State of the Nation Report 2024

Stroke care received between April 2023 to March 2024

KING'S College LONDON

SSNAP
Sentinel Stroke National Audit Programme

Commissioned by

HQIP
Healthcare Quality Improvement Partnership

The Sentinel Stroke National Audit Programme (SSNAP) is led by the School of Life Course and Population Sciences at King's College London.

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The Sentinel Stroke National Audit Programme (SSNAP) is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). HQIP is led by a consortium of the Academy of Medical Royal Colleges, and the Royal College of Nursing. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage, and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies. www.hqip.org.uk/national-programmes.

School of Life Course and Population Sciences

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Sentinel Stroke National Audit Programme (SSNAP)

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Introduction

SSNAP measures the quality and organisation of stroke care across England, Wales and Northern Ireland. The overall aim of SSNAP is to provide timely information to clinicians, commissioners, patients, and the public on how well stroke care is being delivered. Processes of care are measured against evidence-based quality standards referring to the interventions that any patient may be expected to receive. These standards are laid out in the latest clinical guidelines including the National Clinical Guideline for Stroke (2023) and NICE guidelines (Stroke and TIA, NG128; Stroke rehabilitation, NG236; and Quality standard for stroke), as well as national policy documents including the NHS Long Term Plan, the National Stroke Service Model, the National service model for an integrated community stroke service and the Quality statement for stroke.

Further information on the programme including data analysis and methodology, full datasets, and reports produced are available on the SSNAP website: www.strokeaudit.org. The full annual results portfolio and annual thrombectomy portfolio can be accessed by going to: www.strokeaudit.org > Results > Clinical audit > National > Annual.

Throughout the report, five key messages are shown in **green** boxes and five national recommendations in **pink** boxes. A full line of sight table, linking national recommendations to report findings, is available online.

Patient characteristics

95,222 patients were admitted to hospital with a stroke in 2023/24, compared to 92,134 in 2022/23 and 92,067 in 2021/22. Table 1 summarises the key characteristics of those patients admitted in 2023/24, highlighting the complex nature of this disease requiring a skilled multidisciplinary specialist team across the patient's entire journey.

Total stroke admissions	95,222	**Ethnicity**	
Infarction	82,484 *(86.6%)*	*White*	77,575 *(81.5%)*
Intracerebral haemorrhage	12,387 *(13.0%)*	*Black*	1,819 *(1.9%)*
Not known	351 *(0.4%)*	*Asian*	3,775 *(4.0%)*
Age (median, IQR)	*76 [65-84]*	*Mixed*	501 *(0.5%)*
Age (under 65 years)	22,719 *(23.9%)*	*Other*	1599 *(1.7%)*
Gender (female)	44,188 *(46.4%)*	*Not stated/Not known*	9953 *(10.5%)*

Comorbidities before stroke		**IMD quintile** (England only)	
Congestive heart failure	6,037 *(6.3%)*	*1 - most deprived*	16,334 *(19.7%)*
Hypertension	54,532 *(57.3%)*	*2*	16,005 *(19.2%)*
Diabetes	23,635 *(24.8%)*	*3*	17,303 *(20.7%)*
Previous stroke/TIA	23,014 *(24.2%)*	*4*	17,400 *(20.8%)*
Atrial fibrillation (AF)	18,329 *(19.2%)*	*5 - least deprived*	16,416 *(19.7%)*
Dementia	6,590 *(6.9%)*		

Table 1: Casemix of patients admitted with stroke in England, Wales and Northern Ireland. *IMD = Index of Multiple Deprivation, English patients only.*

Summary of results for people admitted to hospital with stroke

Stroke care providers

95,222
stroke admissions

250
hospitals

195
community services

184
6 month follow-up providers

Arrival at hospital

4h00m
median time from onset to arrival at first hospital
3h55m 2022/23

Acute interventions

11.6%
of all stroke patients received thrombolysis
10.7% 2022/23

Click here to see country rates

3.9%
of all stroke patients received a thrombectomy
3.1% 2022/23

Click here to see country rates

24.9%
of eligible patients received hyperacute intervention for intracerebral haemorrhage within 1 hour of hospital arrival
22.8% 2022/23

6 month follow-up

38.8%
of applicable patients received a 6 month follow-up
38.7% 2022/23

Hyperacute assessment

26.5%
of patients received brain imaging within 20 minutes of hospital arrival
24.9% 2022/23

22.5%
of patients were assessed by a stroke specialist consultant within 1 hour of hospital arrival
19.3% 2022/23

Specialist pathway

46.7%
of patients were directly admitted to a stroke unit within 4 hours of hospital arrival
40.2% 2022/23

75.9%
of patients spent at least 90% of their hospital stay on a specialist stroke unit
72.8% 2022/23

63.4%
of patients were discharged to a stroke/neurology specific community rehabilitation service
61.1% 2022/23

22.9%
of patients were discharged to a stroke/neurology specific combined ESD-CRT service

***Hyperacute intervention for intracerebral haemorrhage**: for patients on anticoagulants eligible for reversal, given reversal agents within 1hr of arrival OR for patients with elevated systolic blood pressure (>150mmHg) on admission, given anti-hypertensives within 1hr of arrival.*

***Discharge to a combined ESD-CRT service** can only be measured for the 2023/24 year and so there is no comparative data for 2022/23.*
*From 2024/25, a new metric for the proportion of patients assessed by a **stroke-skilled clinician** within 1hr of arrival will be reported. In this report, the proportion of patients assessed by a **stroke specialist consultant** within 1hr of arrival has been used.*
***Key:** green icons show improvement against previous year, orange no change, and red worsening. Technical guidance on metrics available here.*

Arrival at hospital

Onset to arrival time

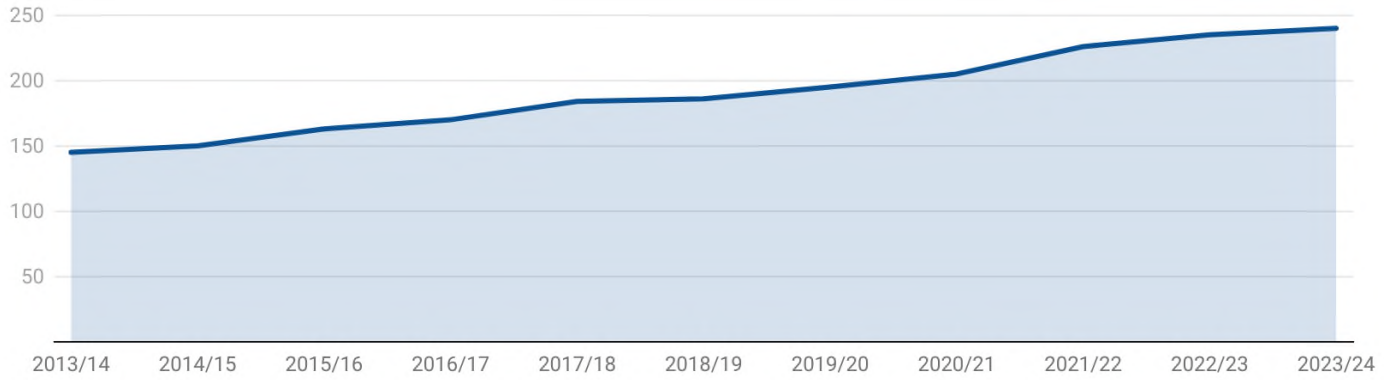

Figure 1: Median time (in minutes) from onset of stroke to arrival at hospital between 2013 and 2024.

There has been a continued increase in stroke onset to hospital arrival time (fig. 1), and data from the last 4 years (2019-2023) show that all component timings of the pre-hospital pathway have significantly increased (ESOC 2024: Pre-hospital timings for emergency stroke presentations in the UK), highlighting opportunities for quality improvement. Collaboration between stroke networks and ambulance providers is a pressing priority to ensure efficient practices are adopted to reduce delays, including a renewed approach in using the Face Arm Speech Test (FAST) for the public, and other innovations such as pre-hospital video triage.

Recommendation 1
Collaborate in regional networks to reduce the time from stroke onset to hospital and subsequently to specialist care on a stroke unit. *For action by: Integrated Stroke Delivery Networks (ISDNs) and Local Health Boards (LHBs).*

Hyperacute assessment

Access to initial brain imaging

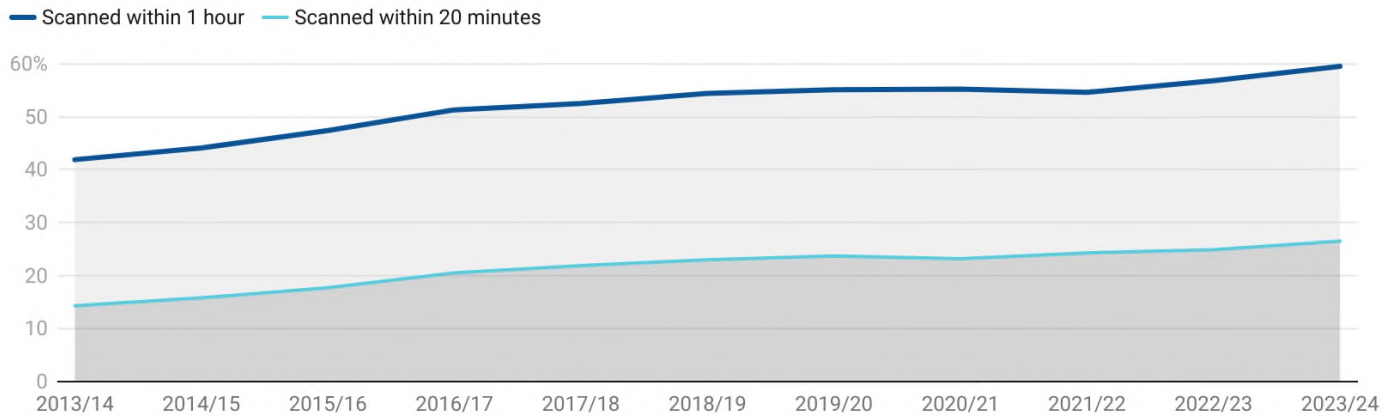

Figure 2: Proportion of patients receiving brain imaging within 1 hour of arrival and within 20 minutes of arrival between 2013 and 2024.

The proportion of patients receiving brain imaging within 1 hour of arrival has increased to 59.5% in 2023/24, and the proportion scanned within 20 minutes of arrival is 26.5% (fig. 2). A key priority is to ensure that the appropriate sequence of brain imaging is undertaken at the first sitting as rapidly as possible, with adoption of Artificial Intelligence (AI) to expedite decision making for acute reperfusion therapies (National optimal stroke imaging pathway [NOSIP]). Data suggests that there is still considerable scope to simplify

and extend the use of advanced imaging (UKSF 2023: Advanced imaging implications of new national guidelines for thrombolysis beyond 4.5 hours).

Recommendation 2
Increase the proportion of patients receiving the appropriate imaging immediately on arrival at hospital, to accelerate the identification of patients eligible for hyperacute interventions. *For action by: ISDNs, LHBs and Regional Radiology Networks.*

Assessment by Stroke Clinician within 1 hour

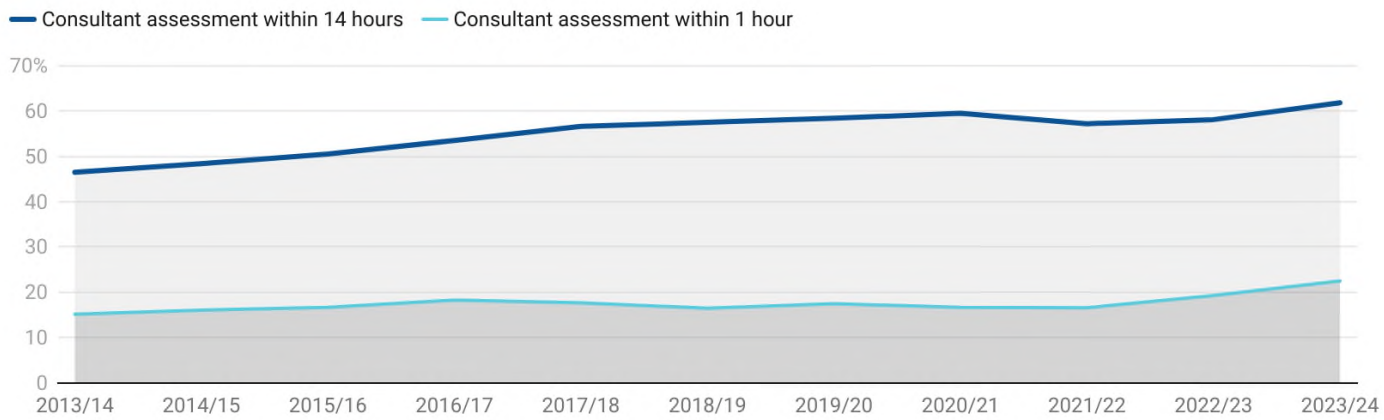

Figure 3: Proportion of patients assessed by a stroke consultant within 14 hours of arrival and within 1 hour of arrival between 2013 and 2024.

The proportion of patients receiving a consultant assessment within 1 hour and 14 hours has increased to 22.5% and 61.8% respectively (fig. 3). Diagnostic and therapeutic assessment of patients with suspected stroke by a trained and skilled clinician is key to the delivery of reperfusion and hyperacute treatments for ICH, and critical to the patient's progress through the pathway to specialist care on a stroke unit, reinforcing the maxim that 'time is brain'. Assessment of all acute medical admissions within 14 hours has been an objective since the 2017 Seven day services clinical standards, and reporting the assessment by a stroke-skilled clinician within 1 hour is a new performance metric that will help to drive improvements in hyperacute specialist care.

Acute interventions

Thrombolysis rate

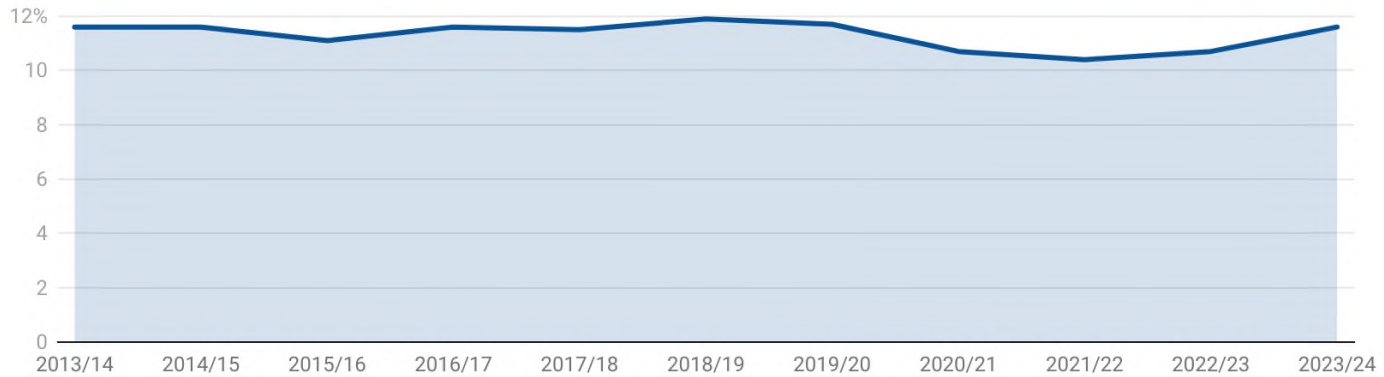

Figure 4: Proportion of patients (out of all strokes) receiving thrombolysis between 2013 and 2024.

The proportion of patients receiving thrombolysis has increased from 10.7% in 2022/23 to 11.6% in 2023/24 (fig. 4), recovering to pre-pandemic levels. Understanding the sources of variation in thrombolysis practice is important for quality improvement and novel methods using machine learning can help identify locally

important means of improving thrombolysis rates (Pearn et al., 2023). As the evidence for thrombolysis eligibility expands with increasing population benefit, the measurement of thrombolysis rates compared with bespoke site-specific targets will become even more significant.

Thrombectomy rate

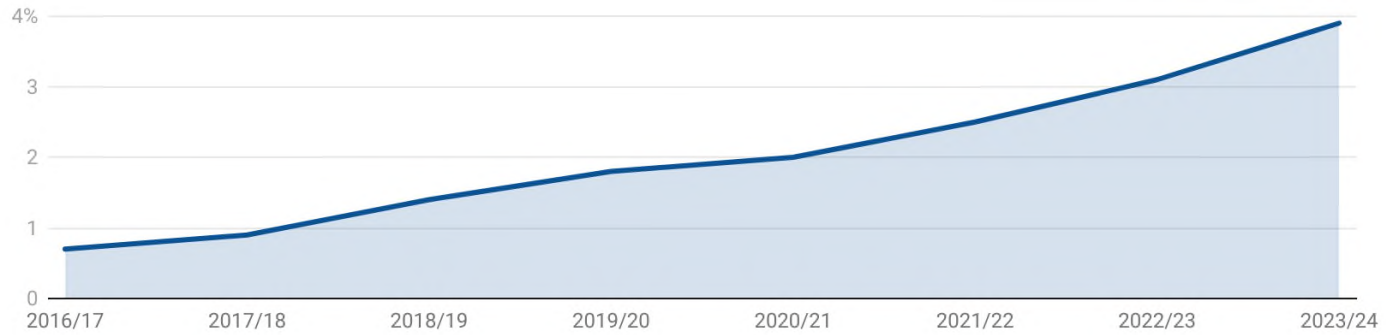

Figure 5: Proportion of patients (out of all strokes) receiving thrombectomy between 2016 and 2024.

Although the rates of mechanical thrombectomy (MT) are lower than the European average, the proportion of patients undergoing treatment has increased to 3.9% in 2023/24 (fig. 5) with a 30% increase in the number of thrombectomies from the previous year. As the evidence continues to advance significantly, it is likely that up to 15% of patients may be eligible for MT. Approaching this ambition will require improvements in availability of services and workforce, equity of geographical coverage and early identification of patients suitable for MT using advanced imaging. Thrombectomy networks are important in supporting comprehensive and acute stroke centres so that higher volumes of MT can be managed as efficiently as possible, for example through improved repatriation.

Key message
Reperfusion treatment rates have improved: the proportion of all patients receiving thrombolysis has increased from 10.7% in 2022/23 to 11.6% in 2023/24, and 3.9% of all patients received thrombectomy in 2023/24 compared to 3.1% in 2022/23.

Hyperacute interventions for intracerebral haemorrhage

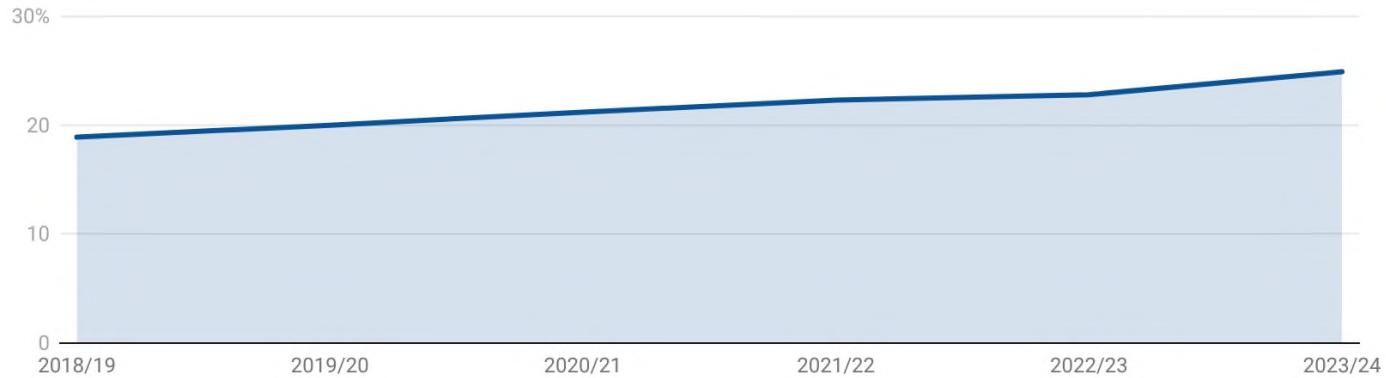

Figure 6: Proportion of eligible patients diagnosed with intracerebral haemorrhage given anticoagulant reversal agents within 1 hour OR given antihypertensives within 1 hour of arrival between 2018-2024.

Outcomes for patients with intracerebral haemorrhage (13% of all stroke admissions) have improved over the past 10 years, including a significant fall in in-hospital mortality associated with an increase in the proportion of ICH patients directly admitted to a stroke unit. Better specialist access for ICH supports the delivery of quality improvement bundles of care including rapid anticoagulant reversal and blood pressure

lowering (fig. 6), critical to preventing deterioration and to improving survival and disability outcomes (Ma et al., 2023; Parry-Jones et al., 2023).

Key message
The proportion of eligible patients receiving an appropriate hyperacute intervention has increased since SSNAP started collecting this data, from 18.9% in 2018/19 to 24.9% in 2023/24.

Specialist pathway

Access to stroke unit within 4 hours

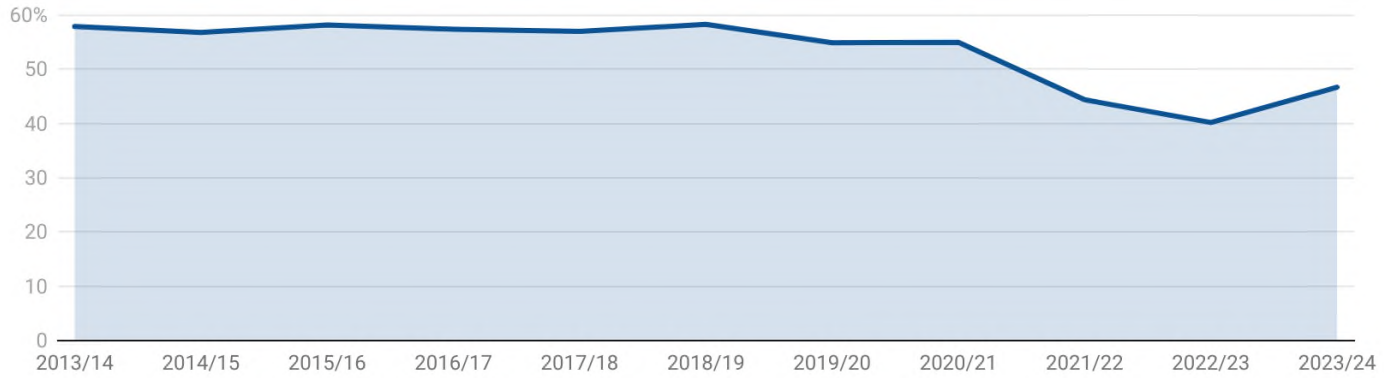

Figure 7: Proportion of patients directly admitted to a stroke unit within 4 hours of arrival between 2013-2024.

The proportion of patients directly admitted to a stroke unit within 4 hours of admission has improved from 40.2% in 2022/23 to 46.7% in 2023/4 (fig. 7). This partial recovery reflects the organisational priority for acute stroke care that is needed to ensure timely interventions and key multidisciplinary assessments. A refreshed whole systems approach to optimising inpatient flow through the hospital is critical to preserve stroke unit capacity according to demand. Such approaches should include early access to needs-based, 7-day rehabilitation at all stages of the pathway, which will provide earlier discharge and improve hospital capacity and flow.

90% stay on a stroke unit

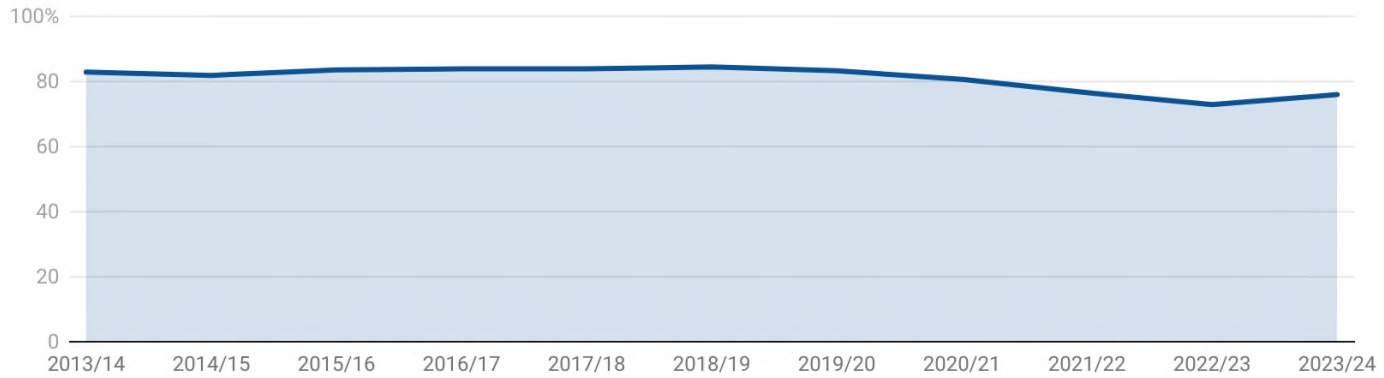

Figure 8: Proportion of patients spending at least 90% of their stay on a stroke unit between 2013-2024.

The proportion of patients spending at least 90% of their inpatient stay on a stroke unit has improved from 72.8% in 2022/23 to 75.9% in 2023/24 (fig. 8), but not yet returned to pre-pandemic levels. This metric highlights that despite a partial recovery in access to organised stroke care, services are still challenged in optimising patient flow efficiently on stroke units. A collective approach across the entire stroke pathway is required to improve access for patients to specialist care and stroke rehabilitation consistently.

The Stroke Rehabilitation Spotlight Report focusses on the performance of stroke rehabilitation across the pathway.

Key message
Timely access to specialist acute stroke care has partly recovered this year: 46.7% patients were directly admitted to a stroke unit within 4 hours in 2023/24 compared to 40.2% in 2022/23, and 75.9% patients spent at least 90% of their stay on a stroke unit in 2023/24 compared to 72.8% in 2022/23.

Recommendation 3
Restore timely access to hyperacute specialist inpatient care for stroke. *For action by: Integrated Care Boards (ICBs) and LHBs.*

Access to stroke/neurology specific ESD and/or CRT services

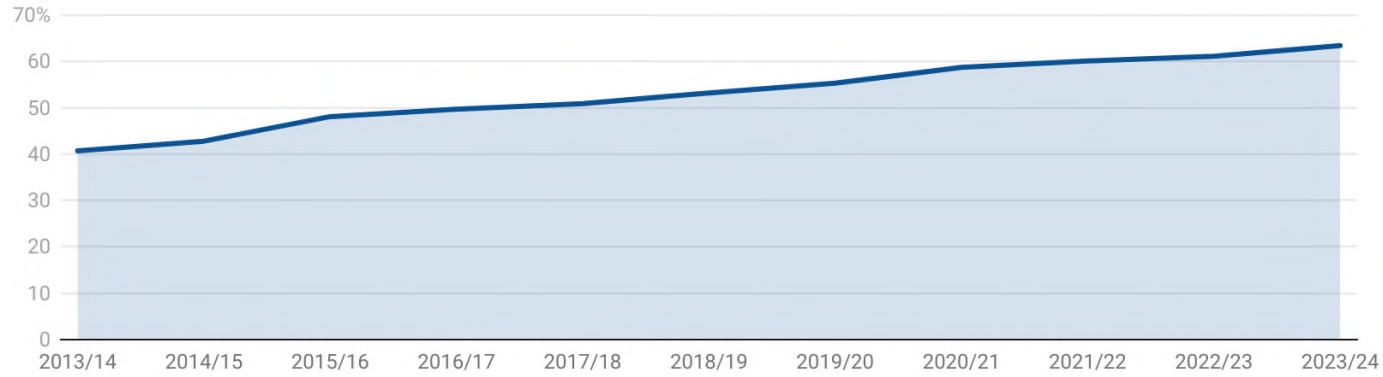

Figure 9: Proportion of patients discharged to a stroke-specific ESD and/or stroke-specific CRT service between 2013 and 2024.

The proportion of patients discharged to a stroke/neurology specific community rehabilitation service has increased to 63.4% in 2023/24 (fig. 9). There are currently 106 (47.5%) community teams registered as combined ESD-CRT services and 22.9% of patients were transferred to a combined ESD-CRT service on discharge from hospital in 2023/24. This reflects the ongoing commitment to continued implementation of the National service model for an integrated community stroke service (ICSS) across England. The NHS England National stroke rehabilitation pilots demonstrated the feasibility of implementation of the ICSS model in different geographical contexts.

Key message
The transition to integrated, needs-based community stroke services continues with 47.5% of community providers identifying as a combined ESD-CRT service. 63.4% of patients were discharged to an ESD (Early Supported Discharge) and/or CRT (Community Rehabilitation Team) service in 2023/24 compared to 40.7% in 2013/14.

Recommendation 4
Support the shift to leaving hospital much sooner and at an earlier stage in rehabilitation by providing equitable access to needs-based integrated 7-day rehabilitation along the whole pathway. *For action by: ICBs and LHBs.*

6 month follow-up

Access to 6-month follow-up

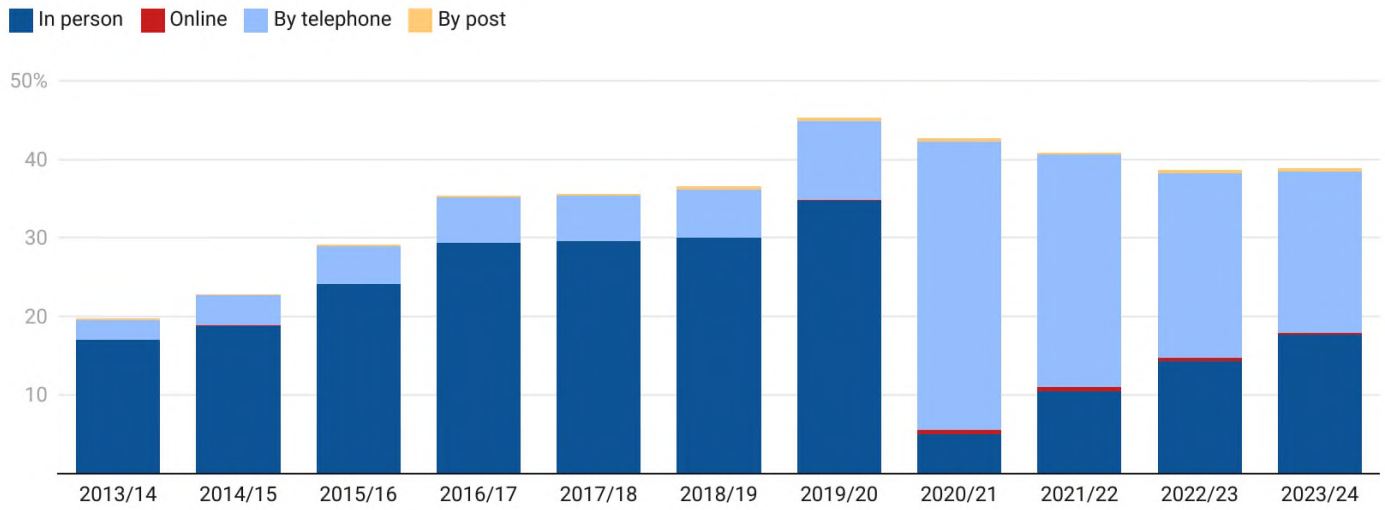

Figure 10: Proportion of patients receiving a 6 month assessment after stroke, by follow-up method, between 2013 and 2024.

The proportion of patients receiving a 6-month stroke review has remained stable at 39% between 2022/23 and 2023/24 (fig. 10). An increase in face-to-face assessments likely reflects the restoration and recovery of the review process following the COVID pandemic, and however it is delivered, a personalised approach to 6-month reviews is important to ensure that the full range of patients' needs are identified and met. For example, patient-reported outcome measures (EQ5D-5L) have highlighted that approximately one fifth of patients have mood and pain issues that require ongoing management (Patient Outcomes Spotlight Report).

Key message
Personalised review of people with stroke 6 months after the event remains patchy and is only available to a minority of stroke survivors, with 39% of applicable patients receiving a 6-month review.

Recommendation 5
Respond to the need for ongoing support and regular review when recovering from the life-changing effects of acute stroke and ensure that all stroke survivors receive formal follow-up 6 months after their stroke, with further support made available for those identified with ongoing needs. *For action by: ICBs and LHBs.*

Conclusion

Implementation of this report's **five national recommendations** will lead to better outcomes for patients and will also improve patients' experience of stroke services. Restoring access to specialist care in hospital to levels considered typical before the COVID pandemic must remain a high priority for hyperacute stroke services. 2023 saw the publication of major updates to national guidance for stroke treatment and rehabilitation (National Clinical Guideline for Stroke [2023]), and in turn 2024 has seen major revisions to the measurement of the intensity and frequency of rehabilitation in SSNAP, along with the refreshed set of performance metrics laid out in this report. As the ageing of the UK's population ensures that the prevalence of stroke-related disability and the cost to society increases, reducing the population burden of physical and cognitive disability after stroke will need to remain the unrelenting focus for services in the years to come.

We would like to express our thanks to the following people and organisations for their invaluable contribution in producing this report:

SSNAP Clinical and Associate Directors: Dr Ajay Bhalla, Consultant Stroke Physician, Ms Louise Clark, Stroke Consultant Therapist, Dr Rebecca Fisher, Programme Manager - Stroke, NHS England, and Professor Martin James, Consultant Stroke Physician.

Carol Parsons, stroke survivor and an artist who provided us with the artwork featured in this report. Our patient representatives on the Intercollegiate Stroke Working Party (ICSWP), for their continued support of the programme: Danny Lloyd, Emily Toplis and Marney Williams, and our Patient and Public Voice Representation group. Their valuable contribution keeps the patient voice at the heart of what we do as a programme.

The hospitals and community teams and ambulance trusts for continuing to participate in SSNAP. Their participation and commitment to the audit ensures that high quality, rich and robust data is available which can be used to improve stroke services.

Cover art provided by: Carol Parsons

Carol has always been an artist so her recovery from stroke in 2018 has been about learning how to continue with her work. She is also a trained tutor and has run workshops, courses, demonstrations and painting holidays for over twenty years. She has work in private collections in Australia, Canada, France, USA and the UK.