7</td>
<td>2,936</td>
<td></td>
</tr>
<tr>
<td>Monklands Hospital, Coatbridge</td>
<td>270</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>7,320</td>
<td>10.8</td>
<td>2,904</td>
<td></td>
</tr>
<tr>
<td>Wishaw General Hospital</td>
<td>279</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>7,320</td>
<td>15.5</td>
<td>4,329</td>
<td></td>
</tr>
<tr>
<td>Royal Infirmary of Edinburgh at Little France (RIE)</td>
<td>469</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>41</td>
<td>23,058</td>
<td>35.1</td>
<td>16,454</td>
<td>19 - Liberton Hospital; 22 - Astley Ainslie Hospital</td>
</tr>
<tr>
<td>St John's Hospital, Livingston (SJH)</td>
<td>180</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>7,320</td>
<td>28.2</td>
<td>5,076</td>
<td></td>
</tr>
<tr>
<td>Western General Hospital, Edinburgh (WGH)</td>
<td>244</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>14,640</td>
<td>36.6</td>
<td>8,941</td>
<td>In June 2012, 26 beds offsite at Royal Victoria Hospital moved to WGH site, and an integrated stroke unit with 40 beds was created in Dec 2012.</td>
</tr>
<tr>
<td>Hospital Name</td>
<td>Number of acute strokes discharged in 2012</td>
<td>Acute Stroke Unit (ASU) beds</td>
<td>Integrated Stroke Unit (ISU) beds</td>
<td>Rehab Stroke Unit (RSU) beds on acute site</td>
<td>RSU beds off acute site</td>
<td>Number of stroke bed days available per year</td>
<td>Mean length of stay (days)</td>
<td>Calculated no. stroke bed days needed per year</td>
<td>Comments (e.g. Off-site Locations)</td>
</tr>
<tr>
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<td>---------------------------------------------</td>
<td>--------------------------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Balfour Hospital, Orkney</td>
<td>23</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>36.5</td>
<td>839</td>
<td>No specific stroke beds. but beds will be made available within Assessment and Rehabilitation Unit when needed.</td>
</tr>
<tr>
<td>Gilbert Bain Hospital, Shetland</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>17.4</td>
<td>486</td>
<td></td>
</tr>
<tr>
<td>Ninewells Hospital, Dundee</td>
<td>459</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6,588</td>
<td>17.0</td>
<td>7,823</td>
<td>18 beds (acute in shared ward to Dec 2012) 14 Beds (single specialty from Dec 2012)</td>
</tr>
<tr>
<td>Perth Royal Infirmary (PRI)</td>
<td>190</td>
<td>0</td>
<td>24</td>
<td>0</td>
<td>0</td>
<td>8,784</td>
<td>31.9</td>
<td>6,054</td>
<td>Stracathro has 10 rehabilitation beds for stroke. RVH, Dundee has 40 generic rehabilitation beds.</td>
</tr>
<tr>
<td>Uist &amp; Barra Hospital, Benbecula</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3.6</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Western Isles Hospital (WIH)</td>
<td>26</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>2,196</td>
<td>22.4</td>
<td>583</td>
<td></td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>7,809</strong></td>
<td><strong>186</strong></td>
<td><strong>321</strong></td>
<td><strong>15</strong></td>
<td><strong>181</strong></td>
<td><strong>257,298</strong></td>
<td><strong>23.9</strong></td>
<td><strong>186,330</strong></td>
<td></td>
</tr>
</tbody>
</table>

Note: For the purpose of the SSCA and as presented in the table above, length of stay (LOS) is calculated according to the SSCA data definitions document, i.e. record the discharge date at the end of all care for that stroke event. This will include acute care and any period of stroke rehabilitation including that undertaken in a general rehabilitation unit but will not include slow stream rehabilitation or medicine of the elderly, NHS continuing care, transfer to ‘boarding bed’ or transfer due to other overriding diagnosis (for further information see www.strokeaudit.scot.nhs.uk).
3.4 Hospital Data

This section presents performance of hospitals against the NHS QIS stroke care standards in a Red, Amber, Green or traffic light (RAG) chart format. Performance (decline, no change or improvement against the previous year), is measured on statistically significant change at the 95% confidence level (if one was to measure performance 100 times, one’s confidence interval would be expected to include the true proportion 95 out of these 100 times). Charts illustrating performance across the NHS QIS stroke care standards for swallow screen, brain scan, aspirin and outpatients in 2011 and 2012, grouped by hospital, are given below, while the charts grouped by Health Board can be found on the SSCA website (www.strokeaudit.scot.nhs.uk).

This methodology was initially adopted for the first time in 2012, using a conservative approach for measuring differences, an improvement on the previous measurement used. The approach used will be reviewed further prior to the publication of the 2014 National Report.

Differences in performance may reflect real differences in the process of care but also differences in the way these data were collected between hospitals or over time. Although we have attempted to standardise the methods of case ascertainment, data extraction, definition of variables, data entry and analysis, inevitably individuals responsible for aspects of the audit were not always able to adhere strictly to the standards often for very practical reasons. The data used to calculate the figures presented in the charts below can be found in excel tables on the SSCA website (www.strokeaudit.scot.nhs.uk).

Key to charts:

- 2011 results
- 2012 results: statistically significant improvement since 2011
- 2012 results: no statistically significant change since 2011
- 2012 results: statistically significant decline in performance since 2011

Notes regarding charts 3a-d:

1. The data included in charts 3a-d:
   - were extracted from eSSCA on the 27 March 2013. Changes/ updates to the data following this date will therefore not feature in these analyses;
   - relate to patients with final diagnosis of stroke; and
   - are for calendar years 2011 and 2012 (i.e. 1 January – 31 December).
2. Data for NHS Grampian is incomplete due to local data collection issues during 2012.
3. The data presented for Victoria Hospital Kirkcaldy are combined with Queen Margaret Hospital data. Forth Valley Royal Hospital data include information from Stirling Community Hospital. Aberdeen Royal Infirmary data are combined with Woodend General Hospital. Glasgow Royal Infirmary data are combined with Stobhill Hospital. Royal Alexandra Hospital data are combined with Vale of Leven General Hospital.
Charts 3a – 3d: Performance against NHS QIS stroke care standards for swallow screen, brain scan and aspirin, by hospital, 2011 and 2012 data (based on final diagnosis)

3a. Percentage of stroke patients with a swallow screening on day of admission, 2011 and 2012 data (based on final diagnosis)

Horizontal line reflects NHS QIS standard (2009) of 100% of stroke patients swallow screened on day of admission.

3b. Percentage of stroke patients with a brain scan on day of admission, 2011 and 2012 data (based on final diagnosis)

Horizontal line reflects NHS QIS standard (2009) of 80% of stroke patients to receive brain imaging on day of admission.

Notes regarding chart 3b:
1. Balfour Hospital, NHS Orkney does not have a CT scanner. Patients are airlifted to Aberdeen Royal Infirmary and a proportion arrive in sufficient time to have brain imaging within the required NHS QIS standard.
2. Uist & Barra Hospital, NHS Western Isles does not have a CT scanner. Patients are airlifted to Western Isles Hospital and a proportion arrive in sufficient time to have brain imaging within the required NHS QIS standard.
3c. Percentage of acute ischaemic stroke patients given aspirin in hospital within one day of admission, 2011 and 2012 data (based on final diagnosis)

Horizontal line reflects NHS QIS standard (2009) of 100% of ischaemic stroke patients to receive aspirin within one day of admission.

Notes regarding chart 3c:
1. The denominator for the percentages excludes patients with valid contraindications to aspirin. New contraindications were introduced in 2012, e.g. end of life pathway, post thrombolysis bleed and admitted already on alternative antiplatelet.

3d. Percentage of patients with definite cerebrovascular diagnosis seen in neurovascular clinic with referral to examination time within 7 days, 2011 and 2012 data

Horizontal line reflects NHS QIS standard (2009) of 80% of stroke patients being seen in neurovascular clinic within 7 days of receipt of referral.

Notes regarding chart 3d:
1. Data presented are for hospitals using eSSCA where all relevant dates (last event, referral, referral-received, appointment and examination) are present and ordered chronologically.
2. The following hospitals either do not hold specialist neurovascular clinics or do not collect and submit data to SSCA – Caithness, SGH, WIG, GCH, Belford, GRI, IRH, VI Glasgow, RAH, RIE, Balfour, Gilbert Bain and Uist & Barra.
Chart 4: Percentage of stroke patients with a swallow screening by number of days to swallow screening, 2012 data (based on final diagnosis)

Horizontal line reflects NHS QIS standard (2009) of 100% of stroke patients swallow screened on day of admission.

Notes regarding chart 4:
1. The data presented for Victoria Hospital Kirkcaldy are combined with Queen Margaret Hospital data. Forth Valley Royal Hospital data include information from Stirling Community Hospital. Aberdeen Royal Infirmary data are combined with Woodend General Hospital. Glasgow Royal Infirmary data are combined with Stobhill Hospital. Royal Alexandra Hospital data are combined with Vale of Leven General Hospital.

Chart 5: Percentage of stroke patients with a brain scan by number of days to scanning, 2012 data (based on final diagnosis)

Horizontal line reflects NHS QIS standard (2009) of 80% of stroke patients to receive brain imaging on day of admission.

Notes regarding chart 5:
1. Balfour Hospital, NHS Orkney does not have a CT scanner. Patients are airlifted to Aberdeen Royal Infirmary and a proportion arrive in sufficient time to have brain imaging within the required NHS QIS standard.
2. Uist & Barra Hospital, NHS Western Isles does not have a CT scanner. Patients are airlifted to Western Isles Hospital and a proportion arrive in sufficient time to have brain imaging within the required NHS QIS standard.
3. The data presented for Victoria Hospital Kirkcaldy are combined with Queen Margaret Hospital data. Forth Valley Royal Hospital data include information from Stirling Community Hospital. Aberdeen Royal Infirmary data are combined with Woodend General Hospital. Glasgow Royal Infirmary data are combined with Stobhill Hospital. Royal Alexandra Hospital data are combined with Vale of Leven General Hospital.
Chart 6: Percentage of stroke patients with a brain scan by number of hours to scan compared to percentage scanned same day, 2012 data (based on final diagnosis)

Horizontal dashed line reflects NHS QIS standard (2009) of 80% of stroke patients to receive brain imaging on day of admission.
Horizontal solid line reflects Scottish Stroke Care Standard (2013) of 90% of stroke patients to receive brain imaging within 24 hours of admission.

Notes regarding chart 6:
1. The data presented for Victoria Hospital Kirkcaldy are combined with Queen Margaret Hospital data. Forth Valley Royal Hospital data include information from Stirling Community Hospital. Aberdeen Royal Infirmary data are combined with Woodend General Hospital. Glasgow Royal Infirmary data are combined with Stobhill Hospital. Royal Alexandra Hospital data are combined with Vale of Leven General Hospital.
2. Balfour Hospital, NHS Orkney does not have a CT scanner. Patients are airlifted to Aberdeen Royal Infirmary and a proportion arrive in sufficient time to have brain imaging within the required NHS QIS standard.
3. Uist & Barra Hospital, NHS Western Isles does not have a CT scanner. Patients are airlifted to Western Isles Hospital and a proportion arrive in sufficient time to have brain imaging within the required NHS QIS standard.
Chart 7: Percentage of acute ischaemic stroke patients given aspirin in hospital by number of days to receipt, 2012 data (based on final diagnosis)

Horizontal line reflects NHS QIS standard (2009) of 100% of ischaemic patients to receive aspirin within 1 day of admission. The denominator for the percentages excludes patients with valid contraindications to aspirin. New contraindications were introduced in 2012, e.g. end of life pathway, post thrombolysis bleed and admitted already on alternative antplatelet.

Notes regarding chart 7:
1. The data presented for Victoria Hospital Kirkcaldy are combined with Queen Margaret Hospital data. Forth Valley Royal Hospital data include information from Stirling Community Hospital. Aberdeen Royal Infirmary data are combined with Woodend General Hospital. Glasgow Royal Infirmary data are combined with Stobhill Hospital. Royal Alexandra Hospital data are combined with Vale of Leven General Hospital.

Chart 8: Percentage of ischaemic patients given aspirin or alternative antplatelets within 1 day of admission, 2012 data (based on final diagnosis)

Horizontal line reflects NHS QIS standard (2009) of 100% of ischaemic patients to receive aspirin within 1 day of admission. The denominator for the percentages excludes patients with valid contraindications to aspirin except those with Known Allergy who are included to allow the aspirin and antplatelet groups to be combined. This may result in a reduction in the percentages when compared to chart 7 (aspirin-only) since the two denominator groups are not absolutely identical.

Notes regarding chart 8:
1. Lanarkshire 2012 data are based on the period Jul-Dec 2012. Detailed information relating to contraindications and antplatelets was not previously collected in SAIL. This means the overall number of cases for 2012 in chart 8 is less than the aspirin total in chart 7.
2. The data presented for Victoria Hospital Kirkcaldy are combined with Queen Margaret Hospital data. Forth Valley Royal Hospital data include information from Stirling Community Hospital. Aberdeen Royal Infirmary data are combined with Woodend General Hospital. Glasgow Royal Infirmary data are combined with Stobhill Hospital. Royal Alexandra Hospital data are combined with Vale of Leven General Hospital.
4 Outpatients

4.1 Summary and key findings relating to outpatient data

The number of hospitals collecting TIA clinic data has increased in 2012, with Dr Gray’s in Elgin now contributing data. However, several hospitals still find that they are unable to contribute comprehensive outpatient data – most notably those in Greater Glasgow & Clyde.

Data were collected on 4,092 patients with acute cerebrovascular disease seen in the TIA clinics contributing data in 2012, compared with 4,335 in 2011.

Access to early TIA/stroke clinics has been maintained. The percentage seen within 7 days of receipt of a referral was 91%, exceeding the NHS QIS standard of 80% (chart 3d and chart 9). This is an improvement from 86% in 2011. However, there is still variation between Health Boards and hospitals which means that some hospitals need to reduce delays. All hospitals contributing data exceed the current standard of 7 days except for Raigmore (NHS Highland), Dr Gray’s (NHS Grampian) and St John’s Hospitals (NHS Lothian). Hairmyres (NHS Lanarkshire), Stracathro Hospitals and Perth Royal Infirmary (NHS Tayside) have reduced the delays substantially in the last year (chart 3d).
4.2 Hospital data

Chart 9: Percentage of patients with definite cerebrovascular diagnosis seen in neurovascular clinic with referral to examination time (days): same day and within 1, 2-4 and 5-7 days, 2012 data

Horizontal line reflects NHS QIS standard (2009) of 80% of TIA patients are seen in a neurovascular clinic within 7 days of receipt of referral.

The following hospitals either do not hold specialist neurovascular clinics or do not collect and submit data to SSCA – Caithness, SGH, WIG, GCH, Belford, GRI, IRH, VI Glasgow, RAH, RIE, Balfour, Gilbert Bain and Uist & Barra.

For those hospitals using eSSCA where all relevant dates (last event, referral, referral-received, appointment and examination) are present and ordered chronologically.

Notes regarding chart 9:
1. Forth Valley Royal Hospital data include information from Stirling Community Hospital.

4.3 The future

There is increasing evidence that very early initiation of treatments to reduce the risk of stroke after TIA, and minor strokes, is more effective than later treatment. Hospitals will therefore need to strive for even shorter delays. The new Scottish Stroke Care Standard introduced in January 2013 is for 80% of patients to be seen within 4 days of receipt of referral. Chart 9 shows the delays to clinic assessment, broken down into same day, 1, 2-4 and 5-7 days. Based on performance in 2012, only the clinics at Ayr, Forth Valley Royal, Wishaw General, Western General, Ninewells and Western Isles Hospitals will meet this new standard. Other hospitals may have to redesign their services. Perhaps by further streamlining the referral processes and running more frequent clinics. Alternatively, more patients might be seen by stroke specialists in emergency departments, and by-pass the TIA clinic system. The SSCA does have a facility for counting patients managed in this way. However, to be effective, patients attending the emergency department need early access to relevant investigations including carotid Duplex and brain scans if they are not to be disadvantaged.
5 Thrombolysis

5.1 Summary and key findings relating to thrombolysis

Treatment within four and a half hours of ischaemic stroke with a clot-dissolving treatment (recombinant tissue plasminogen activator (rtPA)) is effective for selected patients with acute ischaemic stroke. Based on pooled study data, it is estimated that, between 5 and 10 extra people per 100 treated with thrombolysis are independent 3-6 months later. The earlier the medication can be administered, the more likely the patient is to have a good outcome.

Data on all patients thrombolysed in Scotland have been entered into the SSCA prospectively since January 2010, with retrospective data collected for 2009. The NHS QIS standard revised in June 2009 was for a treatment rate of at least 5 patients per 100,000 population per year. If there are 8,000 new ischaemic strokes per year in Scotland, this equates to at least 3% of all new patients. This report includes an overview of the delivery of rtPA from 2009 to 2012.

Table 2: Thrombolysis - numbers thrombolysed, 2009-2012 data

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Number of patients receiving thrombolysis in 2012</th>
<th>Number of patients receiving thrombolysis in 2011</th>
<th>Number of patients receiving thrombolysis in 2010</th>
<th>Number of patients receiving thrombolysis in 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scotland summary</td>
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<td>649</td>
<td>543</td>
<td>411</td>
</tr>
<tr>
<td>Ayrshire &amp; Arran</td>
<td>28</td>
<td>16</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Ayr Hospital</td>
<td>15</td>
<td>11</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Crosshouse Hospital, Kilmarnock</td>
<td>13</td>
<td>5</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Borders</td>
<td>11</td>
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</tr>
<tr>
<td>Borders General Hospital, Melrose</td>
<td>11</td>
<td>9</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Dumfries &amp; Galloway</td>
<td>26</td>
<td>15</td>
<td>21</td>
<td>4</td>
</tr>
<tr>
<td>Dumfries &amp; Galloway Royal Infirmary (DGRI)</td>
<td>23</td>
<td>11</td>
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</tr>
<tr>
<td>Galloway Community Hospital (GCH)</td>
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<td>4</td>
<td>1</td>
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<td>Fife</td>
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<td>33</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
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<td>18</td>
<td>8</td>
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<tr>
<td>Forth Valley</td>
<td>21</td>
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<td>13</td>
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<td>Forth Valley Royal Hospital, Larbert (FVRH)</td>
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<td>10</td>
<td>13</td>
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<td>Grampian</td>
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<td>98</td>
<td>74</td>
<td>77</td>
</tr>
<tr>
<td>Aberdeen Royal Infirmary (ARI)</td>
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<td>70</td>
<td>68</td>
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<tr>
<td>Dr Gray’s Hospital, Elgin</td>
<td>6</td>
<td>13</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Greater Glasgow &amp; Clyde</td>
<td>192</td>
<td>194</td>
<td>211</td>
<td>193</td>
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<td>Glasgow Royal Infirmary (GRI)</td>
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<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Inverclyde Royal Hospital, Greenock (IRH)</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hospital</td>
<td>Number of patients receiving thrombolysis in 2012</td>
<td>Number of patients receiving thrombolysis in 2011</td>
<td>Number of patients receiving thrombolysis in 2010</td>
<td>Number of patients receiving thrombolysis in 2009</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Royal Alexandra Hospital, Paisley (RAH)</td>
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<td>4</td>
<td>7</td>
<td>5</td>
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<tr>
<td>Southern General Hospital, Glasgow (SGH)</td>
<td>90</td>
<td>86</td>
<td>103</td>
<td>109</td>
</tr>
<tr>
<td>Victoria Infirmary, Glasgow</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Western Infirmary/Gartnavel General, Glasgow (WIG)</td>
<td>96</td>
<td>104</td>
<td>100</td>
<td>79</td>
</tr>
<tr>
<td>Highland</td>
<td>35</td>
<td>48</td>
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<td>34</td>
</tr>
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<td>Belford Hospital, Fort William</td>
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<td>3</td>
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<td>0</td>
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<tr>
<td>Caithness General Hospital, Wick</td>
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<td>5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Lorn &amp; Islands Hospital, Oban</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Raigmore Hospital, Inverness</td>
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<td>34</td>
<td>32</td>
</tr>
<tr>
<td>Lanarkshire</td>
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<td>53</td>
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</tr>
<tr>
<td>Hairmyres Hospital, East Kilbride</td>
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<td>Monklands Hospital, Coatbridge</td>
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<td>0</td>
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<tr>
<td>Wishaw General Hospital</td>
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<td>24</td>
<td>24</td>
<td>13</td>
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<tr>
<td>Lothian</td>
<td>73</td>
<td>73</td>
<td>81</td>
<td>43</td>
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<tr>
<td>Royal Infirmary of Edinburgh at Little France (RIE)</td>
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<td>23</td>
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<td>0</td>
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<td>0</td>
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<td>Shetland</td>
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<td>0</td>
</tr>
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<td>Gilbert Bain Hospital, Shetland</td>
<td>-</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tayside</td>
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<td>79</td>
<td>29</td>
<td>18</td>
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<tr>
<td>Ninewells Hospital, Dundee</td>
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<td>Perth Royal Infirmary (PRI)</td>
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<td>0</td>
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<td>1</td>
</tr>
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<td>Uist &amp; Barra Hospital, Benbecula</td>
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<tr>
<td>Western Isles Hospital (WIH)</td>
<td>10</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes regarding table 2:
1. Records are included if a thrombolysis date is present; a small proportion of these records will not have an associated thrombolysis time recorded.
2. Data for this table is derived from the ‘admission hospital’ field (inpatient dataset). There is one patient noted on table 2 for Glasgow Royal Infirmary. This was an in-hospital stroke patient who was transferred to the Western Infirmary Glasgow for thrombolysis.

In order to view these data in the context of the local demand (in particular population size and likely clinical need) we have expressed these results in terms of the population in each region. The original annual standard of 5 thrombolysis treatments per 100,000 population was exceeded in 2009 and the crude rate now stands at 12 for Scotland with modest variation between regions. This has plateaued with little difference in rates between 2011 and 2012.
Table 3: Thrombolysis - numbers thrombolysed and crude rate per 100,000 by NHS board of residence of patient, 2012 data

<table>
<thead>
<tr>
<th>Health Board of Residence¹</th>
<th>Number of patients receiving thrombolysis in 2012</th>
<th>Mid-Year Population Estimate² 2011</th>
<th>Crude Rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scotland</td>
<td>626</td>
<td>5,254,800</td>
<td>11.9</td>
</tr>
<tr>
<td>Ayrshire &amp; Arran</td>
<td>46</td>
<td>366,890</td>
<td>12.5</td>
</tr>
<tr>
<td>Borders</td>
<td>10</td>
<td>113,150</td>
<td>8.8</td>
</tr>
<tr>
<td>Dumfries &amp; Galloway</td>
<td>23</td>
<td>148,060</td>
<td>15.5</td>
</tr>
<tr>
<td>Fife</td>
<td>38</td>
<td>367,292</td>
<td>10.3</td>
</tr>
<tr>
<td>Forth Valley</td>
<td>24</td>
<td>295,541</td>
<td>8.1</td>
</tr>
<tr>
<td>Grampian</td>
<td>73</td>
<td>555,280</td>
<td>13.1</td>
</tr>
<tr>
<td>Greater Glasgow &amp; Clyde</td>
<td>157</td>
<td>1,210,254</td>
<td>13.0</td>
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<td>Highland</td>
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</tr>
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<td>Lothian</td>
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<td>7.9</td>
</tr>
<tr>
<td>Orkney³</td>
<td>6</td>
<td>20,160</td>
<td>29.8</td>
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<tr>
<td>Shetland</td>
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<td>0.0</td>
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<td>Tayside</td>
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</tr>
<tr>
<td>Western Isles</td>
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<tr>
<td>Outside Scotland/ Not Known/ Other</td>
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<td>-</td>
</tr>
</tbody>
</table>

Notes regarding table 3:
1. A small proportion of records could not be assigned to a Health Board because they were either for non-Scottish residents or there was insufficient information to allow their assignment to a Health Board (e.g. partial or incorrect postcode).
2. Latest available population estimates from National Records of Scotland (formerly General Register Office for Scotland, which merged with National Archives of Scotland from 1st April 2011).
3. There are six patients in table 3 for NHS Orkney. Patients from NHS Orkney are airlifted to NHS Grampian and some patients will arrive in time to have thrombolysis, but they are included in the NHS Grampian data as they are admitted to Aberdeen Royal Infirmary for treatment. Table 3 presents those receiving thrombolysis by Health Board of residence.

The numbers (percentage) of stroke patients being treated with rtPA initially increased between 2009 and 2011, reflecting improved service provision and extension of the time window to 4.5 hours. Rates have stabilised at 12 per 100,000 population and exceed the current standard (table 4).

Over the past three years regional variation has reduced, reflecting service expansion, increased use of telemedicine and increasing clinician confidence. However, service provision is not yet equal across Scotland.

Table 4: Thrombolysis - numbers thrombolysed as percentage of stroke patients, and as a rate per 100,000 total population, Scotland, 2008-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of patients thrombolysed (numerator)</th>
<th>Number of stroke patients (denominator)</th>
<th>Percentage</th>
<th>Number of patients per 100,000 (target is 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>260</td>
<td>8,439</td>
<td>3%</td>
<td>5</td>
</tr>
<tr>
<td>2009</td>
<td>411</td>
<td>8,012</td>
<td>5%</td>
<td>8</td>
</tr>
<tr>
<td>2010</td>
<td>543</td>
<td>8,478</td>
<td>6%</td>
<td>10</td>
</tr>
<tr>
<td>2011</td>
<td>649</td>
<td>8,232</td>
<td>8%</td>
<td>12</td>
</tr>
<tr>
<td>2012</td>
<td>658</td>
<td>8,013</td>
<td>8%</td>
<td>12</td>
</tr>
</tbody>
</table>
Across Scotland, only 29% of patients are treated with rtPA within one hour of arrival at hospital (chart 10), with little improvement from 2011. No hospital is achieving the standard of 80% treated within one hour of admission. This is an area which will require attention nationally, with review of service delivery pathways (chart 11).

**Chart 10: Thrombolysis – percentage of patients with door-to-needle times: within 1 and 1.5 hours, 2012 data**

Horizontal line reflects NHS QIS standard (2009) 80% of stroke patients thrombolysed within 1 hour of arrival at first hospital.

**Notes regarding chart 10:**
1. Hospitals shown are those that provide a thrombolysis service. See table 2 for further details. Records included must have date and time of arrival at first hospital and date and time of thrombolysis to permit the calculation of time to thrombolysis and a small proportion of records are missing these data items.
2. Some percentages are based on very small numbers (see numbers in brackets on axis) and should be interpreted with caution.
3. Some hospitals (e.g. Southern General Hospital) receive patients transferred from neighbouring Health Boards which will affect their onset-to-needle time performance.
4. Chart 10 excludes two patients thrombolysed at Ayr Hospital for whom detailed information was not available in time for inclusion in this chart.
5. Two patients appear on chart 10 for Glasgow Royal Infirmary (GRI). During the quality assurance process it was noted that one had been thrombolysed and admitted to the Western Infirmary Glasgow (WIG - data entry issue) and the other was an in-hospital stroke at GRI who was transferred to the WIG for thrombolysis.
Chart 11: Mean times from onset of stroke to brain imaging and thrombolysis for patients receiving thrombolysis, 2012 data

Notes regarding chart 11:
1. Hospitals shown are those that provide a thrombolysis service. See table 2 for further details. Records included must have a valid date and time of onset, arrival at first hospital, brain imaging and thrombolysis to permit the calculation of time to thrombolysis and a small proportion of records are missing these data items, therefore numbers may differ from chart 10.
2. Some percentages are based on very small numbers (see numbers in brackets on axis) and should be interpreted with caution.
3. Some hospitals (e.g. Southern General Hospital) receive patients transferred from neighbouring Health Boards which will affect their onset-to-needle time performance.
4. One patient appears on chart 11 for Glasgow Royal Infirmary (GRI). This was an in-hospital stroke at GRI who was transferred to the Western Infirmary Glasgow for thrombolysis.

While data on outcomes are not included in this report, initial analysis of 2010 and 2011 data corrected for stroke severity show improved outcomes up to a year after stroke. These data are being prepared for publication.

5.2 Thrombolysis pre-alerts

Over the past year it has become clear that there is variation in how pre alert of FAST positive stroke patients is communicated to Accident & Emergency departments. Following a recent consultation with NHS24 and the Scottish Ambulance Service it was felt that a Scotland wide policy would not be particularly helpful and that the preferred option would be for stroke MCNs to develop a local pathway which meets with the local need thus taking into account issues such as rurality and the set up of the local thrombolysis service.

This has been a priority action for the stroke MCNs since April 2013 and is being monitored through the ongoing review process.
6 Carotid Intervention

6.1 Background

Carotid endarterectomy is a prophylactic procedure performed for stroke prevention. The evidence base for effectiveness is strong and it therefore follows that the need for quality control is strong. In the majority of cases, the indication to intervene is a clinical event in the relevant cerebral territory in a patient who has made good or complete recovery from the neurological or ocular event. The effectiveness of the procedure diminishes as time passes following this index event, most benefit being derived from a procedure performed within 14 days. For these reasons audit of the process as well as the outcomes associated with this invasive procedure is highly desirable.

Estimates of the numbers of procedures performed based upon SMR01 data are likely to be accurate, although likely errors within a non-validated dataset mean that estimated outcomes will be less than 100% reliable and should not be published without cross-checking each case.

6.2 Summary and key findings relating to carotid intervention

The SSCA commenced collecting carotid intervention data on 1 July 2012. The data are entered by participating hospitals into eSSCA. The presented data are the first attempt at reporting carotid intervention within the SSCA National Report. Naturally, conclusions drawn will be limited as the data extraction process is new and incomplete, and should be interpreted with caution.

Table 5: Carotid Endarterectomy - numbers of patients receiving a carotid endarterectomy in acute hospitals in Scotland during Jul-Dec 2012

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aberdeen Royal Infirmary</td>
<td>10</td>
</tr>
<tr>
<td>Ayr Hospital</td>
<td>27</td>
</tr>
<tr>
<td>Dumfries &amp; Galloway Royal Infirmary</td>
<td>18</td>
</tr>
<tr>
<td>Forth Valley Royal Hospital, Larbert (FVRH)</td>
<td>20</td>
</tr>
<tr>
<td>Hairmyres Hospital, East Kilbride</td>
<td>20</td>
</tr>
<tr>
<td>Ninewells Hospital, Dundee</td>
<td>16</td>
</tr>
<tr>
<td>Raigmore Hospital, Inverness</td>
<td>19</td>
</tr>
<tr>
<td>Royal Infirmary of Edinburgh at Little France (RIE)</td>
<td>38</td>
</tr>
<tr>
<td>Southern General Hospital, Glasgow</td>
<td>16</td>
</tr>
<tr>
<td>Victoria Hospital, Kirkcaldy (VHK)</td>
<td>5</td>
</tr>
<tr>
<td>Western Infirmary/Gartnavel General, Glasgow (WIG)</td>
<td>44</td>
</tr>
<tr>
<td>Scotland</td>
<td>234</td>
</tr>
</tbody>
</table>

Notes regarding table 5:
1. These data are derived from SMR01 (database of inpatient and day case discharge summaries from acute hospitals in Scotland).
2. Operations are recorded using the Office of Population Census and Surveys (OPCS4) classification of interventions and procedures. The table is based on the relevant OPCS4 codes (L294, L295) being mentioned in the discharge summary as primary operations.
3. One patient was treated in a hospital not shown in the table. This record is omitted from the hospital rows of the table for disclosure control purposes but remains in the Scotland total.
The SMR01 estimates for carotid endarterectomy indicate a significant variation in the number of procedures performed per 100,000 population, from 4.3 to 14.5. This estimate is based upon the number of cases performed in a hospital(s) and the population of the Health Board and therefore does not take into account cross boundary flow. The estimates are derived for the data presented in table 5.

Chart 12: Percentage of patients undergoing a carotid intervention within 14 days of the event that led the patient to first seek medical assistance, Jul-Dec 2012 data

Horizontal line reflects NHS QIS standard (2009) of 80% of patients undergoing carotid endarterectomy for symptomatic carotid stenosis have the operation within 14 days of the stroke event.

Notes regarding chart 12:
1. Hospitals shown are those that provide a carotid intervention service and have submitted data to eSSCA since July 2012.
   Records included must have a valid date when the patient first sought medical assistance and date of carotid intervention to permit the calculation of time to carotid intervention and a small proportion of records are missing these data items.
2. The data contained in this chart should be treated with caution as they are known to be very incomplete. There are no data included from NHS Grampian.

The only part of the process to be examined in this cycle is the proportion of cases performed within 14 days of index event. The period examined is July to December 2012, inclusive. Using SMR01 returns from the same period as a comparator, it is clear that the data capture is far from complete (approximately 50%) and any crude sample may contain significant bias. Nonetheless, the proportion of cases operated within 14 days of the presenting event in the data provided is only 40% (48/119), again with wide variation in practice (chart 12).

6.3 Future work

As noted above carotid intervention data have only been collected for six months and this is the first SSCA national report to contain data relating to carotid surgery. The process of identifying cases and tracking progress will improve with time and the simple identification of cases and the date referred to a vascular surgical service will allow follow-up using SMR01 data.
6.4 Carotid pathway in Health Boards across Scotland

The carotid pathway now features as a priority action on the Better Heart Disease and Stroke Care Action Plan¹. Although most Health Boards offer access to carotid endarterectomy there is variance in the pathway and in local delivery. Over the coming year there will be a focus by the stroke MCNs to develop an equitable pathway across the clinical area and improve performance in the number of patients receiving appropriate intervention within 14 days of symptom onset.
7 Use of SSCA data in research

The Research Subgroup of the SSCA Steering Committee continues to oversee the use of SSCA data in research. The datasets are primarily available for researchers based in Scotland who have contributed to the Audit, but open to other researchers also.

This section of the report briefly outlines work undertaken by CHSS Fellow Dr Melanie Turner to date using the SSCA dataset.

Information about the SSCA Research Subgroup and forms for requesting data are available on the SSCA website (http://www.strokeaudit.scot.nhs.uk/Research.html).

7.1 Example of use of SSCA data in research

**Chest Heart & Stroke Scotland Funded Research**: Using routine data to answer important questions about the optimal care of stroke and TIA patients in Scotland?

The Scottish Stroke Care Audit data from 2005-2011 have now been linked and anonymised with inpatient (SMR01) and death certification data from ISD.

Currently data analysis is ongoing and we are in the process of investigating several important research questions. These include

1. Investigation of the benefits of Stroke Unit care – does it affect outcomes and impact on long term survival of patients looking at 7-, 30-, 60-, and 90-day and 6- and 12-month case fatality?;

2. Impact and outcomes (death, 7-, 30-, 60-, and 90-day and 6- and 12-month mortality) following thrombolysis treatment; and

3. The stroke and cardiovascular event rate following outpatient clinic attendance.

Publications based on these data are planned and once published more information will be available on the SSCA website.

For further information relating to this work please contact m.e.turner@abdn.ac.uk.
List of References


Appendix A: Response from Chief Executives

During the preparation of this report the Health Board Chief Executives were asked to comment on the performance of their Health Board/ local hospitals highlighting achievements and areas that require improvement. The Chief Executives were provided with charts 1a and 1b (HEAT Target) and charts 3a-3d (NHS QIS stroke care standards) to inform their comment.

The Chief Executives responses are noted (by Health Board) below:

**NHS AYRSHIRE AND ARRAN**

NHS Ayrshire & Arran continues to exceed the Stroke Admission HEAT Target at both Board and individual hospital level with performance currently sitting at 96% admitted to a Stroke Unit within one day of admission. Exception reporting is being introduced to identify and learn from instances where the target is not met.

Improvements in swallow screening have taken place, and both University Hospital Crosshouse and University Hospital Ayr achieved 79% compliance rates. In order to further improve performance, swallow screen training has been reviewed and an e-learning module supported by annual updates is under development.

In response to disappointing performance in relation to CT scanning during 2012, radiologists and stroke teams have worked together to review the CT pathway in order to improve access to CT imaging for stroke patients at both University Hospital Ayr and University Hospital Crosshouse. Medical staff now include the date and time of a patient's arrival at A&E when ordering CT scans. This enables the radiology department to prioritise referrals. An escalation process is also in place if there is a possibility that the 24 hour standard will not be met. This standard remains challenging, but early indications for 2013 show an improving performance and the pathway will continue to be audited.

The timely prescribing of aspirin is adversely impacted on by delays in accessing CT scanning. However, improving performance against the CT standard and increased training for staff will lead to an improvement in aspirin prescribing.

Both University Hospital Ayr and University Hospital Crosshouse are consistently exceeding the standard of 80% of patients being seen in the TIA clinic within 7 days during 2012. We will, however, continue to review our pathways in order to further improve performance. All GP Practices have been reminded of the accelerated referral process that is in place.

**NHS BORDERS**

NHS Borders and the Borders Stroke MCN achieved the Stroke Admission HEAT 90% Target this year as part of an evolving program of improvement measures. The responsible clinical Stroke Team worked with the Scottish Ambulance Service (SAS), Emergency Department and the Medical Admissions Unit. Formal teaching and regular pathway feedback is essential to all stakeholders and daily data is fed back to these departments.

In January 2013 the Borders Stroke Unit was opened. This is a 12 bedded acute and rehabilitation ward with a flexible bed configuration and improved patient facilities. At its opening the FAST campaign was re-launched.

Patients failing to reach the QIS standards are exception reported and trends are identified and addressed. Newly introduced measures for this year have been the introduction of a ‘stroke care
bundle sticker’ in the admissions unit, TRAK (electronic) investigation requesting and SAS pre-alerts to the emergency department for thrombolysis cases to improve our door-to-needle time.

Although the admissions target has been reached we are planning to use a series of Models for Improvement to address the other standards. Our goal for 2013/14 is to improve consistency over seven days and resilience during periods of patient flow pressures to improve patient safety, care, outcome and experience.

**NHS DUMFRIES AND GALLOWAY (D&G)**

Galloway Community Hospital is consistently achieving 100% against the Stroke Admission HEAT target and exceeding the QIS admitted to Stroke Unit on day of admission standard. Dumfries & Galloway Royal Infirmary (DGRI) is exceeding the access to neurovascular clinic within 7 days standard.

Variances are noted in relation to all other standards however, with one exception - aspirin prescribing, NHS Dumfries and Galloway remains above the national average.

In working towards delivering the target/standards we have begun active exception reporting and are developing a detailed understanding of challenges e.g.:

Access to Stroke Unit in DGRI during periods of ward closure due to norovirus - we are currently in the process of completing an education programme within the rehabilitation ward to meet the HEAT target criteria for an area with “designated stroke beds”. This will provide an alternative in times of closure.

Management of people who are admitted following stroke, who would be more appropriately managed on an “end of life pathway” than a stroke pathway - our priority is caring for these people within a suitable environment and therefore if no single room is available in the Stroke Unit we will either transfer the person to another appropriate ward where a single room is available, or keep them in our Medical Assessment Unit (MAU) where a relationship with the family is already established. As this is a small district general, with only approximately 24 cases per month, these small numbers have a significant impact on our ability to deliver the target/standards.

The aspirin standard continues to prove challenging and we have regular reviews of the process between the stroke and MAU teams to identify possible solutions.

**NHS FIFE**

For a number of years NHS Fife has had in place a ‘stroke care bundle’ to drive improvement of the in-patient stroke standards. An SBAR (Situation, Background, Assessment, Recommendations) is now completed for any failure to comply and gives recommended actions. Training and education of staff in A&E and AU (Assessment Units) continues, but implementation and documentation of the water swallow screening (WSS) remains challenging despite this. Exception reporting against performance is regularly disseminated to relevant staff.

Improved access to CT scanning in the evenings (until 9pm) and at weekends and raising awareness of the importance of early scanning has improved performance. A proposal to allow specialist stroke nurses to request scans will ensure continued improvement.

Aspirin prescription has improved slightly. Further improvement will be achieved by developing a Patient Group Directive (PGD) to enable senior nursing staff to administer a STAT dose of 300mg Aspirin.
The percentage of patients seen at TIA clinics within 7 days has slightly improved. We recognise the challenge posed by the new standard of 4 days, and have introduced additional medical and nurse led TIA clinics to address this.

Performance against the HEAT target had slipped due to pressures on medical beds throughout the hospital which made patient flow extremely challenging. A Standard Operating Procedure (SOP) for the Acute Stroke Unit (ASU) has been developed, along with a 7 day work pattern, to ensure that a senior member of staff is on duty to ‘pull’ patients swiftly into the ASU and to commence the stroke care bundle.

Monthly MDT governance meetings review all patients thrombolysed, auditing all aspects of the pathway as well as clinical outcomes for patients. This has identified a number of areas that could be more timely. Work continues with both ambulance service and A&E staff to improve this.

**NHS FORTH VALLEY (FV)**

Forth Valley has made good progress between the two periods. This comparison coincides with the move of services from Stirling Royal Infirmary to Forth Valley Royal Hospital (FVRH), where we created our Integrated Stroke Unit (ISU). Importantly, there has been a significant improvement in timely access to the ISU at FVRH. There have also been improvements in people getting timely access to swallow screen assessments, brain imaging, aspirin administration and assessment at a neurovascular clinic. We recognise that some of these standards have been tightened recently and that this will continue to be an ongoing focus in the coming months and years. In April 2013 we introduced a new stroke bundle at FVRH, which we are hoping will help to continue to ensure the highest standards of care are achieved. It is with some encouragement that we noted that those diagnosed with stroke fell from 547 to 475 during this period, which is a 13% reduction. We have a clear picture of our challenges and will continue to work through the stroke MCN to review and improve our performance.

**NHS GRAMPIAN**

Despite the fall in early admission to the Acute Stroke Unit (ASU), the percentage having a swallow screen/ scanning on day of admission and aspirin on day of admission or day following have all increased slightly. There is ongoing training of nurses in the Acute Medical Admissions Unit (AMAU) and Accident & Emergency (A&E), and an increase in patients through A&E having early assessment by the Stroke Team. The mobile Stroke Team continues to review and contribute to the management of patients not being directly admitted to the ASU.

We failed to achieve the HEAT target for April 2013. The challenges have been a limited number of acute stroke beds, a lack of community services resulting in delayed discharges and the opening of the Emergency Care Centre (December 2012), impacting on service pathways. In addition increased admissions in January 2013 caused a dip in admissions to the ASU.

There is a need for more acute stroke beds, and ways of achieving this are currently under discussion. Difficulty recruiting carers will continue to impact on discharging patients.

We achieved the standard of 80% of outpatients reviewed within 7 days of receipt of referral. Ongoing service redesign will help us review patients within four days.

A new Audit Coordinator has been appointed following the untimely death of Elaine Horne in August. This should help facilitate timely and accurate data capture. A sustainable audit collection system utilising the night staff has been put in place at Dr Gray's.
We are aware of the challenges that face NHS Grampian in terms of acute and rehabilitation provision for stroke patients within the Moray area. The Dr Gray’s team are working hard to address these issues. A series of meetings are underway to determine a 2020 vision for stroke services across NHS Grampian to determine the changing needs of an ageing population. This will in turn produce a work plan of what needs to be achieved and developed to ensure we reach our goal.

NHS Grampian as a whole is committed to improving the care of stroke patients.

**NHS GREATER GLASGOW & CLYDE (GG&C)**

NHSGGC is the largest NHS Board in Scotland and the busiest for stroke treating approximately one third of all stroke patients in Scotland. Two NHSGGC hospitals have a regional role supporting other West of Scotland Boards.

We are pleased to note the consistently high performance at the Southern General Hospital and improvements being maintained at Inverclyde Royal Hospital (IRH) following redesign work in 2011. In particular, admission to the IRH stroke unit shows considerable improvement.

The report highlights inconsistencies in performance across NHSGGC in 2012. This has been a significant concern to NHSGGC throughout the year. Each month performance reports are produced and are reported to the Chief Operating Officer and the NHS Board.

NHSGGC is placing a strong focus on improving admission to the acute stroke units. This is seen as a driver for improvements across all other areas of inpatient acute stroke care. All our hospitals in NHSGGC have very different issues to address and this has required an individual site based approach towards improving performance. Actions in 2012 to improve performance have included:

- The appointment of an additional stroke consultant at the Royal Alexandra Hospital (RAH) in August 2012
- A detailed analysis of the patient pathway undertaken at the RAH in autumn 2012 with subsequent redesign implemented from January 2013. This redesign is showing significant improvements in performance for 2013
- All hospitals completing daily and weekly reporting/analysis of the reasons why patients fail to get timely access into a stroke unit
- Improved joint working with Radiology colleagues around scanning performance, including a comprehensive audit of the patient pathway during September 2012. Exception analysis of patients who fail to meet the scanning standard is now undertaken on a monthly basis
- Meeting held in September 2012 confirmed processes for the transfer of stroke patients back to NHS Ayrshire & Arran from IRH within agreed timescales
- Regular meetings established amongst NHSGGC Scottish Stroke Care Audit coordinators to ensure consistency of data collection across all NHSGGC hospitals

The lack of improvement in swallow screen remains a concern. New documentation introduced during 2012 has taken some time to become embedded within our acute hospitals but we anticipate improvements will be demonstrated in 2013.

All actions described above are being continued in 2013. In addition from early 2013 stroke units have been provided with additional monthly reporting introducing a red/amber/green format to highlight where improvements in performance are required.
Whilst this annual report refers to performance to end December 2012, it is important to recognise the significant further improvement achieved since January 2013.

NHSGGC has chosen to collect data against all Fast Track neurovascular referrals made to the service. This differs from the national data set which reports on referrals with a final diagnosis of stroke. For this reason NHSGGC data is not presented within the charts.

**NHS HIGHLAND**

NHS Highland would wish to highlight the following points as they relate to the performance charts:

- **Chart(s) 1a/1b:** Belford Hospital continues to perform well and is exceeding the 90% HEAT Target for admission to Stroke Unit on the day following admission. Caithness General Hospital (CGH) has also performed well though is slightly under the target at 85% (at time of data extract – April 2013). However both the Raigmore and Lorn & Islands (L&I) Hospitals are failing to meet the target. While some significant improvement has been made at Raigmore, it is of key concern to us that neither has achieved the HEAT target for 2012. Work has commenced in both hospitals to ensure improvement including exception reporting on failures to meet the target. Monthly breach meetings, led by the service manager for stroke and neurology are being set up at Raigmore to identify underlying trends.

- **Chart 3a:** Swallow screening continues to be inconsistent across all sites. We are working with the nursing teams in all sites to improve. In May 2013 at Raigmore new documentation was introduced on the Acute Medical Admission Unit (AMAU) to promote timely swallow screening. Compliance is being monitored with early indications proving positive. In L&I the stroke coordinator is working with the nursing teams throughout the hospital to ensure swallow assessment takes place in all wards.

- **Chart 3b:** None of the hospitals in NHS Highland met the standard for brain imaging, as it stood in 2012. Significant improvement work was started in Raigmore towards the end of the year. Improvements are indicated in the data for the first quarter of this year. It is our intention to replicate that work across the hospital sites.

- **Chart 3c:** Aspirin prescribing has continued to be an issue at all sites across NHS Highland. In particular it is an issue at the Belford Hospital and will be the subject of focussed work in 2013.

- **Chart 3d:** L&I met the standard for access to Neurovascular Clinic (NVC) within seven days of receipt of referral. Raigmore did not. Access to NVC is not recorded at either the Belford or CGH. Recognising the new standard for 2013 a review of the clinic set up at Raigmore was undertaken and additional capacity created. A similar process is required at L&I. The new standard will be challenging to meet across our geography.

- **Other:** Key issues/pieces of work for the coming weeks in NHS Highland include identification of lead clinicians for stroke at Belford and CGH.

**NHS LANARKSHIRE**

**HEAT (Stroke Unit Admission)**

This target requires 90% of all patients admitted with a diagnosis of stroke be admitted to a Stroke Unit on the day of admission or day after. We achieved this target (one of only 5 Health Boards). All three of our hospitals independently achieve the 90% target.
Robust data analysis and sharing of the data with the clinical teams allowed this pathway to be embedded and monitored by the MCN. We work with the clinical team across the whole pathway to improve the care delivered to all patients using a quality improvement model based on exception reporting, every patient who fails any of the indicators is reported to the MCN manager and appropriate actions taken.

**Brain imaging**

The data in this year’s report refer to the day of admission standard which we did not perform well against. Against the 24 hour scan we have met the standard in the majority of months and been very close in the others at 88% over past 12 months. The delays are largely due to the requests being less efficient than they should be for patients who are not being considered for thrombolysis. There is still an issue with radiology not prioritising all stroke scanning within 24 hours. We will improve education of A&E and receiving units doctors who initiate these requests by delivering a rolling education programme to medical staff and highlight any failures to radiology when they have not prioritised patients efficiently.

**Swallow screen**

This standard is set at 100% and all three sites made significant improvement on last year achieving 80%-90%. Better than the national average of 68%. (From Jan 2013 the standard is 90% and not 100%.)

The majority of patients who fail are admitted late in the evening to A&E, if diagnosis is delayed swallow screen is not identified until after midnight. Inpatient events contribute to this standard not being 100%.

We are working with the A&E staff to improve early recognition and screening.

**Aspirin**

This standard is 100% administration on day of admission or day after.

Between 83%-90% of patients achieved the standard, majority of patients who fail are inpatient events resulting in delays to both scanning and aspirin. We are raising awareness of the need to refer inpatients urgently to both the stroke physician and the Stroke Unit to facilitate rapid access to treatment.

**Neurovascular clinics**

All three of our hospitals meet the 7 day standard.

**NHS LOTHIAN**

**Key achievements**

Our performance for scanning stroke patients on day of admission has improved from 2011 across all hospitals. Radiology services have worked with stroke teams to consistently improve delivery of this standard by prioritising stroke patients.

Outpatient appointments are provided at Western General Hospital (WGH) and St John’s Hospital (SJH), and although performance on each site is different it has improved from 2011. WGH continues to consistently achieve above 90% performance, but SJH has difficulty maintaining a steady performance due to issues with cover for annual and study leave for consultant, and time-tabling of clinics. This will improve with reorganised SJH clinics to meet
the revised standard and ongoing plans to reallocate consultant Programmed Activities (PAs) to ensure this service can operate efficiently and improve performance.

**Key issues**

Performance against the HEAT target has not improved compared to 2011 with poorer performance in each hospital. Over 50% of stroke patients are admitted to Royal Infirmary of Edinburgh (RIE), but it only has 30% of the acute beds. Pre-hospital triage needs to be progressed so Bed Bureau can actively direct patients to either RIE or WGH during in-hours, depending on stroke unit bed availability.

All three Acute Stroke Units have agreed to maintain a protected bed at all times, to enable prompt admission of a post-thrombolysis patient. However, with challenging front door targets it is proving very difficult to sustain and keep these beds available for direct admission from Emergency Departments.

The marked improvement in scanning has not been totally replicated in our aspirin prescribing performance for ischaemic strokes although improvement is evident at SJH and RIE. Delays occur when scan results are received and aspirin needs to be prescribed but this is not done until the next ward round. We have introduced a system at RIE and WGH for scan results to be phoned to a dedicated mobile phone number, held by the charge nurse, so the aspirin prescription is arranged and treatment started promptly.

Swallow screen performance is disappointing and has indeed deteriorated since 2011. Training for front door staff has been introduced but it is proving difficult to sustain any activity improvement as it is either not done or not documented due to pressures at the front door.

In 2013 the clinical education practitioners have agreed to add nurse-led swallow assessment (theory and practical competency) to mandatory training for front door, stroke and Medicine of the Elderly nurses. This should ensure they are all competent and able to undertake and record the assessment.

**NHS ORKNEY**

NHS Orkney has improved the training for staff in the ward where people who suffer strokes are cared for. Staff have completed stroke care specific training. We have a multi disciplinary team with allied health professionals having input into the care of the individual.

We maintain good performance with the swallow screening target.

We are currently in the process of recruiting consultant physicians to the Balfour Hospital a new development to our staffing model. This will provide additional leadership around the management of stroke patients in Orkney. We have also secured remote telehealth support from a specialist stroke rehabilitation consultant into our service.

NHS Orkney has committed to securing CT scanning provision on Orkney which will improve this target around CT scanning for Strokes. This will allow consultation with stroke consultants in Aberdeen via telecare, and thrombolysis on island if appropriate.

These developments will help us improve in those target areas where we are currently challenged.

**NHS SHETLAND**

NHS Shetland has continued to deliver effective services to patients who have suffered stroke. The multi-disciplinary team work within a general ward in the Gilbert Bain Hospital,
which provides all the required HEAT elements of a stroke pathway. We are pleased to note that the administration of aspirin within one day has risen from 72% to 95% which reflects the development of the stroke checklist with reinforcement of the training delivered to the frontline medical and nursing staff. We acknowledge that out of hours access to CT scanning can present a challenge, but we note our improved performance against the CT standard and will continue to work towards a sustainable service that has CT trained radiographers available at all times.

**NHS TAYSIDE**

Although, the audit shows encouraging improvement in stroke care performance against National Standards, further improvement is anticipated. The services will work with the Stroke Managed Clinical Network (MCN) to address outstanding issues from the audit and support plans to consistently achieve the Clinical Standards.

**Key achievements:**

- NHS Tayside has been consistently meeting the HEAT target (90% of all patients admitted with a diagnosis of stroke will be admitted to a Stroke Unit within one day of admission) up to November 2012, however, a dip in performance in November and December (<90%) is acknowledged. Across NHS Tayside significant improvement work has been underway in both Ninewells Hospital and Perth Royal Infirmary (PRI) to improve patient flow across both areas.

- The recent reduced performance in Ninewells Hospitals was due to the relocation of the Acute Stroke Unit and infection control issues, which impacted on capacity and flow.

- In PRI a redesign and improvement programme is underway to reduce delayed discharges and improve patient flow. A pilot of a 7 day working physiotherapy service has also led to an improvement with patient flow.

- Ninewells Hospital continues to consistently exceed the 80% target for referral to examination time within 7 days to Neurovascular Clinic and PRI and Stracathro Hospitals both exceeded the 80% target in 2012.

- Weekly exception reporting on all stroke patients in both Ninewells Hospital and PRI has contributed to maintaining improvements in stroke care.

- A priority of the MCN has been to improve thrombolysis, with the numbers (percentage) of stroke patients being treated showing improvement. Pre-alert of FAST positive stroke patients is communicated to A&E Departments. There are clear processes in place for delivery of thrombolysis supported by local audits.

**Key issues:**

- On occasions patients have been transferred out of the Stroke Unit to enable acute admissions and improved patient flow will obviate this.

- Delays to obtain CT imaging at Ninewells Hospital will be addressed through enhanced availability and the introduction of an electronic referral system to radiology in Ninewells Hospital. Out-of-hours/ weekend scanning, when Stroke Physician not available requires further improvement work.

- Recent decline in swallow screen target is due to training issues for new staff and the Senior Charge Nurse in the Stroke Unit is implementing training for these staff.

- Out-of-hours thrombolysis, when stroke physician not available – door to needle time requires further improvement.
This year's report highlights areas of outstanding performance as well as areas in which there are ongoing improvements required in NHS Western Isles as noted below:

- **Areas where improvements are being made**
  - Stroke Unit admission: Current Integrated Care Pathway (ICP) has been rewritten to allow patients to be admitted six hours after thrombolysis rather than 24 hours. Clear clinical criteria will ensure patient safety at the time of transfer.
  - Aspirin administration on the Day of Admission: A Patient Group Directive has been written to allow non-prescribing nursing staff to administer aspirin to ensure compliance with the Stroke Care Standard.
  - Swallow assessment: The ICP has been rewritten to simplify the process and recording of the swallow assessment.

- **Areas of outstanding performance**
  - The close working with our Obligate Network to NHS Borders and NHS Grampian has ensured timely access to CT scanning for acute admissions.
  - The virtual Neurovascular Clinic run on a weekly basis with NHS Grampian has ensured excellent rates of patients being seen in a very short time frame.
  - Working in partnership with NHS Lanarkshire in relation to stroke rehabilitation which is a great example of joined up working, the use of technology and sustainable improvement. There is real evidence of reduced length of stay associated with this.

NHS Western Isles is committed to further develop our services and the recent appointment of a Physician with an interest in Stroke Medicine is expected to lead to improvements in all areas in the coming year.

Following publication of the 2012 SSCA National Report Hazel Dodds (SSCA Clinical Coordinator, ISD) and Katrina Brennan (National Action Plan Coordinator, Scottish Government) visited all Health Boards in Scotland to meet with stroke clinical teams, stroke MCNs, radiologists, senior managers/executives, planners and other relevant personnel with input to stroke care locally. The meetings were held between October 2012 and May 2013.

The meetings were well attended in most Boards. There was evidence of improvements in practice in some areas and many actions were being taken forward to further improve the delivery of stroke care locally. However, in some areas there was still significant work required to ensure that hospitals in Scotland continue to improve performance against the stroke admission HEAT target and NHS QIS standards.

Hazel and Katrina will continue to work with Health Boards throughout 2013/14 to improve delivery of stroke care across Scotland.
Appendix B: Additional Information

Additional information is available on the SSCA website:

- Aims and methods of the audit.
  http://www.strokeaudit.scot.nhs.uk/about.htm
- Audit documentation, e.g. data collection forms.
  http://www.strokeaudit.scot.nhs.uk/Participants/main.html
- Core dataset definitions.
  http://www.strokeaudit.scot.nhs.uk/Participants/main.html
- Current Steering Committee members.
- Contact details of Project Team.
  http://www.strokeaudit.scot.nhs.uk/contact.htm
- Previous Annual Reports.
  http://www.strokeaudit.scot.nhs.uk/reports.html
- Information on Research relating to SSCA.
  http://www.strokeaudit.scot.nhs.uk/Research.html
- Information on Quality standards.
  http://www.strokeaudit.scot.nhs.uk/Quality.html
- Information for Patients and Carers.
  http://www.strokeaudit.scot.nhs.uk/Patients.html
Acknowledgements

This report could not have been written without the help of a great many people. This includes:

- Patients with stroke who have contributed medical information to the audit.
- Audit, clinical, IT and Managed Clinical Network staff at all units participating in the audit who ran their local data collection, provided local reports and commented on drafts of this National Report.
- Chief Executives in each Health Board who provided feedback on local performance.
- The SSCA Audit Team and ISD Publications Team as part of the Information Services Division of NHS Scotland who co-ordinate and collate the necessary information to produce the report and support the publication of the National Report.
- Members of the Report Writing Sub-Group of the SSCA Steering Committee who have contributed to the writing of and commented on drafts of this report.
- The Scottish Government through the CHD & Stroke Strategy providing funding for the Scottish Stroke Care Audit.

This Annual National Report was prepared by Dr Mark Barber, Professor Martin Dennis, Hazel Dodds, Moranne MacGillivray, Dr Mary-Joan Macleod, Professor Peter Langhorne, David Murphy, Alan Reekie, Mr Wesley Stuart, Dr Melanie Turner, with contributions from Health Boards and partner organisations.

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This report is also available as an Easy Access Public Summary, this version of the report can be found on the SSCA website  (http://www.strokeaudit.scot.nhs.uk/reports.html).

We are grateful to Chest Heart & Stroke Scotland, the Stroke Association, Speakability, patient/carer groups and health professionals that provided feedback on the 2012 Public Summary and those involved in reviewing the drafts of the 2013 Public Summary.
## Contacts

If you have any general questions about stroke care in your local area please contact your local Stroke Managed Clinical Network.

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**Website**

http://www.strokeaudit.scot.nhs.uk
Any questions about the SSCA should be referred to the co-ordinating centre. Please refer questions on this report to Hazel Dodds, Moranne MacGillivray, David Murphy or Alan Reekie

For general questions about the Audit please contact Hazel Dodds, National Clinical Coordinator for the SSCA.

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