

ESO Emerging Stroke Leader Programme 2024-2026

Final Report

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FINAL REPORT OVERVIEW

It is a great honour to present my final report as a participant in the ESO Emerging Stroke Leader Programme. This experience has been both professionally transformative and personally rewarding, offering a unique platform for advanced education, active engagement within the European Stroke Organisation, and meaningful contribution to the field of cerebrovascular diseases.

The programme is structured around three main pillars. First, to receive high-quality stroke education through participation in major ESO activities and targeted training opportunities. Second, to return this knowledge to the broader community through involvement in educational initiatives, scientific activities, and collaborative work. Third, to design and complete a project with the aim of enhancing stroke care in clinical practice.

The following sections outline my activities and achievements across these three pillars.

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1. ATTENDANCE TO ESO EVENTS

Through the ESO Emerging Leader Programme, I had the opportunity to attend major European Stroke Organisation events, including the European Stroke Organisation Conference (ESOC) 2024 in Basel and ESOC 2025 in Helsinki, with a third ESOC participation anticipated in the coming months. The financial support provided through the programme was particularly important, as my institution does not offer reimbursement for international conference attendance, thereby enabling my consistent engagement with the ESO scientific community.

Participation in ESOC meetings provided invaluable exposure to cutting-edge clinical research, including late-breaking results from large randomized controlled trials and evolving evidence across the spectrum of acute stroke care. Beyond the scientific content, these meetings offered a unique opportunity to interact with internationally renowned experts, facilitating meaningful discussions and fostering collaborations that have directly influenced my research trajectory and professional development. Importantly, these experiences enhanced my understanding of how high-impact research is presented, critically appraised, and translated into clinical practice and guidelines.

In addition to ESOC, I participated in the ESO Summer School in Vilnius, an intensive and highly interactive educational experience that combined state-of-the-art lectures with case-based discussions and close interaction with leading stroke specialists. This experience was particularly impactful in strengthening both my clinical reasoning and my ability to approach complex cerebrovascular cases in a structured and evidence-based manner. Furthermore, the collaborative environment promoted strong networking among participants from different countries, fostering long-term professional connections. My experience was summarized in a dedicated post on the ESO website, reflecting both the scientific and personal value of this initiative (<https://eso-stroke.org/my-experience-at-the-eso-summer-school/>).

I also attended the ESO Focused Workshop on Cerebral Amyloid Angiopathy (CAA) in Milan, a highly specialised and intellectually stimulating event that addressed a complex and evolving field within cerebrovascular diseases. The workshop brought together a select group of participants and international experts, covering a comprehensive range of topics from fundamental pathophysiological mechanisms to advanced diagnostic approaches and emerging therapeutic strategies. Interactive sessions allowed for in-depth discussions on clinical and neuroimaging aspects, evolving diagnostic criteria, biomarker development, and challenging management scenarios, including iatrogenic CAA and both acute and chronic treatment approaches. The focused nature of the workshop, combined with the high

level of interaction, provided a unique opportunity to deepen my expertise in this field and to engage in meaningful scientific exchange within a highly collaborative environment.

Finally, I participated in the ESO Stroke Research Workshop, which was, in my view, one of the most transformative components of the programme. This workshop provided essential, hands-on insight into the design and conduct of clinical research, including hypothesis generation, study design, methodological considerations, and critical appraisal of evidence. It offered a structured framework for developing a research project from concept to implementation, while also emphasizing teamwork and interdisciplinary collaboration. The experience significantly enhanced my ability to design and refine research questions and has had a direct impact on my ongoing and future projects. I strongly believe that this workshop should be considered a core component of the programme, ideally early in the Emerging Leader pathway, given its substantial educational and practical value. My experience was also highlighted in an ESO blog post, further reflecting its importance (<https://eso-stroke.org/highlights-from-the-12th-eso-edinburgh-stroke-research-workshop-esrw/>).

Overall, attendance at ESO events through the Emerging Leader Programme has been instrumental in advancing both my clinical and academic development. These experiences not only strengthened my scientific knowledge and critical thinking but also facilitated integration into the international stroke research community, fostering collaborations and shaping my future role within ESO.

2. RETURNING THE LEARNING

ESO Educational Contributions

Within the ESO framework, I have been actively engaged in both the scientific and educational pillars of the organisation, contributing to ESOC through abstract evaluation, session leadership, and invited lectures.

I served as a member of the ESOC Scientific Abstract Committee for ESOC 2024, 2025, and 2026, participating in the peer-review and selection process of submitted abstracts, while also contributing as an abstract reviewer across all three meetings. These roles required critical appraisal of a large volume of submissions and contributed to maintaining the high scientific standards of ESOC.

During ESOC 2024, I further served as Chairperson in an intracerebral haemorrhage session, facilitating high-level scientific discussion in a complex and evolving field, and as a poster moderator, supporting early-career researchers and promoting interactive exchange of ideas.

In parallel, I delivered invited lectures at ESOC, addressing key areas of cerebrovascular disease with direct clinical relevance. At ESOC 2024, within the session “Treatment of Atherosclerotic Stroke: Current Status and Future Perspectives”, I presented on “Symptomatic carotid stenosis: evidence from clinical trials”. In this lecture, I critically synthesised evidence from landmark trials and contemporary studies, highlighting the evolving balance between optimized medical therapy and revascularization strategies. Particular emphasis was placed on intensive risk factor management, modern antithrombotic approaches, lipid-lowering therapies, and emerging pharmacological agents, as well as on the comparative effectiveness and limitations of carotid endarterectomy and stenting in the current era. The presentation underscored the increasing importance of individualized, patient-centered decision-making based on clinical and imaging characteristics.

At ESOC 2025, I delivered an invited lecture in the session “From heart to brain and back again”, entitled “Leaving no stone unturned: incidentally discovered cerebrovascular disease: status of long-term ECG monitoring”. This presentation addressed the clinical relevance of covert cerebrovascular disease and the role of prolonged cardiac rhythm monitoring in detecting atrial fibrillation. Drawing on recent randomized trials and meta-analyses, I highlighted that prolonged monitoring substantially increases atrial fibrillation detection, while also discussing the balance between stroke prevention and bleeding risk. Importantly, I emphasized that incidentally discovered cerebrovascular lesions are not

benign findings, but rather markers of increased vascular and cognitive risk, advocating for a more personalized and risk-stratified diagnostic approach.

My continued engagement with ESOC is further reflected in my upcoming invited lecture at ESOC 2026, within the scientific session on the management of recurrent stroke in patients with atrial fibrillation on oral anticoagulation. My presentation, “Investigating alternative etiologies underlying breakthrough stroke”, will focus on the diagnostic and therapeutic challenges in patients who experience stroke despite appropriate anticoagulation, addressing competing mechanisms, comorbidities, and emerging strategies for individualized secondary prevention. This invitation reflects my ongoing involvement in shaping discussions on complex and high-priority clinical topics within the ESO community.

In addition to scientific sessions, I have been actively involved in innovative educational formats within ESOC. As part of the ESO Simulation Education Committee, I served as faculty and chair in hands-on simulation workshops, focusing on the management of acutely deteriorating stroke patients. These workshops integrate principles of Crew Resource Management, emphasizing decision-making, communication, and the development of a shared mental model within multidisciplinary teams. Through interactive, scenario-based training with simulated patients and structured debriefing, participants engage in experiential learning that directly translates into improved clinical performance and team coordination in real-world acute stroke settings. My role included both the delivery and facilitation of these sessions, highlighting my active contribution to advanced educational methodologies within ESO.

Furthermore, I have contributed to the development of future simulation-based initiatives, including the “Train-the-Trainer” workshop by the ESO Simulation Education Committee, aimed at equipping clinicians with the skills to design and implement simulation programmes within their own institutions. This initiative represents an important step toward expanding structured stroke simulation training across Europe and strengthening local educational capacity.

My involvement in ESO educational activities also included invited lectures in ESO webinars. In the ESO-ESMINT joint webinar on ischaemic stroke with large core infarcts (2024), I presented the evolving evidence from recent randomized controlled trials evaluating endovascular treatment in this traditionally excluded population. The lecture provided a comprehensive overview of pivotal trials such as RESCUE-Japan LIMIT, ANGEL-ASPECT, SELECT2, and TENSION, highlighting their methodological differences and the consistent signal of benefit of endovascular therapy despite increased rates of radiological hemorrhage. In ESO Educational Webinar #25 (2025), focused on small-vessel disease, I delivered a case-based interactive lecture addressing the clinical challenges of managing

patients with silent cerebrovascular disease and cerebral microbleeds, emphasizing diagnostic uncertainty, heterogeneity in clinical practice, and the need for individualized management strategies.

Overall, these activities reflect continuous progression from participation to active contribution and leadership within ESO scientific and educational initiatives.

Contribution to ESO Guidelines and Evidence-Based Practice

A central component of my contribution to the European Stroke Organisation has been my active involvement in the development and dissemination of evidence-based guidelines. I participated in four ESO guidelines during the programme period (one completed and published, one completed and forthcoming, and two ongoing), which I consider a key way of contributing to the advancement of stroke care at an international level.

As a fellow member, I contributed to the ESO expedited recommendation on tenecteplase for acute ischaemic stroke, a rapidly developed guideline addressing one of the most practice-changing questions in acute stroke management. This work synthesised emerging randomized evidence comparing tenecteplase with alteplase and provided timely, evidence-based recommendations that have already influenced clinical practice worldwide, particularly in the context of reperfusion strategies and streamlined thrombolysis workflows.

I also participated as a fellow member in the 2025 update of the ESO guideline on blood pressure management in acute ischaemic stroke and intracerebral haemorrhage, which is to be presented at ESOC 2026. This comprehensive update addressed a highly complex and unresolved clinical question, incorporating new randomized controlled trial data and providing refined recommendations across multiple clinical scenarios. The guideline was developed following rigorous ESO methodology and GRADE principles, including systematic reviews, meta-analyses, and structured consensus processes. The updated recommendations emphasise the nuanced and context-specific management of blood pressure in both ischaemic stroke and intracerebral haemorrhage, while also highlighting the persistent gaps in high-quality evidence and the need for further randomized trials.

In parallel, I contributed to the ESO Annual Stroke Evidence Update 2025, a comprehensive synthesis of the most important recent advances in stroke research. This initiative provides clinicians with an up-to-date overview of emerging evidence across the full spectrum of stroke care, supporting rapid translation of research findings into clinical practice.

Furthermore, I am currently involved in two ongoing ESO guideline projects. As a fellow member, I am contributing to the update on reperfusion therapies for acute ischaemic stroke, focusing on evolving evidence in intravenous thrombolysis, endovascular treatment,

and adjunctive strategies. In addition, as a voting member, I participate in the development of recommendations for pre-hospital stroke management, contributing to consensus decisions on key organisational and therapeutic aspects of early stroke care.

Beyond authorship roles, I also served as a reviewer for the ESO guideline on aneurysmal subarachnoid haemorrhage, which will be presented at ESOC 2026, further contributing to the quality assurance and methodological rigor of ESO guideline production.

Importantly, my involvement in the ESO Guideline Board extended beyond guideline development to education and dissemination. I have participated in five ESO Guideline Webinars, collectively training more than 200 participants. These webinars focused on methodological aspects of guideline development, interpretation of evidence, and practical implementation of recommendations, contributing to capacity building and fostering a deeper understanding of evidence-based medicine within the stroke community.

Overall, my engagement in ESO guideline activities reflects a strong commitment to evidence-based practice, methodological rigor, and the translation of research into clinical recommendations. Through active participation in guideline development, peer review, and educational initiatives, I have contributed to shaping contemporary stroke care and supporting the implementation of high-quality evidence across diverse clinical settings.

International and Regional Dissemination of Knowledge

Beyond my involvement in core ESO activities, I have been actively engaged in the dissemination of contemporary stroke knowledge across international, regional, and collaborative platforms, contributing to education, scientific exchange, and the implementation of evidence-based practice.

At the global level, I was invited to deliver a lecture at the World Stroke Conference 2025 in Barcelona, where I contributed to a high-level scientific debate on the role of cerebral embolic protection devices in stroke prevention. In this presentation, I critically evaluated the available evidence from early-phase studies and ongoing trials, highlighting important limitations related to incomplete vascular protection, device-related complications, and lack of robust clinical efficacy data. I further contextualized these findings within broader stroke prevention strategies, emphasizing that current evidence does not support the routine use of such devices over established therapies such as anticoagulation. This contribution reflects my engagement not only in evidence synthesis but also in critical appraisal and scientific debate on emerging and controversial topics.

At the European level, I delivered multiple invited lectures in Germany (Herne 2024 and 2025), focusing on the interpretation and clinical implications of recent randomized

controlled trials presented at ESOC and the World Stroke Congress. These presentations addressed key developments in acute stroke management, including thrombolysis strategies, endovascular treatment, and adjunctive therapies, while also highlighting the importance of individualized, evidence-based decision-making in clinical practice.

In parallel, I contributed to collaborative research and educational initiatives such as PRESTO (PRE-Hospital Stroke Treatment Organization), where I delivered lectures on blood pressure management in stroke, with particular emphasis on blood pressure variability as a clinically relevant and often under-recognized determinant of outcomes. This work highlighted the need to move beyond static treatment thresholds towards more dynamic and individualized management approaches.

A particularly meaningful aspect of my international engagement has been my collaboration with fellow ESO Emerging Leaders, Dr. Rytis Masiliūnas and Dr. Marieta Peycheva, with whom I contributed to several joint educational activities across Europe. Within this framework, I delivered invited lectures at the Lithuanian Stroke Association Conference and at the Bulgarian Association of Neurosonology and Cerebral Hemodynamics Congress. These collaborative efforts represent an important example of peer-to-peer knowledge dissemination within the ESO Emerging Leaders network, fostering cross-country exchange of expertise and strengthening the integration of young stroke specialists across Europe. At the Lithuanian conference (<https://insultoasociacija.lt/lietuvos-insulto-asociacijos-konferencija-2025-m/>), I presented on cerebral venous thrombosis, addressing contemporary diagnostic strategies, etiological work-up, and evolving therapeutic approaches in this complex and often under-recognized stroke subtype. In Bulgaria (<https://www.neurosonology-bg.com/en/>), my lecture focused on microembolic signal detection using transcranial Doppler, emphasizing its pathophysiological relevance, prognostic implications, and potential role in guiding secondary prevention strategies. These contributions were part of a coordinated effort to disseminate up-to-date stroke knowledge across different European healthcare systems.

Importantly, I also participated in European Stroke Organisation (ESO) Outreach activities, aimed at enhancing stroke education and supporting the development of stroke care in regions with evolving healthcare infrastructures. As part of the ESO Outreach meeting in Romania, I delivered an invited lecture on secondary stroke prevention, emphasizing the critical importance of a comprehensive, multifactorial approach targeting modifiable vascular risk factors, optimization of antithrombotic therapy, and improved adherence to evidence-based interventions. I highlighted that recurrent strokes may account for up to 40% of cases over time, underlining the urgent need for improved preventive strategies.

Beyond lecturing activities, I have also contributed to the organisation of major educational initiatives. In 2025, I served as a member of the Local Organising Committee of the ESO Stroke Summer School in Athens, an intensive programme that brought together 40 young physicians and approximately 70 international faculty members, combining high-level lectures, interactive case discussions, and hands-on workshops (https://eso-stroke.org/wp-content/uploads/ESO-Summer-School_Event-report_Athens-2025.pdf). This experience provided valuable insight into the design and delivery of large-scale educational programmes and reinforced my commitment to training the next generation of stroke specialists.

Building on this experience, I am currently serving on the Local Organising Committee of the upcoming World Organization of Neurosonology Conference in Athens (<https://conference.won-neurosonology.org/>), further strengthening my involvement in international scientific organisation and collaboration.

Overall, these activities reflect a sustained and multifaceted contribution to international stroke education and scientific exchange. Through invited lectures, collaborative initiatives with fellow Emerging Leaders, ESO Outreach activities, and involvement in the organisation of major educational events, I have actively contributed to the dissemination and implementation of high-quality evidence, in alignment with the mission of the European Stroke Organisation to improve stroke care across diverse healthcare settings.

National Educational Activities

Beyond international engagement, I remained highly active in national educational initiatives, contributing to the dissemination and implementation of contemporary stroke knowledge within the Greek medical community. During the programme period, I delivered invited lectures and chaired sessions in more than ten national scientific meetings, reflecting a continuous commitment to medical education and knowledge translation into clinical practice.

In 2024, I contributed to the 4th Athens Heart and Brain Symposium with lectures focusing on thrombolysis, including updates on current evidence and patient selection strategies, addressing the evolving question of “thrombolysis for whom” in the modern era of reperfusion therapies. During the Hellenic Neurological Society Conference, I delivered lectures on reperfusion therapies and secondary prevention in patients with acute ischemic stroke and diabetes, as well as on national stroke registries, highlighting the importance of structured data collection and quality improvement in stroke care. At the Conference of the Hellenic Society of Cerebrovascular Disorders, I presented on the selection of thrombolytic agents, critically discussing the role of alteplase and tenecteplase in acute stroke

management, alongside a comprehensive overview of major clinical trials presented at international conferences. These presentations aimed to bridge emerging evidence with real-world clinical decision-making and to support the adoption of updated therapeutic strategies.

In 2025, I continued this activity with invited lectures at major national meetings. At the Hellenic Neurological Society Conference, I addressed key aspects of secondary stroke prevention, emphasizing a multifactorial and individualized approach. At the Conference of the Hellenic Society of Cerebrovascular Disorders, I delivered lectures on recent clinical trial data presented at ESC and the World Stroke Congress, as well as on symptomatic intracranial hemorrhage, focusing on risk stratification and management challenges. Furthermore, I contributed to interdisciplinary education at the Panhellenic Conference of Heart Failure, where I presented on the complex interaction between cerebrovascular disease and cardiac dysfunction, highlighting shared pathophysiological mechanisms and implications for patient management. In addition, I participated in the 9th Conference of Education and Research, delivering lectures on “Tenecteplase versus alteplase in acute ischemic stroke” and on practical aspects of intravenous thrombolysis, including “tips and tricks” for optimizing treatment delivery. These sessions focused on translating evidence into practical guidance for clinicians involved in acute stroke care.

Beyond conferences, I also contributed to postgraduate medical education through invited lectures in multiple MSc programmes of the National and Kapodistrian University of Athens and the Aristotle University of Thessaloniki, including “Arterial Hypertension and Associated Cardiovascular-Renal Diseases”, “Cardiovascular Disease (AUTH)”, “Nanomedicine”, “Diabetes Mellitus and Stroke”, and “High-risk Pregnancy”. These lectures addressed various aspects of stroke pathophysiology, acute management, and prevention, adapting the content to multidisciplinary audiences and reinforcing the integration of stroke medicine across different specialties.

Importantly, my educational engagement extended beyond the medical community to the general public. I actively participated in public awareness initiatives through television programmes focusing on stroke recognition, emergency response, and prevention. These activities aimed to improve public understanding of stroke symptoms and the importance of timely medical attention, contributing to early presentation and improved outcomes, in alignment with the broader mission of the European Stroke Organisation to reduce the burden of stroke at a population level.

Overall, these activities reflect a sustained effort to disseminate high-quality, evidence-based knowledge across both professional and public domains, supporting continuous medical education and promoting stroke awareness at a national level.

Mentorship

Mentorship has been a central component of my academic activity. I currently mentor six young neurologists, working closely with them on their PhD theses. Since my appointment as Assistant Professor at the National and Kapodistrian University of Athens, I have been actively guiding their research development, including study design, methodological approaches, data analysis, and scientific writing, with the aim of fostering the next generation of clinician–scientists in cerebrovascular diseases.

Scientific Productivity and Contribution to Stroke Research

Scientific productivity has been a central component of my academic activity during the programme period. Since 2024, I have co-authored 75 publications indexed in PubMed, reflecting a sustained and high-level contribution to the field of cerebrovascular diseases. My research has primarily focused on acute stroke management, reperfusion therapies, blood pressure management, and adjunctive antithrombotic strategies, closely aligning with the current priorities of the European Stroke Organisation.

These publications include a substantial number of systematic reviews and meta-analyses, as well as collaborative multicentre studies and contributions to large-scale research consortia. Through this work, I have been actively involved in synthesizing emerging evidence, critically appraising the literature, and contributing to the translation of research findings into clinical practice. Several of these studies address clinically relevant and evolving questions, such as optimal thrombolytic strategies, management of large-core infarcts, and individualized approaches to secondary prevention.

Overall, my scientific output reflects both methodological expertise and active engagement in international research collaborations, contributing to the generation and dissemination of high-quality evidence aimed at improving stroke care.

In conclusion, through a combination of scientific contribution, educational engagement, international collaboration, mentorship, and public outreach, I have sought to actively “return the learning” acquired through the ESO Emerging Leader Programme. These activities reflect a continuous effort not only to disseminate knowledge, but also to contribute to the generation of evidence, the development of guidelines, and the training of future clinicians and researchers in cerebrovascular diseases. Collectively, this multifaceted engagement has strengthened my integration within the ESO community and has shaped my trajectory towards a sustained and meaningful contribution to advancing stroke care at local, European, and international levels.

3. COMPLETION OF A PROJECT

As part of the ESO Emerging Leader Programme, I chose to focus on a project with direct and immediate impact on stroke care within my local healthcare system, specifically the evaluation and promotion of stroke unit implementation in Greece.

Until recently, the Greek public healthcare system lacked dedicated stroke units, despite the overwhelming international evidence supporting their effectiveness in improving patient outcomes. Following coordinated efforts led by Professor Georgios Tsivgoulis and the national stroke community, a ministerial decision was issued in November 2023 mandating the establishment of 18 stroke units across the country. This represented a major step forward toward aligning national stroke care with European standards.

However, despite this important policy milestone, implementation has been limited. To date, only three stroke units have been established in the public domain – two in Athens and one in Thessaloniki – and only one has received ESO certification, while the others have been implemented more recently and remain in early operational phases. After this initial progress, the national implementation plan has entered a phase of relative inactivity.

In this context, I identified a critical need to generate robust, real-world evidence demonstrating the clinical impact of stroke units within the Greek healthcare system. The aim of this project was therefore not only to evaluate patient outcomes, but also to provide actionable data that could support policy decisions and contribute to the reactivation and expansion of the national stroke unit implementation strategy.

Evaluating the Impact of Stroke Units in Greece to Support National Implementation

Introduction

Stroke remains one of the leading causes of mortality and long-term disability worldwide, imposing a substantial burden on patients, healthcare systems, and societies. Over recent decades, advances in acute stroke management – including intravenous thrombolysis, endovascular treatment, and optimized secondary prevention – have significantly improved outcomes. However, beyond individual therapeutic interventions, the organization of care delivery has emerged as a key determinant of patient prognosis. Stroke units represent a cornerstone of modern stroke care. Defined as specialized hospital units providing coordinated, multidisciplinary management for patients with stroke, they have consistently been shown to reduce mortality and disability compared with general ward care. Evidence from randomized controlled trials and meta-analyses has demonstrated that the benefits of stroke unit care are robust across a wide range of patient populations, stroke subtypes, and

healthcare systems. Accordingly, international guidelines strongly recommend treatment in dedicated stroke units as standard of care.

Despite this well-established evidence, access to stroke units remains uneven across Europe. In several countries, particularly in Southern and Eastern Europe, implementation has been delayed or incomplete, leading to disparities in care and outcomes. Greece represents a characteristic example, where, until recently, the public healthcare system lacked formally established stroke units, resulting in variability in acute stroke management and limited access to organized, multidisciplinary care. In response to this gap, a ministerial decision issued in November 2023 mandated the development of a national network of stroke units, with a plan to establish 18 units strategically distributed across the country. While this initiative marked a major step forward, early implementation has been limited, and the expansion of stroke units has progressed more slowly than anticipated.

In this setting, the generation of real-world, locally relevant evidence is crucial to support ongoing policy efforts and to inform future healthcare planning. While the benefits of stroke units are well documented internationally, demonstrating their effectiveness within the specific context of the Greek healthcare system is essential for strengthening the case for broader implementation.

Therefore, the aim of the present study was to evaluate the impact of stroke unit implementation within the Greek public healthcare system using data from the RES-Q registry. Specifically, we compared clinical outcomes and care processes before and after stroke unit establishment in participating centres, with a particular focus on functional outcomes at discharge. Through this work, we sought to provide robust, real-world evidence to support the national implementation of stroke units and to contribute to the improvement of stroke care in Greece.

Methods

Study design and data source

Consecutive patients with acute stroke were prospectively registered in the Registry of Stroke Care Quality (RES-Q) by participating sites in Greece between 2017 and 2025. The RES-Q registry is an international, web-based quality improvement platform developed within the framework of the ESO-EAST initiative and is freely accessible for non-commercial use.

The study was approved by the local Ethics Committee of “Attikon” University Hospital (decision number EBΔ37), which served as the coordinating center of the RES-Q registry in Greece. Written informed consent was obtained from all patients or their legal representatives in accordance with local regulations.

Patient population

Adult patients (≥ 18 years) presenting with acute cerebrovascular events and admitted for in-hospital management were eligible for inclusion. This included patients with acute ischemic stroke (AIS), intracerebral hemorrhage (ICH), transient ischemic attack (TIA), subarachnoid hemorrhage (SAH), and cerebral venous thrombosis (CVT).

Patients were excluded if they were younger than 18 years, had a final diagnosis other than stroke (i.e., stroke mimics), or if informed consent was not available.

For the purposes of the present analysis, only patients treated within the public national healthcare system were included, while cases from private-sector hospitals were excluded.

Data collection and variables

Demographic characteristics, including age and sex, were recorded for all patients. Baseline clinical data included stroke type, time metrics (symptom onset and hospital admission), and stroke severity, assessed by certified neurologists using the National Institutes of Health Stroke Scale (NIHSS).

Acute management variables included neuroimaging performed within 1 hour of hospital arrival, as well as reperfusion therapies in patients with AIS. Reperfusion treatment modalities included intravenous thrombolysis (IVT), endovascular treatment (EVT), and bridging therapy (combined IVT and EVT), administered according to current international guidelines and local availability. Process metrics, including door-to-needle (DTN) and door-to-groin puncture (DTG) times, were recorded when applicable.

In-hospital management variables included admission to a stroke unit or intensive care unit (ICU), rehabilitation assessment, speech therapy, atrial fibrillation (AF) screening, and carotid artery imaging. Data on discharge destination and prescribed medications at discharge (including antithrombotic agents, statins, and antihypertensive therapy) were also collected.

Study design and comparisons

A temporal, before-and-after analysis was conducted in hospitals that established stroke units during 2024–2025. Outcomes and process metrics during the post-implementation period (2024–2025) were compared with historical data from the same centres during the pre-implementation period (2017–2023).

The primary outcome of interest was excellent functional outcome at discharge, defined as a modified Rankin Scale (mRS) score of 0–1. Secondary outcomes included good functional outcome (mRS 0–2), in-hospital mortality, and NIHSS score at discharge.

In addition, key process-of-care metrics were evaluated, including rates of reperfusion therapies, imaging within 1 hour, rehabilitation assessment, speech therapy, atrial fibrillation screening, carotid artery imaging, and time metrics (door-to-needle and door-to-groin times).

Statistical analysis

Categorical variables are presented as absolute numbers with corresponding percentages, while continuous variables are presented as mean $\pm$ standard deviation for normally distributed data or median with interquartile range (IQR) for non-normally distributed data.

Comparisons between the pre-implementation (2017–2023) and post-implementation (2024–2025) periods were performed using the χ^2 test or Fisher's exact test for categorical variables, as appropriate. Continuous variables were compared using the independent samples t-test or the Mann–Whitney U test, depending on data distribution.

For all analyses, percentages were calculated after exclusion of missing values from the denominator.

To assess the independent association between stroke unit implementation and clinical outcomes, multivariable logistic regression analysis was performed with excellent functional outcome at discharge (mRS 0–1) as the dependent variable. The model was adjusted for clinically relevant covariates selected a priori, including age, baseline NIHSS score, pre-stroke mRS, onset-to-door time, and receipt of reperfusion therapy. Results are presented as odds ratios (ORs) with 95% confidence intervals (CIs).

All statistical tests were two-sided, and a p-value ≤ 0.05 was considered statistically significant. Statistical analyses were performed using R (R Foundation for Statistical Computing, Vienna, Austria).

Results

A total of 7,869 patients were registered in the RES-Q database by 14 participating sites across Greece between 2017 and 2025 (Table 1; Figure 1). Three sites belonged to the private healthcare sector and were excluded from further analyses, in line with the study objective to focus on the national public healthcare system. This resulted in a final cohort of 5,748 patients included in the analysis.

The geographical distribution of participating sites is illustrated in Figure 1a, demonstrating the national coverage across mainland Greece and several islands. Site contribution to the registry was heterogeneous (Figure 1b), with the largest contributions originating from tertiary academic centers, particularly University Hospital Attikon and Metropolitan

Hospital, followed by high-volume regional hospitals such as General Hospital of Serres and General Hospital of Eleusina Thriassio.

Baseline characteristics

The overall study population had a median age of 63 years (IQR 55–71), and 64.1% were male (Table 2). The majority of patients presented with acute ischemic stroke (75.3%), followed by intracerebral hemorrhage (10.9%) and transient ischemic attack (11.7%), while other stroke subtypes were less frequent. Median baseline stroke severity was low-to-moderate [NIHSS 4 (IQR 2–9)], and most patients were functionally independent prior to the index event [pre-stroke mRS 0 (IQR 0–0)].

In terms of acute management, imaging within 1 hour was achieved in 44.1% of cases. Among patients with acute ischemic stroke, reperfusion therapies were administered in 20.6%, with intravenous thrombolysis being the predominant modality (18.1%), while mechanical thrombectomy and bridging therapy were used less frequently. Among thrombolysed patients, alteplase remained the most commonly used agent (68.5%), although a substantial proportion received tenecteplase (31.5%).

During hospitalization, only 13.9% of patients were admitted to a stroke unit or ICU, reflecting the limited availability of organized stroke care during the study period. Rehabilitation assessment (38.8%) and speech therapy (15.5%) were suboptimally utilized. At discharge, 49% of patients achieved an excellent functional outcome (mRS 0–1), while in-hospital mortality was 3.6%.

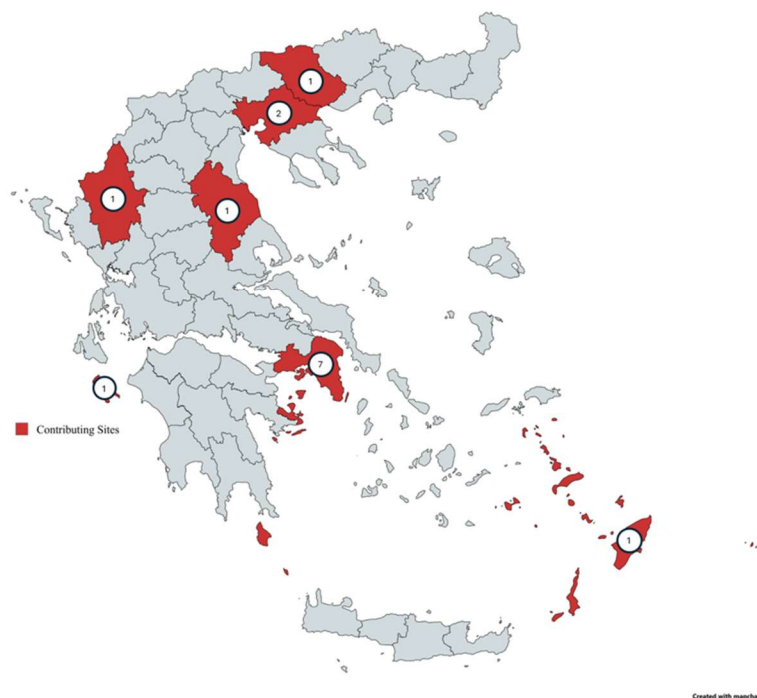
Table 1: Contribution of participating sites to the RES-Q registry in Greece from 2017 to 2025.

Site	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Metropolitan Hospital*	65	157	182	188	145	249	185	139	88	1398
University Hospital Attikon	33	173	206	144	167	171	146	188	133	1361
General Hospital of Serres	0	1	0	0	162	207	233	247	214	1064
General Hospital Eleusina Thriassio	0	0	132	116	98	198	139	130	123	936
University Hospital of Ioannina	0	62	161	120	101	120	114	0	7	685
Athens Euroclinic*	0	18	35	69	70	44	34	129	105	504
AHEPA University Hospital of Thessaloniki	11	27	0	1	0	17	79	146	145	426
Hippokration General Hospital-Thessaloniki	0	0	10	17	11	7	126	122	132	425
General Hospital of Rhodes	0	0	0	0	0	0	30	117	127	274
University General Hospital of Larissa	0	0	0	0	6	9	0	140	81	236
Mediterraneo Hospital*	0	0	0	0	0	0	0	88	131	219
Korgialenio-benakio Greek Red Cross Hospital of Athens	1	0	0	0	0	0	1	58	147	207
Athens General Hospital Evaggelismos	0	45	0	0	0	79	5	0	0	129
General Hospital of Zakynthos	0	0	0	0	0	0	0	0	5	5
Total	110	483	726	655	760	1101	1092	1504	1438	7869

*Sites marked with an asterisk belong to the private healthcare sector and were excluded from further analyses.

Figure 1: (a) Geographic distribution of participating sites contributing to the RES-Q registry across Greece. (b) Relative contribution of each site to the total number of patients included in the registry.

a.



b.

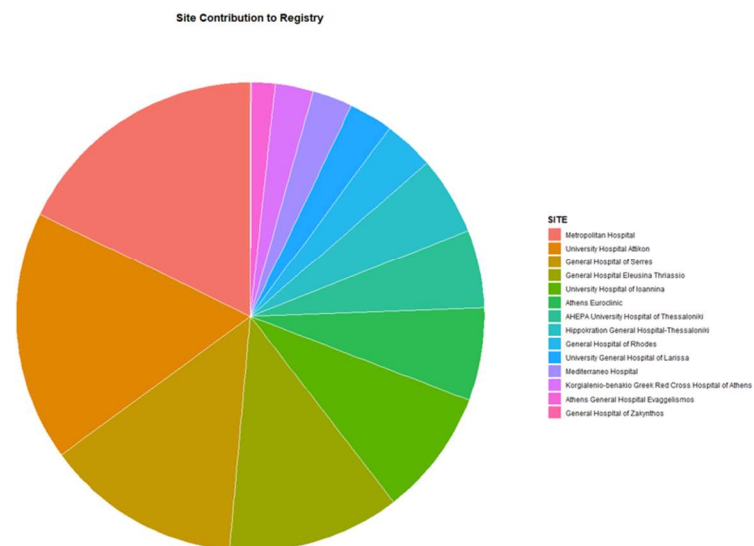


Table 2. Baseline characteristics, management, and clinical outcomes of patients included in the analysis (public healthcare system, 2017–2025).

Variable		Overall
At baseline		
Age, years, median (IQR)		63 (55–71)
Male sex, n (%)		3685 (64.1%)
Index Stroke		
	AIS, n (%)	4326 (75.3%)
	ICH, n (%)	624 (10.9%)
	TIA, n (%)	673 (11.7%)
	SAH, n (%)	42 (0.7%)
	CVT, n (%)	35 (0.6%)
	Undetermined, n (%)	9 (0.2%)
Prior history of stroke, n (%)		790 (13.7%)
NIHSS, median (IQR)		4 (2–9)
Pre-stroke mRS, median (IQR)		0 (0–0)
Onset-to-door, minutes, median (IQR)		240 (105–648)
Acute management		
Imaging within 1 h, n (%)		2536 (44.1%)
Reperfusion procedures, n (% AIS)		892 (20.6%)
Intravenous thrombolysis alone, n (% AIS)		784 (18.1%)
Thrombolytic Drug, n (% intravenous thrombolysis)		
	Alteplase	396 (68.5%)
	Tenecteplase	182 (31.5%)
Mechanical thrombectomy alone, n (% AIS)		52 (1.2%)
Bridging therapy, n (% AIS)		56 (1.3%)
Hemorrhagic transformation, n (% reperfusion)		54 (6.1%)
Door to needle time, minutes, median (IQR)		55 (40–75.5)
Door to Groin time, minutes, median (IQR)		115.5 (75–155.2)
During hospitalization		

Stroke unit/ICU hospitalization, n (%)	801 (13.9%)
Rehabilitation assessment, n (%)	2229 (38.8%)
Speech therapy, n (%)	891 (15.5%)
AF screening, n (% AIS or TIA)	4320 (88.3%)
Carotid arteries imaging, n (% AIS or TIA)	4100 (82%)
Duration of hospitalization, days, median (IQR)	6 (3–11)
Stroke Etiology	
Large-artery atherosclerosis, n (% AIS)	544 (12.6%)
Cardioembolic, n (% AIS)	599 (13.8%)
Lacunar, n (% AIS)	362 (8.4%)
Other Etiology, n (% AIS)	137 (3.2%)
Cryptogenic, n (% AIS)	963 (22.3%)
At discharge	
Antithrombotic treatment, n (% AIS or TIA)	3930 (78.6%)
Anticoagulant treatment, n (% AF-related AIS or TIA)	520 (81.2%)
Statin treatment, n (% AIS or TIA)	4444 (88.9%)
Antihypertensive treatment, n (%)	3796 (66%)
Discharge to home, n (%)	4600 (80%)
Clinical outcomes at discharge	
NIHSS, median (IQR)	2 (0–4)
mRS score, median (IQR)	1 (0–3)
Excellent functional outcome, n (%)	2818 (49%)
Good functional outcome, n (%)	3349 (58.3%)
Death, n (%)	166 (3.6%)

IQR: interquartile range; AIS: acute ischemic stroke; ICH: intracerebral hemorrhage; TIA: transient ischemic attack; SAH: subarachnoid hemorrhage; CVT: cerebral venous thrombosis; NIHSS: National Institutes of Health Stroke Scale; ICU: intensive care unit; AF: atrial fibrillation; mRS: modified Rankin Scale.

Temporal comparison before and after stroke unit implementation

Among the two centers with available longitudinal data, a total of 1,787 patients were included in the temporal comparison, with 1,175 treated in the pre-implementation period (2017–2023) and 612 in the post-implementation period (2024–2025) (Table 3). A third site with an established stroke unit was not included in this analysis, as it did not contribute data to the RES-Q registry during the study period.

Patients treated after stroke unit implementation were older (median 66 vs 62 years, $p<0.001$) and presented with higher baseline stroke severity (NIHSS 4 vs 3, $p<0.001$). Pre-stroke functional status was also slightly worse in the post-implementation group ($p<0.001$). Despite these less favorable baseline characteristics, several important improvements in care processes and outcomes were observed.

Acute management

The overall use of reperfusion therapies increased significantly following stroke unit implementation (27% vs 19%, $p<0.001$). This increase was primarily driven by a marked rise in the use of mechanical thrombectomy (5% vs 0.6%, $p<0.001$) and bridging therapy (4.6% vs 1%, $p<0.001$), while rates of intravenous thrombolysis alone remained stable.

A substantial shift in thrombolytic practice was also observed, with a transition from exclusive use of alteplase in the pre-implementation period to a predominant use of tenecteplase in the post-implementation period (59%, $p=0.003$), reflecting rapid adoption of emerging evidence into clinical practice.

Time metrics, including door-to-needle and door-to-groin times, remained largely unchanged between the two periods.

In-hospital management

Stroke unit implementation was associated with major improvements in in-hospital care processes. Rates of rehabilitation assessment increased more than fourfold (66.5% vs 15.9%, $p<0.001$), while the use of speech therapy also increased significantly (15.8% vs 6.7%, $p<0.001$).

AF screening rates improved modestly (99.1% vs 97.6%, $p=0.039$) and carotid artery imaging rates were higher in the post-implementation period (83.8% vs 96.1%, $p<0.001$). Duration of hospitalization was slightly longer following stroke unit implementation (median 7 vs 6 days, $p<0.001$), potentially reflecting more comprehensive in-hospital management.

Clinical outcomes

Importantly, stroke unit implementation was associated with improved functional outcomes. The proportion of patients achieving excellent functional outcome at discharge increased significantly from 54.6% to 61.9% ($p=0.003$). Similarly, a trend toward higher rates of good functional outcome (mRS 0–2) was observed, although this did not reach statistical significance ($p=0.070$). In-hospital mortality was numerically lower in the post-implementation period (1.8% vs 3%), although this difference was not statistically significant.

Multivariable analysis

In multivariable logistic regression analysis adjusting for age, baseline NIHSS, pre-stroke mRS, onset-to-door time, and reperfusion therapy, treatment during the stroke unit era remained independently associated with improved functional outcomes (Table 4; Figure 2).

Specifically, stroke unit implementation was associated with a 37% increase in the odds of achieving excellent functional outcome at discharge (OR 1.37, 95% CI 1.08–1.74, $p=0.01$). None of the other covariates included in the model were independently associated with the primary outcome.

The adjusted effect estimates are illustrated in Figure 2, which demonstrates a consistent direction of effect favoring stroke unit implementation, with confidence intervals crossing unity for most covariates except for the primary exposure variable. This finding underscores the independent contribution of structured stroke care to improved patient outcomes, beyond baseline clinical characteristics and acute treatment variables.

Table 3. Comparison of baseline characteristics, management, and clinical outcomes before (2017–2023) and after (2024–2025) stroke unit implementation in participating sites.

Variable		Before SU (2017-2023) n=1175	After SU (2024-2025) n=612	p value
At baseline				
Age, years, median (IQR)		62 (54–68)	66 (57–75)	<0.001
Male sex, n (%)		761 (64.8%)	385 (62.9%)	0.437
Index Stroke				0.099
	AIS, n (%)	879 (74.8%)	478 (78.2%)	
	ICH, n (%)	110 (9.4%)	61 (10%)	
	TIA, n (%)	159 (13.5%)	66 (10.8%)	
	SAH, n (%)	16 (1.4%)	2 (0.3%)	
	CVT, n (%)	11 (0.9%)	4 (0.7%)	
	Undetermined, n (%)	0 (0%)	0 (0%)	
Prior history of stroke, n (%)		185 (15.7%)	77 (12.6%)	0.073
NIHSS, median (IQR)		3 (1–7)	4 (1–10)	<0.001
Pre-stroke mRS, median (IQR)		0 (0–0)	0 (0–1)	<0.001
Onset-to-door, minutes, median (IQR)		185 (91–530)	193 (101–501)	0.030
Acute management				
Imaging within 1 h, n (%)		977 (83.1%)	528 (86.3%)	0.085
Reperfusion procedures, n (% AIS)		167 (19%)	129 (27%)	<0.001
Intravenous thrombolysis alone, n (% AIS)		153 (17.4%)	83 (17.4%)	0.984
Thrombolytic Drug, n (% intravenous thrombolysis)				0.003
	Alteplase	7 (100%)	43 (41%)	
	Tenecteplase	0 (0%)	62 (59%)	
Mechanical thrombectomy alone, n (% AIS)		5 (0.6%)	24 (5%)	<0.001

Bridging therapy, n (% AIS)	9 (1%)	22 (4.6%)	<0.001
Hemorrhagic transformation, n (% reperfusion)	6 (3.6%)	5 (3.9%)	>0.999
Door to needle time, minutes, median (IQR)	50 (35–70)	50 (33–71)	0.419
Door to Groin time, minutes, median (IQR)	88 (71.2–129.8)	94 (70.8–121.2)	0.664
During hospitalization			
Rehabilitation assessment, n (%)	187 (15.9%)	407 (66.5%)	<0.001
Speech therapy, n (%)	79 (6.7%)	97 (15.8%)	<0.001
AF screening, n (% AIS or TIA)	1011 (97.6%)	539 (99.1%)	0.039
Carotid arteries imaging, n (% AIS or TIA)	997 (96.1%)	456 (83.8%)	<0.001
Duration of hospitalization, days, median (IQR)	6 (4–10)	7 (4–11)	<0.001
Stroke Etiology			<0.001
Large-artery atherosclerosis, n (% AIS)	27 (10.8%)	86 (18%)	
Cardioembolic, n (% AIS)	55 (22.0%)	119 (24.9%)	
Lacunar, n (% AIS)	31 (12.4%)	62 (13%)	
Other Etiology, n (% AIS)	17 (6.8%)	29 (6.1%)	
Cryptogenic, n (% AIS)	120 (48.0%)	176 (36.8%)	
At discharge			
Antithrombotic treatment, n (% AIS or TIA)	841 (81%)	448 (82.4%)	0.517
Anticoagulant treatment, n (% AF-related AIS or TIA)	50 (90.9)	110 (92.3%)	0.682
Statin treatment, n (% AIS or TIA)	970 (93.4%)	497 (91.4%)	0.129
Antihypertensive treatment, n (%)	735 (62.6%)	451 (73.7%)	<0.001
Discharge to home, n (%)	1031 (87.7%)	532 (86.9%)	0.546
Clinical outcomes at discharge			

NIHSS, median (IQR)	0 (0–2)	1 (0–2)	<0.001
mRS score, median (IQR)	1 (1–3)	1 (1–3)	0.009
Excellent functional outcome, n (%)	642 (54.6%)	379 (61.9%)	0.003
Good functional outcome, n (%)	766 (65.2%)	425 (69.4%)	0.070
Death, n (%)	35 (3%)	11 (1.8%)	0.135

SU: stroke unit; IQR: interquartile range; AIS: acute ischemic stroke; ICH: intracerebral hemorrhage; TIA: transient ischemic attack; SAH: subarachnoid hemorrhage; CVT: cerebral venous thrombosis; NIHSS: National Institutes of Health Stroke Scale; ICU: intensive care unit; AF: atrial fibrillation; mRS: modified Rankin Scale.

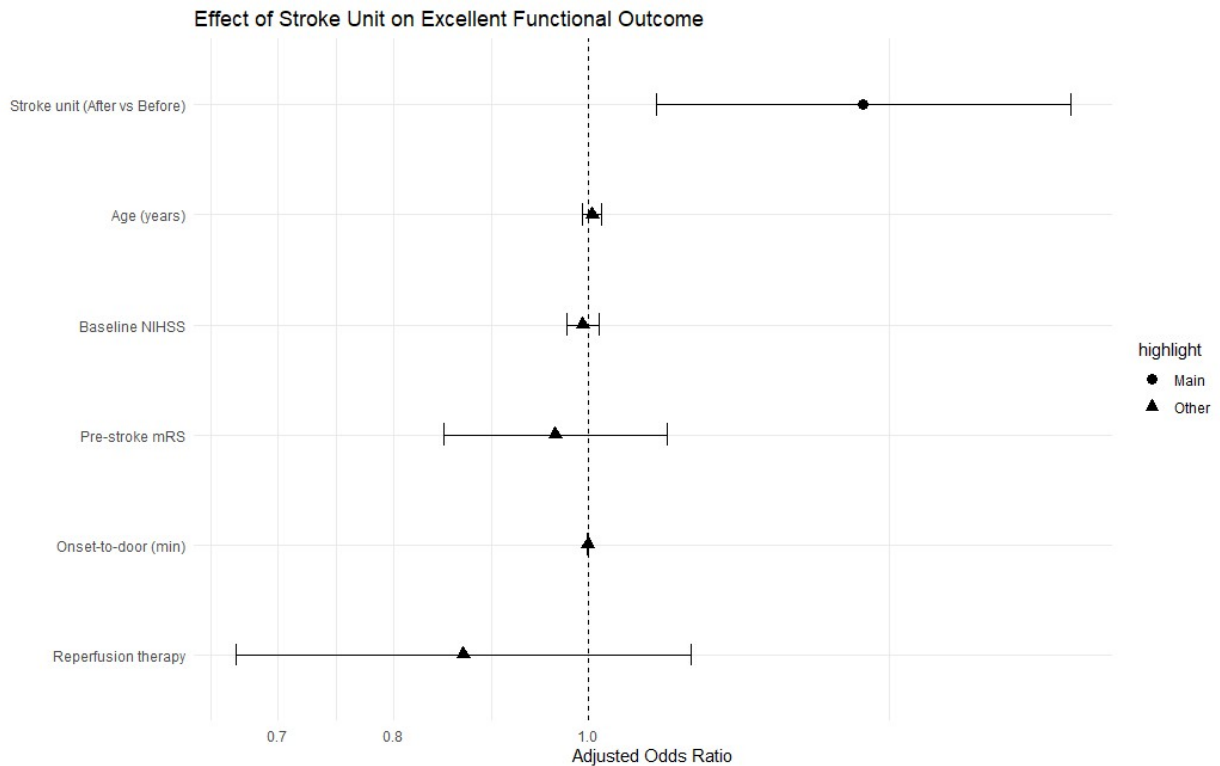
Table 4: Multivariable logistic regression analysis for excellent functional outcome at discharge (mRS 0–1).

Variable	OR	Lower 95%CI	Higher 95%CI	p-value
After SU Implementation	1.37	1.08	1.74	0.01
Age	1.00	0.99	1.02	0.38
NIHSS at baseline	0.99	0.98	1.01	0.52
Pre-stroke mRS	0.96	0.85	1.09	0.56
Onset to door	1.00	1.00	1.00	0.66
Reperfusion procedures	0.87	0.67	1.13	0.28

SU: Stroke Unit; NIHSS: National Institutes of Health Stroke Scale; mRS: modified Rankin Scale.

Figure 2: Forest plot of multivariable logistic regression analysis for excellent functional outcome at discharge (mRS 0–1).

Adjusted odds ratios (ORs) with 95% confidence intervals (CIs) are presented for stroke unit implementation and covariates included in the model. The vertical dashed line indicates the null effect (OR = 1).



Discussion

In this national registry-based analysis, we evaluated the impact of stroke unit implementation within the Greek public healthcare system using real-world data from the RES-Q registry. Several key findings emerge. First, despite limited and recent implementation, stroke units were associated with significant improvements in both processes of care and clinical outcomes. Second, these improvements were observed even though patients treated after stroke unit establishment were older and presented with higher baseline stroke severity. Third, the introduction of stroke units coincided with increased use of evidence-based therapies – particularly reperfusion treatments – and with substantial enhancements in in-hospital multidisciplinary care, including rehabilitation assessment and speech therapy. Finally, in multivariable analysis adjusting for clinically relevant confounders, stroke unit implementation remained independently associated with improved odds of excellent functional outcome at discharge.

These findings are highly consistent with the robust body of international evidence supporting the effectiveness of organized stroke care. Stroke units are among the most well-established interventions in stroke medicine, with randomized trials and meta-analyses demonstrating reductions in mortality and disability across diverse healthcare systems. Importantly, our study extends this evidence to a real-world national setting where stroke unit infrastructure has historically been lacking. The fact that improvements were observed rapidly after implementation – and in a healthcare system undergoing transition – highlights the scalability and immediate impact of structured stroke care.

A particularly notable observation is the improvement in outcomes despite less favorable baseline characteristics in the post-implementation group. Patients treated after stroke unit establishment were older and had higher NIHSS scores, both of which are traditionally associated with worse prognosis. Nevertheless, functional outcomes improved significantly. This finding strongly suggests that system-level changes in care delivery can offset, at least in part, adverse baseline clinical profiles. It also reinforces the concept that stroke outcomes are not solely determined by patient characteristics, but are highly dependent on the organization and quality of care.

The mechanisms underlying these improvements appear multifactorial. The increased use of reperfusion therapies, particularly mechanical thrombectomy and bridging strategies, likely contributed to improved outcomes. In parallel, the observed shift toward tenecteplase reflects rapid adoption of emerging evidence and may have facilitated more efficient thrombolysis workflows. However, beyond acute interventions, the most striking improvements were seen in in-hospital care processes. The dramatic increase in rehabilitation assessment and speech therapy utilization underscores the importance of

multidisciplinary management, which is a defining feature of stroke units. These elements are often underappreciated but are critical determinants of recovery and functional independence.

Interestingly, time metrics such as door-to-needle and door-to-groin times did not significantly change, suggesting that the benefits of stroke unit implementation in this context may be driven more by comprehensive care pathways rather than by further optimization of already established acute workflows. This highlights an important message for health systems: while rapid treatment remains essential, the organization of post-acute care is equally critical in determining patient outcomes.

Despite these encouraging findings, our study has several limitations. First, the observational nature of the analysis precludes definitive causal inference. Although multivariable adjustment was performed, residual confounding cannot be excluded. Second, the analysis was restricted to two stroke-unit centers with available longitudinal data, which may limit generalizability. However, these centers represent high-volume tertiary hospitals and provide valuable insights into the early phase of stroke unit implementation in Greece. Third, registry-based data are subject to variability in data completeness and accuracy, although the RES-Q platform incorporates standardized definitions and quality control measures. Fourth, some process variables and outcomes may have been influenced by temporal trends unrelated to stroke unit implementation, although the consistency of findings across multiple domains supports a true effect.

Importantly, one of the planned analyses – comparison between stroke-unit and non-stroke-unit hospitals within the same time period – was not included in the present report. This analysis remains of high interest and will be revisited with refined methodology and more complete datasets in future work. Such comparisons are essential to further disentangle the independent effect of stroke unit care from broader temporal improvements in stroke management.

From a policy perspective, the implications of this work are substantial. The findings provide the first real-world, nationally derived evidence supporting the effectiveness of stroke units in Greece. This is particularly relevant given the current status of implementation, where only three stroke units have been established despite a national plan for 18 units. The results of this study will be used to inform discussions with the Ministry of Health, with the aim of reactivating and accelerating the national stroke unit implementation strategy. By demonstrating measurable improvements in patient outcomes within a short time frame, this work provides a compelling argument for investment in structured stroke care.

Looking ahead, several additional analyses are planned to further strengthen the evidence base and support health system transformation. One key direction is the evaluation of advanced neuroimaging, particularly perfusion imaging, which has recently been introduced in the public healthcare system through targeted funding initiatives. This development is of particular importance in the Greek context, where onset-to-door times remain prolonged, as demonstrated in the present study. Advanced imaging has the potential to expand treatment eligibility beyond conventional time windows, enabling more patients to benefit from reperfusion therapies. Evaluating the real-world impact of perfusion imaging on treatment decisions and outcomes will therefore be a critical next step.

In addition, future analyses will focus on expanding the dataset, incorporating more sites as stroke unit implementation progresses, and refining comparative methodologies to allow robust evaluation of stroke-unit versus non-stroke-unit care. These efforts will also include exploration of regional disparities, access to care, and system-level barriers, with the ultimate goal of informing a comprehensive national stroke strategy.

In conclusion, this project provides important real-world evidence that stroke unit implementation in Greece is associated with meaningful improvements in stroke care delivery and patient outcomes. Despite limited and early-stage adoption, the observed benefits highlight the critical role of organized stroke care and underscore the urgent need for broader national implementation. These findings support ongoing efforts to strengthen stroke systems of care and provide a strong foundation for future policy initiatives and research in the Greek healthcare setting.

4. CONCLUDING REMARKS OF THE ESO EMERGING STROKE LEADER PROGRAMME

The ESO Emerging Leader Programme has been a highly formative and impactful experience, providing a unique combination of advanced education, scientific engagement, and leadership development within the international stroke community. Through participation in major ESO activities, contribution to educational initiatives, involvement in guideline development, and the implementation of a project with direct relevance to national healthcare policy, this programme has significantly shaped my academic and professional trajectory.

A central highlight of this experience has been the opportunity to actively contribute to the European Stroke Organisation, transitioning from participant to contributor and collaborator. Engagement in ESOC activities, ESO educational programmes, and guideline initiatives has strengthened my skills in critical appraisal, scientific communication, and evidence-based medicine, while also reinforcing the importance of multidisciplinary and collaborative approaches in advancing stroke care.

The development and execution of my project on stroke unit implementation in Greece has been particularly meaningful, as it reflects the core mission of the programme: to translate knowledge into tangible improvements in clinical practice and healthcare systems. By generating real-world evidence to support national stroke unit implementation, this work aims to contribute not only to scientific understanding but also to policy change and improved patient outcomes.

I would like to express my sincere gratitude to my mentors and to the ESO leadership for their continuous support, guidance, and trust throughout this journey. Their encouragement has been instrumental in fostering both my professional development and my confidence as an emerging leader in stroke medicine.

Equally important has been the opportunity to connect with fellow Emerging Leaders across Europe. These interactions have created a strong network of motivated and like-minded clinicians and researchers. These connections are something I truly value and hope to build on through future collaborations.

Overall, the ESO Emerging Leader Programme has provided a solid foundation for continued growth, collaboration, and contribution to the field of cerebrovascular diseases. I look forward to remaining actively engaged within the ESO community and to further contributing to the advancement of stroke care at both national and international levels.