RIKSSTROKE

QUALITY OF THE SWEDISH STROKE CARE

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A BRIEF SUMMARY OF DATA FOR THE FULL YEAR 2024

RIKSSTROKE
The Swedish Stroke Register

A brief summary of data for the full year 2024

TIA

Number of recordings and coverage

- During 2024, there were 8 721 TIA events registered at 68 out of the 71 emergency hospitals that treat acute TIA. Compared to 2023, there were 440 fewer TIA events registered during 2024, partly probably due to three hospitals not registering.

- The ratio between the number of TIAs and ischemic stroke is about 1:2 and has been stable for several years.

Demographics, risk factors, type of care and length of stay

- Slightly more men than women were registered, 52% and 48%, respectively. The mean age was 75 years (74 years among men and 76 years among women), around one year younger than patients with stroke.

- At the time of onset, 62% of the patients with TIA had treatment for high blood pressure, 22% had a known atrial fibrillation, 20% diabetes mellitus, and 8% were smokers.

- Of the registered TIA patients, 46% arrived at the hospital within three hours from symptom onset and 90% within 24 hours. Roughly half (54%) of the patients arrived by ambulance.

- 85% of the TIA patients were directly admitted to a stroke care unit. The median length of stay was three days (including day of admittance and day of discharge).

Diagnostics

- Practically all patients had a CT scan examination (98%) and 19% had an MRI scan, with large variations in imaging methods between hospitals. CT angiography is the most common vascular examination method. In all, 84% were examined and the most common method to visualize the carotid arteries was CT angiography (61%), followed by ultra-sonography (33%).

- For cardiac arrhythmia detection, 79% of the patients without a known atrial fibrillation had a long-term ECG recording. An additional 11% had a planned long-term ECG recording after discharge.

Secondary prevention

- Of the TIA patients with atrial fibrillation 91% were prescribed oral anticoagulants at discharge, normally NOACs. The variation between different regions was moderate.

- For those with no atrial fibrillation, 98% were treated with antiplatelets. Aspirin in monotherapy was used by 40%, clopidogrel in monotherapy in 12%, and a combination of aspirin and clopidogrel in 44%. There was considerable regional variation in the choice of antiplatelet regime between hospitals.

- Anti-hypertensive medicine was prescribed for 73% of the patients and 88% with statins.

- Roughly half of the smokers (51%) received advice about smoking cessation. Information about advice on smoking cessation was missing or not performed in 48% of TIA patients.

- 69% of those with a driver's license were reported to have been advised about driving after TIA. For 13%, information was not deemed relevant.

- As in previous years, almost all TIA patients, 96%, had a planned follow-up visit at the hospital or in primary care.

STROKE

Number of registrations and coverage

- During 2024 there were 19 832 stroke events registered in Riksstroke, which is 91 fewer stroke events compared to 2023 (Figure 1). All hospitals but one treating acute stroke reported to Riksstroke during 2023. As in 2023, 20% were recurrent strokes.

Demography, risk factors, type of care and length of stay

- Mean age and the distribution in terms of sex was unchanged compared to previous years. Slightly more men than women had a stroke, 54% and 46%, respectively. The mean age was 75 years, 73 years among men and 77 years among women.

- 85% of the patients were fully conscious on arrival. The proportion of patients in whom NIHSS was registered was 77%. There was a considerable variation in the proportions of NIHSS registrations among the hospitals.

- 66% of the stroke patients had high blood pressure, 28% atrial fibrillation, 25% diabetes and 13% were smokers.

- 13% of all stroke events were intracerebral hemorrhages. Among the 2 503 patients with intracerebral bleedings, 27% had ongoing anticoagulant treatment, 86% with non-vitamin K oral anticoagulants and 14% with warfarin (Figure 2). In relation to the number of people being treated with respective OAC that represents 0.2% of people treated with warfarin and 0.1% of those treated with NOAC. Half of those with ongoing OAC-treatment were treated with reversal of anticoagulation.

- In all, 75% of stroke patients arrived at the hospital by ambulance.

- A third (34%) of the stroke patients arrived at hospital within three hours from onset and an additional 6% in the interval of 3-4.5 h. In all, 47% arrived as a thrombolysis/thrombectomy alarm.

- The proportion of acute stroke patients receiving care at a stroke care unit at some point during their hospital stay remained high, 94% (Figure 3). The variation between hospitals is small.

- Still, several stroke patients, 15%, received treatment at an observation- or other non- stroke care unit during the first critical day (Figure 4).

- The median length of stay at the hospital was 6 days. There was a considerable variation in length of stay between the hospitals which at least partially can be explained by various usage of early supported discharge with stroke rehabilitation at home.

Diagnostics

- The use of computer tomography for diagnostic imaging was at an exceedingly high level in all hospitals, 98% on average.

- The average usage of MRI examinations of the brain was 37% with large variations between hospitals.

- CT-angiography in association with the initial computer tomography keeps increasing and was performed in 64% of the patients with ischemic stroke, with large variation between hospitals.

- CT perfusion to visualize potentially salvageable brain tissue was performed in around half of the hospitals and in 24% of the patients with ischemic stroke.

- For patients with ischemic stroke, CT-angiography was the most common method for vascular examination and in all 84% had vascular imaging performed.

- The proportion of patients with ischemic stroke examined with long-term ECG with the purpose of diagnosing atrial fibrillation was 81% and an additional 6% had the investigation planned after discharge. This varied between the hospitals.

- A swallowing assessment was performed for 86% of the stroke patients.

Reperfusion therapy (to restore the blood flow with thrombolysis and thrombectomy)

- The proportion of patients who received reperfusion therapy was 21% in 2024 (Figure 5). 11% received thrombolysis only, 3% with thrombolysis + thrombectomy, and 7% with thrombectomy only. There was no difference between men and women. A third of the patients treated were 80 years or older.

- There were 1,714 thrombectomies registered in Riksstroke for 2024. The absolute number of thrombectomies has increased and the proportion of thrombectomies in 2024 was 10% in all ischemic strokes. The largest proportions of patients with ischemic stroke receiving thrombectomy treatment are found in the Uppsala/Örebro area, and the urban areas around Stockholm, Gothenburg, and Malmö/Lund.

- In all, there were 3,778 contacts with hospitals with a thrombectomy center from other hospitals.

- The differences in the proportions of patients who received reperfusion therapy varied between the hospitals, and the treatment still seems under-used in several hospitals (Figure 6).

- The time from arrival at the hospital to the start of thrombolysis treatment (door-to-needle time) show large variations between the hospitals. 49% of all patients had a door-to-needle time within 30 minutes, 17% in the interval 31-40 minutes, 16% in the interval 41-60 minutes and 18% more than 60 minutes.

- The majority of the ischemic stroke patients who received reperfusion treatment improved in NIHSS (Figure 7 and 8, for thrombolysis and thrombectomy, respectively).

Neurosurgical operation performed for patients with intracerebral hemorrhages

- In patients with intracerebral hemorrhages, 7% had a neurosurgical procedure.

Physical therapy and occupational therapy

- In all, 87 and 84% of the patients were evaluated by a physical therapist or occupational therapist, respectively. Around half of them within 24 hours after arrival at the hospital.

Speech therapist

- In all, 42% of the patients had their speech- or swallow function evaluated by a speech therapist during the hospital stay.

Secondary prevention

- Of all patients, 13% were smokers at the time of stroke. Data on information about smoking cessation was missing in 49% of the patients and the efforts to encourage patients to not smoke seem to be insufficient at many hospitals. Half of the smokers received information about smoking cessation.

- The proportion of patients with an embolic stroke (defined as ischemic stroke associated with atrial fibrillation, 28%) that received secondary prevention with oral anticoagulants was 84% with no difference between men and women (Figure *9*). Of these, 79% were treated with one of the non-vitamin K oral anticoagulants (NOAC) and 5% with warfarin at discharge.

- 95% of the patients with ischemic stroke and no atrial fibrillation were treated with antiplatelets after the stroke. A combination of Aspirin and Clopidogrel was most common, while 35% and 12% had monotherapy with Aspirin or Clopidogrel, respectively.

- The proportion of patients with antihypertensive medicine at discharge remained at a relatively high level, 79%, with relatively small variation between the hospitals.

- The use of statins after an ischemic stroke increased further to 85% (87% in men and 82% in women). The variation between the hospitals remains large.

Driving

- For patients with a driver's license, 59% had received information about driving after stroke. Data was missing for 17% of the patients.

Accommodation after discharge and planned rehabilitation

- In all, 78% of the patients were discharged to their own home while 20% were discharged to an assisted living facility.

- Early supported discharge with rehabilitation at home from a multidisciplinary team associated with the stroke unit was planned for 21% of the patients who were discharged to their own home. There were large variations in the proportions with rehabilitation at home and in a hospital-based day rehabilitation clinic (Figure 10).

- 95% of the stroke patients had a planned follow-up visit at the hospital or in primary care.

SUBARACHNOIDAL HEMORRHAGE

- The report includes data from three of the seven neurosurgical departments in Sweden and, therefore the numbers are not representative for Sweden as a whole and need to be interpreted with care.

- In all, 294 patients were reported, 59% women and 41% men. The median age was 68 years.

- Of the reported patients with SAH, 58% were admitted to a neurosurgical ward. Among these, ventricular drainage was inserted in 42% and 11% had invasive treatment for vasospasm.

- In 83 patients, a bleeding site was treated with neuro-intervention and in 19 with neurosurgery. The remaining 61 patients had no treatment, in most of these patients no bleeding site was found.

- At 3 months, 18% were deceased. The response rate to the follow-up questionnaire was 50%, substantially lower compared to other stroke types.

3-MONTH FOLLOW-UP STROKE

Follow-up

- Out of the 19,832 stroke events in 2024, 76% answered a follow-up survey or were deceased 3 months after their stroke.

Survival

- In all, 15% of the patients were deceased within 90 days after their stroke and 31% were deceased or ADL dependent at the 3 months follow up after stroke.

- The proportion of deceased and deceased or ADL-dependent varied significantly between the hospitals, but the differences were small between the regions after statistical adjustment for age, sex, and level of consciousness.

Function

- The proportion of patients who were dependent in ADL 3 months after stroke was 14% (Figure 11).

- Patient characteristics can partly explain the differences in proportion of ADL-dependent patients between the hospitals but there are still considerable differences between the hospitals even after statistical adjustment. Data might be affected by transfers between hospitals for thrombolysis and thrombectomy in the acute phase.

Accommodation

- Three months after stroke, 79% of the patients lived in their own home without community service, 14% in their own home with community service, 5% in assisted living and 2% in some other living facility.

Hospital interventions

- The proportion of patients who reported being satisfied or very satisfied with the rehabilitation during the hospital stay (among those who received rehabilitation) was high

92% for the whole nation, with a moderate variation between the regions. The proportion of patients who were satisfied or very satisfied with the rehabilitation after hospitalization was slightly lower, 87%.

- The proportion who stated that they had received early supported discharge with rehabilitation from the hospital at home was 20%. There are still large variations across regions.

- Of all stroke patients, 84% were evaluated by an occupational therapist, and 87% by a physiotherapist, and 42% were evaluated by a speech therapist. The variations between the regions were large.

- Of the 13% who smoked at the time of the stroke, 54% reported to have received advice on smoke cessation. The proportion of stroke patients who quit smoking was 46%.

- Of the patients who responded to the question about lifestyle changes, 54% reported receiving such advice, 49% and 59% of women and men, respectively.

Symptoms and quality of life

- In all, 78% percent of the patients reported their general health to be *very good* or *good* 3 months after stroke, with some variation between the hospitals.

- 29% stated that they had gone back to the life and activities they had before their stroke, 41% percent answered “yes, but not quite like before” and 30% answered “no”.

- Fatigue, depression, pain, speech difficulties and memory difficulties are common after a stroke. However, about half of the patients report no such difficulties.

Acute care satisfaction

- Most of the stroke patients were satisfied with the acute care, and the differences in satisfaction between the hospitals were moderate.

Need of support

- 43% of the patients were satisfied with the support from the hospitals and the municipality after discharge. The proportion of patients who were satisfied with the support varied substantially between hospitals (31-83%).

- Three months after stroke 66% of the men and 58% of the women under the age of 80 years, reported that they managed independently, without help. The proportion of individuals in need of help or support was higher than those above 80 years of age. Still, 47% of men and 31% of women reported that they managed independently, without help.

Figures

NUMBER OF STROKE EVENTS IN RIKSSTROKE 2010-2024

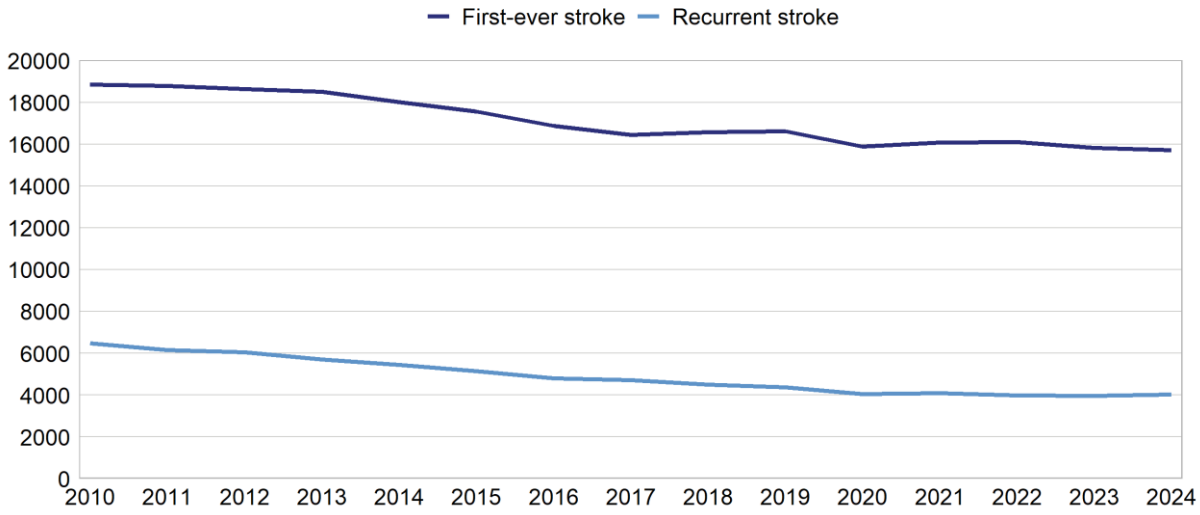

Figure 1. Number of stroke events registered in Riksstroke from 2010 to 2024. Separate lines for first-time events and recurrent stroke events.

ANTICOAGULANTS AT ADMISSION AMONG PATIENTS WITH INTRACEREBRAL HEMORRHAGES

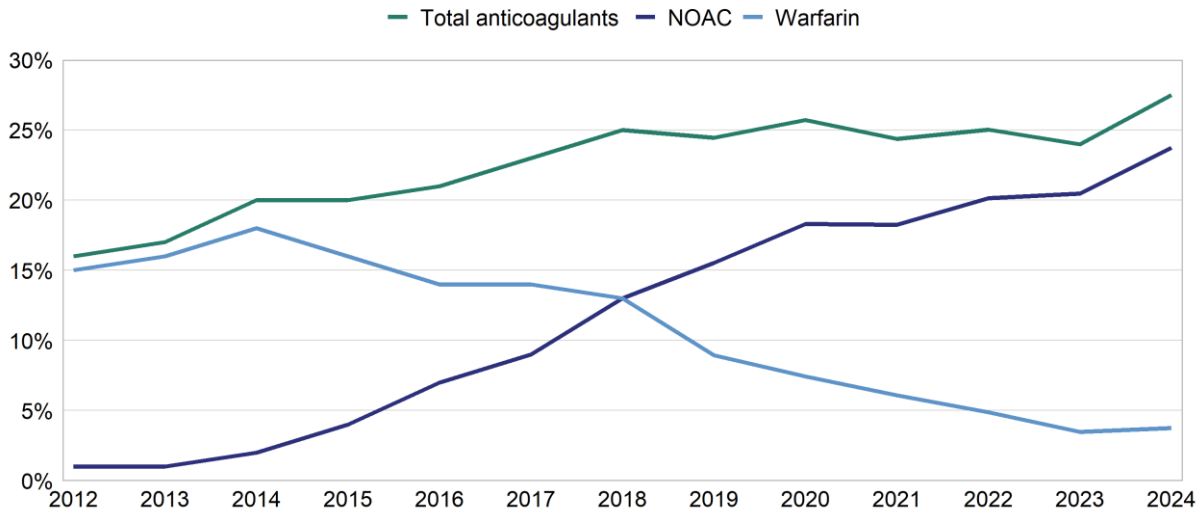

Figure 2. The proportion of patients with anticoagulant treatment at admission among intracerebral hemorrhages, 2012-2024.

CARE AT A STROKE CARE UNIT, INTENSIVE CARE UNIT OR NEUROSURGICAL UNIT (AT SOME PERIOD DURING THE ACUTE PHASE)

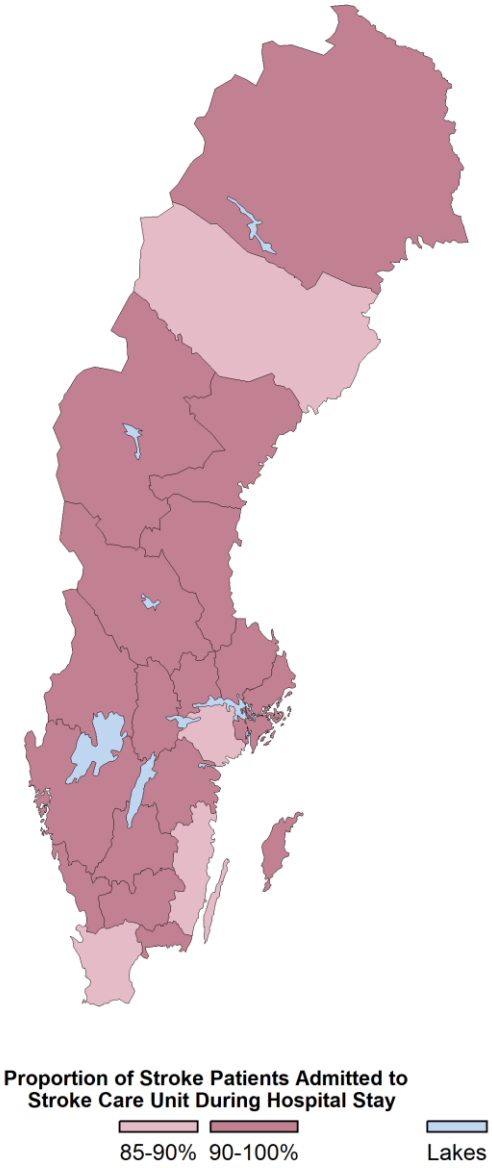

Figure 3. The proportion of patients with acute stroke receiving care at a stroke care unit/intensive care unit/neurosurgical unit or other ward in the different Swedish regions in 2024.

DIRECT ADMISSION TO STROKE CARE UNIT (AS FIRST LEVEL OF CARE)

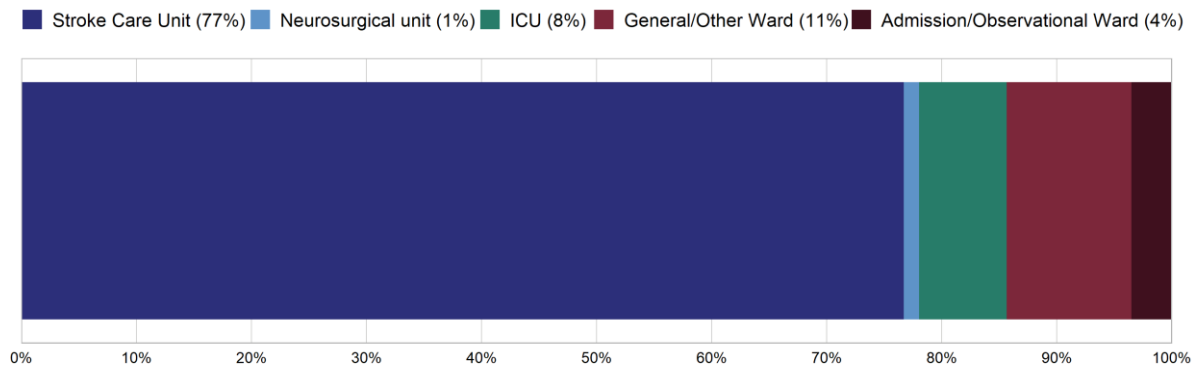

Figure 4. Proportion of acute stroke patients directly admitted to stroke unit, intensive care unit, neurosurgical unit, or other type of ward, 2024.

REPERFUSION THERAPY

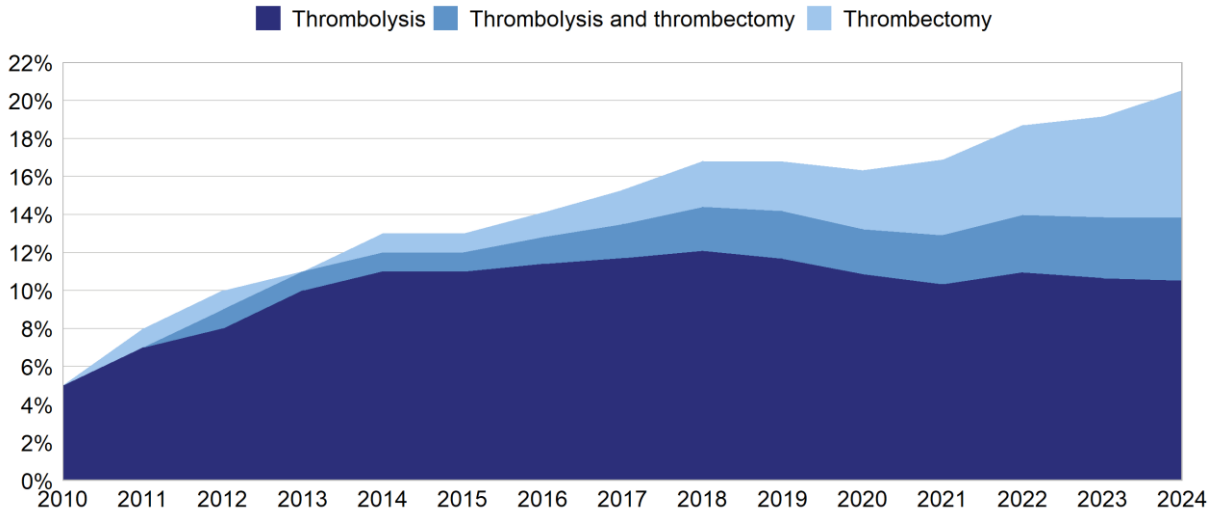

Figure 5. The proportion of patients with ischemic stroke receiving reperfusion therapy, 2010-2024.

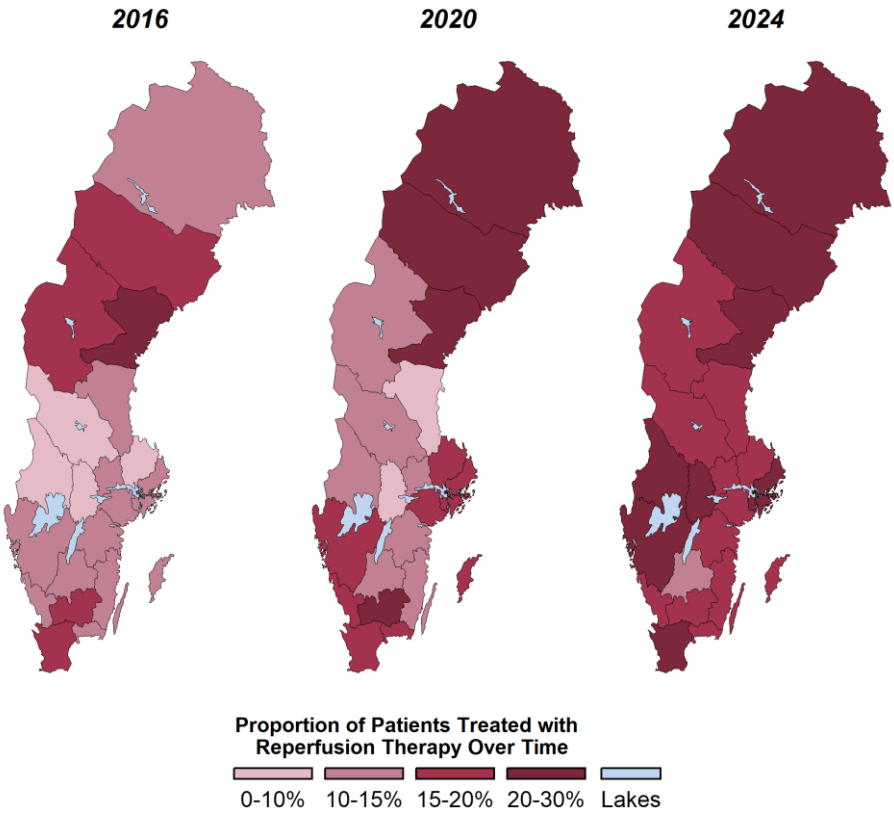

Figure 6. The proportion of patients with ischemic stroke receiving reperfusion therapy in different Swedish regions, 2016, 2020, and 2024.

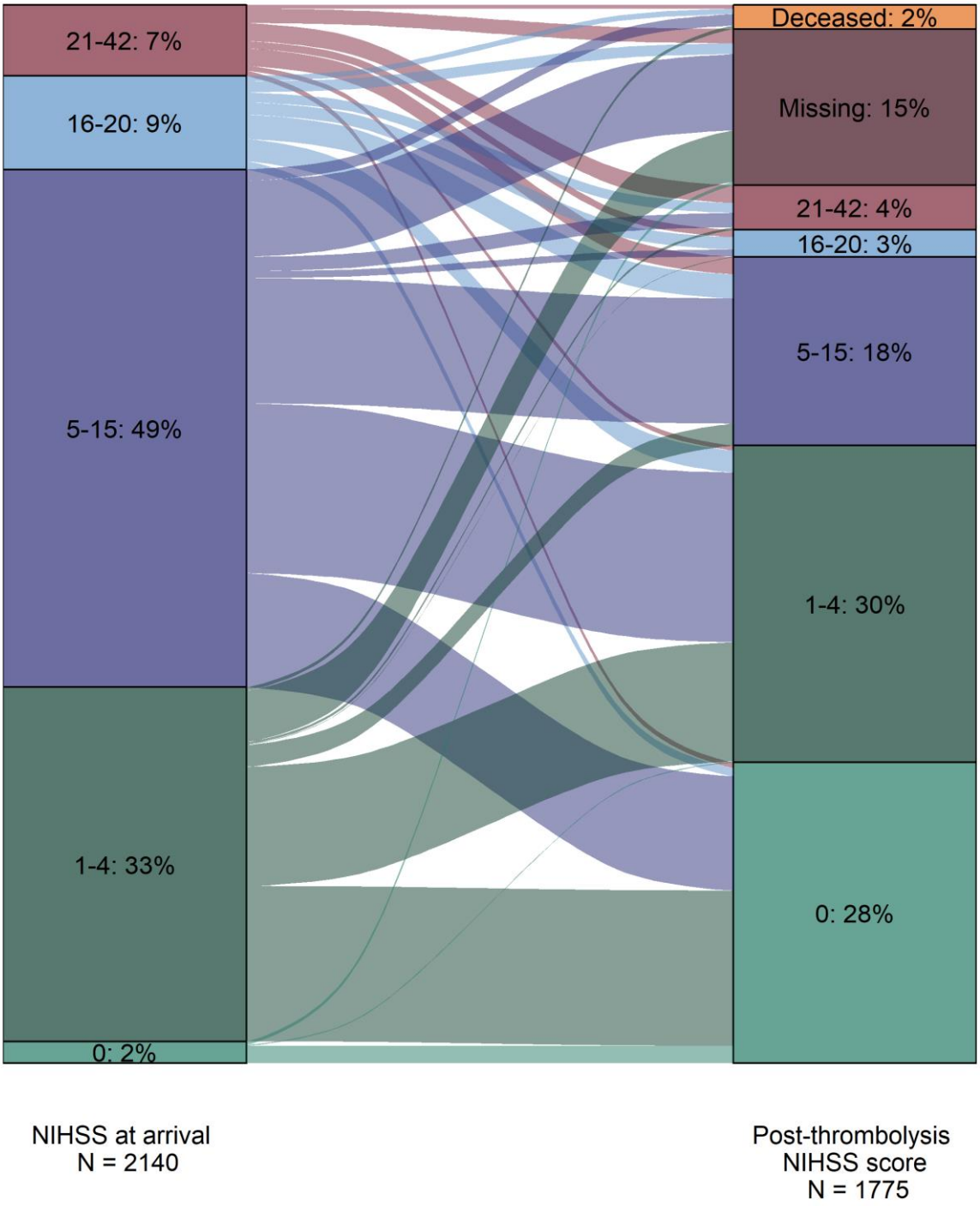

Figure 7. NIHSS before and after thrombolysis in patients with ischemic stroke in 2024.

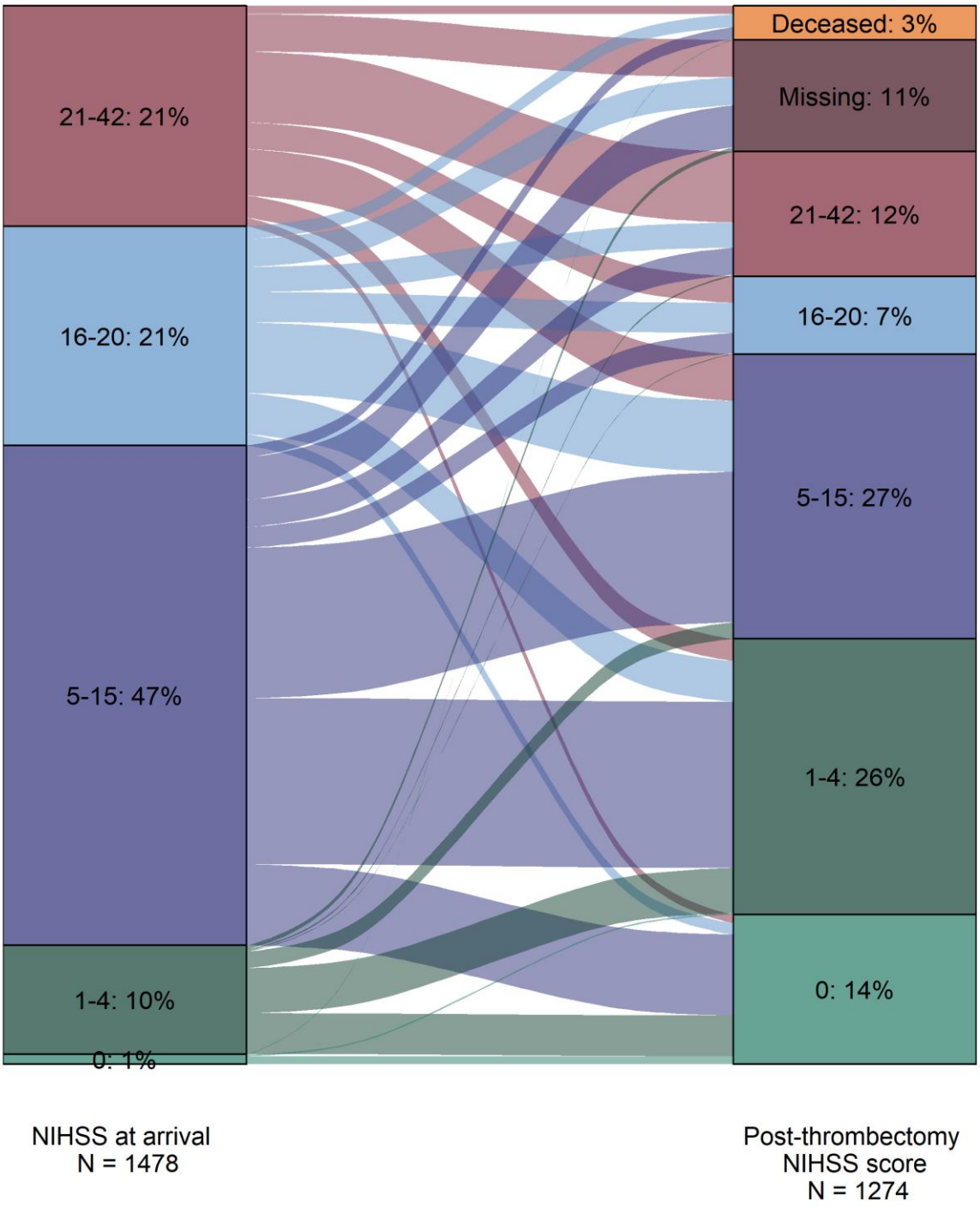

Figure 8. NIHSS before and after thrombectomy in patients with ischemic stroke in 2024.

ANTICOAGULANTS AMONG PATIENTS WITH ISCHEMIC STROKE AND ATRIAL FIBRILLATION

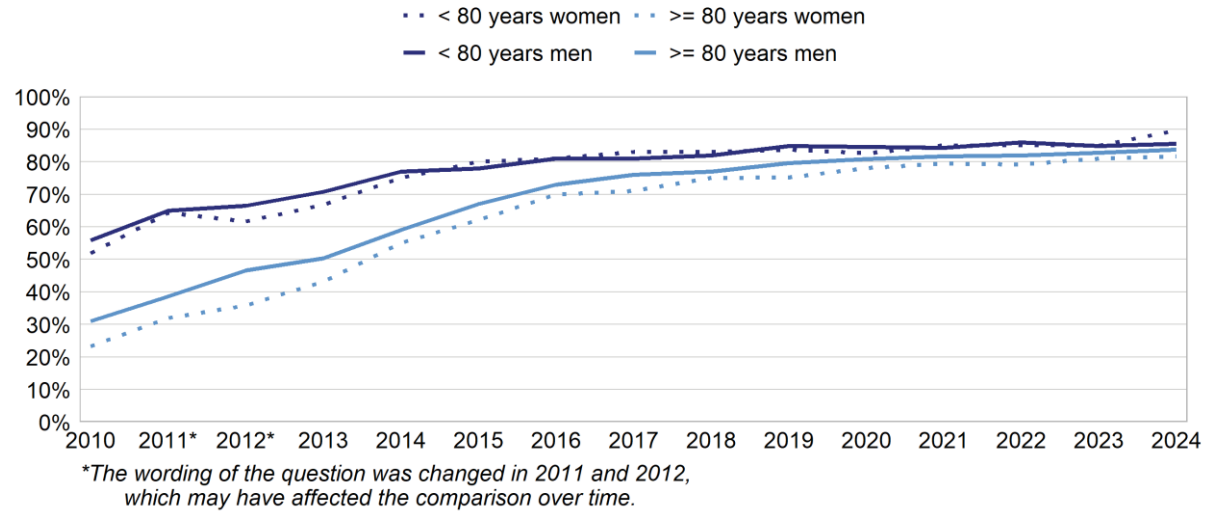

Figure 9. Proportion of patients with ischemic stroke and atrial fibrillation who were prescribed anticoagulant treatment (NOAC or warfarin) at discharge, 2010-2024.

PLANNED REHABILITATION AMONG PATIENTS DISCHARGED TO THEIR OWN HOME

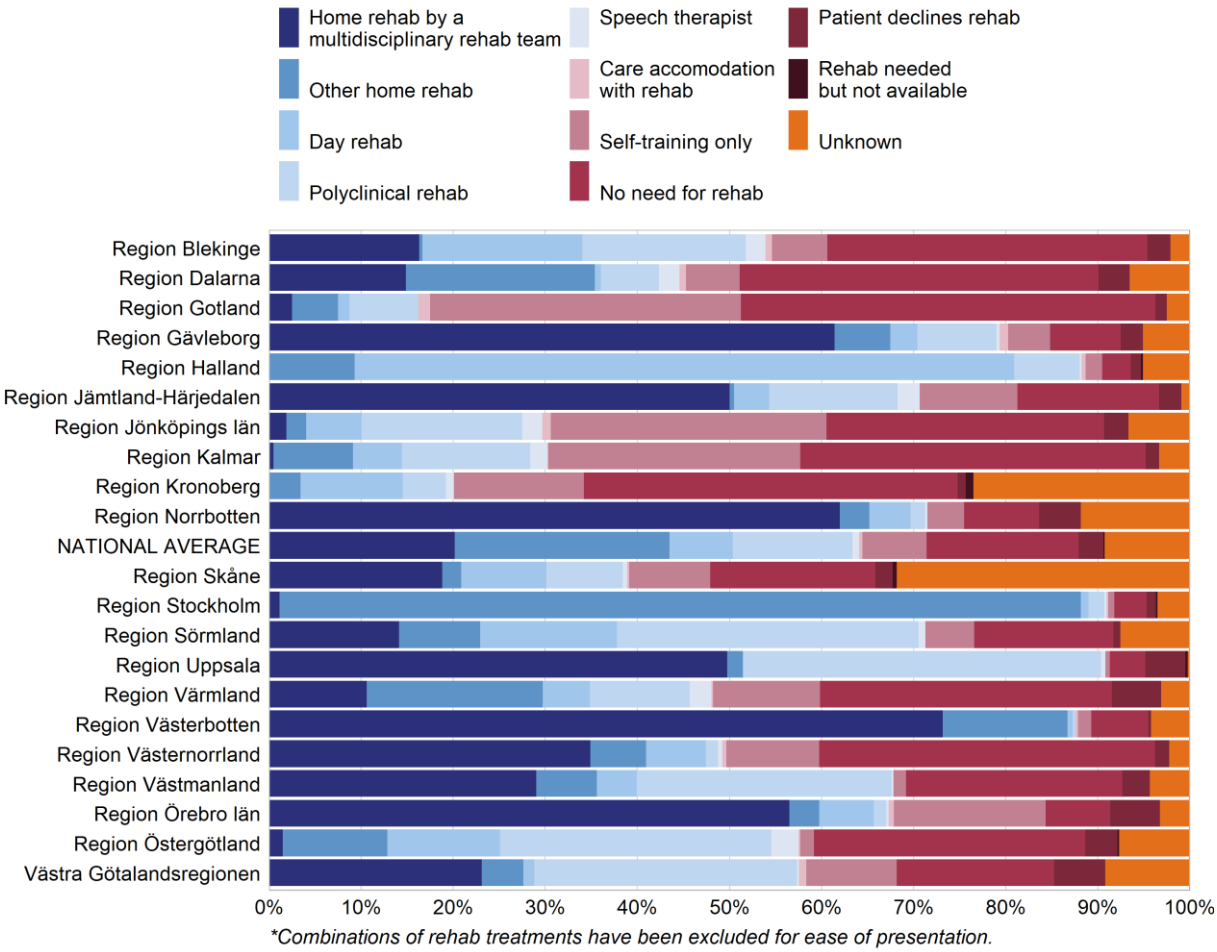

Figure 10. The proportion of patients with planned rehabilitation among those discharged to their own home, by region 2024.

ADL-DEPENDENCY 3 MONTHS AFTER STROKE

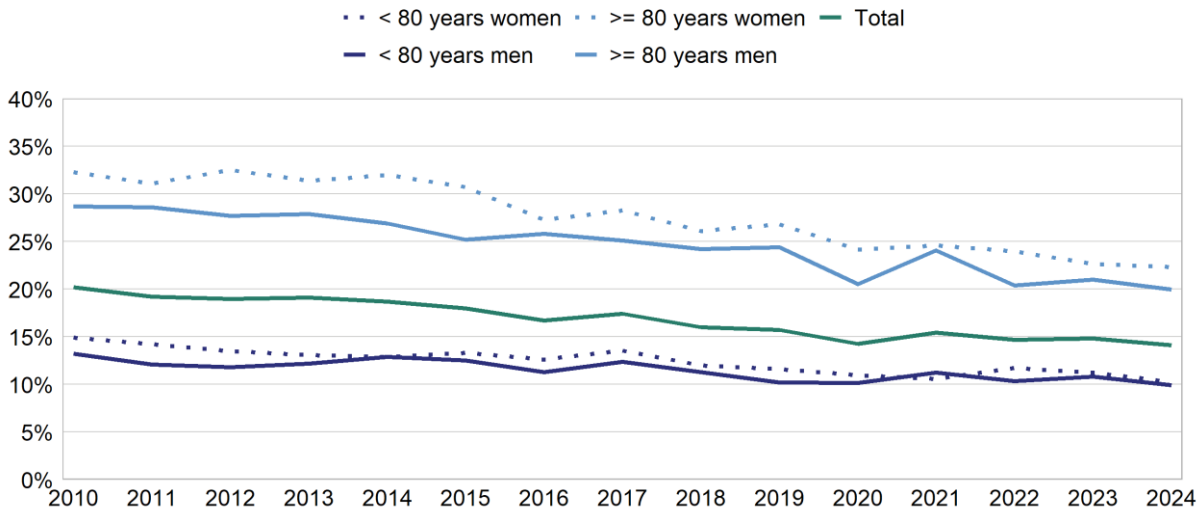

Figure 11. The proportion of patients who were ADL-dependent three months after stroke, 2010-2024. Patients who already were ADL-dependent before their stroke were excluded from the calculations.