

RIKSSTROKE

QUALITY OF THE SWEDISH STROKE CARE 2021



A BRIEF SUMMARY OF DATA FOR THE FULL YEAR 2021



RIKSSTROKE
The Swedish Stroke Register

A brief summary of data for the full year 2021

TIA

Number of recordings and coverage

- During 2021, there were 8 961 TIA events registered at 71 out of the 72 emergency hospitals that treat acute TIA. Compared to 2020, 858 (11 %) more TIA events were registered during 2021.
- The coverage of the register for TIA was 86 % in 2021 (register entries compared with official administrative data).
- 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 74 years (73 among men and 76 among women), about one year younger than patients with stroke.
- At time of onset, 60 % of the patients with TIA had treatment for high blood pressure, 17 % had a known atrial fibrillation, 19 % diabetes mellitus, and 9 % were smokers.
- Similar to previous years, 89 % of the TIA patients sought health care at the emergency room as a first instance, 10 % at primary care and 1 % at some other health care facility.
- Of the registered TIA patients, 45 % arrived at the hospital within three hours from onset and 95 % within 24 hours. More than half (56 %) of the patients arrived by ambulance.
- 81 % of the TIA patients were directly admitted to a stroke care unit. The median length of stay was three days.

Diagnostics

- Practically all patients had a CT scan examination, while 18 % had an MRI scan, the latter an increase of 20 % compared to 2020. During the last years there has been an increasing trend for the use of CT angiography, and this is now the most common vascular examination method. In all, 81 % were examined and the most common method to visualize the carotid arteries was CT angiography (50 %), followed by ultra-sonography (40 %), and a few by MR angiography (1 %).
- For cardiac arrhythmia detection, 74 % of the patients without known atrial fibrillation had a long-term follow-up with long term ECG recording. Further 12 % had a planned long-term ECG recording after discharge.

Secondary prevention

- Of the TIA patients with atrial fibrillation 89 % were prescribed oral anticoagulants at discharge. Most, around nine out of ten, patients use NOACs. There was no significant geographical variation in receiving the treatment.

- For those with no atrial fibrillation, 98 % were treated with antiplatelets. Aspirin in monotherapy was used by 41 %, clopidogrel in 17 %, and a combination of aspirin and clopidogrel in 40 %. There was a considerable regional variation in choice of antiplatelet regime between hospitals.
- Antihypertensive medicine was prescribed for 73 % of the patients and 86 % with statins, both numbers unchanged from 2020. There was still a considerable regional variation in usage.
- More than half of the smokers (56 %) received advice about smoking cessation and 51 % of those with a driver's license received advice about driving after stroke. Information about smoking cessation and/or driving was missing for every fifth and third TIA patient, respectively.
- As previous year, almost all TIA-patients, 95 %, had a planned follow-up visit at the hospital or in primary care.

STROKE

Number of registrations and coverage

- During 2021 there were 20 228 stroke events registered in Riksstroke, which is 231 (1 %) more stroke events compared to 2020 (Figure 1). If this represent an end to the slightly declining trend in registered stroke events or if it reflects an underreporting during the height of the pandemic is not clear. As in 2020, 20% were recurrent strokes, the lowest proportion in the history of Riksstroke.
- The coverage of the register was 87 % (calculated as register entries compared with official administrative data, first ever strokes for both sources).

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, 55 % and 45 %, respectively. The mean age was 75 years, 73 years among men and 77 years among women.
- Eighty-five percent of the patients were fully conscious at arrival. The proportion of patients in whom NIHSS was registered was 72 %, compared to 65 % the year before. There was a considerable variation in proportion of NIHSS registrations among the hospitals.
- Sixty-four percent of the stroke patients had high blood pressure, 28 % atrial fibrillation, 24 % diabetes and 13 % were smokers.
- Twelve percent of all stroke events were intracerebral hemorrhages. Among the 2 522 patients with intracerebral bleedings, almost one in four (24 %) had ongoing anticoagulant treatment, 75 % with non-vitamin K oral anticoagulants and 25 % with warfarin (Figure 2). Around half of the patients (56 %) were treated with reversal of anticoagulation.
- A third of the stroke patients arrived at hospital within three hours from onset and 42 % 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, 92 % (Figure 3). The variation between hospitals is small.
- Still, many of the stroke patients, 19 %, 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 7 days which is unchanged from the last couple of years. There was a considerable variation in length of stay between the hospitals; a partial explanation could be various usage of early supported discharge with stroke rehabilitation at home.

Diagnosics

- The use of computer tomography for diagnostic imaging was at a very high level at all hospitals, mean 98 %.
- The average usage of MRI examinations of the brain was 34 % with large variations between hospitals.
- CT-angiography in association to the initial computer tomography has increased and was performed in 52 % of the patients with ischemic stroke, with great variation between hospitals.
- CT perfusion to visualize potentially salvageable brain tissue was performed in half of the hospitals and in 14 % of the patients with ischemic stroke.
- For patients with ischemic stroke, CT-angiography was the most common method for vascular examination (60 %), followed by ultra-sonography (27 %) and MR-angiography (3 %). The usage of CT-angiography is increasing.
- The proportion of patients with ischemic stroke examined with long-term ECG with the purpose to discover atrial fibrillation was 82 % but varied between the hospitals.
- 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 17 % in 2021 (Figure 5). Ten percent received thrombolysis only, 3 % with thrombolysis + thrombectomy, and 4 % with thrombectomy only. There was no difference between men and women. A third of the treated patients were 80 years or older.
- The differences in the proportion of patients who received thrombolysis between the hospitals decreased, but the treatment still seems under-used at several of the hospitals.
- The time from arrival at the hospital to the start of thrombolysis treatment (door-to-needle time) has decreased compared to earlier years and median time was now 31 minutes. There are still large variations between the hospitals.

- There are now seven thrombectomy centers in Sweden. The number of thrombectomies (mechanical removal of a clot in arteries in the brain using a catheter) has further increased in 2021. In 2021, 1 143 treatments patients in Riksstroke were treated with thrombectomy, an increase from 942 in 2020. Usage of the treatment corresponds to 7 % of all ischemic strokes with a large variation between regions. The largest proportions of patients with ischemic stroke receiving thrombectomy treatment are found in the Uppsala/Örebro area, and the urban areas Gothenburg and Stockholm.
- There were in all 3,241 contacts with hospitals with a thrombectomy center from other hospitals. Almost a third of these resulted in a thrombectomy treatment.

Neurosurgical operation performed for patients with intracerebral hemorrhages

- In patients with intracerebral hemorrhages, 8 % had a neurosurgical procedure.

Physical therapy and occupational therapy

- In all, 86 % of the patients were evaluated by a physical therapist or occupational therapist, about half of them within 24 hours after arrival at the hospital.

Speech therapist

- Two out of five of the patients had their speech- or swallow function evaluated by a speech therapist during the hospital stay.

Secondary prevention

- Data on information about smoking cessation were missing in every third patient and the efforts to encourage patients to not smoke seems 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) that received secondary prevention with oral anticoagulants continued to increase and was now 81 % (Figure 6). Of these, 75 % were treated with one of the non-vitamin K oral anticoagulants (NOAC) at discharge.
- The proportion of patients with antihypertensive medicine at discharge remained on a relatively high level, 79 %, with relatively small variation between the hospitals.
- The use of statins after an ischemic stroke increased further to 84 % during 2021. The variation between the hospitals remains large.

Driving

- For patients with a driver's license, half (48 %) had received information about driving after stroke. This is a less than the previous year. Furthermore, data was missing for one fourth of the patients, an increase compared to the previous year.

Accommodation after discharge and planned rehabilitation

- In all, 78 % returned to their own home after discharge while 21 % were discharged to an assisted living facility.
- Early supported discharge with rehabilitation at home from a multidisciplinary team associated to the stroke unit was planned for 19 % 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 7).

- Ninety-five percent of the stroke patients had a planned follow-up visit at the hospital or in primary care.

SUBARACHNOIDAL HEMORRHAGE

- The report includes data from five of six neurosurgical departments and, therefore the numbers are not fully representative for Sweden and need to be interpreted with care.
- In all, 421 patients were reported, 65 % women and 35 % men. The median age was 62 years.
- Of patients with a SAH, 77 % were admitted to a neurosurgical ward. Among these, ventricular drainage was inserted in 42 % and 22% had invasive treatment for vasospasm.
- In 44% of the patients, a bleeding site was treated with neurointervention and in 13% with neurosurgery. The remaining 30% of patients had no treatment, in the majority of these patients no bleeding site was found.
- At 3 months, 18 % were deceased. The response rate to the follow up questionnaire was 55 %, substantially lower compared to other stroke types. Increased fatigue stood out as a common problem.

3-MONTH FOLLOW-UP

Follow-up

- Out of the 20 228 stroke events in 2021, 78 % answered a follow-up survey or were deceased 3 months after their stroke. The proportion of patients being followed up has decreased slightly compared to 2020 and 2019.

Survival

- In all, 17 % of the patients were deceased within 90 days after their stroke and 23 % 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 15 % (Figure 8).
- 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, 68 % of the patients lived in their own home without community service, 20 % in their own home with community service, 11 % in assisted living and 2 % in some other living facility.

Hospital interventions

- The proportion of patients who were 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, 86 %.
- The proportion who stated that they had received early supported discharge with rehabilitation from the hospital at home was 19 %. There are still large variations across regions.
- Of all stroke patients 42 % were evaluated by a speech therapist. The variations between the regions were large.
- The proportion of stroke patients who quit smoking was 40 %. Barely half the patients reported to have received advice on smoke cessation.
- Of the patients who responded to the question about lifestyle changes, 59% reported receiving such advice, 54 % and 62 % of women and men, respectively.

Symptoms and quality of life

- Seventy-nine percent of the patients reported their general health to be very good or good 3 months after stroke, with substantial variation between the hospitals.
- Twenty-eight percent 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 31 % answered “no”.
- Fatigue, depression, pain, speech difficulties and memory difficulties are common after a stroke. About a third of the patients had three or more of these symptoms (**Fel! Hittar inte referenskölla.**).

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

- Forty-two percent 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 the hospitals, and more than half of the hospitals did not reach moderate target level.
- Three months after stroke, more than half of the stroke patients who lived at home stated that they were fully or partly dependent on the help from a relative (this proportion is

unchanged compared to the previous year). Even among the patients living in a nursing home, the proportion in need of help from a relative was very high.

Figures

NUMBER OF STROKE EVENTS IN RIKSSTROKE 1994-2021

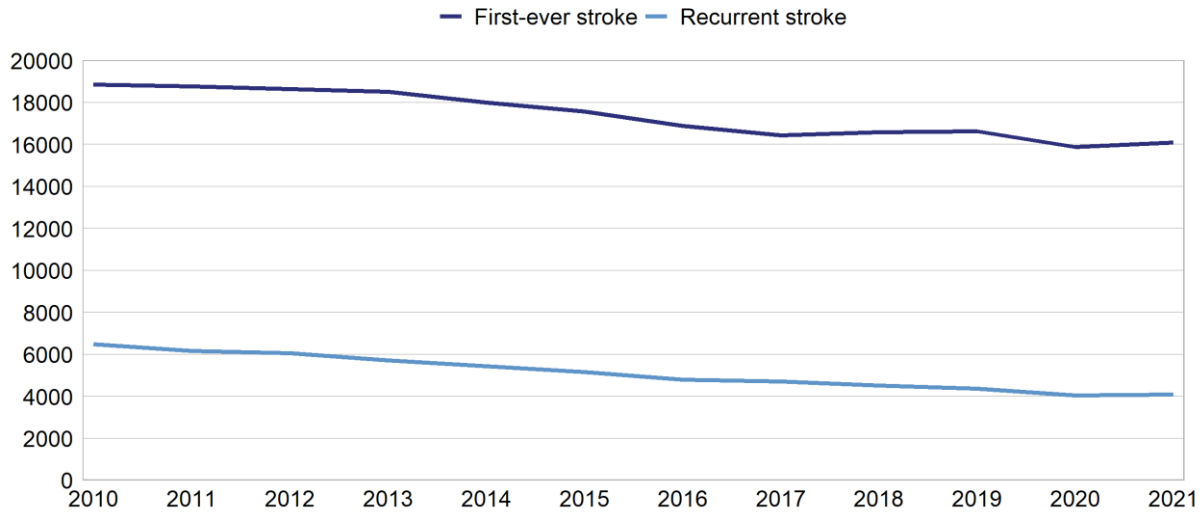


Figure 1. Number of stroke events registered in Riksstroke from 1994 to 2021. Separate lines for first-time events and recurrent stroke events.

ANTICOAGULANTS AT ADMISSION AMONG PATIENTS WITH INTRACEREBRAL HEMORRHAGES

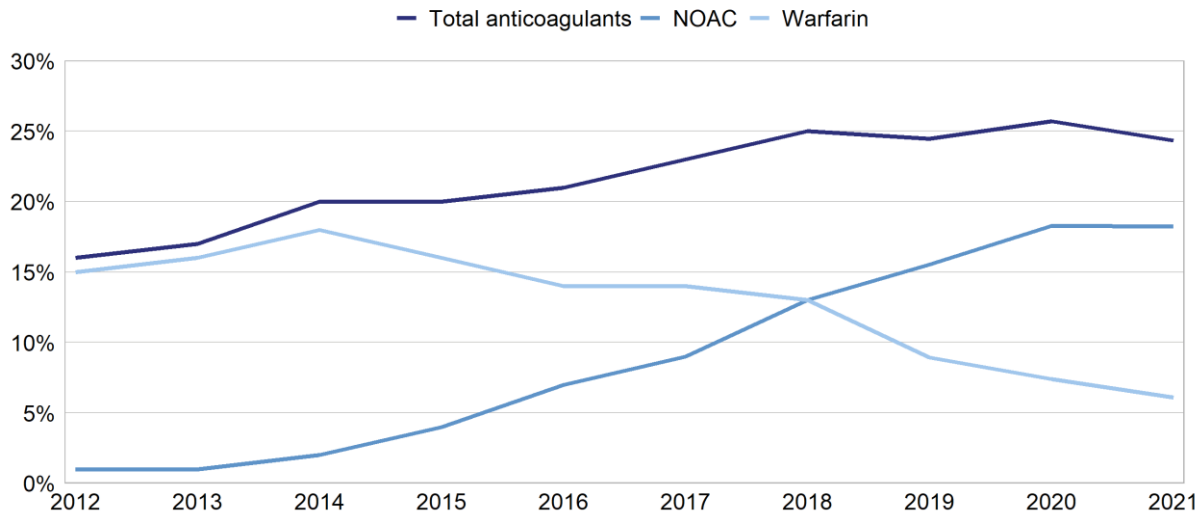


Figure 2. The proportion of patients with anticoagulant treatment at admission among intracerebral hemorrhages, 2012-2021.

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

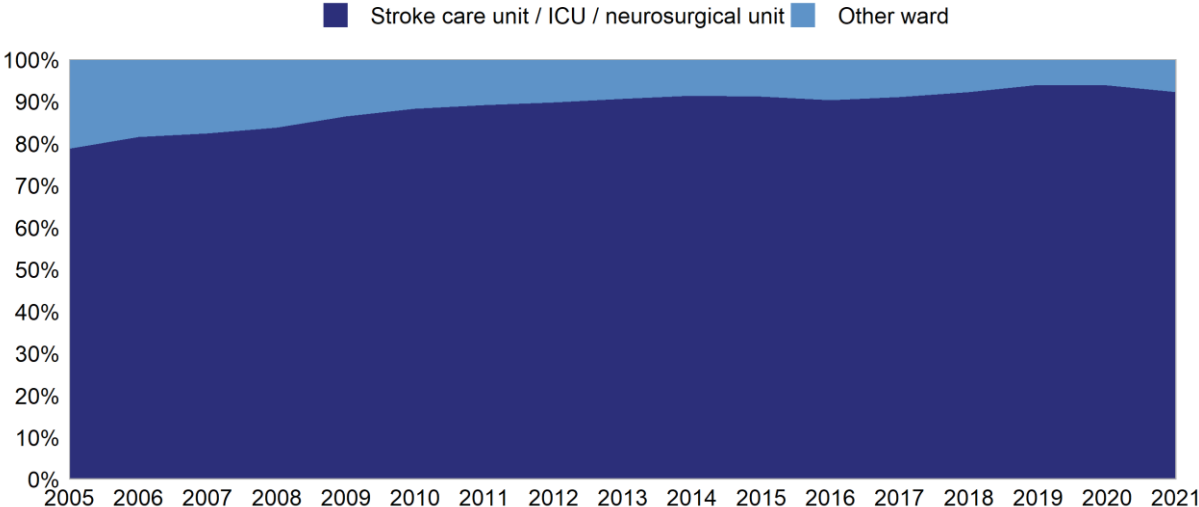


Figure 3. The proportion of patients with acute stroke receiving care at a stroke care unit/intensive care unit/neurosurgical unit or other ward, 2005-2021.

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

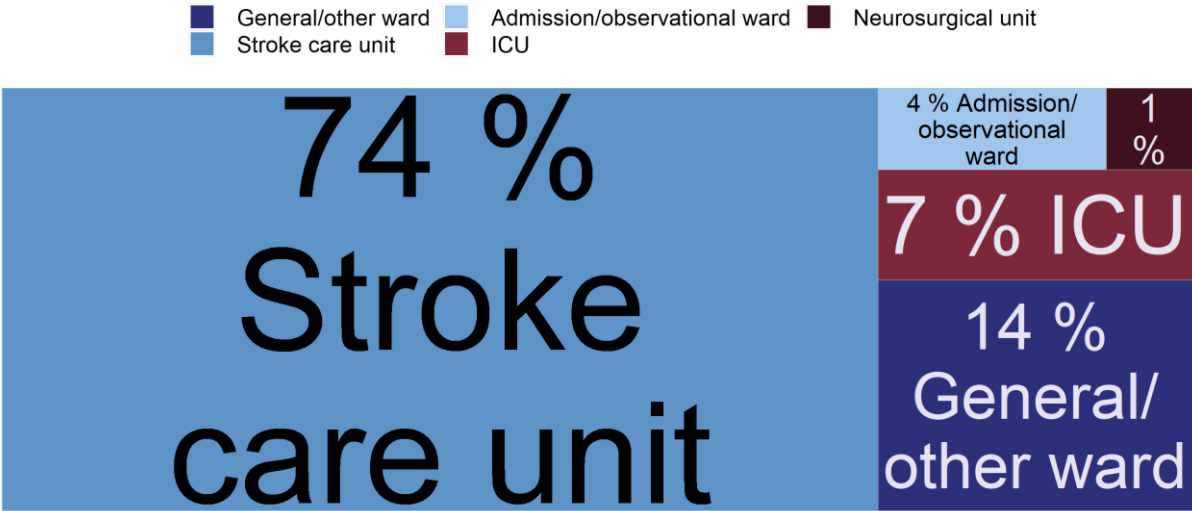


Figure 4. Proportion of acute stroke patients directly admitted to stroke unit, intensive care unit, neurosurgical unit or other type of ward, 2021.

REPERFUSION THERAPY

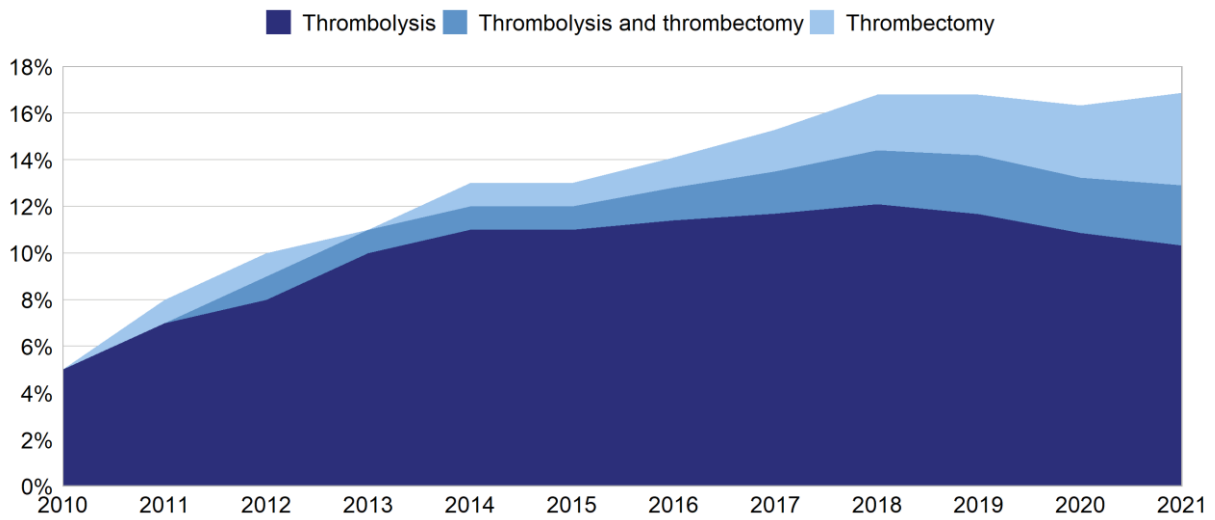
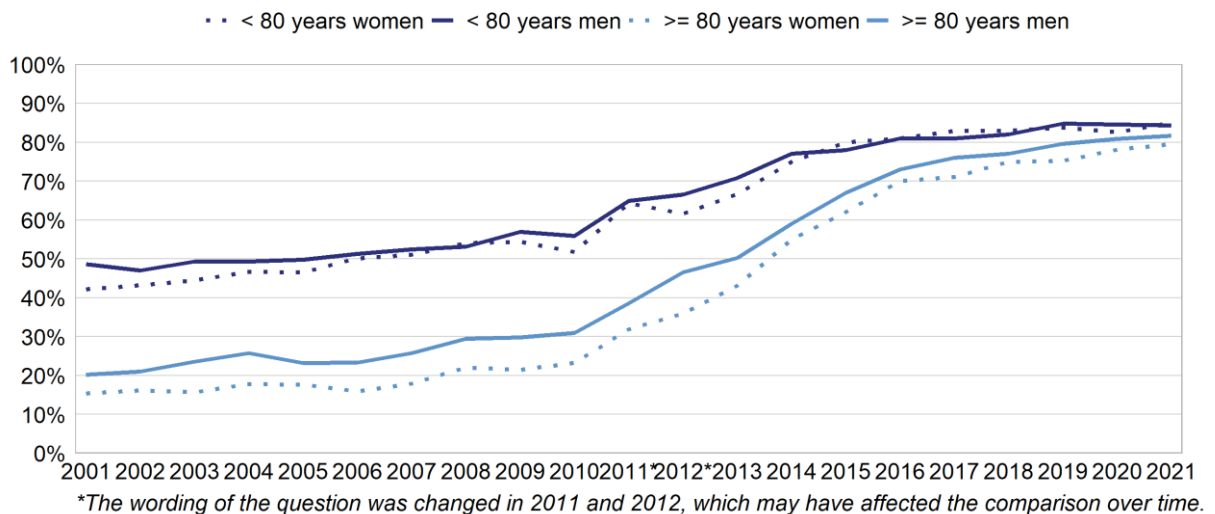


Figure 5. The proportion of patients with ischemic stroke receiving reperfusion therapy, 2010-2021.

ANTICOAGULANTS AMONG PATIENTS WITH ISCHEMIC STROKE AND ATRIAL FIBRILLATION



*The wording of the question was changed in 2011 and 2012, which may have affected the comparison over time.

Figure 6. Proportion of patients with ischemic stroke and atrial fibrillation who were prescribed anticoagulant treatment (NOAC or warfarin) at discharge, 2001-2021.

PLANNED REHABILITATION AMONG PATIENTS DISCHARGED TO THEIR OWN HOME

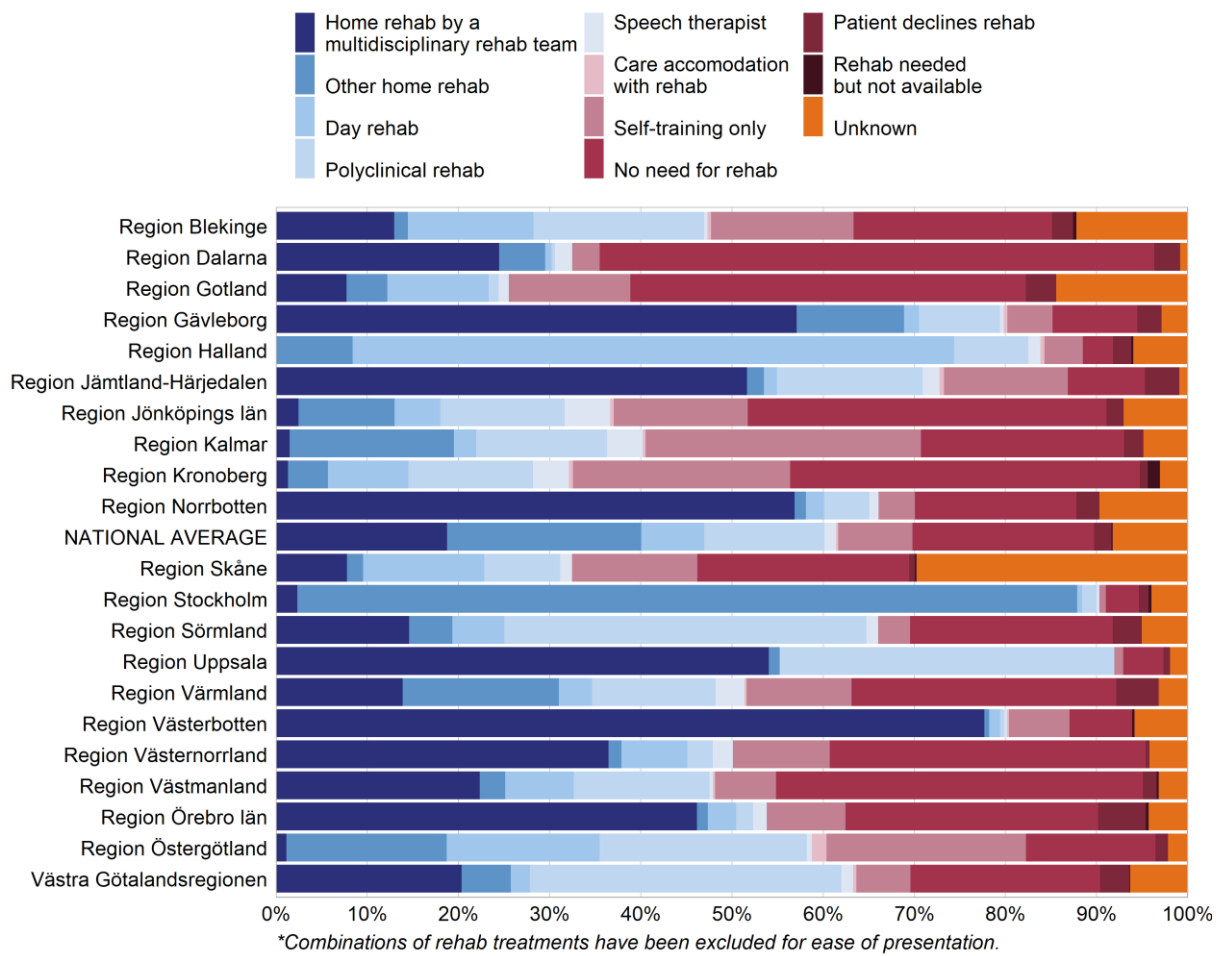


Figure 7. The proportion of patients with planned rehabilitation among those discharged to their own home, by region 2021.

ADL-DEPENDENCY 3 MONTHS AFTER STROKE

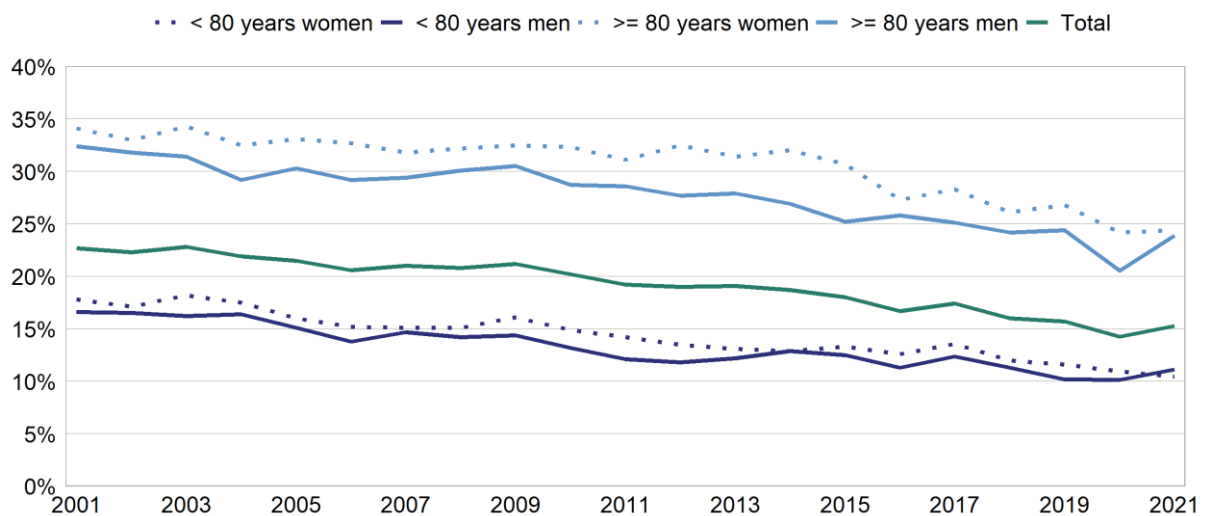


Figure 8. The proportion of patients who were ADL-dependent three months after stroke, 2001-2021. Patients who already were ADL-dependent before their stroke are excluded from the calculations.