

Dear Reader,

SITS started as an internet-based registry for intravenous thrombolysis already in 1996.

In 2002 it was given a broader international role when European Union authorities requested that all patients treated with thrombolysis should be registered in SITS for a period of three years.

Today, over 300 000 patient files are included from more than 80 countries in the SITS Registry. Ninety-six scientific reports have been published in international peer-reviewed journals based on SITS data, and many abstracts have been presented at different stroke conferences. This year, three abstracts based on SITS data have been accepted for presentation at ESO-WSO 2022 in Lyon, France: 2 oral and 1 e-poster presentation.

Early in 2022, SITS launched a new data entry form for capturing data on cerebral venous thrombosis (CVT). The SITS CVT protocol enables documentation of risk factors, pathophysiology, clinical presentation etc. Due to the low incidence compared to arterial stroke, our aim is to enable SITS global network to capture high-volume real-world data on CVT. We hope that existing SITS centres will find the CVT protocol useful, and we encourage new centres to start using it.

Covid-19 has changed the world but also put an emphasis on the importance of science and research. SITS is primarily a research register but also provides the opportunity for individual centres to use SITS for quality control and benchmark their data with national and global data. With this annual report we provide an overview of the registry data, ongoing and planned activities. The publications based on data from the SITS Registry is merely possible through contribution from all SITS centres and users. SITS always welcome ideas for research projects and we have many exiting ongoing and upcoming projects.

We take the opportunity to acknowledge the contributions of more than 350 authors involved in SITS publications since its beginning. International, regional, national, and centre / Local Coordinators at participating centres are also acknowledged in this report, in the Appendix.

We thank our present and previous Scientific Committee members who oversee scientific activities within SITS and contribute with their expert knowledge. We thank all patients participating in the registry and all the hard-working local users who enter data in the registry. Finally, we are grateful to our team members at the SITS Coordination Office who have been involved in the preparation of this report.

Kind regards,

Niaz Ahmed
SITS Chairman

Nils Wahlgren
Previous SITS Chairman

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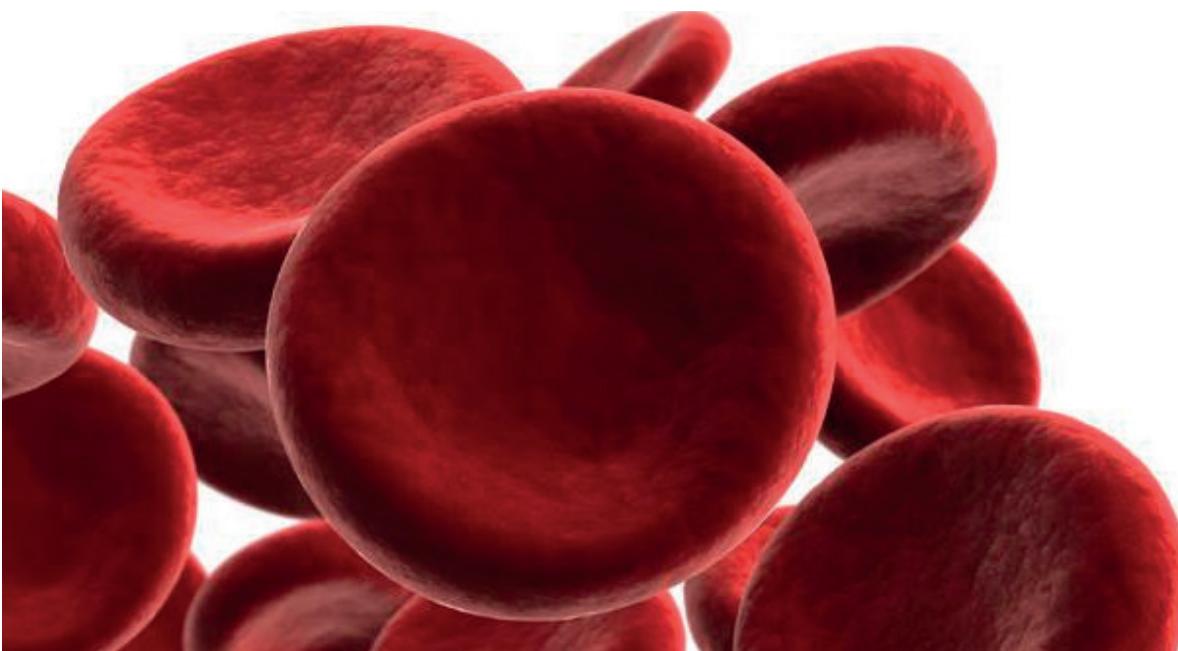


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Background and purpose

SITS (Safe Implementation of Treatment in Stroke) is a non-profit, research-driven, independent, international collaboration. It is an initiative by the medical profession to assure excellence in acute treatment and secondary prevention of stroke, as well as to facilitate clinical trials.

SITS started in 1996 as an initiative by participants in the European-Australian randomised stroke thrombolysis studies (ECASS). In 2002, the European Medicines Agency (then EMEA, currently EMA) endorsed SITS as the registry for follow-up on thrombolysis treatment in acute ischemic stroke. SITS has since developed its services to enable follow-up of other evidence-based treatments in acute stroke such as thrombectomy, as well as secondary prevention.

The purpose of this report is to demonstrate how the registry has developed since 2002 with updated data since the previous report of 2019 and summarize how SITS has contributed to the body of knowledge on modern stroke treatment. The time span of the presented data is December 2002 – December 2021, illustrating the growth of SITS over 19 years. 96 scientific articles based on SITS data have been published/are accepted for publication in peer reviewed journals since 2007, with more than 350 co-authors. This would not have been possible without the dedicated efforts of SITS national, regional, and Local Coordinators, as well as local users.

The SITS network is expanding. More than 1900 stroke centres in more than 80 countries on five continents have contributed with data to the registry. This makes SITS one of the world's largest stroke treatment databases and networks, with participation of many leading stroke experts.

Support and Funding

SITS is financed from an unrestricted sponsorship from Boehringer-Ingelheim. SITS has previously been financed directly and indirectly by grants from Karolinska Institutet, Stockholm County Council, the Swedish Heart and Lung Foundation, the Swedish Order of St. John, Friends of Karolinska Institutet, and private donors, as well as received grants from the European Union Framework 7, the European Union Public Health Authority and Ferrer Internacional. SITS has completed studies supported by EVER Pharma, as well as in collaboration with Karolinska Institutet, supported by the Swedish Heart and Lung Foundation, Stryker, Covidien, PhenoX, Codman and Biogen. SITS is currently conducting studies supported by Biogen and Boehringer-Ingelheim.

SITS Studies

Completed Studies

SITS-MOST

An open, prospective, non-randomised observational study of safety and efficacy of treatment with intravenous rt-PA within 3 hours of onset of acute ischaemic stroke, based on the SITS International Stroke Thrombolysis Register. Performed in European Union countries.

SITS-NEW

An observational study of safety and efficacy of intravenous rt-PA within 3 hours of symptom onset in acute ischaemic stroke patients, according to the Summary of Product Characteristics (SPC) of the countries involved. Performed in India, People's Republic of China, Singapore and South Korea.

SITS-UTMOST

A prospective, post-approval registry study of intravenous rt-PA (0.9 mg/kg) up to 4.5 hours after symptom onset in acute ischaemic stroke patients. The study has been completed and the main results were published in the European Stroke Journal in 2016.

SITS-OPEN

An international, multicentre, prospective, controlled, blinded evaluation study of safety and efficacy of thrombectomy in acute occlusive stroke. The SITS-OPEN trial results were published in Stroke in 2021.

SITS Thrombectomy Studies

Implementation of thrombectomy in large artery occlusive stroke in routine clinical practice was published in 2021. Until now 6 scientific articles have been published based on thrombectomy data from the SITS Thrombectomy Registry.

SITS Dabigatran initiation Study

A retrospective study on timing of dabigatran initiation after acute ischaemic stroke was published in 2020.

Ongoing Studies / Projects

SITS AF Studies

A retrospective and prospective study to identify the safest and most effective time point for initiation of oral anticoagulation (OAC) following ischaemic stroke of different severity in patients with atrial fibrillation.

Preliminary results will be presented at ESOC 2022 by Malin Säflund (Sweden), E-Poster Online Library, Wednesday May 4th, 08:00 - 20:00.

A retrospective and prospective study to investigate the type, timing, safety, and reasons for choice of acute interventions in patients taking direct OACs or warfarin prior to stroke onset. This study shall also evaluate the use of idarucizumab in patients on dabigatran suffering acute stroke.

Intracerebral Haemorrhage (ICH) Registry and Network

Intracerebral haemorrhage is the most devastating form of stroke, with 30-day mortality reaching 50% and half of the survivors suffering from severe disability. With emerging treatments, new diagnostic techniques and updated management guidelines for ICH, there is a need for a large international collaborative registry to enable better follow-up, care quality assurance, and research studies in this field. We hope that the SITS ICH Registry will become a valuable tool and provide a network for clinicians and researchers striving to improve outcomes in the most severely afflicted stroke patients. Results from the SITS-ICH Registry will be published once sufficient amount of data is captured. Top recruiting centre coordinators will be invited to join as co-authors and all participating centres will be acknowledged as collaborators.

SITS IVT > 80 years Study

A prospective, post-approval registry of intravenous rt-PA (0.9 mg/kg) in acute ischaemic stroke patients over 80 years within the SITS-ISTR Registry. Although IVT in patients > 80 years has been used off-label in many countries, treatment in patients > 80 years will probably increase further after approval. The SITS-ISTR provides an instrument for continuous monitoring of thrombolysis treatment in stroke and provides a technical platform for the SITS > 80 years post-approval study. At least 1000 patients from approximately 60 European sites will be included in this prospective study.

SITS IVT Paediatric Study

Until recently, IVT with alteplase was not approved in patients with acute ischaemic stroke aged under 18 years. Based on observational data, regulatory authorities in several countries have now approved use of IVT with alteplase in patients 16-18 years if other Summary of Product Criteria (SmPC) are fulfilled. Regulatory authorities have requested monitoring of treatment in this age group, SITS will therefore perform a study of IVT in patients with acute ischaemic stroke aged 16-17 years. The study protocol is approved by the Swedish ethics committee.

SITS Cerebral Oedema Study

Large hemispheric infarction often leads to high morbidity and mortality, and real-world data on clinical management, outcomes and healthcare utilization is limited. There is also a growing interest in understanding the efficacy and effectiveness on thrombectomy in patients with large infarcts. The number of incidents, current clinical management, recurrent strokes and functional outcomes, including how thrombectomy modifies the risk of cerebral oedema in patients with large hemispheric infarction, forms the basis for this study.

SITS Tenecteplase Study

The SITS Tenecteplase in Ischemic Stroke Monitoring Study: the option to use tenecteplase as IVT therapy in acute ischemic stroke has been implemented in the SITS IVT Registry for a few years already. Initial results of the safety and outcome of intravenous tenecteplase in acute stroke in routine clinical use has been submitted for publication. The results will be presented as an oral presentation at ESOC 2022 by Aristeidis Katsanos (Canada), Wednesday May 4th, 08:35 - 08:43: Scientific Communications 6 - Intravenous Thrombolysis

SITS-Thrombectomy in large artery occlusive stroke with minor stroke symptom

Safety and efficacy of endovascular thrombectomy plus intravenous thrombolysis versus intravenous thrombolysis alone in mild symptoms stroke with large vessel occlusion: propensity score matched analysis. The results will be presented at ESOC 2022 by Ghil Schwarz (Italy), Wednesday May 4th, 17:45 - 17:53: Scientific Communications 24 - Hyperacute Management

SITS Fertile Woman Study

A retrospective and prospective study of intravenous rt-PA (0.9 mg/kg) given up to 4.5 hours after symptom onset in female acute ischaemic stroke patients, aged between 13 and 50 years, with particular focus on pregnancy and menstruation.

SITS Collaborative Project ESO-Angels / WSO-Angels

The European Stroke Organisation (ESO) and World Stroke Organisation (WSO) is currently implementing a Europe-wide and a world-wide project respectively, aiming to stimulate high quality in stroke management by awarding excellent performance in key quality factors such as high proportion of ischaemic stroke patients undergoing reperfusion treatment, door-to-needle time, and proportion of patients treated in stroke units. Based on requests from numerous SITS users, we created the SITS-Quality Registry (SITS-QR) which can be used by SITS centres, including those participating in the ESO-Angels Award Program or the Angels Program outside ESO member countries.

SITS Collaboration Project AHA/ASA

SITS is collaborating with the American Heart Association/American Stroke Association (AHA/ASA) on a certification program to evaluate and provide hospitals with needed tools and support to achieve long-term success in improving stroke patient outcomes. Through this robust performance improvement program and dedicated staff, centres can achieve the goal to provide high quality stroke care. Certification helps put a framework in place to guide the journey. Currently this program has been launched in collaboration with AHA/ASA and Middle East and North Africa Stroke Organization (MENASO).

Monitor ISA

SITS is the national stroke registry in Italy and Italian centres use SITS-QR for ESO-Angels Award program. SITS has been working closely with Professor Danilo Toni and the Italian Angels representatives to develop and translate a new add-on to the SITS-QR protocol.

SITS QR Latin America

In 2021, SITS developed a new add-on to the SITS QR protocol in collaboration with Tony Fabian Alvarez Guzman and Sheila Martins from Brazil. This add-on gives centres the opportunity to register data not only for the Angels award, but also for the WSO certification program, Certificación de los Centros de ACV en Latinoamérica.

SITS APNA-MERIT Collaboration

SITS has started a collaboration with the Association of Physicians of Pakistani Descent of North America and Medical Education, Research, International Training and transfer of Technology (the APNA-MERIT organization). Together with SITS, a new ground-breaking research project is focusing on medical education and quality improvement in stroke care in Pakistan.

Planned Projects

SITS Seizure Study

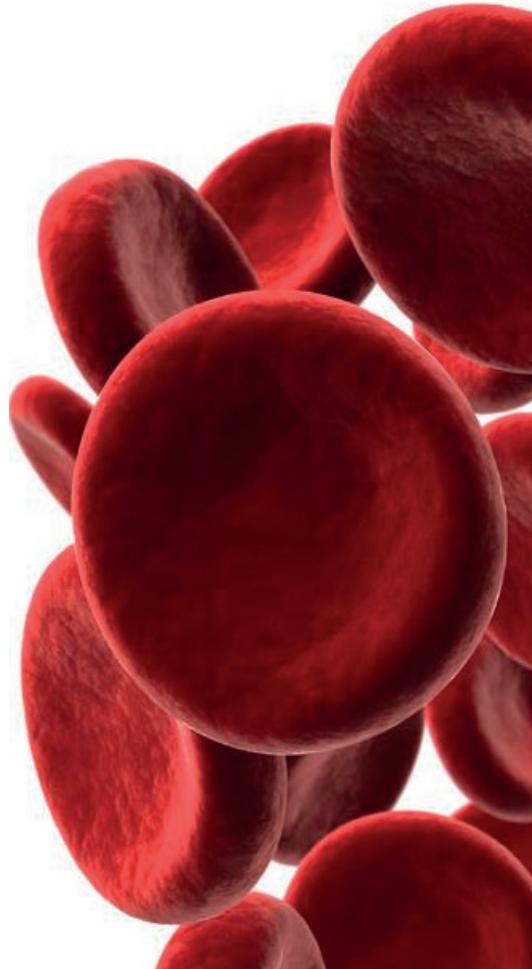
A prospective study of seizures in acute stroke patients treated with intravenous rt-PA (0.9 mg/kg) up to 4.5 hours after symptom onset.

SITS IVT Wake-up Stroke Study

SITS has published one article on IVT in patients with unknown stroke symptom onset. However, the main weakness of the study was missing data on whether the unknown onset time was due to wake-up stroke, the last known well time being known, or truly unknown timepoints. Relevant variables have been added to the registry and data collection is ongoing. Top recruiting centre coordinators will be invited to join as co-authors.

SITS Low-dose IVT Study

In many Asian countries, 0.6 mg/kg bodyweight IVT thrombolysis is given instead of 0.9 mg/kg. Although the ENCHANTED trial did not show noninferiority of low-dose alteplase compared to standard-dose alteplase with respect to death and disability at 90 days, significantly fewer symptomatic intracerebral haemorrhages with low-dose alteplase occurred. SITS has now added the option to specify the alteplase dose and data collection is ongoing.



SITS Registries / Data entry forms / Protocols

A range of SITS data entry forms allow centres to collect data on patients receiving treatments during the acute stroke phase, care quality parameters and long-term outcomes.

SITS data entry protocols are electronic forms that are automatically enabled in the registry depending on the chosen acute phase intervention. SITS protocols can also be downloaded as Case Record Forms in PDF format on the SITS website.

Current Registries / Data entry forms / Protocols

Thrombolysis Registry (IVT data entry forms)

- Suitable for all stroke patients treated with IV thrombolysis.

- **Intravenous Thrombolysis Protocol, standard version (IVTP-s)**
 - protocol for registering stroke patients treated with IV thrombolysis.
- **Intravenous Thrombolysis Protocol, minimal version (IVTP-m)**
 - protocol for registering all stroke patients treated with IV thrombolysis.

The minimal version omits certain variables at various time points, making the protocol less extensive compared to IVTP-s.

General Stroke Registry (APP data entry forms)

- Suitable for any stroke and TIA patients who have not received IV thrombolysis or thrombectomy or for centres which do not use the IV thrombolysis or thrombectomy registries.

- **All Patients Protocol, standard version (APP-s)**
 - protocol for registering stroke and TIA patients who have not been treated with IV thrombolysis or thrombectomy or for centres which do not use the IV thrombolysis or thrombectomy registries.
- **All Patients Protocol, minimal version (APP-m)**
 - protocol for registering stroke and TIA patients who have not been treated with IV thrombolysis or thrombectomy. The minimal version omits certain baseline and imaging variables, 2-, and 24-hour follow-up.

Thrombectomy Registry (TBY data entry forms)

- Suitable for all stroke patients treated with thrombectomy.
 - **Thrombectomy Protocol, standard version (TBYP-s)**
 - protocol for registering stroke patients treated with thrombectomy with (bridging protocol) or without prior treatment with IV thrombolysis.
 - **Thrombectomy Protocol, minimal version (TBYP-m)**
 - protocol for registering stroke patients treated with thrombectomy without prior treatment with IV thrombolysis. The minimal version omits certain variables.

Atrial Fibrillation and Oral Anticoagulation in Acute Stroke and TIA Registry

- Suitable for all patients admitted to hospital with an acute ischemic stroke or TIA, diagnosed with atrial fibrillation. The registry provides additional data entry options for details surrounding atrial fibrillation and the use of oral anticoagulation for secondary stroke prevention.

SITS Quality Registry (SITS-QR)

- Suitable for some SITS centres, which prefer a short and simple stroke care quality registry protocol completed in 5 minutes. Can be used by centres in western European countries participating in the ESO-Angels Award Program or the Angels Program outside ESO member countries.

SITS Intracerebral Haemorrhage Registry (SITS ICH)

- Suitable for all stroke patients suffering intracerebral haemorrhage and/or intraventricular haemorrhage. The layout and data entry form for the SITS ICH Registry is different than the traditional SITS registry data entry form. Our aim with the new layout is to simplify data entry.

SITS COVID-19 specific variables

- SITS received a request from investigators to add COVID-19 specific variables to the data entry forms. We prioritized this project considering the global pandemic and the COVID-19 variables were launched in June 2020.

SITS Cerebral Venous Thrombosis Registry (SITS CVT)

- This data form was launched February 2022 and enables documentation of CVT risk factors, aetiology, management, and outcomes of patients.

SITS World Map



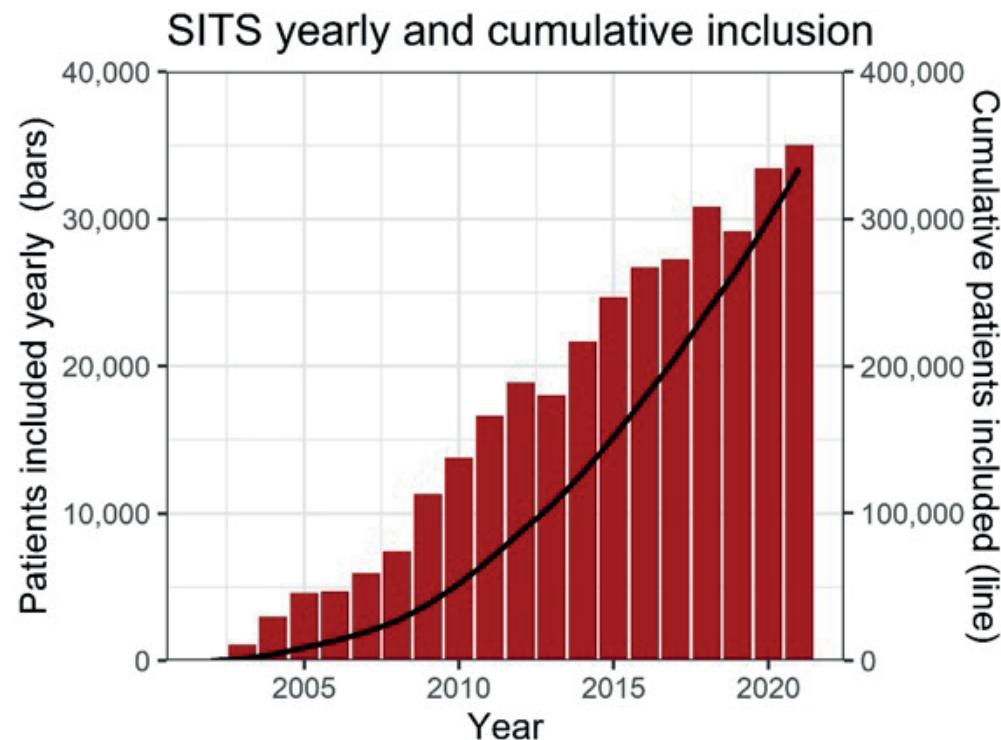
A	E	L	R
Albania	Ecuador	Lebanon	Romania
Algeria	Egypt	Libya	Russian Federation
Argentina	El Salvador	Lithuania	
Armenia	Estonia		
Australia	Ethiopia*		
Austria	Finland	M	Saudi Arabia
B	F	Malta*	Serbia
Bahrain	France	Mexico	Singapore
Belgium		Moldova, Rep of	Slovakia
Bermuda	G	Montenegro	Slovenia
Bolivia	Germany	Morocco	South Africa*
Bosnia and Herzegovina	Greece	N	South Korea
Brazil	Guatemala	Netherlands	Spain
Bulgaria	H	New Zealand	Sri Lanka
	Honduras	Nicaragua	Sudan*
	Hong Kong	Nigeria	Sweden
C	Hungary	North Macedonia	Switzerland
Chile		Norway	
China	I	O	Tanzania*
Colombia	Iceland	Oman	Thailand
Costa Rica	India		Tunisia
Croatia	Iran	P	Türkiye
Cyprus*	Ireland	Pakistan	
Czech Republic	Israel	Panama	
	Italy	Paraguay	
D		Peru	Ukraine
Denmark	J	Philippines	United Arab Emirates
Dominican Rep.	Japan	Poland	United Kingdom
		Portugal	Uzbekistan*
K			Uruguay
	Kazakhstan	Q	Venezuela
	Kenya*	Qatar	Vietnam
	Kuwait		
	Kyrgyzstan		

* Not yet recruiting patients

General SITS data overview

Data presented in this general overview is based on all patient files entered in the SITS registries between December 25, 2002 and December 31, 2021. Patient recruitment is calculated using unique patient files with both confirmed and unconfirmed data.

Figure 1. Yearly and cumulative patient recruitment in SITS: line is showing cumulative inclusion, bars are yearly inclusion



*See the Appendix for patient recruitment per country

Table 1. Top 20 recruiting countries

Rank	Country	Patients	Rank	Country	Patients
1	Italy	91 395	11	Germany	8 198
2	Czech Republic	33 093	12	Slovakia	7 155
3	United Kingdom	28 638	13	Portugal	6 755
4	Brazil	17 360	14	Estonia	5 643
5	Sweden	12 256	15	Qatar	5 293
6	Iran	11 570	16	Spain	5 143
7	Poland	9 571	17	Bulgaria	5 064
8	Belgium	9 157	18	Russian Federation	4 446
9	India	8 824	19	Lithuania	4 241
10	Egypt	8 798	20	Finland	4 086

Table 2. Number of patients registered as per SITS data entry forms / protocols

Protocol	Paients
IVT	205 965
IVT + TBY treated	13 226
TBY	9 865
APP	100 909
QR	61 702
Total	391 667

SITS Thrombolysis Registry

Data based on all patient files entered between December 25, 2002 and December 31, 2021 using the standard and minimal SITS IV Thrombolysis protocols. Patient recruitment is calculated using unique patient files with both confirmed and unconfirmed data.

Figure 2. Cumulative and annual registration of patients using IV thrombolysis protocols, line is showing cumulative inclusion, bars are yearly inclusion

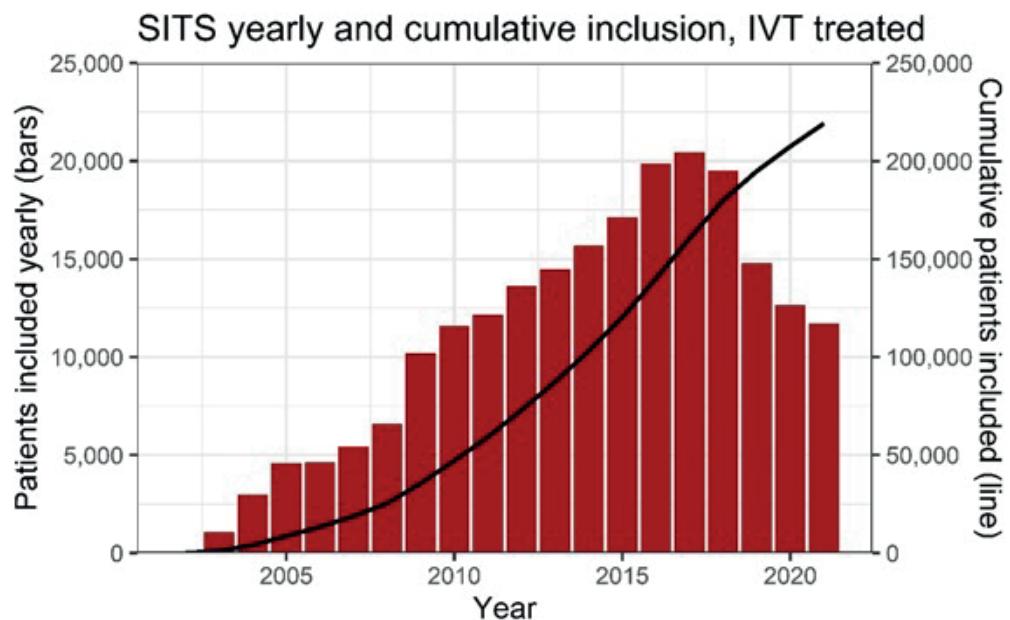


Figure 3. Change in median age per year in patients during the last 20 years with acute ischaemic stroke treated with IVT

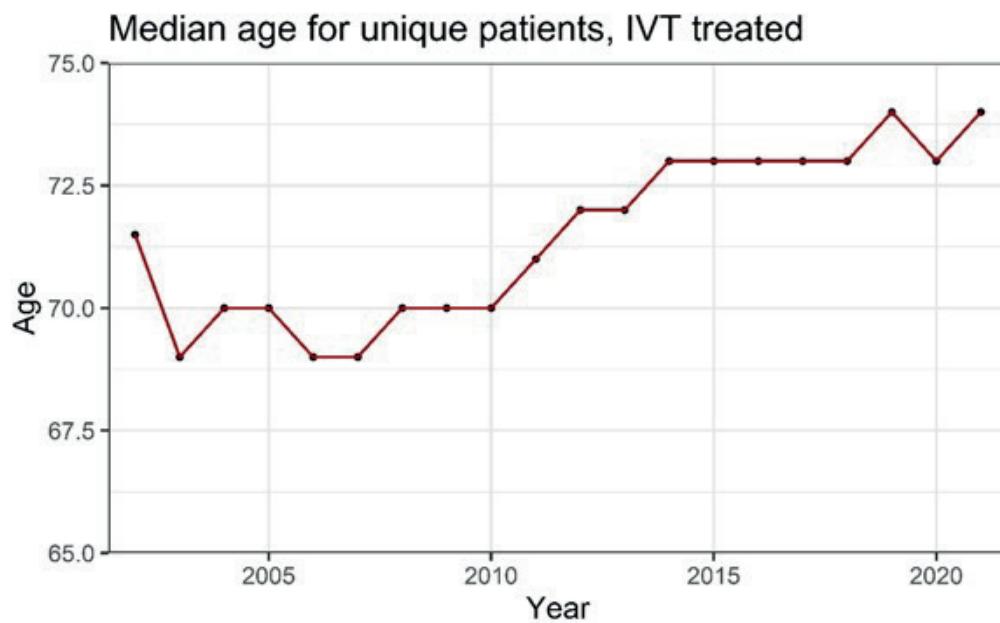


Figure 4. Change in median NIHSS score per year during the last 20 years in patients with acute ischaemic stroke treated with IVT

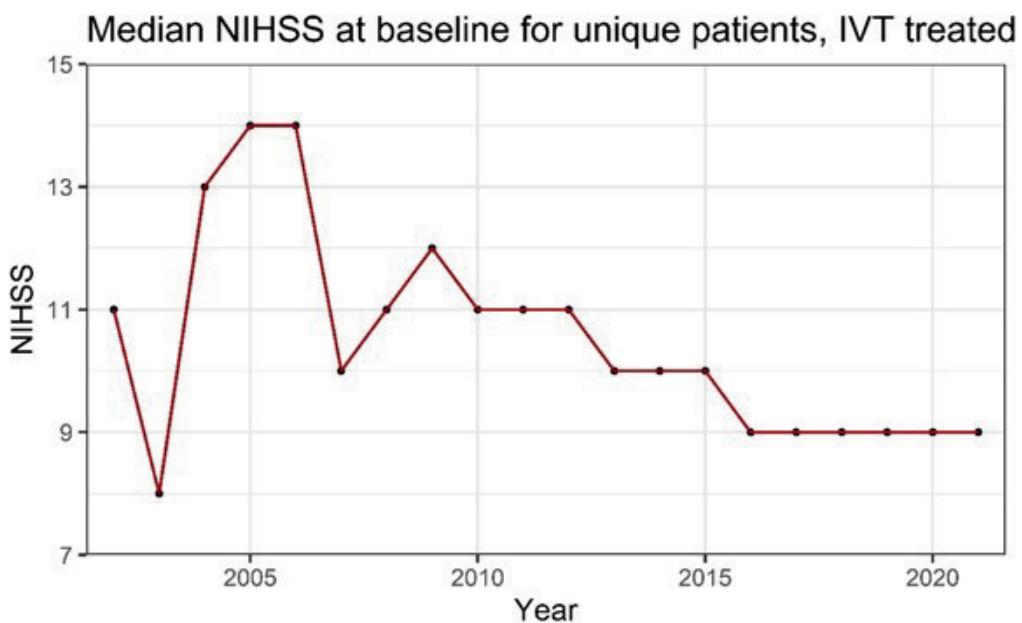
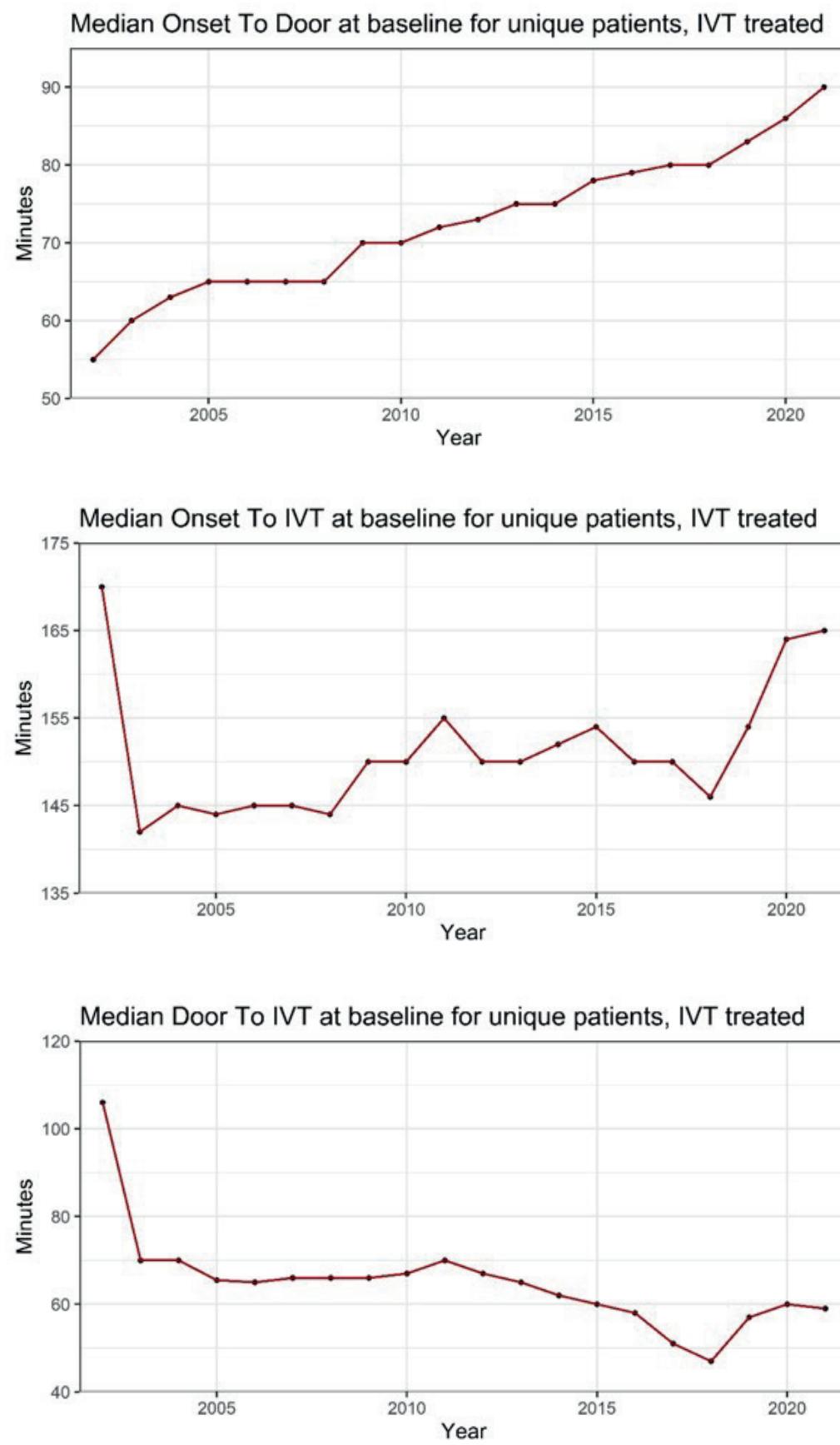


Figure 5. Change in median time logistics in minutes in IV thrombolysis treated patients
- Onset to Door (OTD), Onset to Treatment (OTT) and Door to Needle (DTN)



Outcome data

Intracerebral haemorrhage in patients treated with IVT

In the table below, frequency of intracerebral haemorrhage (ICH) of various types, and of symptomatic intracerebral haemorrhage (SICH) by three definitions, in patients treated with IV thrombolysis is presented. Data is based on more than 300.000 patients.

Table 3. Proportions of patients with intracerebral haemorrhage*

ICH	Proportion	SICH	Proportion
HI1	4,5%	SICH SITS-MOST	1,7%
HI2	3,1%	SICH ECASS II	4,5%
PH1	2,6%	SICH NINDS	6,3%
PH2	2,7%		
P<small>H</small>r1	1,9%		
P<small>H</small>r2	1,0%		

*Data from 2019

ICH Definitions

Haemorrhagic infarction type 1 (HI1): small petechiae along the margins of the infarct.

Haemorrhagic infarction type 2 (HI2): confluent petechiae within the infarcted area without space-occupying effect.

Parenchymal haemorrhage type 1 (PH1): local, or intra-ischemic confluent hematoma in $\leq 30\%$ of the infarcted area with at the most some slight space-occupying effect.

Parenchymal haemorrhage type 2 (PH2): local, or intra-ischemic confluent hematoma $>30\%$ of the infarcted area with a substantial space-occupying effect.

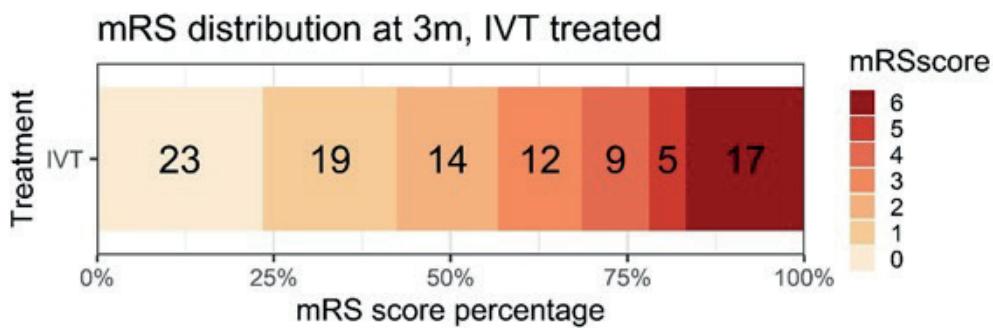
Remote parenchymal haemorrhage type 1 (P_{Hr}1): small to medium sized hematoma located remote from the infarct(s), with mild space occupying effect.

Remote parenchymal haemorrhage type 2 (P_{Hr}2): large confluent hematoma in an area remote from the actual infarct(s), with substantial space occupying effect.

SICH Definitions

SICH per ECASS II: Any haemorrhage with neurologic deterioration as indicated by an increase in NIHSS ≥ 4 compared to baseline or the lowest value within 7 days, or any haemorrhage leading to death.

SICH per NINDS: Any intracerebral haemorrhage on any post-treatment imaging scans combined with any decline in neurologic status as measured by NIHSS between baseline and 7 days.

Figure 6. Outcome at 3 months in IVT treated patients

Data shows the distribution of patients on the modified Rankin Scale (mRS) as assessed at three months after the acute stroke.

Table 4. Outcome at 3 months in IVT treated patients

Outcome within 3 months	Proportion
Excellent outcome (mRS 0-1)	42,4%
Functional independence (mRS 0-2)	56,7%
Death	16,3%

SITS Thrombectomy Registry

Data based on all patient files entered between 2014 and December 31, 2021, using the SITS protocols for thrombectomy and bridging of thrombectomy with IV thrombolysis. Patient recruitment is calculated using unique patient files with both confirmed and unconfirmed data. Data collection using the thrombectomy protocols is ongoing and will be used in upcoming studies.

Figure 7. Yearly and cumulative registration of patients using thrombectomy protocols, line is showing cumulative inclusion, bars are yearly inclusion

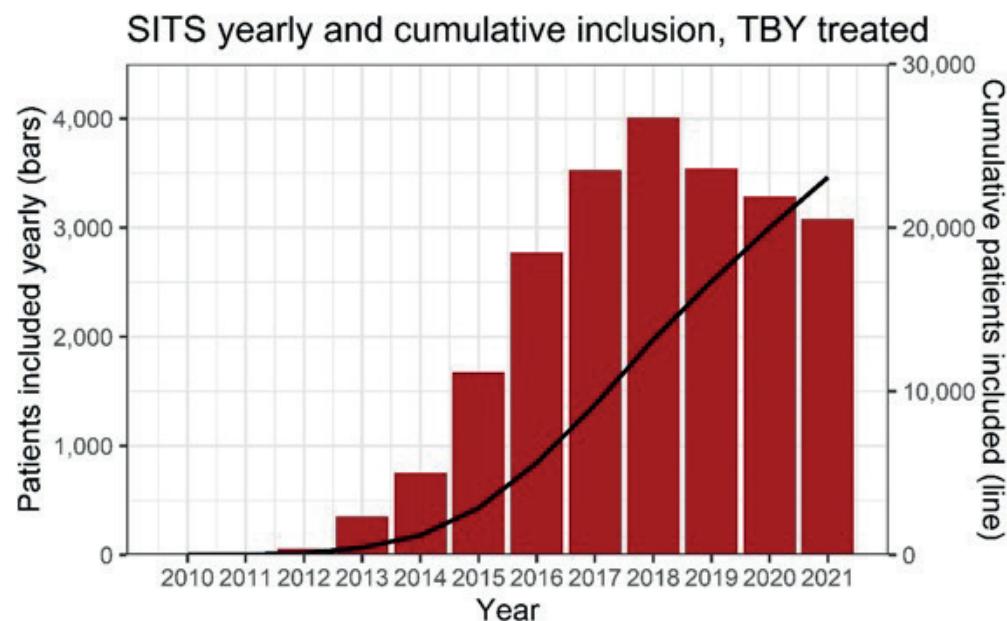


Table 5. Top 20 patient recruitment by country, thrombectomy protocols

Rank	Country	Patients	Rank	Country	Patients
1	Italy	8 089	11	United Kingdom	534
2	Czech Republic	3 510	12	Türkiye	406
3	Portugal	2 352	13	Poland	234
4	Sweden	1 203	14	Germany	177
5	Slovakia	1 110	15	Greece	148
6	Estonia	1 010	16	India	126
7	Belgium	1 008	17	Russian Federation	116
8	Lithuania	986	18	Egypt	100
9	Spain	895	19	Brazil	86
10	Finland	748	20	United Arab Emirates	60

TBY trends

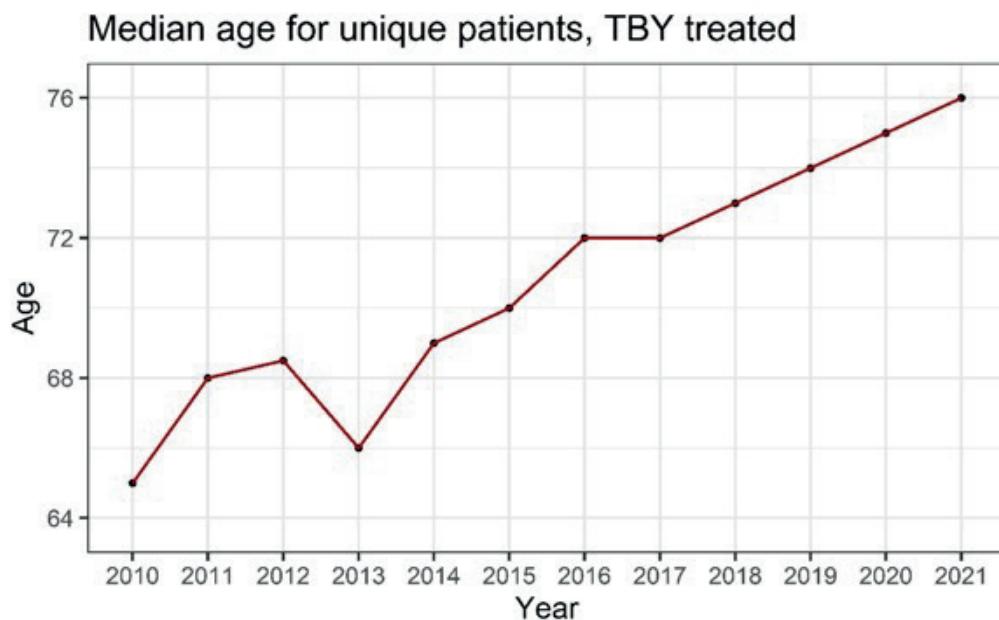
Figure 8. Change in median age per year in patients with acute ischaemic stroke treated with TBY

Figure 9. Change in median NIHSS score per year in patients with acute ischaemic stroke treated with TBY

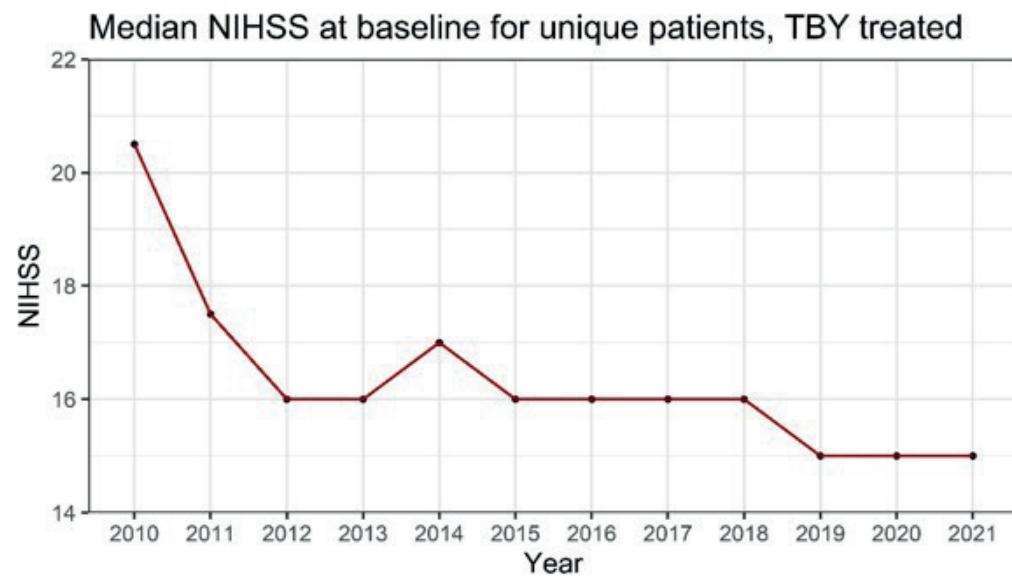
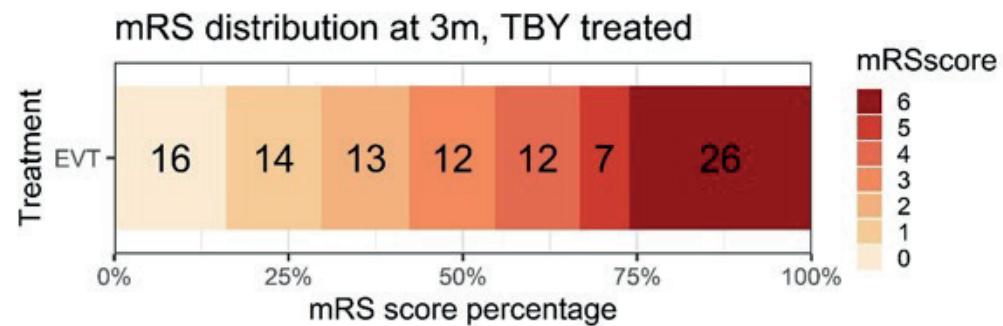


Figure 10. Outcome at 3 months in TBY treated patients



SITS General Stroke Registry

The SITS general registry is aimed at registering all stroke and TIA patients. Recruitment numbers presented are based on unique patient files with confirmed and unconfirmed data entered until December 31, 2021.

Figure 11. Annual global recruitment, line is showing cumulative inclusion, bars are yearly inclusion

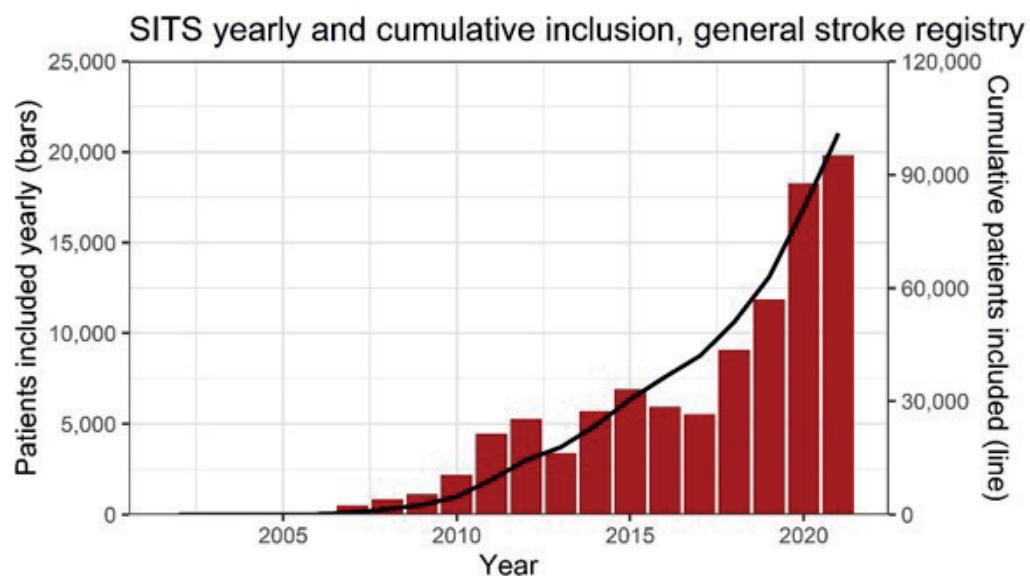


Table 6. Top 30 recruiting countries, general stroke protocols

Rank	Country	Patients	Rank	Country	Patients
1	Italy	20 325	16	Poland	1 663
2	Brazil	13 716	17	Türkiye	1 580
3	India	7 664	18	Moldova	1 506
4	Egypt	6 896	19	Kyrgyzstan	1 479
5	Iran	4 682	20	Chile	1 419
6	Qatar	4 497	21	Argentina	1 130
7	Bulgaria	4 179	22	Australia	1 012
8	Tunisia	3 189	23	Mexico	975
9	Belgium	3 184	24	Morocco	917
10	Russian Federation	3 053	25	Germany	774
11	Peru	2 284	26	United Kingdom	681
12	Sweden	2 233	27	Thailand	668
13	Sri Lanka	2 167	28	Slovakia	578
14	Venezuela	2 059	29	Czech Republic	513
15	United Arab Emirates	1 751	30	Dominican Republic	448

SITS EAST

SITS-EAST is a regional network in Central and Eastern Europe.

It started as a study of implementation of evidence-based stroke therapy supported by the SITS International Registry. The registry was initiated in autumn 2007 with the support of a European Union grant. It is now an ongoing registry for the documentation and statistical evaluation of stroke management in Eastern Europe.

Contributing countries*:

Albania, Bulgaria, Croatia, Czech Republic, Estonia, Greece, Hungary, Kazakhstan, Kyrgyzstan, Lithuania, Macedonia, Moldova, Poland, Romania, Russian Federation, Slovakia, Slovenia, Türkiye, Ukraine, Bosnia and Herzegovina, Armenia, Serbia

Figure 12. Cumulative recruitment SITS-EAST – all protocols, line is showing cumulative inclusion, bars are yearly inclusion

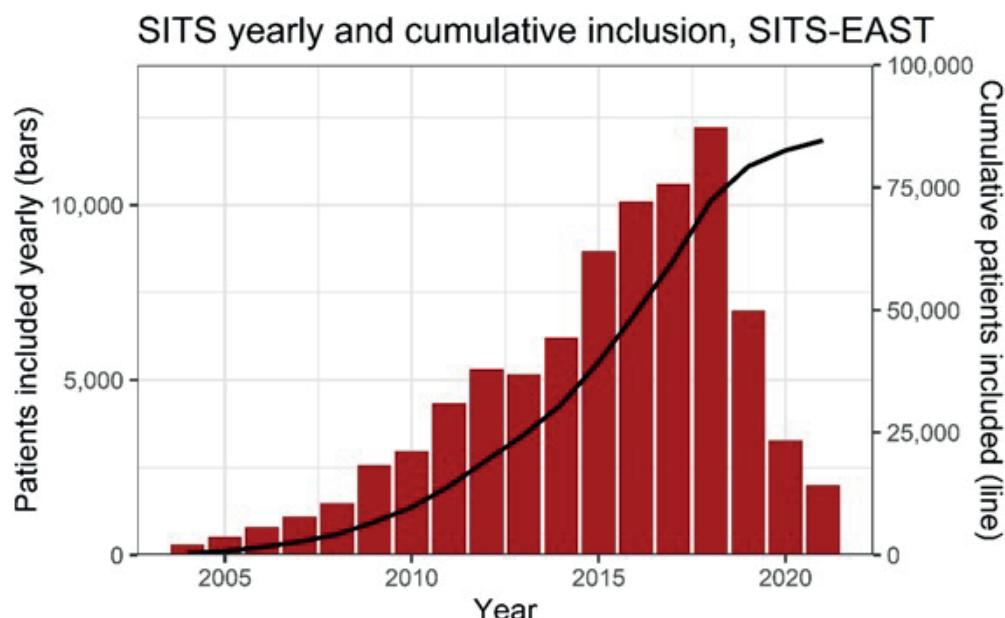


Table 7. Number of patients registered using SITS protocols in SITS-EAST

Data entry forms	Number of patients
TBY Protocols	2 613
IVT Protocols	60 221
IVT + TBY Protocols	4 955
APP Protocols	15 428
QR Protocols	1 376
Total	84 593

SIECV-SITS

The SIECV-SITS Registry was initiated through a joint venture by Sociedad Iberoamericana de Enfermedades Cerebrovasculares (SIECV) and SITS. The SIECV-SITS Stroke Registry is a database for documentation and statistical evaluation of stroke management in Central and Latin America. Recruitment numbers presented are based on patient files with confirmed and unconfirmed data, entered until December 31, 2021. Since 2018, Sheila Martins is appointed International Regional Coordinator for SIECV-SITS.

Contributing countries*:

Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela.

*See the Appendix for contributing centres.

Figure 13. Annual recruitment SIECV-SITS – all protocols, line is showing cumulative inclusion, bars are yearly inclusion

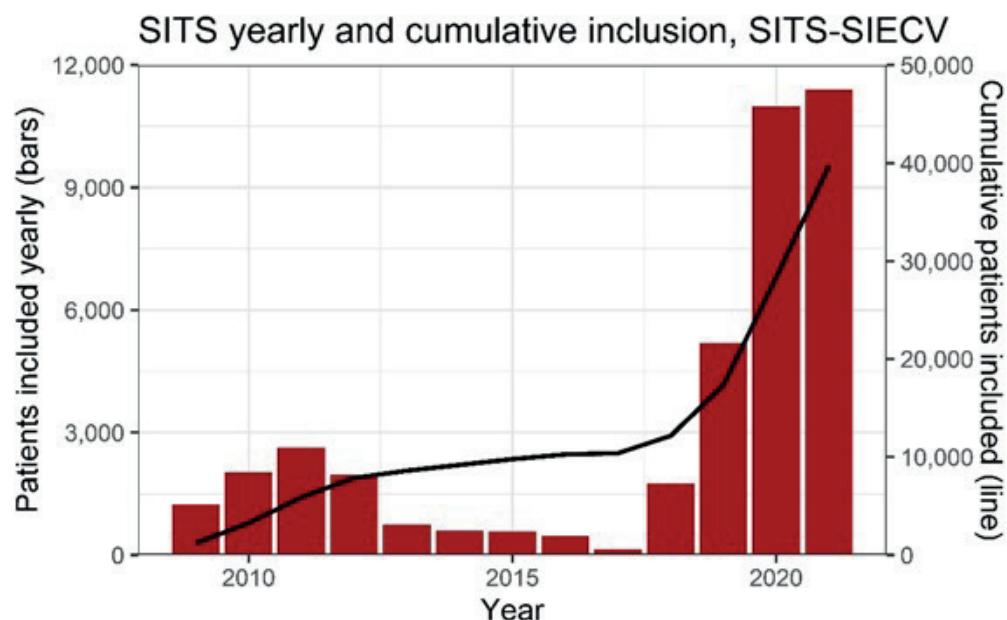


Table 8. Number of patients registered using SITS protocols in SIECV-SITS

Data entry forms	Number of patients
TBY Protocols	67
IVT Protocols	3 931
IVT + TBY Protocols	28
QR Protocols	13 743
APP Protocols	21 961
Total	39 730

SITS Sub-Saharan Africa

The SITS Sub-Saharan Africa is a regional network south of Sahara. Since 2018, Foad Abd-Allah functions as the International Regional Coordinator for SITS Sub-Saharan Africa.

Contributing countries*:

Ethiopia, Kenya, Nigeria, Tanzania

*See the Appendix for contributing centres.

Figure 14. Annual recruitment SITS Sub-Saharan Africa, line is showing cumulative inclusion, bars are yearly inclusion

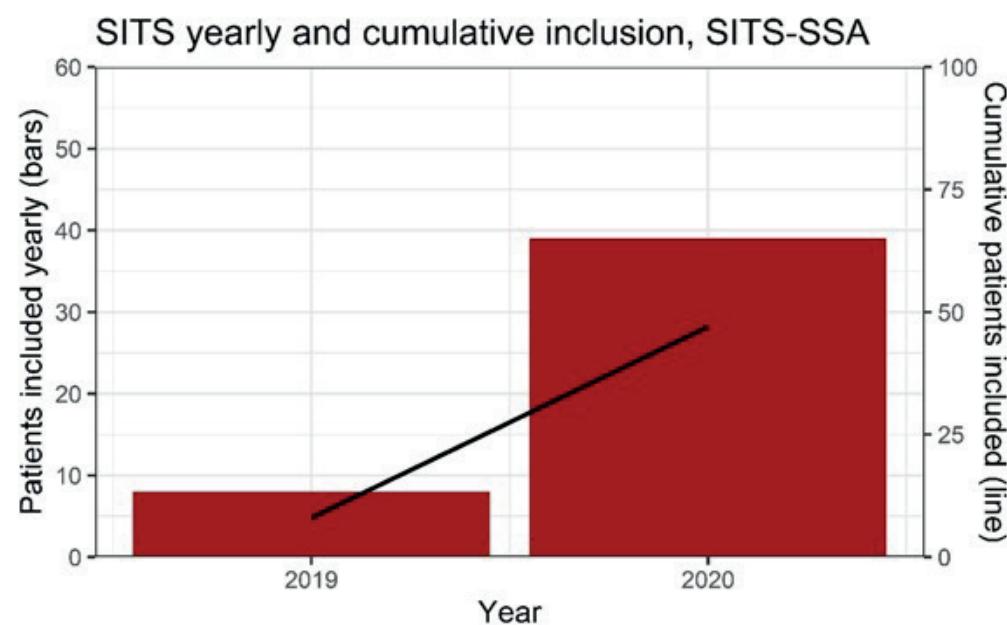


Table 9. Number of patients registered using SITS protocols in SITS Sub-Saharan Africa

Data entry forms	Number of patients
APP Protocols	47

SITS-MENA

The SITS-MENA Registry was initiated in 2013 as part of the SITS Regional Network in the Middle East and North Africa. Several countries and centres in the Regional Network are also participating in a prospective observational study of ischemic stroke in the region. Recruitment numbers presented are based on patient files with confirmed and unconfirmed data, entered until December 31, 2021. Since 2018, Suhail Al Rukn functions as the International Regional Coordinator for the SITS MENA region. The SITS MENA group started during 2021 and 2022 three studies based on IVT, TBY and CVT data in SITS.

Contributing countries*:

Algeria, Egypt, Iran, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates, Kuwait, Sudan, Bahrain

*See the Appendix for contributing centres.

Figure 15. Annual recruitment SITS-MENA – all Protocols, line is showing cumulative inclusion, bars are yearly inclusion

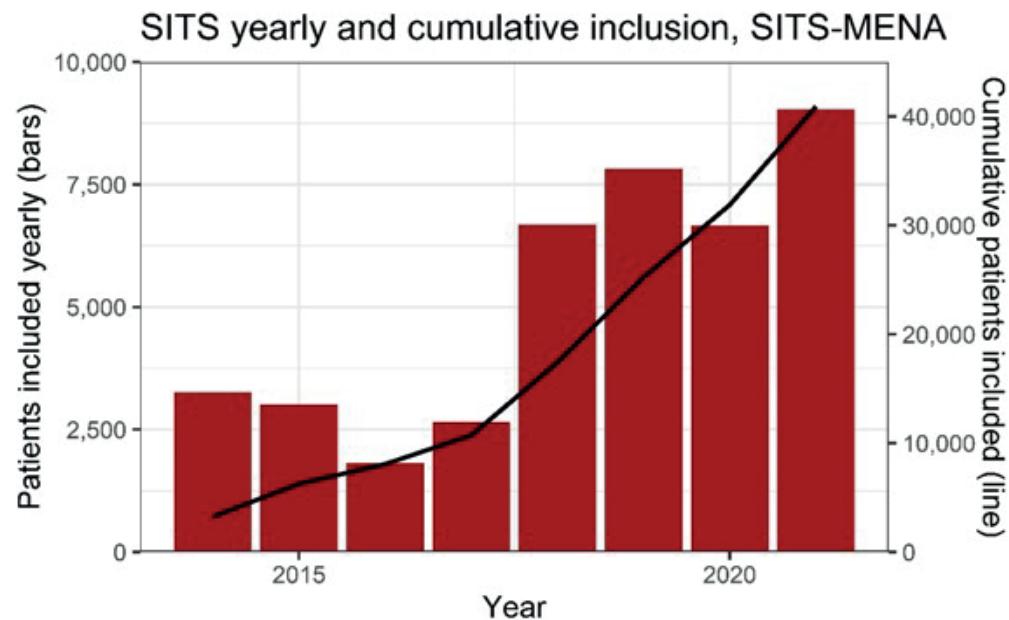


Table 9. Number of patients registered using SITS protocols in SITS-MENA

Data entry forms	Number of patients
TBY Protocols	92
IVT Protocols	6 395
IVT + TBY Protocols	119
APP Protocols	21 763
QR Protocols	12 561
Total	40 930

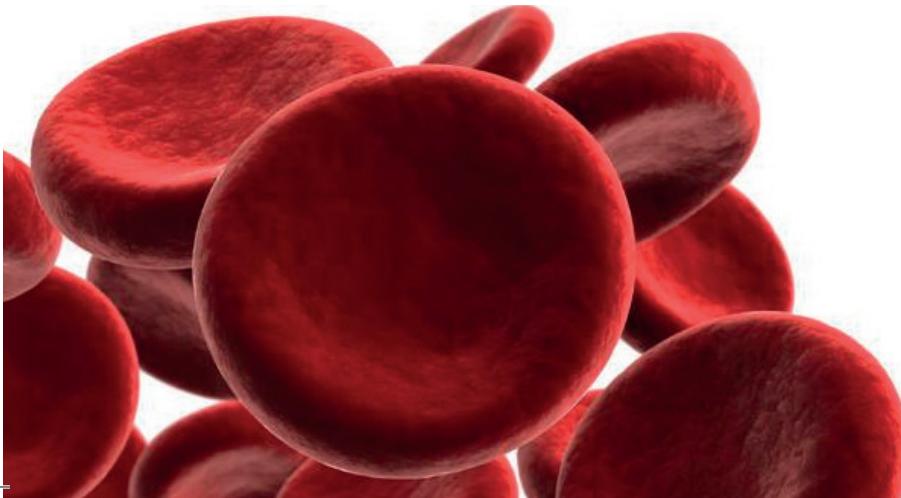
SITS Top centres 2020 and 2021

Each year, SITS points out the top 20 centres fulfilling the highest standards of data collection into the SITS Registry over the last year (2020 and 2021). The SITS Top Centres list is initiated to encourage centres to continue enter high quality data into the SITS Registry and in keeping with our mission - to assure excellence in acute treatment and secondary prevention of stroke, as well as to facilitate clinical research.

The following centres received a diploma as the 2020 and 2021 top centre in SITS using the IVT/TBY/APP protocols:

IVT protocol Top Centres 2021

1. Hospital Sao Jose – PORTUGAL
LC: Ana Paiva Nunes
2. Newcastle upon Tyne Hospitals NHS Foundation Trust – UNITED KINGDOM
LC: Anand Dixit
3. North Estonia Medical Centre – ESTONIA
LC: Viiu-Marika Rand
4. Morriston – UNITED KINGDOM
LC: Manju Krishnan
5. Imam Reza – IRAN
LC: Elyar Sadeghi-Hokmabadi, Mehdi Farhoudi
6. Northampton General Hospital – UNITED KINGDOM
LC: To be appointed
7. CHU St. Luc – Woluwe – BELGIUM
LC: Andre Peeters
8. Ain Shams Specialized Hospital – EGYPT
LC: Tamer Roushdy



IVT protocol Top Centres 2020

1. Hospital Sao Jose – PORTUGAL
LC: Ana Paiva Nunes
2. Valiasr - IRAN
LC: Abdoreza Ghoreishi
3. Tartu University Hospital – ESTONIA
LC: Janika Körv
4. North Estonia Medical Centre – ESTONIA
LC: Viiu-Marika Rand
5. Newcastle upon Tyne Hospitals NHS Foundation Trust – UNITED KINGDOM
LC: Anand Dixit, Gary Ford
6. Addenbrookes hospital – UNITED KINGDOM
LC: Liz Warburton
7. University Hospital of Heidelberg – GERMANY
LC: Peter Ringleb
8. 107th Military Hospital with Polyclinic – POLAND
LC: Marcin Rogoziewicz

TBY protocol Top Centres 2021

1. Hospital Sao Jose – PORTUGAL
LC: Ana Paiva Nunes
2. Policlinico Bari – ITALY
LC: Marco Petruzzellis
3. Hospital San Carols – SPAIN
LC: Jose Egido
4. CHU St. Luc – Woluwe – BELGIUM
LC: Andre Peeters
5. North Estonia Medical Centre – ESTONIA
LC: Viiu-Marika Rand
6. San Giovanni Bosco – ITALY
LC: Roberto Cavallo

TBY protocol Top Centres 2020

1. Hospital Sao Jose – PORTUGAL
LC: Ana Paiva Nunes
2. North Estonia Medical Centre – ESTONIA
LC: Viiu-Marika Rand
3. CHU St. Luc – Woluwe – BELGIUM
LC: Andre Peeters
4. Hospital San Carlos – SPAIN
LC: Jose Egido
5. Tartu University Hospital – ESTONIA
LC: Janika Körv
6. Addenbrookes hospital – UNITED KINGDOM
LC: Liz Warburton

APP protocol Top Centres 2021

1. Ain Shams Specialized Hospital – EGYPT
LC: Hossam Shokri
2. Ain Shams University Hospital – EGYPT
LC: Tamer Roushdy
3. AZ Rivierenland – BELGIUM
LC: Massimiliano Montagna
4. Policlinico Bari – ITALY
LC: Marco Petruzzellis

APP protocol Top Centres 2020

1. Hamad General Hospital – QATAR
LC: Naveed Akhtar
2. Valiasr – IRAN
LC: Abdoreza Ghoreishi
3. Ain Shams Specialized Hospital – EGYPT
LC: Hossam Shokri
4. Sri Jayewardenepura General Hospital – SRI LANKA
LC: Harsha Gunasekara
5. University hospital of Heidelberg – GERMANY
LC: Peter Ringleb
6. Newcastle upon Tyne Hospitals NHS Foundation Trust – UNITED KINGDOM
LC: Anand Dixit, Gary Ford

What is new in SITS – current and future

The number of centres and countries participating in SITS has increased further during 2021. Patient input to the registry has continued to reach all time high levels. We believe this is a strong indicator that SITS remains highly relevant for centres treating acute stroke patients worldwide.

SITS DATA ENTRY FORMS

The SITS CVT data entry form was launched in February 2022 and enables documentation of CVT risk factors, aetiology, management, and outcomes of patients. We encourage all SITS centres to use SITS CVT when appropriate.

There has been an increasing interest in a minimal version of the thrombectomy protocol as the treatment is getting established globally. In January 2021 SITS launched TBY mini: a shorter version of the standard TBY protocol with fewer variables making it less time consuming to use.

During the COVID-19 pandemic SITS received a request from users to create a COVID-19 stroke related questionnaire in the SITS Registry. The COVID-19 stroke related questionnaire was launched in June 2020.

SITS NETWORK

SITS is collaborating with the American Heart Association (AHA) / Stroke Association (ASA) regarding a new Stroke Centre Certification program through ASA and the Middle East and North Africa Stroke Organization (MENASO). SITS encourage already existing centres from the MENA region to take part of the ASA and MENASO Stroke Centre Certification Program.

In Italy, SITS is working closely with Italian centres who use SITS-QR for the ESO-Angels Award program. Together with Prof. Danilo Toni and the Italian Angels representatives we have developed new add-ons to the SITS-QR protocol. We also collaborate with our Italian colleagues on development of a mobile application to collect acute phase data.

For Latin America, SITS launched another add-on to the SITS QR protocol. The Latin American version of SITS QR has been initiated with key people in the region and will be a part of collection of data for the WSO certification program, Certificación de los Centros de ACV en Latinoamérica.

SITS is also in close collaboration with the APPNA-MERIT organization. APPNA (Association of Physicians of Pakistani Descent of North America) and MERIT (Medical Education, Research, International Training and transfer of Technology) organizes quality lectures on various topics by doctors abroad to medical students and doctors in Pakistan.

Dr. Shahid Rafiq (APPNA MERIT chair) and Dr. Danish Bhatti (APPNA MERIT co-chair) from USA, together with medical experts from Canada, UK, Middle East and Pakistan have now initiated a ground-breaking project in Pakistan focusing on medical education and quality improvement in stroke care.

SITS FUTURE

SITS continue to announce centres with top recruitment and high level of data completeness. With this we hope to stimulate recruitment and data quality in the SITS Registry. SITS is primarily a research registry, and we wish to encourage users to engage in various research projects, at local as well as national and international level. With SITS strong online real time report tool users can download data and various reports. In addition, SITS International Coordinating Office is now also working on an improved dashboard solution to provide hospitals with a better overview of their data. We plan to launch the new and improved dashboard at ESOC 2022.

Our intention with this report is to give the reader an update on SITS patient and centre recruitment status, as well as ongoing and planned activities since the publication of the first SITS International Report in 2014. We plan to publish the next report in spring 2023. We would be delighted to receive feedback on the current issue, as well as suggestions for future report contents. Any views and ideas on all matters concerning SITS are warmly welcomed by the SITS International Coordinating Office.

SITS Publications

96. Feil K, Matusevicius M, Herzberg M, Tiedt S, Küpper C, Wischmann J, Schönecker S, Mengel A, Sartor-Pfeiffer J, Berger K, Dimitriadis K, Liebig T, Dieterich M, Mazya M, Ahmed N, Kellert L. **Minor stroke in large vessel occlusion: A matched analysis of patients from the German Stroke Registry-Endovascular Treatment (GSR-ET) and patients from the Safe Implementation of Treatments in Stroke-International StrokeThrombolysis Register (SITS-ISTR).** Eur J Neurol. 2022 Feb 4. doi: 10.1111/ene.15272. Epub ahead of print. PMID: 35122371.
95. Janssen PM, van Overhagen K, Vinklárek J, Roozenbeek B, van der Worp HB, Majoe CB, Bar M, Černík D, Herzig R, Jurák L, Ostrý S, Mikulik R, Lingsma HF, Dippel WJ; **MR CLEAN Registry investigators and the SITS TBY Registry investigators from the Czech Republic.** **Between-Center Variation in Outcome After Endovascular Treatment of Acute Stroke: Analysis of Two Nationwide Registries.** Circ Cardiovasc Qual Outcomes. 2022 Mar;15(3):e008180. doi: 10.1161/CIRCOUTCOMES.121.008180. Epub 2022 Jan 31. PMID: 35094522; PMCID: PMC8920023.
94. Aref H, Zakaria M, Shokri H, Roushdy T, El Basiouny A, El Nahas N. **Changing the landscape of stroke in Egypt.** Cerebrovasc Dis Extra. 2021 Dec 3. doi: 10.1159/000521271. Online ahead of print. PMID: 34864736. [PubMed]
93. El Nahas NM, Shokri HM, Roushdy TM, Dawood NL, Abushady EM, Georgy SS, Zaki AS, Bedros RV, Aref HM. **Door to Needle Count Down: A 3 Years Experience in an Egyptian University Stroke Center.** Neurologist. 2021 Nov 30. doi: 10.1097/NRL.0000000000000372. Online ahead of print. PMID: 34855665. [PubMed]
92. Sadeghi-Hokmabadi E, Ghoreishi A, Rikhtegar R, Sariaslani P, Rafie S, Vakilian A, Sharifpour E, Mehrpour M, Saadatnia M, Mirza-Aghazadeh-Attari M, Farhoudi M. **Low-dose versus standard-dose alteplase for intravenous thrombolysis in patients with acute ischemic stroke in Iran: Results from the safe implementation of treatments in stroke registry.** Curr J Neurol. 2021 Oct 7. doi: http://dx.doi.org/10.18502/cjn.v20i4.8346. [Current Journal of Neurology]
91. Matusevicius M, Cooray C, Rand VM, Nunes AP, Moreira T, Tassi R, Egido JA, Ollikainen JP, Bigliardi G, Holmin S, Ahmed N. **Stroke Etiology and Outcomes after Endovascular Thrombectomy: Results from the SITS Registry and a Meta-Analysis.** J Stroke. 2021 Sep;23(3):388-400. doi: 10.5853/jos.2021.00850. Epub 2021 Sep 30. PMID: 34649383. [PubMed]
90. Ahmed N, Mazya M, Nunes AP, Moreira T, Ollikainen JP, Escudero-Martinez I, Bigliardi G, Dorado L, Dávalos A, Egido JA, Tassi R, Strbian D, Zini A, Nichelli P, Herzig R, Jurák L, Hurtikova E, Tsivgoulis G, Peeters A, Nevšímalová M, Brozman M, Cavallo R, Lees KR, Mikulik R, Toni D, Holmin S. **Safety and Outcomes of Thrombectomy in Ischemic Stroke With vs Without Intravenous Thrombolysis.** Neurology. 2021 Jun 4:10.1212/WNL.00000000000012327. doi: 0.121WNL.00000000000012327. Epub ahead of print. PMID: 34088873. [PubMed]
89. Ahmed N, Mazya M, Nunes AP, Moreira T, Ollikainen JP, Escudero-Martinez I, Bigliardi G, Dorado L, Dávalos A, Egido JA, Tassi R, Strbian D, Zini A, Nichelli P, Herzig R, Jurák L, Hurtikova E, Tsivgoulis G, Peeters A, Nevšímalová M, Brozman M, Cavallo R, Lees KR, Mikulik R, Toni D, Holmin S. **Safety and outcomes of routine endovascular thrombectomy in large artery occlusion recorded in the SITS Register: An observational study.** J Intern Med. 2021 May 17. doi: 10.1111/joim.13302. Epub ahead of print. PMID: 33999451. [PubMed]

- 88.** Anadani M, Matusevicius M, Tsivgoulis G, Peeters A, Nunes AP, Mancuso M, Roffe C, de Havenon A, Ahmed N. **Magnitude of blood pressure change and clinical outcomes after thrombectomy in stroke caused by large artery occlusion.** Eur J Neurol. 2021 Jun;28(6):1922-1930. doi: 10.1111/ene.14807. Epub 2021 Mar 19. PMID: 33682232. [PubMed]
- 87.** Ahmed N, Lees KR, von Kummer R, Holmin S, Escudero-Martinez I, Bottai M, Jansen O, Wahlgren N; Collaborators. **The SITS Open Study: A Prospective, Open Label Blinded Evaluation Study of Thrombectomy in Clinical Practice.** Stroke. 2021 Mar;52(3):792-801. doi: 10.1161/STROKEAHA.120.031031. Epub 2021 Feb 10. PMID: 33563015. [PubMed]
- 86.** Tsivgoulis G, Katsanos AH, Ahmed N. Ann Neurol. **Reply to "Prior Dual Antiplatelet Therapy and Thrombolysis in Acute Stroke".** 2020 Oct;88(4):859-860. doi: 10.1002/ana.25851. Epub 2020 Aug 5. PMID: 32683728 [PubMed]
- 85.** Cooray C, Karlinski M, Kobayashi A, Ringleb P, Kõrv J, Macleod MJ, Dixit A, Azevedo E, Bladin C, Ahmed N. **Safety and early outcomes after intravenous thrombolysis in acute ischemic stroke patients with prestroke disability.** Int J Stroke. 2020 Sep 2:1747493020954605. doi: 10.1177/1747493020954605. Online ahead of print. PMID: 32878588 [PubMed]
- 84.** Hossam M, Shokri, Nevine M, El Nahas, Hany M, Aref, Noha L, Dawood, Eman M, Abushady, Eman H, Abd Eldayem, Shady S, Georgy, Amr S, Zaki, Rady Y, Bedros, Mona M, Wahid El Din, Tamer M, Roushdy. **Factors related to time of stroke onset versus time of hospital arrival: A SITS registry-based study in an Egyptian stroke center.** Plos One 2020 Sep 11;15(9):e0238305. doi: 10.1371/journal.pone.0238305. eCollection 2020 [PubMed]
- 83.** Yu WM, Abdul-Rahim AH, Cameron AC, Körv J, Sevcik P, Toni D, Lees KR and SITS Scientific Committee. **The Incidence and Associated Factors of Early Neurological Deterioration After Thrombolysis, Results From SITS Registry.** Stroke. 2020 Aug 19:STROKEAHA119028287. doi: 10.1161/STROKEAHA.119.028287 AHA Journals
- 82.** Irene Escudero-Martínez, Michael V. Mazya, Christine Teutsch, Norbert Lesko, Zuzana Gdovinova, Leonardo Barbarini, Waldemar Fryze, Michal Karlinski, Adam Kobayashi, Georgi Krastev, Ana Paiva Nunes, Katarina Pasztoova, Andre Peeters MD, Piotr Sobolewski, Aleksandras Vilionskis, Danilo Toni, Niaz Ahmed MD; on behalf of the SITS Investigators. **Dabigatran initiation in patients with non-valvular AF and first acute ischemic stroke: a retrospective observational study from the SITS registry.** BMJ Open 2020;10:e037234. doi: 10.1136/bmjopen-2020-037234
- 81.** Keselman B, Gdovinová Z, Jatuzis D, Melo TPE, Vilionskis A, Cavallo R, Frol S, Jurak L, Koyuncu B, Nunes AP, Petrone A, Lees KR, Mazya MV, **Safety and Outcomes of Intravenous Thrombolysis in Posterior Versus Anterior Circulation Stroke: Results From the Safe Implementation of Treatments in Stroke Registry and Meta-Analysis.** Stroke. 2020 Mar;51(3):876-882. doi:10.1161/STROKEAHA.119.027071. Epub 2020 Jan 9 [PubMed]
- 80.** Alhazzani A, Al-Rukn S, Khan M, Moreira T, Wahlgren N. **Changing the face of stroke care in the Middle East North Africa region.** Stroke. 2020 February, Journal of the Neurological Sciences vol. 412, doi:10.1016/j.jns.2020.116727 [Epub ahead of print] [ScienceDirect]

- 79.** Thorén M, Dixit A, Escudero-Martinez I, Gdovinová Z, Klecka L, Rand VM, Toni D, Vilionskis A, Wahlgren N, Ahmed N. **Effect of Recanalization on Cerebral Edema in Ischemic Stroke Treated With Thrombolysis and/or Endovascular Therapy.** *Stroke.* 2020 Jan;51(1):216-223. doi: 10.1161/STROKEAHA.119.026692 [PubMed]
- 78.** Matusevicius M, Cooray C, Bottai M, Mazya M, Tsivgoulis G, Nunes AP, Moreira T, Ollikainen J, Tassi R, Strbian D, Toni D, Holmin S, Ahmed N. **Blood Pressure After Endovascular Thrombectomy: Modeling for Outcomes Based on Recanalization Status.** *Stroke.* 2019 Dec 11:STROKEAHA119026914. doi:10.1161/STROKEAHA.119.026914. [Epub ahead of print] [PubMed]
- 77.** Al-Rukn S, Mazya M, Akhtar N, Hashim H, Mansouri B, Faouzi B, Aref H, Abdulrahman H, Kesraoui S, Hentati F, Gebely S, Ahmed N, Wahlgren N, Abd-Allah F, Almekhlafi M, Moreira T. **Stroke in the Middle-East and North Africa: A 2-year prospective observational study of intravenous thrombolysis treatment in the region. Results from the SITS-MENA Registry.** *Int J Stroke.* 2019 Oct 8:1747493019874729. doi: 10.1177/1747493019874729. [Epub ahead of print] [PubMed]
- 76.** Charith Cooray, Michael Mazya, Robert Mikulik, Jurak Lubomir, Miroslav Brozman, Peter Ringleb, Anand Dixit, Danilo Toni, Niaz Ahmed. **Safety and outcome of intravenous thrombolysis in acute ischaemic stroke patients on prophylactic doses of low-molecular-weight heparins at stroke onset.** *Stroke* 2019 May;50(5):1149-1155.doi: 10.1161/STROKEAHA.118.024575.[PubMed]
- 75.** Charith Cooray, Michael Mazya, Robert Mikulik, Jurak Lubomir, Miroslav Brozman, Peter Ringleb, Anand Dixit, Danilo Toni, Niaz Ahmed. **Safety and outcome of intravenous thrombolysis in acute ischaemic stroke patients on prophylactic doses of low-molecular-weight heparins at stroke onset.** *Stroke.* Accepted for publication 7 March 2019
- 74.** Keselman B, Cooray C, Vanhooren G, Bassi P, Consoli D, Nichelli P, Peeters A, Sanak D, Zini A, Wahlgren N, Ahmed N, Mazya MV. IV thrombolysis in stroke mimics - **Results from the SITS International Stroke Thrombolysis Register (SITS-ISTR).** *European Journal of Neurology.* Accepted for publication, 2019-02-19.
- 73.** Marius Matusevicius, Maurizio Paciaroni, Valeria Caso, Matteo Bottai, Dheeraj Khurana, Mario de Bastos, Sheila Cristina Ouriques Martins, Yakup Krespi, Charith Cooray, Danilo Toni, Niaz Ahmed. **Outcome after intravenous thrombolysis in patients with acute lacunar stroke, an observational study based on SITS international registry** *Int J Stroke.* 2019 Dec;14(9):878-886. doi: 10.1177/1747493019840947.
- 72.** Rukn SA, Mazya MV, Hentati F, Sassi SB, Nabli F, Said Z, Faouzi B, Hashim H, Abd-Allah F, Mansouri B, Kesraoui S, Gebeily S, Abdulrahman H, Akhtar N, Ahmed N, Wahlgren N, Aref H, Almekhlafi M, Moreira T. **Stroke in the Middle-East and North Africa: A 2-year prospective observational study of stroke characteristics in the region-Results from the Safe Implementation of Treatments in Stroke (SITS)-Middle-East and North African (MENA).** *Int J Stroke.* 2019 Oct;14(7):715-722. doi: 10.1177/1747493019830331. Epub 2019 Mar 12. PubMed PMID: 30860454.
- 71.** Cooray C, Mazya MV, Bottai M, Scheitz JF, Abdul-Rahim AH, Moreira TP, Mikulik R, Krajina A, Nevsimalova M, Toni D, Wahlgren N, Ahmed N. **Are you suffering from a large arterial occlusion? Please raise your arm!** *Stroke Vasc Neurol.* 2018 Sep 3;3(4):215-221. doi: 10.1136/svn-2018-000165. eCollection 2018 Dec.

- 70.** Tsivgoulis G, Katsanos AH, Mavridis D, Gdovinova Z, Karliński M, Macleod MJ, Strbian D, Ahmed N. **Intravenous Thrombolysis for Ischemic Stroke Patients on Dual Antiplatelets.** Ann Neurol. 2018 Jul;84(1):89-97. doi: 10.1002/ana.25269. Epub 2018 Jul 30. PubMed PMID: 30048012.
- 69.** Tsivgoulis G, Geisler F, Katsanos AH, Körv J, Kunz A, Mikulik R, Rozanski M, Wendt M, Audebert HJ. **Ultraearly Intravenous Thrombolysis for Acute Ischemic Stroke in Mobile Stroke Unit and Hospital Settings: A Comparative Analysis.** Stroke. 2018 Jul 9. pii: STROKEAHA.118.021536. doi: 10.1161/STROKEAHA.118.021536. [Epub ahead of print] PubMed PMID: 29986934
- 68.** Tsivgoulis G, Kargiotis O, Rudolf J, Komnos A, Tavernarakis A, Karapanayiotides T, Ellul J, Katsanos AH, Giannopoulos S, Gryllia M, Safouris A, Papamichalis P, Vadikolias K, Mitsias P, Hadjigeorgiou G. **Intravenous thrombolysis for acute ischemic stroke in Greece: the Safe Implementation of Thrombolysis in Stroke registry 15-year experience.** Ther Adv Neurol Disord. 2018 Jun 28;11:1756286418783578. doi: 10.1177/1756286418783578. eCollection 2018. PubMed PMID: 30034535; PubMed Central PMCID: PMC604860
- 67.** Mazya MV, Ahmed N, Azevedo E, Davalos A, Dorado L, Karlinski M, Lorenzano S, Neumann J, Toni D, Moreira TP; SITS Investigators. **Impact of Transcranial Doppler Ultrasound on Logistics and Outcomes in Stroke Thrombolysis: Results From the SITS-ISTR.** Stroke. 2018 Jul;49(7):1695-1700. doi: 10.1161/STROKEAHA.118.021485. Epub 2018 May 29. PMID: 29844031
- 66.** Vaclavik D, Vilionskis A, Jatuzis D, Karlinski MA, Gdovinova Z, Körv J, Tsivgoulis G, Mikulik R. **Clinical outcome of cardioembolic stroke treated by intravenous thrombolysis.** Acta Neurol Scand. 2018 Mar;137(3):347-355.
- 65.** Cappellari M, Turcato G, Forlivesi S, Zivelonghi C, Bovi P, Bonetti B, Toni D. **TARTING-SICH Nomogram to Predict Symptomatic Intracerebral Hemorrhage After Intravenous Thrombolysis for Stroke.** Stroke. 2018 Feb;49(2):397-404.
- 64.** Mundiyapurath S, Hees K, Ahmed N, Wahlgren N, Uhlmann L, Kieser M, Ringleb PA, Hacke W, Nagel S. **Predictors of symptomatic intracranial haemorrhage in off-label thrombolysis: an analysis of the Safe Implementation of Treatments in Stroke registry.** Eur J Neurol. 2018 Feb;25(2):340-e11.
- 63.** Volny O, Krajina A, Belaskova S, Bar M, Cimflova P, Herzig R, Sanak D, Tomek A, Köcher M, Rocek M, Padrl R, Cihlar F, Nevsimalova M, Jurak L, Havlicek R, Kovar M, Sevcik P, Rohan V, Fiksa J, Menon BK, Mikulik R. **Mechanical thrombectomy performs similarly in real world practice: a 2016 nationwide study from the Czech Republic.** J Neurointerv Surg. 2018 Aug;10(8):741-745.
- 62.** Ahmed N, Lees KR, Ringleb PA, Bladin C, Collas D, Toni D, Ford GA; The SITS Investigators. **Outcome after stroke thrombolysis in patients >80 years treated within 3 hours vs >3-4.5 hours.** Neurology. 2017 Oct 10;89(15):1561-1568.
- 61.** Thorén M, Azevedo E, Dawson J, Egido JA, Falcou A, Ford GA, Holmin S, Mikulik R, Ollikainen J, Wahlgren N, Ahmed N. **Predictors for Cerebral Edema in Acute Ischemic Stroke Treated With Intravenous Thrombolysis.** Stroke. 2017 Sep;48(9):2464-2471.
- 60.** Kellert L, Hametner C, Ahmed N, Rauch G, MacLeod MJ, Perini F, Lees KR, Ringleb PA; SITS Investigators. **Reciprocal Interaction of 24-Hour Blood Pressure Variability and Systolic Blood Pressure on Outcome in Stroke Thrombolysis.** Stroke. 2017 Jul;48(7):1827-1834.

- 59.** Tsivgoulis G, Katsanos AH, Kadlecová P, Czlonkowska A, Kobayashi A, Brozman M, Švigelj V, Csiba L, Fekete K, Körv J, Demarin V, Vilionskis A, Jatuzis D, Krespi Y, Liantinoti C, Giannopoulos S, Mikulik R. **Intravenous thrombolysis for ischemic stroke in the golden hour: propensity-matched analysis from the SITS-EAST registry.** *J Neurol.* 2017 May;264(5):912-920.
- 58.** Dorado L, Ahmed N, Thomalla G, Lozano M, Malojcic B, Wani M, Millán M, Tomek A, Dávalos A. **Intravenous Thrombolysis in Unknown-Onset Stroke: Results From the Safe Implementation of Treatment in Stroke-International Stroke Thrombolysis Registry.** *Stroke.* 2017 Mar;48(3):720-725.
- 57.** Anani N, Mazya MV, Chen R, Prazeres Moreira T, Bill O, Ahmed N, Wahlgren N, Koch S. **Applying openEHR's Guideline Definition Language to the SITS international stroke treatment registry: a European retrospective observational study.** *BMC Med Inform Decis Mak.* 2017 Jan 10;17(1):7.
- 56.** Scheitz JF, Abdul-Rahim AH, MacIsaac RL, Cooray C, Sucharew H, Kleindorfer D, Khatri, P, Broderick JP, Audebert HJ, Ahmed N, Wahlgren N, Endres M, Nolte CH, Lees KR. **Clinical selection strategies to identify stroke patients with large anterior vessel occlusion-Results from SITS-ISTR.** (*Stroke*, In press December 2016)
- 55.** Cooray C, Mazya M, Bottai M, Dorado L, Skoda O, Toni D, Ford GA, Wahlgren N, Ahmed N. **External Validation of the ASTRAL and DRAGON Scores for Prediction of Functional Outcome in Stroke.** *Stroke.* 2016 Jun;47(6):1493-9.
- 54.** Ahmed N, Hermansson K, Bluhmki E, Danays T, Nunes AP, Kenton A, Lakshmanan S, Toni D, Mikulik R, Ford GA, Lees KR and Wahlgren N. **The SITS-UTMOST: A registry-based prospective study in Europe investigating the impact of regulatory approval of intravenous Actilyse in the extended time window (3–4.5 h) in acute ischaemic stroke.** *European Stroke Journal*, first published on July 29, 2016 doi:10.1177/2396987316661890
- 53.** Lundström E, Zini A, Wahlgren N, Ahmed N. **How common is isolated dysphasia among patients with stroke treated with intravenous thrombolysis, and what is their outcome? Results from the SITS-ISTR.** *BMJ Open.* 2015 Nov;5(11):e009109. doi: 10.1136/bmjopen.2015-009109. PMID: 26608637
- 52.** Anani N, Mazya MV, Bill O, Chen R, Koch S, Ahmed N, Wahlgren N, Prazeres Moreira T. **Changes in European Label and Guideline Adherence After Updated Recommendations for Stroke Thrombolysis: Results From the Safe Implementation of Treatments in Stroke Registry.** *Circ Cardiovasc Qual Outcomes.* 2015 Oct;8(6 Suppl 3):S155-62. doi: 10.1161/CIRCOUTCOMES.115.002097. PMID: 26515204
- 51.** Mazya MV, Lees KR, Collas D, Rand VM, Mikulik R, Toni D, Wahlgren N, Ahmed N. **IIV thrombolysis in very severe and severe ischemic stroke: Results from the SITS-ISTR Registry.** *Neurology.* 2015 Nov 6. pii: 10.1212/WNL.0000000000002199.
- 50.** Karlinski M, Kobayashi A, Czlonkowska A, Mikulik R, Vaclavik D, Brozman M, Gdovinova Z, Švigelj V, Csiba L, Fekete K, Körv J, Demarin V, Bašić-Kes V, Vilionskis A, Jatuzis D, Krespi Y, Shamalov N, Andonova S, Ahmed N, Wahlgren N; **Safe Implementation of Treatments in Stroke-East Registry (SITS-EAST) Investigators. Intravenous Thrombolysis for Stroke Recurring Within 3 Months From the Previous Event.** *Stroke.* 2015 Oct 8. pii: STROKEAHA.115.010420.

- 49.** Abdul-Rahim AH, Fulton RL, Sucharew H, Kleindorfer D, Khatri P, Broderick JP, Lees KR; SITS-MOST Steering Committee. **National Institutes of Health Stroke Scale Item Profiles as Predictor of Patient Outcome: External Validation on Safe Implementation of Thrombolysis in Stroke-Monitoring Study Data.** Stroke. 2015 Oct;46(10):2779-85. doi: 10.1161/STROKEAHA.115.010380.
- 48.** Tsivgoulis G, Kadlecová P, Kobayashi A, Czlonkowska A, Brozman M, Švigelj V, Csiba L, Kőrv J, Demarin V, Vilionskis A, Jatuzis D, Katsanos AH, Rudolf J, Krespi Y, Mikulik R. **Safety of Statin Pretreatment in Intravenous Thrombolysis for Acute Ischemic Stroke.** Stroke. 2015 Sep;46(9):2681-4. doi: 10.1161/STROKEAHA.115.010244..
- 47.** Flint AC, Rao VA, Chan SL, Cullen SP, Faigeles BS, Smith WS, Bath PM, Wahlgren N, Ahmed N, Donnan GA, Johnston SC; **SITS International and VISTA-plus investigators. Improved ischemic stroke outcome prediction using model estimation of outcome probability: the THRIVE-c calculation.** Int J Stroke. 2015 Aug;10(6):815-21. doi: 10.1111/ijs.12529.
- 46.** Cooray C, Fekete K, Mikulik R, Lees KR, Wahlgren N, Ahmed N. **Threshold for NIH stroke scale in predicting vessel occlusion and functional outcome after stroke thrombolysis.** Int J Stroke. 2015 Aug;10(6):822-9. doi: 10.1111/ijs.12451.
- 45.** Strbian D, Ahmed N, Wahlgren N, Lees KR, Toni D, Roffe C, Surakka IL, Tatlisumak T; SITS Investigators. **Trends in Door-to-Thrombolysis Time in the Safe Implementation of Stroke Thrombolysis Registry: Effect of Center Volume and Duration of Registry Membership.** Stroke. 2015 May;46(5):1275-80. doi: 10.1161/STROKEA-HA.114.007170.
- 44.** Novotná J, Kadlecová P, Czlonkowska A, Brozman M, Švigelj V, Csiba L, Kőrv J, Demarin V, Vilionskis A, Mikulík R; SITS-EAST Investigators. **Hyperdense cerebral artery computed tomography sign is associated with stroke severity rather than stroke subtype.** J Stroke Cerebrovasc Dis. 2014 Nov-Dec;23(10):2533-9. doi:10.1016/j.jstrokecerebrovasdis.2014.04.034.
- 43.** Haršány M, Kadlecová P, Švigelj V, Kőrv J, Kes VB, Vilionskis A, Krespi Y, Mikulík R; SITS-EAST Investigators. **Factors influencing door-to-imaging time: analysis of the safe implementation of treatments in Stroke-EAST registry.** J Stroke Cerebrovasc Dis. 2014 Sep;23(8):2122-9. doi: 10.1016/j.jstrokecerebrovasdis.2014.03.019.
- 42.** Flint AC, Gupta R, Smith WS, Kamel H, Faigeles BS, Cullen SP, Rao VA, Bath PM, Wahlgren N, Ahmed N, Donnan GA; SITS International and VISTA-plus investigators. **The THRIVE score predicts symptomatic intracerebral hemorrhage after intravenous tPA administration in SITS-MOST.** Int J Stroke. 2014 Aug;9(6):705-10. doi: 10.1111/ijs.12335.
- 41.** Mazya MV, Ahmed N, Ford GA, Hobohm C, Mikulík R, Nunes AP, Wahlgren N; **Remote or extraischemic intracerebral hemorrhage-an uncommon complication of stroke thrombolysis: results from the Safe Implementation of Treatments in Stroke-International stroke thrombolysis register.** Stroke. 2014 Jun;45(6):1657--63. doi: 10.1161/STROKEAHA.114.004923.
- 40.** Karlinski M, Kobayashi A, Czlonkowska A, Mikulík R, Vaclavik D, Brozman M, Svigelj V, Csiba L, Fekete K, Kőrv J, Demarin V, Vilionskis A, Jatuzis D, Krespi Y, Ahmed N, Wahlgren N; **Safe Implementation of Treatments in Stroke-Eastern Europe (SITS-EAST) Investigators. Role of preexisting disability in patients treated with intravenous thrombolysis for ischemic stroke.** Stroke. 2014 Feb 4.

- 39.** Lorenzano S, Ahmed N, Tatlisumak T, Gomis M, Dávalos A, Mikulík R, Sevcik P, Ollikainen J, Wahlgren N, Toni D; SITS Investigators **Within-day and weekly variations of thrombolysis in acute Ischemic stroke: results from Safe Implementation of Treatments in Stroke-International stroke thrombolysis register.** Stroke 2014 Jan;45(1):176-84. doi: 10.1161/STROKEAHA.113.002133.
- 38.** Lorenzano S, Ahmed N, Falcou A, Mikulík R, Tatlisumak T, Roffe C, Wahlgren N, Toni D; SITS Investigators. **Does sex influence the response to Intravenous Thrombolysis in ischemic stroke? : Answers from Safe Implementation of Treatments in Stroke-International Stroke Thrombolysis Register.** Stroke. 2013 Dec;44(12):3401-6. doi: 10.1161/STROKEAHA.113.002908.
- 37.** Körv J, Vibo R, Kadlecová P, Kobayashi A, Czlonkowska A, Brozman M, Svilgelj V, Csiba L, Fekete K, Demarin V, Vilionskis A, Jatuzis D, Krespi Y, Ahmed N, Mikulík R; for the Safe Implementation of Treatments in Stroke – East (SITS-EAST) Registry Investigators. **Benefit of thrombolysis for stroke is maintained around the clock: results from the SITS-EAST Registry** Eur J Neurol. 2013 Sep 16. doi: 10.1111/ene.12257.
- 36.** Kharitonova TV, Castillo J, Wahlgren N; SITS investigators. **Importance of cerebral artery recanalization in patients with stroke with and without neurological improvement after Intravenous Thrombolysis** Stroke 2013 Sep;44(9):2513-8. doi: 10.1161/STROKEAHA.111.000048.
- 35.** Mazya MV, Lees KR, Markus R, Roine RO, Seet RC, Wahlgren N, Ahmed N; for the SITS investigators. **Safety of IV thrombolysis for ischemic stroke in patients treated with Warfarin.** Ann Neurol. 2013 Jun 6. doi: 10.1002/ana.23924.
- 34.** Ahmed N, Kellert L, Lees KR, Mikulík R, Tatlisumak T, Toni D; for the SITS Investigators. **Results of Intravenous Thrombolysis Within 4.5 to 6 Hours and Updated Results Within 3 to 4.5 Hours of Onset of Acute Ischemic Stroke Recorded in the Safe Implementation of Treatment in Stroke International Stroke Thrombolysis Register (SITS-ISTR): An Observational Study.** JAMA Neurol. 2013 May 20:1-8. doi: 10.1001/jamaneurol.2013.406.
- 33.** Mazya MV, Bovi P, Castillo J, Jatuzis D, Kobayashi A, Wahlgren N, Ahmed N; **External Validation of the SEDAN Score for Prediction of Intracerebral Hemorrhage in Stroke Thrombolysis.** Stroke 2013 Jun;44(6):1595-600. doi: 10.1161/STROKEAHA.113.000794. Epub 2013 Apr 30. PMID: 23632975
- 32.** Cappellari M, Bovi P, Moretto G, Zini A, Nencini P, Sessa M, Furlan M, Pezzini A, Orlandi G, Paciaroni M, Tassinari T, Procaccianti G, Di Lazzaro V, Bettoni L, Gandolfo C, Silvestrelli G, Rasura M, Martini G, Melis M, Calloni MV, Chiodo-Grandi F, Beretta S, Guarino M, Altavista MC, Marcheselli S, Galletti G, Adobbati L, Del Sette M, Mancini A, Orrico D, Monaco S, Cavallini A, Sciolla R, Federico F, Scoditti U, Brusaferri F, Grassi C, Specchio L, Bongioanni MR, Sparaco M, Zampolini M, Greco G, Colombo R, Passarella B, Adami A, Consoli D, Toni D. **The THRombolysis and STatins (THRaST) study.** Neurology. 2013 Feb 12;80(7):655-61.
- 31.** Rha JH, Shrivastava VP, Wang Y, Lee KE, Ahmed N, Bluhmki E, Hermansson K, Wahlgren N; for the SITS investigators. **Thrombolysis for acute ischemic stroke with alteplase in an Asian population: results of the multicenter, multinational, Safe Implementation of Thrombolysis in Stroke-Non European Union World (SITS-NEW).** In J Stroke 2012, Epub 2012 Sep 18

- 30.** Strbian D, Ahmed N, Wahlgren N, Kaste M, Tatlisumak T; for SITS investigators. **Intravenous thrombolysis in ischemic stroke patients with isolated homonymous hemianopia: analysis of Safe Implementation of Thrombolysis in Stroke - International Stroke Thrombolysis Register (SITS-ISTR).** Stroke 2012; 43: 2695-2698, Epub 2012 Jul 17
- 29.** Mazya M, Egido J, Ford G, Lees K, Mikulík R, Toni D, Wahlgren N, Ahmed N; For the SITS investigators. **Predicting the Risk of Symptomatic Intracerebral Hemorrhage in Ischemic Stroke Treated With Intravenous Alteplase: Safe Implementation of Treatments in Stroke (SITS) Symptomatic Intracerebral Hemorrhage Risk Score.** Stroke 2012; 43:1524-1531, Epub 2012 March 22
- 28.** Mikulík R, Kadlecová P, Czlonkowska A, Kobayashi A, Brozman M, Svigelj V, Csiba L, Fekete K, Körv J, Demarin V, Vilionskis A, Jatuzis D, Krespi Y, Ahmed N; for the Safe Implementation of Treatments in Stroke-East Registry (SITS-EAST) Investigators. **Factors Influencing In-Hospital Delay in Treatment With Intravenous Thrombolysis.** Stroke. 2012 Mar 15 [Epub ahead of print]
- 27.** Karlinski M, Kobayashi A, Mikulík R, Sanak D, Wahlgren N, Czlonkowska A. **Intravenous alteplase in ischemic stroke patients not fully adhering to the current drug license in Central and Eastern Europe.** Int J Stroke. 2012 Feb 7.
- 26.** Toni D, Ahmed N, Anzini A, Lorenzano S, Brozman M, Kaste M, Mikulík R, Putala J, Wahlgren N; For the SITS investigators. **Intravenous thrombolysis in young stroke patients: Results from the SITS-ISTR.** Neurology. 2012 Mar 7.
- 25.** Mishra NK, Ahmed N, Davalos A, Iversen HK, Melo T, Soinne L, Wahlgren N, Lees KR; SITS and VISTA collaborators. **Thrombolysis outcomes in acute ischemic stroke patients with prior stroke and diabetes mellitus.** Neurology. 2011 Nov 22;77(21):1866-72. Epub 2011 Nov 16. PMID: 22094479
- 24.** Zinkstok SM, Vergouwen MD, Engelter ST, Lyer PA, Bonati LH, Arnold M, Mattle HP, Fischer U, Sarikaya H, Baumgartner RW, Georgiadis D, Odier C, Michel P, Putala J, Griebe M, Wahlgren N, Ahmed N, van Geloven N, de Haan RJ, Nederkoorn PJ. **Safety and functional outcome of thrombolysis in dissection-related ischemic stroke: a meta-analysis of individual patient data.** Stroke 2011 Sep;42(9):2515-20. Epub 2011 Jul 28. Review.
- 23.** Kharitonova T, Mikulík R, Roine RO, Soinne L, Ahmed N, Wahlgren N; for the Safe Implementation of Thrombolysis in Stroke (SITS) Investigators. **Association of Early National Institutes of Health Stroke Scale Improvement With Vessel Recanalisation and Functional Outcome After Intravenous Thrombolysis in Ischemic Stroke.** Stroke 2011 Jun;42(6):1638-43. Epub 2011 Apr 21
- 22.** Diedler J, Ahmed N, Glahn J, Grond M, Lorenzano S, Brozman M, Sykora M, Ringleb P; **Is the Maximum Dose of 90 mg Alteplase Sufficient for Patients With Ischemic Stroke Weighing > 100 kg?** Stroke 2011 Jun;42(6):1615-20. Epub 2011 Apr
- 21.** Topakian R, Brainin M, Eckhardt R, Kiechl S, Ahmed N, Ferrari J, Iglseder B, Wahlgren NG, Lang W, Fazekas F, Willeit J, Aichner FT; for the SITS-Austria group. **Thrombolytic therapy for acute stroke in Austria: data from the Safe Implementation of Thrombolysis in Stroke (SITS) register.** Eur J Neurol. 2011 Feb;18(2):306-11.

20. Mishra, NK, Ahmed N, Andersen G, Egido J, Lindsberg P, Ringleb PA, Wahlgren N, Lees KR; for the VISTA and SITS collaborators. **Thrombolysis in the very elderly: controlled comparison of SITS International Stroke Thrombolysis Registry and Virtual International Stroke Trials Archive.** BMJ. 2010 Nov 23;341:c6046.
19. Ford GA, Ahmed N, Azevedo E, Grond M, Larrue V, Lindsberg P, Toni D, Wahlgren N. **Intravenous alteplase for stroke in those older than 80 years old.** Stroke 2010 Nov;41(11):2568-74. Epub 2010 Oct 7
18. Ahmed N, Wahlgren N, Grond M, Hennerici M, Lees KR, Mikulík R, Parsons M, Roine RO, Toni D, Ringleb P; for the SITS Investigators. **Implementation and outcome of thrombolysis with alteplase 3-4.5 h after an acute stroke: an updated analysis from SITS-ISTR.** Lancet Neurol 2010; 9; 866-74
17. Ahmed N, Dávalos A, Eriksson N, Ford GA, Glahn J, Hennerici M, Mikulík R, Kaste M, Lees KR, Lindsberg P, Toni D; for the SITS Investigators. **Association of admission blood glucose and outcome in patients treated with intravenous thrombolysis** Arch Neurol 2011; 67(9): 1123-1130.
16. Diedler J, Ahmed N, Sykora M, Uyttenboogaart M, Overgaard K, Luijckx G-J, Soinne L, Ford GA, Lees KR, Wahlgren N, Ringleb P; **Safety of intravenous thrombolysis for acute ischemic stroke in patients receiving antiplatelet therapy at stroke onset.** Stroke 2010 Feb;41(2):288-94. Epub 2010 Jan 7.
15. Simpson MA, Dewey HM, Churilov L, Ahmed N, Bladin CF, Schultz D, Mrkus R, Stur JW, Levi CR, Blacker DJ, Jannes J, Lindley RI, Parsons MW; **Thrombolysis for acute stroke in Australia: outcomes from the Safe Implementation of Thrombolysis in Stroke registry (2002-2008).** Med J Aust 2010 Oct 18;193(8):439-43.
14. Vanacker P, Thijs V, Peeters A, Bruneel B, Laloux P, Druwé P, De Deyn P, Ahmed N, Wahlgren N, Vanhooren G; Belgian SITS-collaboration group. **The Belgian experience with intravenous thrombolysis for acute ischemic stroke.** Acta Neurol Belg. 2010 Jun;110(2):157-62.
13. Wahlgren N; **Systemic thrombolysis in clinical practice: what have we learned after the Safe Implementation of Thrombolysis in Stroke Monitoring Study?** Cerebrovasc Dis. 2009;27 Suppl 1:168-76. Epub 2009 Apr 3. Review.
12. Kharitonova T, Ahmed N, Thoren M, et al. **Hyperdense middle cerebral artery sign on admission CT scan - prognostic significance for ischaemic stroke patients treated with intravenous thrombolysis in the safe implementation of thrombolysis in Stroke.** Cerebrovasc Dis. 2009;27(1):51-9.
11. Mikulík R, Václavík D, Sanák D, Bar M, Sevcík P, Kalita Z, Wahlgren N; **A nationwide study on topography and efficacy of the stroke treatment network in the Czech Republic.** J Neurol. 2010 Jan;257(1):31-7. Epub 2009 Jul 23.
10. Kharitonova T, Thorén M, Ahmed N, Wardlaw JM, von Kummer R, Thomassen L, Wahlgren N; for the SITS investigators. **Disappearing Hyperdense Middle Cerebral Artery Sign in ischemic stroke patients treated.** J Neurol Neurosurg Psychiatry. 2009 Mar;80(3):248. Epub 2008 Oct 17.
9. Kobayashi A, Czlonkowska A, Ahmed N, Romanowicz S, Glonek M, Nyka WM, Opala G, Wahlgren N; for the SITS Poland Collaborative Group. **Intravenous recombinant tissue plasminogen activator for acute stroke in Poland: an analysis based on the Safe Implementation of Thrombolysis in Stroke (SITS) Registry.** Acta Neurol Scand. 2010 Oct;122(4):229-36.

8. Roje-Bedeković M, Vargek-Solter V, Corić L, Sabolek K, Breitenfeld T, Supanc V, Demarin V; **Thrombolysis for acute ischemic stroke-our experiences as part of SITS-MOST.** Acta Clin Croat. 2009 Sep;48(3):287-93.
7. Ahmed N, Wahlgren N, Brainin M, et al. **Relationship of blood pressure, antihypertensive therapy, and outcome in ischemic stroke treated with intravenous thrombolysis: retrospective analysis from Safe Implementation of Thrombolysis in Stroke - International Stroke Thrombolysis Register (SITS-ISTR).** Stroke 2009 Jul;40(7):2442-9. Epub 2009 May 21.
6. Rodríguez-Yáñez M, Alvarez-Sabín J, Dávalos A, Díez-Tejedor E, Castillo J; **Thrombolytic therapy for acute ischemic stroke. Experience of SITS (Safe Implementation of Thrombolysis in Stroke) register.** Neurologia. 2009 Jun;24(5):288-91. Spanish.*
5. Lorenzano S, Ahmed N, Rosselli A, Marcello N, Inzitari D, Sterzi R, Wahlgren N, Prencipe M, Toni D; **Safe implementation of thrombolysis in stroke-monitoring study in Italy.** Eur J Neurol. 2010 Jan;17(1):163-7. Jun 15.
4. Wahlgren N, Ahmed N, Dávalos A, Hacke W, Millán M, Muir K, Roine RO, Toni D, Lees KR; **Thrombolysis with alteplase 3-4.5 h after acute ischaemic stroke (SITS-ISTR): an observational study.** Lancet 2008; 372: 1303-1309.
3. Lees KR, Ford GA, Muir KW, Ahmed N, Dyker AG, Atula S, Kalra L, Warburton EA, Baron JC, Jenkinson DF, Wahlgren NG, Walters MR; SITS-UK Group. **Thrombolytic therapy for acute stroke in the United Kingdom: experience from the safe implementation of thrombolysis in stroke (SITS) register.** QJM. 2008 Nov;101(11):863-9. Epub 2008 Aug 11
2. Wahlgren N, Ahmed A, Eriksson N, Aichner F, Bluhmki E, Dávalos A, Erilä T, Ford GA, Grond M, Hacke W, Hennerici M, Kaste M, Köhrmann M, Larrue V, Lees KR, Machnig T, Roine RO, Toni D, Vanhooren G; for the SITS-MOST investigators. **Multivariable analysis of outcome predictors and adjustment of main outcome results to baseline data profile in randomized controlled trials; Safe Implementation of Thrombolysis in Stroke Monitoring Study (SITS-MOST).** Stroke 2008; 39: 3316-3322.
1. Wahlgren N, Ahmed N, Dávalos A, Ford GA, Grond M, Hacke W, Hennerici MG, Kaste M, Kulkens S, Larrue V, Lees KR, Roine RO, Soinne L, Toni D, Vanhooren G; **Thrombolysis with alteplase for acute ischaemic stroke in the Safe Implementation of Thrombolysis in Stroke-Monitoring Study (SITS-MOST): an observational study.** Lancet 2007; 369:275-282.

APPENDIX

List with centres contributing with data to the SITS Registry between December 25, 2002 and December 31, 2021.

Country and Hospital

Albania, 9 patients

Mother Theresa University
Hospital Center

Algeria, 124 patients

Hopital Frantz Fanon
CHU Benbadis

Argentina, 1 172 patients

CEMIC
Centro Gallego de Buenos Aires
FLENI
Hospital Cordoba
Hospital Privado Santa Clara de Asís
Instituto Cardiovascular de Rosario
Policlinico Neuquen
Ramos Mejia
Sanatorio Nuestra Senora del Rosario
Sanatorio Parque

Armenia, 1 patient

Erebouni Medical
Centre

Australia, 4 071 patients

Austin Health
Bankstown-Lidcombe
Bendigo Health
Box Hill Hospital
Concord Hospital
Flinders Medical Centre
Frankston Hospital
Fremantle Hospital
Gold Coast Hospital
Gosford Hospital
John Hunter Hospital New South Wales
Liverpool Hospital
Lyell McEwin Hospital

Country and Hospital

Monash Medical Centre
Nambour General Hospital
Northern Health
Royal Adelaide Hospital
Sir Charles Gardiner Hospital
South West Healthcare
St Vincent's Hospital
Tamworth Hospital
The Queen Elizabeth Hospital
The Townsville Hospital
Wagga Wagga Base Hospital
Westmead Hospital

Austria, 1 319 patients

Christian-Doppler-Klinik Salzburg
II. Neurolog. Abteilung Rosenhügel
Wien
Kepler Universitätsklinikum Neuromed
Campus
KH der Barmherzigen Schwestern Linz
KH Vöcklabruck
Klinikum Wels-Grieskirchen
Krankenanstalt Rudolfstiftung
Krankenhaus der Barmherzigen
Brüder Linz
Krankenhaus der Barmherzigen
Brüder Wien
Landesklinikum Tulln
Landesnervenklinik
Sigmund Freud Graz
LKH Steyr
Med Campus III, Kepler
Mostviertelklinikum Amstetten
Neurologisches Zentrum Rosenhügel
Neuromed Campus, Kepler
Universitätsklinikum
Otto-Wagner-Spital Wien
Univ.-Klinikum Graz
University Hospital Innsbruck
Waldviertelklinikum Horn
Weinviertelklinikum Mistelbach
Wilhelminenspital
Wr Neustadt
Zentralklinikum St. Pölten
Zentralklinikum St. Pölten

Country and Hospital

Bahrain, 1 patient

King Hamad University Hospital

Belgium, 9 747 patients

ACZA Stuivenberg - Antwerpen

ASZ Geraardsbergen

AZ Algemeen Ziekenhuis - Aalst

AZ Alma - Eeklo/Sijsele

AZ Damiaan - Oostende

AZ Delta

AZ Groeninge

AZ Jan Palfijn - Gent

AZ Jan Portaels

AZ Jan Ypermanziekenhuis - Ieper

AZ Klinika - Brasschaat

AZ Maria Middelares - Gent

AZ Middelheim - Antwerpen

AZ Monica

AZ Nikolaas

AZ Onze-Lieve-Vrouw - Aalst

AZ Rivierenland

AZ Sint Blasius - Dendermonde

AZ Sint Jan Brugge - Oostende

AZ Sint Jozef - Malle

AZ Sint Lucas - Brugge

AZ Sint Maarten - Duffel

AZ Sint Rembert - Torhout

AZ Sint Vincentius - Antwerpen

AZ Sint-Lucas - Gent

AZ Sint-Maria Halle

AZ Turnhout

AZ Vezalius - Tongeren

AZ Virga Jesse Ziekenhuis - Hasselt

AZ Waasland - Sint Niklaas

AZ West

Centre Hospitalier Peltzer Verviers

CH du Bois de l'Abbaye

CH Reine Fabiola,

Montignies

CHA Libramont

CHR Tournai

CHU Brugmann

CHU Hopital Erasme - Bruxelles

CHU St. Luc - Woluwe

CHU Tivoli

Clinique Saint-Jean, Bruxelles

Clinique St. Joseph - St. Vith

Clinique St.-Pierre - Ottignies

Cliniques de l'Europe

Country and Hospital

Cliniques Saint-Joseph Arlon

Coordination Belgium

GZA Hospital

Heilig Hartziekenhuis Mol

Hôpital Civil Charleroi

Hôpital de Jolimont

Imeldaziekenhuis - Bonheiden

Jessa Hospital

Mariaziekenhuis - Overpelt

Mont-Godinne University Hospital

Regionaal ziekenhuis

H. Hart - Leuven

RZ Tienen

Sint - Andriesziekenhuis

Sint - Trudo

UZ Antwerpen - Antwerpen

UZ Brussel

UZ Gasthuisberg - Leuven

UZ Gent - Gent

Bermuda, 43 patients

King Edward Memorial Hospital

Bolivia, 14 patients

Hospital Materno Infantil

Bosnia and Herzegovina, 70 patients

University Clinical Center of Republic of Srpska

Brazil, 40 969 patients

Centro Hospitalar Unimed

Centro Medico de Campinas

Complexo Hospitalar Unimed Nordeste RS

Fundação Santa Casa de Misericórdia de Franca

Hospital Alianca

Hospital Carlos Fernando Malzoni

Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (HCFMUSP)

Hospital das Clínicas de Ribeirão Preto

Hospital de Base de Bauru

Country and Hospital

Hospital de Clinicas da UFPR
 Hospital de Clínicas da Universidade Federal do Triângulo Mineiro
 Hospital de Clínicas de Porto Alegre
 Hospital de Clínicas de Uberlândia
 Hospital de Clínicas Nossa Senhora da Conceição
 Hospital de Força Aérea do Galeão
 Hospital de Urgência de Sergipe
 Hospital e Maternidade Santa Isabel
 Hospital Espanhol
 Hospital Estadual Central
 Hospital Governador Celso Ramos
 Hospital Icaraí
 Hospital Israelita Albert Einstein
 Hospital LifeCenter
 Hospital Lucio Rebelo
 Hospital Mãe de Deus
 Hospital Maria Auxiliadora
 Hospital Mater Dei Contorno
 Hospital Meridional Cariacica
 Hospital Metropolitano Doutor Celio de Castro
 Hospital Moinhos de Vento
 Hospital Moinhos de Vento Hospital
 Municipal do Campo Limpo
 Hospital Municipal Dr Arthur de Riberiro Saboya
 Hospital Municipal São José
 Hospital Municipal Souza Aguiar
 Hospital Odilon Behrens
 Hospital Paulistano
 Hospital Primavera
 Hospital Regional do Cariri
 Hospital Regional do Sertao Central
 Hospital Regional Justino Luz
 Hospital Santa Catarina de Blumenau
 Hospital Santa Isabel
 Hospital Santa Lucia Norte
 Hospital Santa Lúcia Sul
 Hospital Santa Paula
 Hospital Santa Rosa
 Hospital Sao Carlos
 Hospital Sao Jose
 Hospital São Judas Tadeu
 Hospital Sao Lucas PUCRS
 Hospital Sao Paulo - Unimed Araraquara
 Hospital Unimed Vitoria
 Hospital Universitário de Santa Maria
 Hospital Universitario Maria Aparecida Pedrossian

Country and Hospital

Hospital Veredas
 Hospital Vita
 Instituto Cardiopulmonar
 Instituto de Neurologia de Goiânia
 Instituto Hospital de Base do Distrito Federal
 Irmandade Nossa Senhora das Mercês - Santa Casa de Montes Claros
 Mater Dei Santo Agostinho
 Santa Casa de Ituverava
 Santa Casa de Misericórdia de Maringá
 Santa Casa de Misericórdia de Passos
 Santa Casa de Misericordia de Porto Alegre
 Santa Casa de Misericordia e Asilo dos Pobres de Batatais
 Santa Casa de São Paulo
 São João Batista - Grupo Unimed
 São Lucas Hospital
 Sociedade Portuguesa de Beneficencia de Ribeirao Preto - Hospital Imaculada Conceição
 Unimed Chapecó
 Unimed Ribeirao Preto

Bulgaria, 5 015 patients

MBAL - St.Anna
 MHAT Medika
 MHAT - Dobrich
 MHAT - Plovdiv
 MHAT - Shumen
 MHAT - Siliстра
 Multiprofile Hospital for Active Treatment
 Sveta Marina Varna
 University Multiprofile Hospital for Active Treatment "St. Anna"
 Sofia (BGSOF)

Chile, 1 595 patients

Clinica Alemana de Santiago
 Clinica Alemana de Temuco
 Clinica Renaca
 Hernan Henriquez Aravena
 Hospital Carlos van Buren
 Hospital Fach
 Hospital Naval Almirante Nef
 Hospital San Pablo de Coquimbo

Country and Hospital

China, 260 patients

The First Affiliated Guangzhou Medical College The First Affiliated Hospital JiNan University 1st Municipal Peoples Hospital Guangzhou
 An Zhen Hospital
 Anhui Provincial Hospital
 Beijing Military General Hospital
 Beijing Tiantan Hospital
 Beijing Tsinghua Changgung Hospital
 Da Ping hospital
 Haidian Hospital Beijing City
 Hua Shan Hospital
 Hubei Zhongshan Hospital
 No. 411 Hospital
 Shanghai Sixth Peoples Hospital
 Shanxiayi Hospital
 The Branch of Shanghai first Hospital
 The First Affiliated Hospital of Guang-Zhou University of Chinese Medicine
 The First Affiliated Hospital of Zhengzhou University
 Third Hospital of Sun Yat-sen University
 Xinhua Hospital Affiliated to Shanghai Jiaotong University School of Medicine
 Xuanwu Hospital Capital Medical University
 Zhongshan Hospital - Fudan University

Colombia, 385 patients

Clinica de Marly
 Clinica Misael Pastrana
 Clinica Shaio
 Clinica Universitaria Universidad Nacional de Colombia
 DIME Clinica Neurocardiovascular
 Fundacion Santa Fe
 Fundacion Santa Fe de Bogota
 Hospital de Kennedy
 Hospital El Tunal
 Hospital Universitario San Ignacio

Costa Rica, 38 patients

Hospital San Juan de Dios

Croatia, 1 608 patients

County Hospital Varazdin
 General Hospital Dr. Josip Bencevic
 General Hospital Dubrovnik

Country and Hospital

General Hospital Vukovar
 KBC Rijeka
 Opća bolnica Karlovac
 Opća bolnica Šibenik
 Osijek Clinical Hospital Centre
 Sestre Milosrdnice University Hospital
 University Hospital Center Split
 University Hospital Center Zagreb
 University Hospital Dubrava
 University Hospital Sveti Duh
 Virovitica General Hospital
 University Hospital Center Zagreb
 University Hospital Dubrava
 University Hospital Sveti Duh
 Virovitica General Hospital

Czech Republic, 33 123 patients

Cheb Nemocnice
 Chrudim Nemocnice
 Fakultni Thomayerova Nemocnice
 FN Brno
 FN Bulovka
 FN Hradec Kralove
 FN Kralovske Vinohrady
 FN Motol
 FN Olomouc
 FN Ostrava
 FN Plzen
 FN u sv Anny v Brne
 Frydek-Mistek nem
 Havrov
 Jicin Nemocnice
 Karvinska Hornicka Nemocnice
 Krajska nemocnice Liberec
 Kyjov Nemocnice
 Nemocnice Benesov
 Nemocnice Blansko
 Nemocnice Breclav
 Nemocnice Ceska Lipa
 Nemocnice Ceske Budejovice
 Nemocnice Chomutov
 Nemocnice Decin
 Nemocnice Havlickuv Brod
 Nemocnice Jihlava
 Nemocnice Jindrichuv Hradec
 Nemocnice Karlovy Vary
 Nemocnice Kladno

Country and Hospital

Nemocnice Kolin
 Nemocnice Litomerice
 Nemocnice Litomysl
 Nemocnice Melnik
 Nemocnice Mlada Boleslav
 Nemocnice Most
 Nemocnice Na Homolce
 Nemocnice Nachod
 Nemocnice Nove Mesto na Morave
 Nemocnice Nový Jičín
 Nemocnice Opava
 Nemocnice Ostrava
 Nemocnice Pardubice
 Nemocnice Pisek
 Nemocnice Příbram
 Nemocnice Prostějov
 Nemocnice Rychnov nad Kněžnou
 Nemocnice Sokolov
 Nemocnice Strakonice
 Nemocnice Teplice
 Nemocnice Trnávka Sosna
 Nemocnice Trutnov
 Nemocnice Uherske Hradiste
 Nemocnice Usti nad Labem
 Nemocnice Usti nad Orlici
 Nemocnice Vítkovice
 Nemocnice Vyskov
 Nemocnice Zlín
 Nemocnice Znojmo
 Okresní Nemocnice Tábor
 Praha - Nemocnice na Františku
 Přerov Nemocnice
 SZZ Krnov
 Ustřední Vojenská Nemocnice
 VFN Neurol.kl.1.LF a UK
 Vojenská Nemocnice Brno

Denmark, 2 375 patients

Aalborg Hospital
 Bornholms Central
 sygehus
 Holstebro
 Odense University
 Hospital
 Roskilde
 Sydvestjysk Hospital Esbjerg
 University Hospital of Cph
 at Bispebjerg
 University Hospital of Cph at Gentofte
 University Hospital of Cph at Glostrup
 Århus Hospital, Århus University
 Hospital

Country and Hospital**Dominican Republic, 449 patients**

Juan Pablo Pina

Ecuador, 424 patients

Hospital Especialidades Eugenio
 Espejo
 Hospital Metropolitano
 Hospital Teodoro Maldonado Carbo

Egypt, 10 364 patients

Ain Shams Specialized Hospital
 Ain Shams Universities
 Al Shorouk
 Al-Azhar University Hospitals
 Alexandria University (Stroke Center)
 Assiut University Hospitals
 Aswan University Hospitals
 Beni Suef University Hospital
 Cairo University Hospitals
 Cairo University Hospitals
 Mansoura University Hospital
 Menofia University Hospital
 Minia University Hospital
 Misr International Hospital
 Nasser Institute Hospital
 New Nozha Hospital
 Saudi German Cairo
 Sohag University
 Tanta University Hospital
 Zagazig University

El Salvador, 39 patients

HMQ ISSS
 Hospital Diagnóstico Escalón
 Hospital Nacional Rosales

Estonia, 5 506 patients

East-Tallinn Central Hospital
 LTKH
 North Estonia Medical Centre
 Tartu University Hospital

Country and Hospital

Ethiopia, 0 patients

Finland, 4 109 patients

Central Hospital of Central Finland
Central Hospital of Central Finland
Central Hospital of Kainuu
Central Hospital of Lapland
Etelä-Karjalan Keskussairaala
Helsinki University Central Hospital
Kanta-Häme Central Hospital
Kuopio University Hospital
Kuusankoski District Hospital
Kymenlaakso Central Hospital
Länsi-Pohja Central Hospital
Mikkeli Central Hospital
Oulu University Hospital
Pohjois-Karjalan Keskussairaala
Päijät-Häme Hospital District
Satakunta Central Hospital
Savonlinna Central Hospital
Seinäjoki Central Hospital
Tampere University Hospital
Turku University Central Hospital
Ålands Centralsjukhus

France, 354 patients

Angouleme
Bordeaux
Bourg en Bresse
Centre Hospitalier Belfort Montbeliard
Dijon
Hopital Emile Muller
Lille
Montpellier
Nancy
Nice
Perpignan
Purpan Hospital
Rangueil
Sainte Anne Paris
Tenon
Tours

Germany, 8 307 patients

Charité - Campus Benjamin Franklin
Diakonissenkrankenhaus Flensburg
Herz-Jesu-Krankenhaus
JWK Minden
Katharinenshospital

Country and Hospital

Katholisches Klinikum Koblenz
Brüderhaus
Klinikum Bremen Mitte
Klinikum Dortmund gGmbH
Klinikum Frankfurt / Oder
Klinikum Ludwigsburg
Klinikum Ludwigshafen
Klinikum Mittelbaden
Klinikum Osnabrueck
Klinikum Villingen-Schwenningen
Krankenhaus Nordwest
Krankenhaus Schwabing
Kreisklinik Mindelheim
Kreisklinikum Siegen
Landesklinik Teupitz
Neurologische Universitätslinik Koeln
Ruppiner Kliniken GmbH
St. Bonifatius Hospital
Städt.Krankenhaus
München-Harlaching
TU Munich
Univ.Hospital Mannheim
University Clinic Essen
University Hospital
Düsseldorf
University Hospital Jena
University Hospital of Heidelberg
University Medicine Greifswald
University of Leipzig
University Tübingen
Universitätsklinik
Knappaftskrankenhaus
Universitätsklinik Münster
Universitätsklinikum Bonn
Universitätsklinikum Gießen
Universitätsklinikum
Schleswig-Holstein
Campus Kiel
Westpfalz-Klinikum GmbH
Zentralklinikum Augsburg

Greece, 2 847 patients

"St. Panaleimon" General State Hospital
of Piraeus
"Tzaneio" General Hospital of Piraeus
251 Hellenic Air Force General Staff
Hospital
Agios Pavlos
AHEPA University Hospital
Athens Medical Center
Athens Naval Hospital
Attikon University Hospital
Eginition
Euroclinic
Evaggelismos General Hospital

Country and Hospital

G.Papanikolaou Hospital
 General Hospital of Athens
 General Hospital of Imathia
 General Hospital of Rethymnon
 General Hospital of Rhodes,
 Andreas Papandreou
 General Hospital of Serres
 Korgialenio-Benakio Greek Red Cross
 General Hospital of Athens
 Larisa Regional General Hospital
 Mediterraneo Hospital
 Metropolitan
 Metropolitan General
 Papageorgiou General Hospital
 Thriassio Hospital
 University Hospital of Alexandroupolis
 University Hospital of Heraklion
 University Hospital of Ioannina
 University Hospital of Larissa
 University Hospital of Patras

Guatemala, 89 patients

Hospital General San Juan de Dios
 Hospital Herrera Llerandi
 Hospital Roosevelt

Honduras, 22 patients

Hospital Escuela
 Hospital Nacional Dr. Mario Catarino
 Rivas
 Instituto de
 Neurociencias

Hong Kong, 24 patients

Prince of Wales Hospital

Hungary, 2 049 patients

Aladar Petz County Hospital
 B.-A.-Z. County Hospital
 Bajcsy Zsilinszky Korhaz
 Dr Kenessey Albert Hospital
 Fejer Megyei Szent
 Gyorgy Korhaz
 Felső Szabolcsi Korhaz
 Flor Ferenc Hospital
 Javorszky Odon
 Josa Andras Oktatokorhaz
 Egeszsegugyi
 Szolgaltato Nonprofit Kft.
 Kanizsai Dorotya Korhaz
 Pandy Kalman Korhaz
 Peterfy Sandor u. Korhaz
 Semmelweis University
 State Health Centre
 Szent Borbala
 Szent Rokus Hospital
 University of Debrecen
 University of Pecs Medical School

Country and Hospital

Iceland, 8 patients

Landspitali University Hospital

India, 10 804 patients

Regional Coordinator:
 All India Institute of
 Medical Sciences
 AMRI Hospitals
 AMRI Institute of Neurosciences, AMRI
 Hospitals, Mukundapur
 Apollo Gleneagles
 Hospitals
 Apollo Hospitals
 Hyderabad
 Baby Memorial Hospital
 Care Hospital
 Christian Medical College Hospital
 Civil Hospital Sangrur
 Civil Hospital Ambala Cantt
 Civil Hospital Jalandhar
 Civil Hospital Ludhiana
 Civil Hospital, Sector 6, Panchkula
 District Civil Hospital Gurugram
 District Hospital Sonipat
 Fortis Hospital
 Gleneagles Global Health City
 Government Medical College - Patiala
 Hiranandani Hospital
 Jehangir Hospital Apollo Hospitals
 Group
 Kokilaben Dhirubhai Ambani Hospital
 and Medical Research Institute
 Lalitha Super Speciality Hospital
 Lilavati Hospital and Research
 Centre
 Little Flower Hospital - Research Centre
 Lourdes Hospital neurology
 Maharishi Markandeshwar Institute of
 Medical Sciences and Research
 Max Hospital Shalimar Bagh
 Medanta the Medicity
 N. M. Virani Wockhardt Hospital
 NH Mazumdar Shaw Medical center
 Nizams Institute of Medical Sciences
 Pondicherry Institute of Medical
 Sciences

Country and Hospital

Postgraduate Institute of Medical Education & Research
 Ruby Hall Clinic
 Wockhardt Hospital Nagpur
 Wockhardt Hospital Nashik
 Wockhardt Hospitals Ltd, Unit- Adams Wylie Memorial

Iran, 20 581 patients

Sina
 Ali-Ebn-Abitalib Hospital
 Alzahra
 Bou-Ali Sina
 Firoozgar General Hospital
 Ghaem
 Golestan
 Golestan Hospital
 Imam Husain Hospital
 Imam Reza
 Imam Reza Kermanshah
 Nemazee Hospital
 Razi Hospital
 Shahid Beheshti
 Shahid Beheshti
 Shahid Beheshti
 Imam Reza
 Imam Reza Kermanshah
 Nemazee Hospital
 Razi Hospital
 Shahid Beheshti
 Shahid Beheshti
 Shahid Beheshti

Ireland 57 patients

Mater Misericordiae
 University Hospital
 St James Hospital
 St Vincent's University Hospital

Israel 394 patients

Barzilay Hospital
 Bnai-Zion Medical Centre
 Hadassah Ein-Kerem
 Hadassah University Hospital
 Hillel Yaffe Medical Center
 Makassed Islamic Charitable Hospital
 Sheba Medical Center
 Tel-Aviv Sourasky Medical Center

Country and Hospital

Italy, 142 828 patients

P.O Gravina e Santo Pietro di Caltagirone
 Di Venere
 Giuseppe Mazzini Teramo
 Luigi Sacco Hospital
 Santa Chiara Hospital
 A.O. G. Rummo
 A.O. Spedali Civili di Brescia
 A.O.U. Policlinico G. Martino Messina
 A.O.U. San Giovanni di Dio e Ruggi d'Aragona
 A.S.O. S. Croce e Carle
 Antonio Cardarelli Campobasso
 Antonio Perrino
 A.O. S.G. Moscati
 AOR San Carlo Potenza
 Arcispedale Santa Maria Nuova
 ARNAS Garibaldi
 ASST Franciacorta
 ASST Mantova, Carlo Poma
 Augusto Murri
 Azienda Ospedaliera Bianchi-Melacrino-Morelli
 Azienda Ospedaliera Cannizzaro
 Azienda Ospedaliera di Cosenza
 Azienda Ospedaliera G. Salvini
 Azienda Ospedaliera Pugliese-Ciaccio
 Azienda Ospedaliera s. Maria Degli Angeli Pordenone
 Azienda Ospedaliera S. Maria Terni
 Azienda Ospedaliera Universitaria Integrata Verona
 Azienda Ospedaliera Universitaria Policlinico Paolo Giaccone di Palermo
 Azienda Ospedaliera Universitaria Senese
 Azienda Ospedaliera Valtellina e Valchiavenna
 Azienda Ospedaliero - Universitaria di Parma
 Azienda Ospedaliero Universitaria Ospedali Riuniti di Foggia
 Azienda Sanitaria Universitaria Giuliano Isontina
 B. Ramazzini
 Belcolle
 Bentivoglio Hospital
 Bucceri La Ferla

Country and Hospital

Cà Foncello
 Careggi
 Carlo Urbani
 Casa Di Cura Dott. Pederzoli S.P.A.
 Casa Sollievo della Sofferenza
 Castiglione del Lago
 Cazzavillan
 Ceppo
 Civil Hospital, Macerata
 Crema
 E.O. Ospedali Galliera
 Fabrizio Spaziani
 Felice Lotti . P.O. Pontedera (Pisa)-
 AUS-LToscana Nordovest
 Fond Poliambulanza Brescia
 Fondazione Ca' Granda Maggiore
 Milano
 Fondazione Istituto G. Giglio
 G B Morgagni L Pierantoni Forli
 Giovanni Paolo II
 Gradenigo Hospital
 Guglielmo da Saliceto
 Hospital ASST West Milanese
 INRCA
 IRCCS Centro Neurolesi Bonino
 Pulejo Ospedale Piemonte
 IRCCS Policlinico San Matteo-Casimiro
 Mondino
 IRCCS Sacro Cuore Don Calabria
 Istituto Clinico Città Studi
 Istituto Clinico Humanitas
 Istituto Scientifico Ospedale San Luca
 (Istituto Auxologico Italiano)
 Jazzolino
 Livorno
 Madonna del Soccorso Hospital
 Maggiore della Carità Novara
 Mater Salutis Hospital
 Maurizio Bufalini
 Morelli Sondalo
 Molinette
 Neuromed
 O.C. Renzetti
 Osedali Riuniti Ancona
 Osp Circolo Busto Arsizio
 Ospedale S. Maria delle Croci
 Ospedale San Pio da Pietrelcina
 Ospedale Umberto I - Enna
 Ospedale A Manzoni Lecco
 Ospedale Antonio Cardarelli
 Ospedale Bassa Val di Cecina
 Ospedale Brotzu Cagliari
 Ospedale Cardinal Massaia
 Ospedale Ciriè
 Ospedale Civico di Chivasso
 Ospedale Civico Palermo
 Ospedale Civile S. Agostino-Estense -
 Azienda Ospedaliera Universitaria
 di Modena
 Ospedale Civile Cittadella
 Ospedale Civile di Conegliano (Treviso)
 Ospedale Civile di Ivrea
 Ospedale Civile Elbano
 Ospedale Civile Mirano
 Ospedale Civile Spirito Santo Pescara
 Ospedale Civile Venezia, U.O.C.
 Neurologia
 Ospedale degli Infermi
 Ospedale del Mare
 Ospedale dell'Angelo
 Ospedale della Misericordia
 Ospedale della Murgia
 "F. Perinei"
 Ospedale della Versilia
 Ospedale delle Apuane
 Ospedale Desio
 Ospedale di Circolo e Fondazione
 Macchi Varese
 Ospedale di Città di Castello
 Ospedale di Fidenza (Parma)
 Ospedale di Saronno
 Ospedale di Stato
 Ospedale di Treviglio
 Ospedale di Vimercate
 Ospedale Edoardo Agnelli
 Ospedale G.B. Grassi - ASL Roma 3
 Ospedale Immacolata Concezione
 Ospedale Imperia
 Ospedale Infermi
 Ospedale Lavagna
 Ospedale Maggiore
 Ospedale Maria Vittoria Torino
 Ospedale Martini Torino
 Ospedale Mauriziano Torino
 Ospedale Moriggia-
 Pelascini
 Ospedale Niguarda
 Ca' Granda
 Ospedale Novi Ligure
 Ospedale Papa Giovanni XXIII
 Ospedale Provinciale di Bolzano
 Ospedale Regionale della valle d'Aosta
 Ospedale Regionale Miulli
 Ospedale S. Donato Arezzo
 Ospedale S. Elia Caltanissetta
 Ospedale S. Eugenio
 Ospedale S. Maria del Prato
 Ospedale S. Maria della Scaletta

Country and Hospital

Country and Hospital

Ospedale S. Maria Misericordia Udine
 Ospedale San Bassiano
 Ospedale San Bortolo
 Ospedale San Gerardo
 Ospedale San Giovanni Battista
 Ospedale San Lazzaro - Alba
 Ospedale San Luca
 Ospedale San Salvatore-L'Aquila
 Ospedale Sant'Anna
 Ospedale Santa Corona
 Ospedale Santa Maria Annunziata Firenze
 Ospedale Santa Maria della Misericordia di Rovigo
 Ospedale Santa Maria Nuova
 Ospedale Santo Spirito - Rome
 Ospedale Santo Spirito Casale Monferrato
 Ospedale SS Filippo e Nicola
 Ospedale Umberto I Siracusa
 Ospedale Valduce Como
 Ospedali Riuniti di Foggia
 Ospedaliero Santa Croce di Fano
 P.O. R. Guzzardi
 P.O. San Francesco
 P.O.M Villa Scassi ASL3 Genova
 PO Gorizia-Monfalcone
 PO Vizzolo
 Polyclinico Bari
 Polyclinico Campus Biomedico
 Polyclinico Gemelli
 Polyclinico San Marco
 Polyclinico San Matteo
 Polyclinico tor Vergata
 Polyclinico Umberto I - University La Sapienza
 Polyclinico Universitario Padova
 Polyclinico Universitario Padova Neurol
 Presidio Ospedaliero Sant'Andrea La Spezia
 Presidio Ospedaliero Cremona
 Presidio Ospedaliero Umberto I
 R. Dimiccoli
 Rivoli
 S. Giovanni Calibita
 Fatebenefratelli
 S. Andrea Vercelli
 S. Anna Hospital
 S. Elia
 S. Orsola-Malpighi
 Saint Antonio Abate Sicily
 San Biagio
 San Camillo de Lellis
 San Camillo-Forlanini
 San Carlo Borromeo

Country and Hospital

San Filippo Neri
 San Giacomo Apostolo
 San Giovanni Addolorata
 San Giovanni Bosco
 San Giovanni di Dio Agrigento
 San Giovanni di Dio Hospital. ASP Crotone
 San Giuseppe
 San Giuseppe
 San Jacopo Hospital
 San Leopoldo Mandic
 San Luigi Gonzaga
 San Martino
 San Martino Genova
 San Martino Hospital
 San Paolo
 Sandro Pertini Hospital
 Sant'Andrea
 Sant'Anna
 Sant'Anna e San Sebastiano Caserta
 Sant'Antonio Hospital
 Santa Chiara Hospital
 Santa Croce Moncalieri Maggiore di Chier
 Santa Maria alla Gruccia
 Santa Maria Goretti
 Santi Antonio e Biagio
 Santissima Annunziata
 Santo Stefano Prato
 San Tommaso dei Battuti
 Santorso Alto Vicentino
 Scientific Institute San Raffaele Hospital
 SS. Annunziata
 SS. Annunziata - Taranto
 SS. Annunziata
 SSCosma e Damiano
 ULSS17 - Monselice Hospital
 Universita degli Studi di Perugia
 University of Genova
 Vito Fazzi

Japan, 75 patients

Shonan Kamakura General Hospital

Country and Hospital**Kazakhstan, 108 patients**

GKP na PKHV Gorodskaya bol'niitsa №1
 Regional Hospital Atyrau city
 Shymkent city Regional hospital

Kenya, 0 patients**Kuwait, 0 patients****Kyrgyzstan, 1 479 patients**

Bishkek City Civil Clinic 1
 Chui Regional Clinic

Lebanon, 147 patients

Bellevue Medical Center
 The Lebanese Hospital

Libya, 6 patients

Benghazi Medical Centre

Lithuania, 4 241 patients

Hospital of Lithuanian University of Health Sciences Kaunas Clinics
 Klaipeda Seamen's Hospital
 Klaipeda University Hospital
 Regional Hospital of Panevezys
 Republican Siauliai Hospital
 Republican Vilnius University Hospital
 Telsiu hospital
 Vilnius Uni Hospital
 Santariskiu clinics

Malta, 0 patients**Mexico, 1 047 patients**

Hospital Angeles de Queretaro
 Hospital Civil de Guadalajara
 Hospital General de Culiacan
 Hospital General de Mexico O.D.

Country and Hospital**Hospital Regional ISSSTE Monterrey**

Hospital Universitario UANL
 Instituto Nacional de Neurología y Neurocirugía
 Instituto Panvascular de Occidente
 Médica Sur
 Regioal de ISSSTE
 Dr. Valentín Gómez Farías
 San José/Zambrano Helion

Moldova, 1 611 patients

Institute of Emergency Medicine
 Institute of Neurology and Neurosurgery

Montenegro, 24 patients

Clinical Center of Montenegro

Morocco, 1 226 patients

Hassan II University Hospital
 Ibn Rochd University Hospital

Netherlands, 217 patients

Atrium Medical Center
 Groningen University Medical Centre
 Sint Anna
 University Hospital Maastricht

New Zealand, 175 patients

Christchurch Hospital
 Palmerston North Hospital
 Wellington Regional Hospital

Nicaragua, 25 patients

Hospital Metropolitano

Nigeria, 47 patients

Lagos State University Teaching Hospital
 Lagos State University Teaching Hospital

Country and Hospital

North Macedonia, 326 patients

Clinical Hospital Tetovo

University Clinic of
Neurology

Norway, 2 152 patients

Aker University Hospital

Akershus University Hospital

Buskerud Hospital

Flekkefjord Sykehus

Forde Sentralsjukehus

Haraldsplass Diakonale sykehus

Haugesund Sjukehus

Haukeland University Hospital

Helgelandssykehuset

Mo i Rana

Helgelandssykehuset Mosjøen

Hospital of Asker and Bærum

Laerdal sjukehus Helse Forde HF

Molde Hospital

Nordlandssykehuset

Rikshospitalet, Oslo

University Hospital

Ringerike Sykehus

Sandnessjøen Hospital

Sentralsjukehuset i

Rogaland

St. Olavs Hospital

Medicine

Stord Sjukehus

Sykehuset i Vestfold

Sykehuset Innlandet HF Kongsvinger

Sykehuset Innlandet Lillehammer

Sykehuset Namsos

Sykehuset Østfold

Sørlandet Sykehus Arendal

Sørlandet Sykehus

Kristiansand

Telemark Hospital Skien

Trondheim University Hospital

Ullevål University Hospital Neurology

University Hospital North Norway

Oman, 5 patients

Royal Hospital Muscat

Country and Hospital

Pakistan, 414 patients

District Headquarter Hospital
Rawalpindi

Fauji Foundation Hospital

Pakistan Institute of
Medical Sciences

POF Hospital

Shifa International
Hospital

Panama, 382 patients

Centro Medico Paitilla

Complejo Hospitalario Metropolitano
Dr. Arnulfo Arias/Caja de Seguro Social
Hospital Dr Luis Chicho Fabrega

Hospital Dr. Gustavo

Nelson Collado

Hospital Nacional

Pacifica Salud - Hospital Punta Pacifica

San Fernando

Paraguay, 182 patients

Hospital Central de Policia

Rigoberto Caballero

Hospital Central del Instituto
de Prevision Social

Hospital de Clinicas,
Facultad de Ciencias Medicas
Universidad Nacional de Asuncion

Peru, 2 291 patients

Hospital Alberto Sabogal Sologuren

Hospital Belen de Trujillo

Hospital II Angamos

Essalud

Hospital Jorge Reategui Delgado

Hospital Nacional Almanzor Aguinaga
Asenjo

Hospital Nacional Arzobispo Loayza

Hospital Nacional Carlos Alberto
Seguin Escobedo

Hospital Nacional Edgardo Rebagliati
Martins

Instituto Nacional de Ciencias

Neurológicas

Maria Auxiliadora

Philippines, 157 patients

Community General Hospital
of San Pablo City, Inc.

Davao Regional Medical Center

Las Pinas Doctors Hospital

Mt. Carmel Diocesan General Hospital

Perpetual Succour Hospital

Country and Hospital**Poland, 9 909 patients**

107th Military Hospital with Polyclinic

Bzierski's hospital

Central University Hospital

Clinical Hospital Nr 4 Lublinie

Copernicus Hospital

CSK, MSWiA

Hospital in Radzyń Podlaski

Hospital of Florian

Ceynowy in Wejherowo

Institute of Psychiatry
and NeurologyInstitute of Psychiatry
and Neurology

Koscierzyna Hospital

Marciniak Memorial Hospital

Mazowiecki Szpital Wojewódzki

Medical University of Gdańsk

Medical University of Warsaw

Military Medical Institute

Pomorskie Centrum Traumatologii

im.M.Kopernika

Poviat Hospital

Poznan - Province Hospital

Radomska Szpital Powiatowy

Samodzielny Publiczny

Szpital Wojewódzki im. Papieża

Jana Pawła II

Specialist Hospital

Specialist Hospital in Jaslo

Specialized Hospital

SPSK im. Orlowskiego

SPZOZ Działdowo

SPZOZ Lubartów

SPZZOZ Sandomierz

St. Adalbert Hospital, Copernicus

St. Queen Jadwiga

Clinical District Hospital No. 2

in Rzeszów

Szpital Kolejowy SP ZOZ

Szpital Kolejowy w Pruszkowie Sp. z o.o.

Szpital Krośno

Szpital Powiatowy

Skarżysko-Kamienna

Szpital Powiatowy w Kraśniku

Szpital Powiatowy w Sedziszowie

Malopolskim

Szpital Powiatowy Zespół Opieki

Zdrowotnej w Przeworsku

Country and Hospital

Szpital Specjalistyczny im. H. Klimontowicza w Gorlicach

Szpital Specjalistyczny w Końskich

Szpital Wolski

Szpital Zachodni im. Św Jana Pawła II

Univeristy Hospital No 1

Bydgoszcz A. Juraska

Uniwersytecki Szpital Kliniczny

Uppersilesian Medical Centre

Wojewódzki Specjalistyczny Zespoł

Opieki

Wojewódzki Specjalistyczny Zespół

Neuropsychiatryczny

Wojewódzki Szpital Specjalistyczny

Lublin

Wojewódzki Szpital Specjalistyczny

Olsztyn

Wojewódzki Szpital Specjalistyczny

Siedlce

Wojewódzki Szpital Zespolony w

Koninie

Portugal, 6 729 patients

Centro Hospitalar de

Gaia

Centro Hospitalar de Setúbal

Centro Hospitalar de Tras-os-montes
e Alto Douro

Centro Hospitalar Lisboa Ocidental

Dr. Nélia Mendonça Funchal

Hospitais da Universidade de Coimbra

Hospital de Braga

Hospital de Egas Moniz

Hospital de Faro

Hospital de São Sebastião

Hospital Garcia de Orta

Hospital Geral do Centro Hospitalar
e Universitário de CoimbraHospital Pedro Hispano, Unidade Local
de Saúde de Matosinhos

Hospital S Bernardo

Hospital Santo Antônio

Hospital São João

Hospital São José - CHLC

HPP Hospital de Cascais -

Dr. José de Almeida

Santa Maria

Quatar, 13 791 patients

Hamad General Hospital

Country and Hospital

Romania, 60 patients

Clinical Emergency
County Hospital Oradea
County Emergency Hospital Timisoara
Emergency County Hospital
Emergency Hospital Dr. N. Obiu Lasi
Mures County Clinical Emergency Hospital

Russian Federation, 4 812 patients

Alexandrovskaya hospital
Buzur "1 RCB MZ UR"
BUZOO "OKB"
Citi Clinical Hospital #20 named after A.K. Ermishancev
City Clinical Hospital No 67 named L.A.Vorobova Moscow Health Department
City Clinical Hospital No.20 DM
I.V.Davidovsky Moscow City Hospital
ICDC
Krasnodar City Clinical Emergency Hospital
Krasnoyarsk Regional Hospital
Mariinsky Hospital
Medical Military Academy
MMBU GKBNo 1 Pirogov
Murmansk Regional Clinical Hospital P.A.Bajadin
Naberezhnye Chelny BSMP Tatarstan
National Pirogov Centre
Nikolaevskaya Hospital
Novokuznetsk Municipal Clinical Hospital #1
Novosibirsk City Clinical Hospital No1
NRCEM ERERCOM
Orenburg City Clinical Hospital
Regional Clinical Hospital 2 Tyumen
Research Center of Neurology of Russian Academy of Medical Sciences
Rostov District Clinical Hospital
Russian State Medical University
SPb GBUZ Gorodskaya bolnitsa No 26
St-Petersburg Elizavetinskaya Hospital
St. Joasaph Belgorod Regional Clinical Hospital
State Healthcare Institution of Kaluga Region «City Clinical Hospital #2» "Sosnovaya roscha"
Sverdlovsk Clinical Regional Hospital #1
Vladivostok Hospital №1

Country and Hospital

Saudi Arabia, 843 patients

King Abdulaziz hospital
King Abdulaziz University
King Fahad hospital of the University
King Fahad Medical City
King Fahad Specialist Hospital
Qatif Central Hospital

Serbia, 378 patients

Clinical Centre of Vojvodina
Neurology Clinic, Clinical Center of Serbia

Singapore, 325 patients

National Neuroscience Institute- TTSH campus
National University Hospital
Singapore General Hospital

Slovakia, 7 172 patients

CINRE
Faculty Hospital F.D. Roosevelt, Banska Bystrica
Faculty Hospital J.A.Reimana
Faculty Hospital Nitra
Faculty Hospital Trnava
Fakultna Nemocnica Trencin
FNsP Nove Zamky
FNsP Skalica a.s.
Forlife n.o.
Hospital and Polyclinics Spisska Nova Ves a.s.
Hospital Svidnik
Liptovská Nemocnica s Poliklinikou MUDr.Ivana Stodolu
Lubovnianska Nemocnica n.o.
National Institute of Cardiovascular Diseases
Nemocnica Košice- Šaca a.s.
Nemocnica A. Lena, Humenné
Nemocnica Poprad a.s.
Nemocnica s Poliklinikou Dunajská Streda
Nemocnica s Poliklinikou Povazska Bystrica
Nemocnica s Poliklinikou Svateho Lukasa Galanta
NsP Brezno n.o.
NsP Stefana Kukuru v Michalovciach n.o

Country and Hospital

NsP Sv. Jakuba, Bardejov
 NsP sv. Barbory Rožňava
 Svet Zdravia, a.s. -
 Všeobecná Nemocnica Rimavská Sobota
 University Hospital in Martin
 University Hospital of Bratislava
 University Hospital of L. Pasteur
 UVN SNP Ružomberok
 VNsP Levoča
 Vranovská Nemocnica, n.o.

Slovenia, 1 752 patients

General Hospital Celje
 General Hospital Novo mesto Murska Sobota General Hospital
 SB Jesenice
 SB Nova Gorica
 Splošna Bolnišnica Novo Mesto
 University Clinic
 University Medical Center Ljubljana

South Korea, 665 patients

Ajou University Hospital
 Asan Medical Center
 Bundang Seoul National Uni Hospital
 Cheju National University Hospital
 Chonbuk National University Hospital
 Chonnam National University Hospital
 Chungnam National University Hospital
 Dong-A University Hospital
 Dongguk Uni International Hospital
 Dongsan Medical Center Keimyung Uni
 Eulji General Hospital
 Eulji University Hospital
 Gil Medical Center Gachon University
 Hallym University Sacred Heart Hospital
 Ilsan Paik Hospital
 Inha University Hospital
 Kangbuk Samsung Hospital
 Konkuk University Hospital
 Nat Health Insurance Corp Ilsan Hospital
 Paik Hospital Pusan
 Samsung Medical Center
 Seoul National Uni Boramae Hospital
 Seoul National University Hospital
 Soonchunhyang University Hospital
 Ulsan University Hospital
 Wonju Christian Hospital

Country and Hospital

Yeungnam University Medical Center
 Yonsei University College of Medicine

Spain, 5 120 patients

Basurto
 Clinica Universitaria de Navarra
 Hospital General de Castellón
 Hospital Clínico Universitario
 Hospital Clínico Universitario Dr Lozano Blesa
 Hospital de Bellvitge
 Hospital de Cruces
 Hospital de Donostia
 Hospital de la Santa Cruz y San Pablo
 Hospital de Leon
 Hospital de Navarra
 Hospital de Torrecárdenas
 Hospital del Mar
 Hospital Galdakano
 Hospital General de Albacete
 Hospital General Doctor Negrín
 Hospital General La Mancha Centro
 Hospital General
 Universitario de Alicante
 Hospital General
 Universitario-Valencia
 Hospital General Yagüe
 Hospital Gregorio Marañón
 Hospital Insular de Gran Canaria
 Hospital Meixoeiro (Vigo)
 Hospital Miguel Servet
 Hospital Nuestra Señora del Rosario
 Hospital Parc Taulí
 Hospital Ramón y Cajal
 Hospital Sagrat Cor
 Hospital San Carlos
 Hospital Son Dureta
 Hospital Txagorritxu
 Hospital Univ Central de Asturias
 Hospital Universitari Germans Trias i Pujol
 Hospital Universitari Girona
 Hospital Universitario de Canarias
 Hospital Universitario de la Princesa
 Hospital Universitario
 Hospital Universitario
 Hospital Universitario Principe de Astur
 Hospital Universitario Vall d'Hebron
 Hospital Universitario Virgen del Rocío
 Hospital Universitario Virgen del Macarena

Country and Hospital

Hospital Valme
Hospital Virgen de la Salud
Nuestra Señora de la Candelaria
University Hospital Doce de Octubre
Virgen de las Nieves

Sri Lanka, 2 235 patients

Colombo North Teaching Hospital,
Ragama
Sri Jayewardenepura General
Hospital

Sudan, 0 patients

Sweden, 15 493 patients

Alingsås lasarett
Arvika Sjukhus
Blekingesjukhuset
Capio St Görans sjukhus
Centrallasarettet Västerås
Danderyd Hospital
Falu lasarett
Gällivare sjukhus
Gävle-Sandvikenssjukhus
Helsingborgs Lasarett
Karlskoga Hospital
Karlstad Centralsjukhuset
Karolinska University Hospital-Solna
Karolinska University Sjukhuset-Huddinge
Kiruna sjukhus
Kristianstad Central-sjukhuset
Kullbergska sjukhuset
Kungälvs sjukhus
Kärnsjukhuset Skövde
Köping Hospital
Lasarettet i Enköping
Lasarettet i Motala
Lasarettet i Ystad
Lidköping Hospital
Lindesbergs lasarett
Lund - Skånes Universitetssjukhus
Lycksele
Länssjukhuset Halmstad
Länssjukhuset Kalmar
Malmö - Skånes Universitetssjukhus
Malmö Allmänna Sjukhus
Mora Lasarett
Mälarsjukhuset Eskilstuna
Norrköping lasarett
Norrlands universitetssjukhus

Country and Hospital

Norrtälje sjukhus
Nyköpings lasarett
Oskarshamns Sjukhus
Piteå Älvtdals sjukhus
Ryhovs Länssjukhus
Sahlgrenska Universitetssjukhus
Sjukhuset i Hässleholm
Skellefteå Lasarett
Skene Hospital
Söllefteå sjukhus
Södersjukhuset
Södertälje sjukhus
Södra Älvborgs Sjukhus
Torsby sjukhus
Trelleborgs sjukhus
Uddevalla sjukhus
Universitetssjukhuset Linköping
Uppsala Akademiska sjukhus
Varbergs sjukhus
Visby Lasarett
Västerviks sjukhus
Ängelholms Sjukhus
Örebro sjukhus

Switzerland, 57 patients

GHOL

Thailand, 915 patients

King Chulalongkorn
Memorial Hospital
Phyathai 1 Hospital

Tunisia, 3 192 patients

Institut National Mongi ben Hamida de
Neurologie
Polyclinique Taoufik

Türkiye, 4 631 patients

VM Medicalpark Pendik Hospital
Antalya Education and
Research Hospital
Avrupa Hastanesi
Neurology Department

Bezmialem Vakif
University Medicine
Faculty Hospital
Dokuz Eylül Medical Faculty
Erciyes University Medical Faculty
Hosp
Eskişehir Osmangazi
Üniversity Medical Faculty
Fethiye Dilek Orken

Country and Hospital

Florence Nightingale
 Gop Medical Park Hospital
 Hacettepe University Hospital
 Inonu University, Turgut Ozal Medical Center
 Istanbul Aydin University Florya Medicapark Hospital
 Istanbul Medical Faculty Hospital
 Istanbul University Cerrahpasa School of Medicine
 Istinye University Liv Hospital
 Memorial Hizmet hospital
 Trakya University Faculty of Medicine
 University of Health Sciences, Bursa Yuksek Ihtisas Training and Research Hospital, Bursa, Türkiye
 Yeditepe University Hospital
 Özel Ege Saglik Hastanesi

Ukraine 177 patients

Feofania
 Ivano-Frankivsk Regional Clinical Hospital
 Kyiv Region Clinical Hospital
 Municipal City Clinical Hospital of the Emergency Medical Care
 Odessa City Hospital
 Vinnitsa regional Psychoneurological hospital name academician of O.I. Yshenko

United Arab Emirates, 1 969 patients

Mafraq Hospital
 Mediclinic City Hospital
 Rashid Hospital
 Sheikh Shakbout Medical City
 Shiekh Khalifa Medical City

United Kingdom, 29 873 patients

Aberdeen Royal Infirmary
 Addenbrookes Hospital
 Aintree University Hospital
 Airedale General Hospital
 Altnagelvin Area Hospital
 Antrim Area Hospital
 Arrowe Park Hospital
 Ashford and St Peters NHS Trust
 Ayr Hospital

Country and Hospital

Bedford Hospital
 Barnsley Hospital NHS Foundation Trust
 Basildon Hospital
 Bedford Hospital
 Belfast HSC Trust
 Birmingham Heartlands Hospital
 Blackpool Victoria Hospital
 Bradford Royal Infirmary
 Bristol Royal Infirmary
 Bronglais
 Broomfield Hospital
 Buckinghamshire Hospitals NHS Trust
 Calderdale and Huddersfield NHS Foundation Trust
 Causeway Hospital
 Charing Cross Hospital
 City Hospital Campus NUH NHS Trust
 City Hospital, Birmingham
 Colchester Hospital University NHS Foundation Trust
 Conquest Hospital
 Countess of Chester
 Coventry & Warwickshire University Hosp
 Craigavon Area Hospital
 Cumberland Infirmary
 Daisy Hill Hospital
 Darent Valley Hospital
 Diana Princess of Wales Hospital
 Doncaster Royal Infirmary
 Dorset County Hospital
 East and North Hertfordshire NHS Trust Lister
 East Surrey Hospital
 Edinburgh Western General
 Epsom General Hospital
 Erne Hospital/SWAH
 Fairfield General Hospital
 Forth Valley Royal Hospital
 Glangwili General Hospital
 Glasgow Royal Infirmary
 Gloucestershire Royal Hospital
 Harrogate District Hospital
 Hope Hospital, Manchester
 Hull Royal Infirmary
 Imperial College Healthcare NHS Trust
 Ipswich Hospital NHS Trust
 James Cook University Hospital
 James Paget University Hospital
 John Radcliffe Hospital
 Kent and Canterbury Hospital
 King s College Hospital NHS Trust
 Leeds General Infirmary

Country and Hospital	Country and Hospital
Lincoln County Hospital	Royal Preston Hospital
Luton & Dunstable NHSFT Hospital	Royal Surrey County Hospital
Macclesfield District General hospital	Royal Sussex County Hospital
Manchester Royal Infirmary	Royal United Hospital Bath
Mater Hospital	Russells Hall Hospital
Mayday University Hospital	Salford Royal Foundation Trust
Medical Specialist Group	Salisbury District Hospital
Medway Maritime Hospital	Sandwell and West
Mid Yorkshire Hospitals NHS Trust	Birmingham NHS Trust
Morriston	Scarborough General Hospital
Musgrove Park Hospital	Scunthorpe General Hospital
National Hospital for Neurology	Shrewsbury and Telford Hospital Trust
Nevill Hall Hospital	South Glasgow University Hospital – QEUH
Newcastle upon Tyne Hospitals NHS Foundation Trust	South Tyneside NHS Foundation Trust
Ninewells Hospital Dundee	Southampton General Hospital
Nobles Hospital	Southend Hospital
Norfolk and Norwich University Hospital	Southern General Hospital
North Cheshire Hospitals Trust	Southmead Hospital
North Hampshire Hospital	Southport and Ormskirk NHS Trust
North Tyneside General Hospital	St Helens and Knowsley Teaching Hospital
Northampton General Hospital	St John's Hospital
Northwick Park Hospital	St Thomas Hospital
Peterborough City Hospital	St. George's Hospital
Pilgrim Hospital	St. Richard's Hospital
Poole Hospital	Stockport NHS Foundation Trust
Prince Philip Hospital	Sunderland Royal Hospital
Princess of Wales hospital	The Great Western Hospital NHS Foundation Trust
Princess Royal Hopital	The Maidstone Hospital
Princess Royal Hospital Haywards Heath	The Princess Alexandra Hospital
QEQM Hospital	The Queen Elizabeth Hospital Kings Lynn NHS TRUST
Queen Alexandra Hospital	The Royal Wolverhampton Hospital Trust
Queen Elizabeth Hospital Birmingham	Torbay
Queen Elizabeth Hospital - Gateshead	Tunbridge Wells Hospital in Pembury
Queen s Medical Centre	Ulster Hospital Belfast
Queens Hospital Burton Foundation NHS Trust	University Hospital Coventry
Rotherham General Hospital	University Hospital North Staffordshire
Royal Blackburn Hospital	University Hospital of North Durham
Royal Bournemouth and Christchurch Hospital	University Hospital of Wales
Royal Cornwall Hospital	University Hospital Southampton
Royal Derby Hospital	University Hospitals
Royal Devon & Exeter Hospital	Leicester NHS Trust
Royal Free Hampstead NHS Trust	University Hospitals of North Tees & Hartlepool
Royal Glamorgan Hospital	University Hospitals
Royal Gwent Hospital	Plymouth NHS Trust
Royal Hallamshire Hospital	Victoria Hospital Kirkcaldy
Royal Hampshire County Hospital	Walsall Manor Hospital
Royal Liverpool & Broadgreen University Hospital (NHS) Trust	Walton Centre NHS Foundation Trust
Royal London Hospital	Warrington and Halton Hospitals

Country and Hospital

Warrington and Halton Hospitals
 Watford General Hospital
 West Cumberland Hospital
 Western Infirmary
 William Harvey Hospital
 Wishaw General Hospital
 Worcestershire Acute Hospital
 Worthing
 Wrexham Maelor Hospital
 Yeovil District Hospital
 York Hospital

Uruguay, 270 patients

Hospital de Clínicas
 Medica Uuguaya

Venezuela, 2 060 patients

Clinica La Piramide
 Hospital Univ de Maracaibo
 Hospital Universitario de Caracas
 Instituto Autonomo Hospital
 Universitario de Los Andes

Country and Hospital

Vietnam, 503 patients
 108 Military Central Hospital Stroke
 Unit
 Bach Mai Emergency

 Bach Mai Neurology
 Benh vien da khoa huru nighi Viet Tiep
 Benh vien Thong Nhat
 Benh vien Trung Uong Hue
 Cho Ray Hospital
 General Friendship
 Hospital of Nghe An
 HCMC Univesity Medical Center
 Millitary Hospital 103
 National Hospital of Geriatry
 Nhan Dan Gia Dinh
 Thai Nguyen general hospital
 Thanh Nhan
 Thanhhoa General Hospital
 The People ' 115 hospital
 Trung Vuong