



Differences in Acute Ischemic Stroke Treatment: A Cross-Sectional Study from International Registry of Stroke Care Quality (RES-Q)

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94 Differences in Acute Ischemic Stroke Treatment: A Cross-Sectional Study from International
95 Registry of Stroke Care Quality (RES-Q)

96 Abstract

97 Background: Stroke globally impacts mortality and disability. Compliance with international
98 standards and evidence-based practices for acute stroke management would improve patient
99 outcomes.

100 Objectives: We aimed to present a descriptive analysis of the quality of acute stroke care across
101 different countries using the Registry of Stroke Care Quality (RES-Q).

102 Method: In a cross-sectional study, data from key quality indicators such as Emergency Medical
103 Services (EMS) deployment rates, hospital arrival to imaging time (door-to-imaging: DIT), hospital
104 arrival to thrombolysis time (door-to-needle: DNT), and Stroke Unit Care/Intensive Care Unit
105 (SU/ICU) admission frequencies were examined. The analysis employed descriptive statistics and
106 Spearman correlation tests.

107 Results: Of 334,184 patients from 1130 hospitals in 70 countries, 218,832 patients (65.5%) from 47
108 countries were diagnosed with acute ischemic stroke after exclusions. The number of patients per
109 country ranged from 226 to 62,080. International variability in care quality was observed: EMS (7%-
110 97%); SU/ICU (12%-100%); and median DIT (7-41 mins); and DNT (20-75 mins). IVT rates varied
111 markedly across countries, ranging from <1% to 52%. Higher patient volumes were positively
112 correlated with SU/ICU admission and negatively with DIT and DNT ($\rho = 0.10, -0.22, -0.42,$
113 respectively).

114 Conclusion: This study demonstrates substantial international variation in the use of quality
115 monitoring in clinical practice as well as in key indicators of acute ischemic stroke care, including
116 intravenous thrombolysis rates and treatment timelines. The extent of variability highlights
117 opportunities for benchmarking and targeted quality improvement efforts across diverse healthcare
118 systems.

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123 **Introduction**

124 Patients' outcome after stroke depends on the quality of stroke care ¹ Quality monitoring of stroke
125 care is recommended by guidelines as part of routine clinical care ². Many countries, including the
126 US, UK, and Australia ³⁻⁵ report stroke care quality. There are also some country-to-country
127 comparisons with results obtained through surveys such as the ones by the European Stroke
128 Organisation (ESO) and the Stroke Alliance for Europe (SAFE)⁶. Methodology to obtain results
129 presented in surveys differs and frequently could be based on expert estimations rather than solid
130 evidence.

131 Here, we present an international comparison based on harmonized data collection in an international
132 quality registry using the Registry of Stroke Care Quality (RES-Q) RES-Q was initiated by the ESO
133 as part of the ESO EAST program, which stands for "European Stroke Organisation - Enhancing and
134 Accelerating Stroke Treatment" (www.eso-stroke.org) ⁷.

135 Although the countries have participated in RES-Q with different levels of engagement and data
136 representation ⁸⁻¹⁰, the registry serves as a tool for enhancing the quality of stroke care across different
137 healthcare systems. Additionally, RES-Q, being used in more than 73 countries, facilitates
138 international comparisons and collaborations, creating a broad network to improve stroke care.

139 In the present study, we present an analysis of acute stroke care quality, with a focus on thrombolytic
140 treatment for ischemic stroke.

141 **Method**

142 This cross-sectional study analysed 24-months prospectively collected data from January 1, 2022, to
143 December 31, 2023.

144 *The RES-Q Registry*

145 Launched in 2016, it now spans 1,600 hospitals across 73 countries, tracking over 850,000 stroke
146 patients. It is a free tool supporting both public and private hospitals in monitoring and improving
147 stroke care. Hospitals receive feedback via dashboards, can download their data, and use it for quality
148 improvement or research ¹¹. Dashboards are created immediately after data are entered. Compared to
149 many administrative databases, RES-Q allows timely insights. As shown in Stroke Action Plan for
150 Europe report, only some countries in Europe were able to submit national data for the same year,
151 reflecting limited capability of administrative databased to provide data near real-time¹². Participation
152 is further supported by the ESO and WSO Angels Awards program, which incentivizes engagement

153 by recognizing hospitals that meet predefined quality benchmarks. Additionally, Angels consultants
154 assist hospitals with training and workflow optimization, helping to build capacity for data-driven
155 stroke care improvement¹³⁻¹⁵.

156 The RES-Q registry operates under a structured governance model led by a Global Scientific
157 Committee, National Coordinators, Local Coordinators, and Users. The Global Committee oversees
158 data provision, strategic direction, and scientific integrity, while National Coordinators manage
159 implementation and national data use. Clinicians and healthcare professionals contribute and utilize
160 data to monitor and improve stroke care. This multi-level governance ensures consistent data
161 collection, best practice sharing, and collaborative research to enhance stroke care globally¹⁶.

162 The RES-Q legal framework ensures secure patient data handling in compliance with GDPR,
163 protecting privacy while supporting hospital process improvements¹⁷.

164 Quality control in RES-Q is voluntary, with no formal audits. However, countries use the data for
165 various national and institutional purposes. For instance, the Czech Republic cross-checks RES-Q
166 data with administrative and insurance databases. Brazil, Mexico, and India leverage it for WSO
167 certification, where hospital auditors verify data accuracy.

168 The Supplementary Table summarizes the primary motivations for hospital participation in RES-Q,
169 as reported by National Coordinators from each country.

170 Data collection include (Figure 1):

- 171 • Standardized Patient Data Entry: Hospitals use a uniform form to capture key stroke metrics
172 ¹⁸.
- 173 • Harmonized Data Collection: All hospitals, whether primary or comprehensive, follow the
174 same data entry standards, ensuring consistency. The form is available in 15 validated
175 languages, enhancing accessibility.
- 176 • Electronic Data Submission: Data is entered into the RES-Q platform electronically.
- 177 • Data Validation and Quality Checks: Automated validation algorithms flag inconsistencies or
178 missing data, with National Coordinators and hospital administrators overseeing
179 corrections¹⁹.
- 180 • Data Aggregation, Analysis, and Feedback: Validated data is aggregated at national and
181 international levels, with real-time dashboards helping hospitals compare performance against

182 benchmarks. Hospitals receive regular feedback reports, identifying strengths and areas for
183 improvement ^{7, 11}.

184 **Insert Figure 1 Here**

185 **Figure 1 - RES-Q Data Flow and Performance Feedback System**

186 The study was approved by the St. Anne's University Hospital in Brno Ethics Committee (EK-
187 FNUSA-04/2024), with patient consent waived due to data anonymization, ensuring compliance with
188 international standards for patient safety and data security.

189 *Variables for Stroke Care Assessment*

190 To document the quality of acute ischemic stroke care, the following metrics were chosen: Emergency
191 Medical Services (EMS)²⁰; Stroke Unit/ICU Admission (SU/ICU)²⁰; Door-to-Imaging Time (DIT):
192 Time from hospital arrival to first imaging (CT/MRI) ²¹; and Door-to-Needle Time (DNT): Time
193 from hospital arrival to thrombolytic treatment initiation ²¹. Additional patient characteristics
194 recorded included age, sex, NIHSS score, and health risk factors (Diabetes Mellitus, Hypertension,
195 Hyperlipidaemia, Atrial Fibrillation, and smoking status)²². These variables were recorded using
196 standardized data fields defined by the RES-Q protocol to support consistency across participating
197 hospitals.

198 *Statistical Analysis*

199 Data were summarized using medians (IQR) for continuous variables and percentages for categorical
200 variables. Hospitals were divided into patient volume quartiles, and scatter plots illustrated care
201 indicators across these groups. Stroke care representativeness was assessed by calculating IVT rates
202 and the proportion of ischemic strokes relative to national estimates from the Global Burden of
203 Disease (GBD) 2021 study²³. Spearman correlations tested associations between hospital volume and
204 EMS use, SU/ICU admission, DIT, and DNT. A choropleth map displayed ischemic stroke incidence
205 (GBD 2021), grouped into six categories and overlaid with RES-Q participation. Analyses were
206 conducted in R version 4.3.0; missing data were reported but not imputed.

207 **Results**

208 A total of 334,184 patients were recorded from 1,130 hospitals across 70 countries. After exclusions,
209 the final study sample included 218,832 patients with acute ischemic stroke from 47 countries. The
210 inclusion flow and reasons for country and patient-level exclusions are summarized in the CONSORT

211 diagram (Figure 2). Geographic representation of participating countries and stroke incidence per
 212 100,000 population, based on GBD (2021) data, is shown in Figure 3. Countries included in the final
 213 analysis are highlighted with black borders, providing context for regional data completeness and
 214 stroke burden. Among these, 44% have an ischemic stroke incidence below 72.83 per 100,000
 215 population, while only 11% fall within the highest incidence tier (>123.95 per 100,000), indicating a
 216 predominance of countries with lower to mid-level stroke burden.

217 **Insert Figure 2 Here**

218 Figure 2 -CONSORT Diagram of Patient and Country Inclusion in the RES-Q Registry Analysis

219

220 **Insert Figure 3 Here**

221 Figure 3 - Global Map of Ischemic Stroke Incidence and RES-Q Country Participation

222 **Table 1 - Demographic and Risk Factors by Countries (n = 218,832 from 47 countries)**

Country (n)	Number of Centers	Age Median (IQR)	Estimation of percentage of stroke captured in RES-Q	Female (%)	NIHSS Median (IQR)	HTN (%)	DM (%)	HLD (%)	AF (%)	Smoker (%)
Thailand (62080)	108	64(18)	92	45	4(6)	69	39	59	11	36
Slovakia (7204)	42	72(15)	84	47	6(8)	81	26	NR	21	18
Czech Republic (12581)	49	74(15)	74	47	6(8)	75	55	42	17	26
Estonia (1160)	6	76(15)	72	53	5(8)	84	48	33	29	17
Latvia (3510)	9	76(16)	63	58	7(9)	83	33	34	36	12
Vietnam (34764)	54	67(17)	32	41	6(7)	75	30	13	4	14
Colombia (7066)	79	72(19)	28	50	7(11)	70	52	16	8	16
Bulgaria (6574)	16	73(15)	27	49	6(7)	83	55	16	19	10
Croatia (1956)	19	75(17)	23	47	6(7)	80	61	25	14	18
Lithuania (1348)	9	71(18)	18	46	7(5)	76	49	26	25	13
Kyrgyzstan (733)	9	64(13)	17	45	8(8)	86	34	9	4	8
Poland (8330)	35	72(16)	15	49	6(9)	76	51	27	19	21
Portugal (1856)	21	75(19)	15	45	5(10)	73	59	50	19	18
Argentina (3300)	37	70(19)	12	43	4(7)	71	59	26	10	24
Malaysia (3213)	25	62(20)	12	35	5(8)	67	50	39	5	22
Moldova (752)	13	71(11)	12	53	8(9)	91	30	17	27	12
Belarus (2098)	4	70(16)	10	47	6(7)	91	26	33	22	9
Chile (1177)	10	69(18)	10	47	6(9)	75	63	16	10	26
Greece (1292)	12	66(17)	9	37	4(6)	60	59	40	12	39
Hungary (1806)	29	72(16)	9	51	5(7)	80	58	20	13	18
Peru (1302)	14	71(18)	9	41	7(8)	65	49	8	8	16
South Korea (4206)	26	71(19)	9	39	3(6)	56	50	24	9	32
Ukraine (6497)	34	70(14)	7	48	8(7)	86	29	15	18	14

Dominican Republic (454)	4	68(22)	6	41	5(7)	75	62	9	7	15
Guatemala (331)	3	67(20)	6	51	11(13)	72	58	9	5	17
Romania (3028)	32	72(16)	6	46	8(11)	77	38	27	19	17
South Africa (2276)	53	67(22)	5	50	9(11)	69	48	36	6	20
Brazil (7601)	101	69(19)	4	49	7(10)	73	54	14	6	20
Egypt (4317)	32	64(16)	4	44	11(8)	71	52	17	12	29
Philippines (3314)	45	61(18)	4	43	7(10)	74	31	17	3	17
Spain (1535)	40	74(19)	4	43	6(10)	70	65	48	17	25
United Arab Emirates (406)	5	55(20)	4	23	4(5)	68	52	12	2	21
Azerbaijan (260)	4	63(13)	3	37	16(8)	96	38	18	3	35
Mexico (2297)	61	69(21)	3	48	8(11)	68	60	9	7	21
Nepal (274)	13	69(15)	3	42	7(9)	58	37	7	7	35
Serbia (683)	2	73(17)	3	48	9(10)	83	54	7	17	18
Algeria (840)	4	70(20)	2	54	14(5)	78	63	5	14	16
Bosnia and Herzegovina (226)	1	79(15)	2	47	6(8)	80	54	15	17	12
India (8481)	85	62(18)	2	53	7(7)	64	55	7	5	23
Indonesia (5343)	49	61(15)	2	32	7(8)	63	33	18	3	20
Jordan (255)	4	63(15)	2	40	7(8)	85	62	32	8	47
Australia (266)	2	77(14)	2	40	4(7)	69	64	41	28	17
Kazakhstan (229)	5	66(15)	1	40	8(6)	89	38	14	11	15
Saudi Arabia (289)	2	64(23)	1	40	2(4)	67	68	11	3	18
Turkey (699)	2	68(20)	1	43	2(4)	66	57	8	8	16
Iran (237)	1	71(20)	0.3	46	12(12)	63	27	7	5	25
Russia (386)	5	69(16)	0.1	46	7(8)	93	25	6	26	27

NIHSS -National Institutes of Health Stroke Scale; DM - Diabetes Mellitus; HTN - Hypertension; HLD - Hyperlipidaemia; AF - Atrial Fibrillation; NR- Not Reported, Presence of Risk Factors defined at the discretion of each investigator

Quartile 1, Quartile 2, Quartile 3, Quartile 4.

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225 Table 1 summarizes the demographic and clinical characteristics of stroke patients across countries,
 226 with a heatmap highlighting variations. Countries with the highest capture rates in RES-Q include
 227 Thailand (92%), Slovakia (84%), Czech Republic (74%), and Estonia (72%), suggesting well-
 228 integrated stroke data collection systems.

229 Table 2 highlights stroke treatment efficiency. The Czech Republic (52% IVT rate) leads in
 230 thrombolysis, showing high EMS usage and short DIT and DNT. In contrast, Brazil and Malaysia (1-
 231 3% IVT rate) report longer DIT and DNT.

232

233 **Table 2 - Stroke Quality Care Indexes by Country (n = 218,832 from 47 countries): Intravenous**
 234 **thrombolysis rate (IVT rate), EMS - Emergency Medical Services, SU/ICU - Intensive Care**
 235 **Unit, DIT - Door to Image Time, DNT- Door to Needle Time - Countries are ranked by the**
 236 **estimation of the Percentage of captured ischemic stroke patients**

Country	Estimation of percentage of stroke captured in RES-Q	IVT rate	EMS %	SU/ICU %	DIT (median-IQR)	DNT (median-IQR)
Thailand	92	12	7	93	28(15-47)	42(31-57)
Slovakia	84	21	96	69	15(10-26)	30(20-45)
Czech Republic	74	52	91	90	10(5-18)	22(15-32)
Estonia	72	27	88	80	18(10-36)	29(20-47)
Latvia	63	16	96	83	32(18-52)	31(21-45)
Vietnam	32	5	19	87	20(10-39)	36(25-49)
Colombia	28	6	29	52	27(14-46)	52(34-71)
Bulgaria	27	4	68	86	30(14-52)	42(30-57)
Croatia	23	5	76	49	25(17-44)	35(28-54)
Lithuania	18	7	93	57	16(9-30)	25(18-37)
Kyrgyzstan	17	NR	44	82	53(30-72)	NR
Poland	15	5	84	95	24(15-40)	33(23-49)
Portugal	15	4	76	86	33(21-49)	46(32-64)
Argentina	12	2	45	67	30(16-57)	50(34-70)
Moldova	12	2	88	36	27(15-50)	62(40-81)
Malaysia	12	3	40	57	30(17-46)	53(42-68)
Belarus	10	2	97	90	28(18-40)	63(46-85)
Chile	10	2	32	77	32(20-51)	46(31-58)
Greece	9	2	48	22	30(15-47)	55(40-75)
Peru	9	1	13	29	36(22-60)	68(47-92)
South Korea	9	1	50	53	23(16-36)	41(32-53)
Hungary	9	2	82	68	31(18-50)	59(43-81)
Ukraine	7	2	87	80	10(9-21)	24(20-41)
Romania	6	1	91	24	30(17-50)	44(34-59)
Dominican Republic	6	1	22	51	25(15-45)	59(34-91)
Guatemala	6	1	30	15	26(15-58)	48(33-74)
South Africa	5	1	39	68	24(13-44)	39(21-70)
Philippines	4	1	30	54	20(11-40)	38(25-52)
Brazil	4	1	52	69	22(12-42)	46(30-66)
Egypt	4	1	27	93	20(15-30)	33(26-43)
Spain	4	1	65	86	21(14-32)	40(29-58)
United Arab Emirates	4	1	53	44	25(17-46)	52(42-65)
Mexico	3	1	25	28	27(15-47)	43(30-67)
Azerbaijan	3	NR	84	81	50(40-84)	NR
Nepal	3	0.2	45	46	30(18-42)	80(54-100)
Serbia	3	1	63	25	16(11-29)	60(47-75)
Bosnia and Herzegovina	2	0.1	73	26	33(22-52)	56(48-63)

Jordan	2	1	29	54	15(10-20)	40(30-55)
Algeria	2	1	11	99	15(5-20)	20(9-30)
India	2	1	44	90	18(11-30)	35(29-48)
Indonesia	2	0.3	11	54	25(15-43)	41(30-55)
Australia	2	0.3	74	78	34(25-50)	57(47-76)
Kazakhstan	1	0.2	97	82	10(6-17)	30(22-35)
Saudi Arabia	1	0.04	24	12	28(14-50)	66(44-84)
Turkey	1	0.03	29	17	32(20-47)	50(45-70)
Iran	0	0.2	44	73	11(8-24)	18(15-25)
Russia	0	0.03	92	100	10(5-16)	35(27-45)

IQR - Interquartile Interval. NR- Not reported. Standardized definitions were used for all variables

237

238

239 Insert Figure 4-A-D here

240 Figure 4 A-D - Stroke Care Indexes according to Country with each dot representing a hospital,
241 distinguished by a unique colour code to characterize its Stroke/IVT volume by quartile

242 Figure 4 (A-D) presents scatter plots comparing stroke care quality indicators across countries.
243 Figures 4A and 4B examine the percentage of stroke cases captured in RES-Q, while Figures 4C and
244 4D assess IVT rates. Each dot represents a hospital, color-coded by patient volume.

245 In Figure 4A, Czech Republic and Slovakia report high EMS usage (>75%) and strong RES-Q
246 participation (>70%), suggesting efficient prehospital care. In contrast, Brazil and Indonesia show
247 broader EMS variability, with many hospitals below 50% EMS. Figure 4B illustrates SU/ICU
248 admissions, where Czech Republic and Slovakia maintain high rates ($\geq 75\%$), especially in high-
249 volume hospitals.

250 Figures 4C and 4D introduce critical thresholds (30 and 60 min) for imaging and treatment. Czech
251 Republic, Slovakia, and Estonia achieve DIT <30 min, while Mexico and Brazil struggle with longer
252 imaging times. Figure 4D reveals that Czech Republic and Slovakia meet the DNT ≤ 60 min
253 benchmark, while Brazil, Philippines, and Mexico report DNT >60 min, some exceeding 90 min.
254 These delays correlate with lower IVT rates, highlighting inefficiencies in stroke treatment delivery.

255 To explore potential relationships between Number of Patients and Stroke Quality Care Indexes,
256 Figure 5 presents correlation results. The EMS (%) (5-A) variable showed no significant association,
257 while the SU/ICU%, DIT, and DNT (5B-5D) presented a significant association. The SU/ICU

258 association was positive (i.e. higher volume associated with a higher SU/ICU%) while DIT and DNT
259 had negative correlation (i.e. higher volume associated with shorter DIT and DNT).

260 Insert Figure 5A-D

261 Figure 5A-D: Correlation between Number of Strokes/IVTs per Hospital and Stroke Quality Care
262 Indexes

263 **Discussion**

264 This study provides an international analysis of acute ischemic stroke care quality across 47 countries,
265 utilizing patient-level data from RES-Q. While our analysis focused specifically on acute care
266 processes, RES-Q also collects a wide range of post-acute indicators, including length of stay,
267 rehabilitation access, and in some cases, functional outcomes. These variables were not included in
268 the present report, as they fall outside the scope of our primary objectives. Nonetheless, efforts are
269 underway to expand outcome reporting through enhanced IT infrastructure and integration of patient-
270 reported outcome measures (PROMs)²⁴.

271 Several countries achieved exceptional data coverage, capturing between 63% and 92% of their
272 estimated national stroke burden. This level of participation enables meaningful benchmarking and
273 supports system-level improvement. A relevant comparison is the GWTG-Stroke registry²⁵, which
274 over two decades reached 75% coverage across 2,865 hospitals in the U.S. In contrast, RES-Q has
275 rapidly scaled across 73 countries and collected data from over 850,000 stroke patients in just 7 years.
276 Five countries have captured more than 50% of their national stroke burden, underscoring RES-Q's
277 early success. However, in many countries, coverage remains below 10%, and participating hospitals
278 may disproportionately represent high-performing centers. Broader engagement with national
279 stakeholders—including Ministries of Health—could enhance representativeness.

280 The RES-Q sample spans a wide range of ischemic stroke incidence levels, though nearly half of
281 countries fall within lower to mid-range bands (<88.64 per 100,000 population). This modest
282 overrepresentation of lower-burden countries should be considered when interpreting
283 generalizability. Importantly, countries like the Czech Republic and Thailand demonstrate that robust
284 nationwide quality control is feasible, offering models for others aiming to strengthen systemic
285 commitment. Participation in RES-Q is driven by varied motivations, including internal quality
286 monitoring, national certification, research, and policy alignment. Some countries, such as Czechia
287 and Mexico, aim to build national registries through RES-Q, while others, including Kyrgyzstan and
288 Moldova, embed participation within government strategies.

289 Performance data reveal considerable variability. The Czech Republic, for example, achieved a 52%
290 IVT rate, 91% EMS utilization, and a median door-to-needle time (DNT) of 22 minutes—indicating
291 strong coordination across prehospital and hospital phases. In contrast, Vietnam reported lower IVT
292 (4.6%) and EMS use (19%) but maintained a relatively efficient DNT of 36 minutes. Higher-volume
293 hospitals were also associated with faster treatment, with median DNTs of 36 minutes compared to
294 58 minutes in lower-volume centers. This may reflect more experienced staff, streamlined workflows,
295 or stronger engagement in quality monitoring²².

296 This study has several limitations. Participation in RES-Q is voluntary, and data completeness varies
297 by country and institution. Hospitals contributing data are often better resourced or more motivated
298 by quality initiatives, introducing potential selection bias and limiting cross-country comparisons. A
299 key strength, however, is RES-Q's standardized patient-level data collection and rapid availability of
300 results—typically entered between hospital discharge and the 3-month follow-up. This facilitates
301 ongoing local monitoring, enables the evaluation of quality improvement efforts, and is consistent
302 with prior evidence demonstrating that feedback-driven benchmarking can enhance stroke care^{26, 27}.
303 One remaining limitation is the inability to distinguish between stroke unit and ICU care in many
304 hospitals, often due to a lack of standardized definitions.

305 Finally, the study also highlights variability in the scientific value of data across countries, which
306 often reflects disparities in stroke care infrastructure and documentation. Recognizing these
307 differences is important not only for interpreting benchmarking results, but also for encouraging
308 broader participation and more equitable data contributions globally.

309 **Conclusion**

310 This study demonstrates the immense potential for stroke care quality improvement through timely
311 access to performance feedback, international benchmarking, and national-scale quality control. The
312 RES-Q platform enables hospitals to enter data electronically (usually between discharge and 3-
313 month visit) and provides immediate access to dashboards that offer feedback on key quality
314 indicators. Several countries across different continents and economic backgrounds successfully
315 monitor up to 92% of all strokes, demonstrating that such achievements are feasible and can inspire
316 others. However, in many countries, quality control remains limited to a few hospitals, underscoring
317 the need for greater stakeholder involvement, particularly from Ministries of Health and professional
318 societies. Our findings highlight variability in EMS utilization, IVT access, and treatment logistics,
319 emphasizing international benchmarking as a tool for stroke care improvement. Expanding

320 participation in quality monitoring initiatives has the potential to enhance stroke care and improve
 321 global patient outcomes.

322

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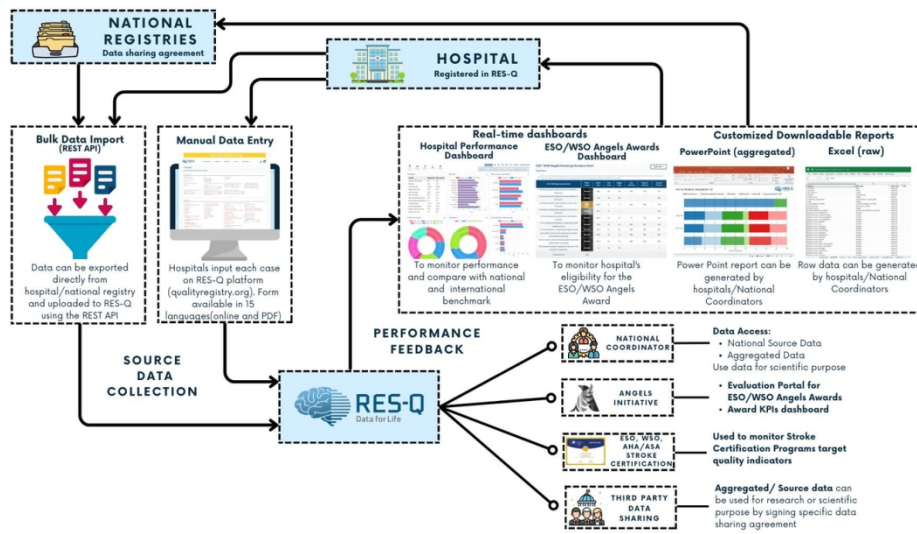


Figure 1 - RES-Q Data Flow and Performance Feedback System

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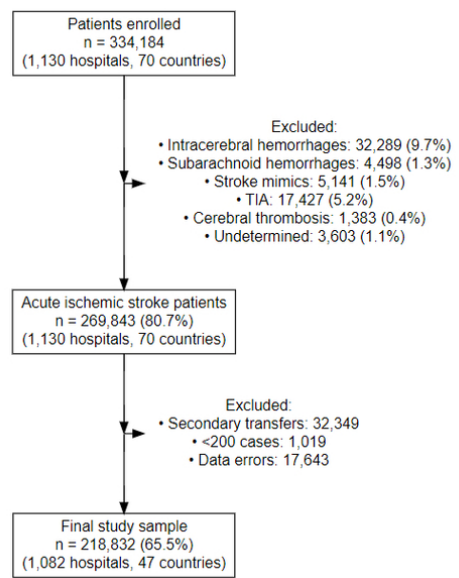


Figure 2 -CONSORT Diagram of Patient and Country Inclusion in the RES-Q Registry Analysis

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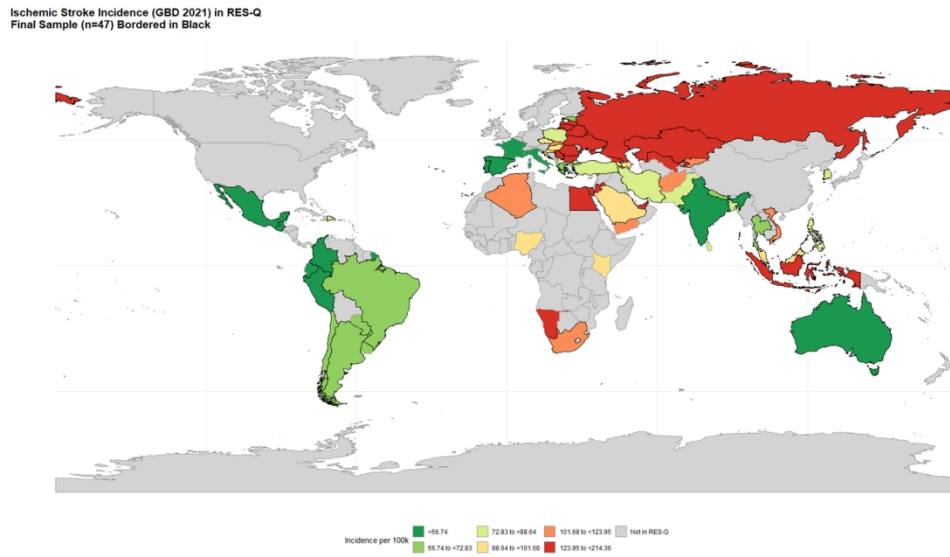


Figure 3 - Global Map of Ischemic Stroke Incidence and RES-Q Country Participation

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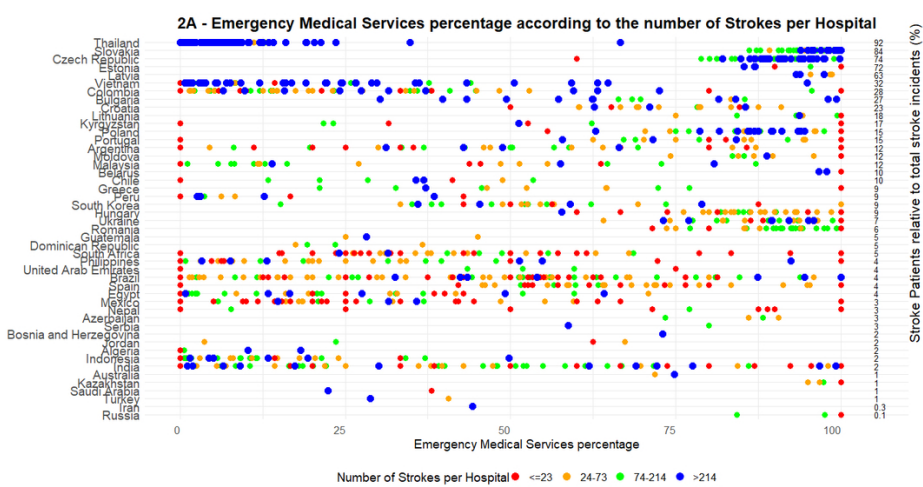


Figure 4 A-D - Stroke Care Indexes according to Country with each dot representing a hospital, distinguished by a unique colour code to characterize its Stroke/IVT volume by quartile

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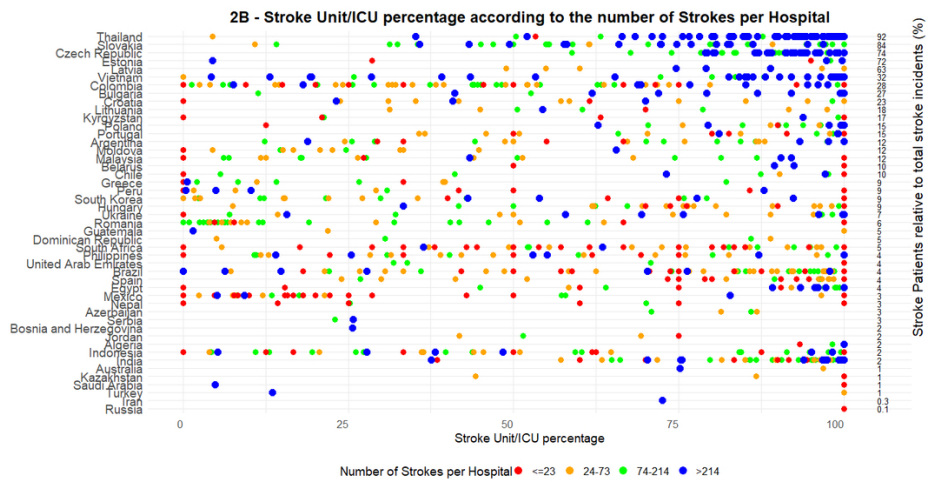


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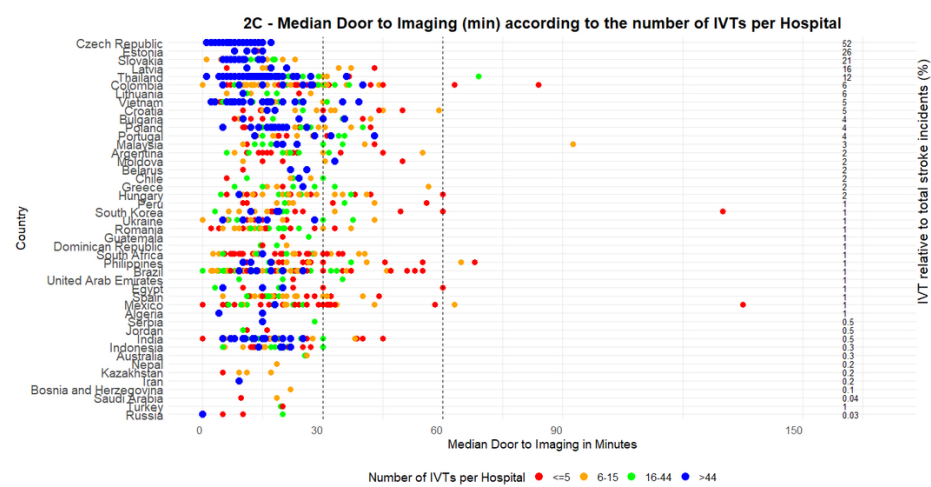


Figure 4 A-D - Stroke Care Indexes according to Country with each dot representing a hospital, distinguished by a unique colour code to characterize its Stroke/IVT volume by quartile

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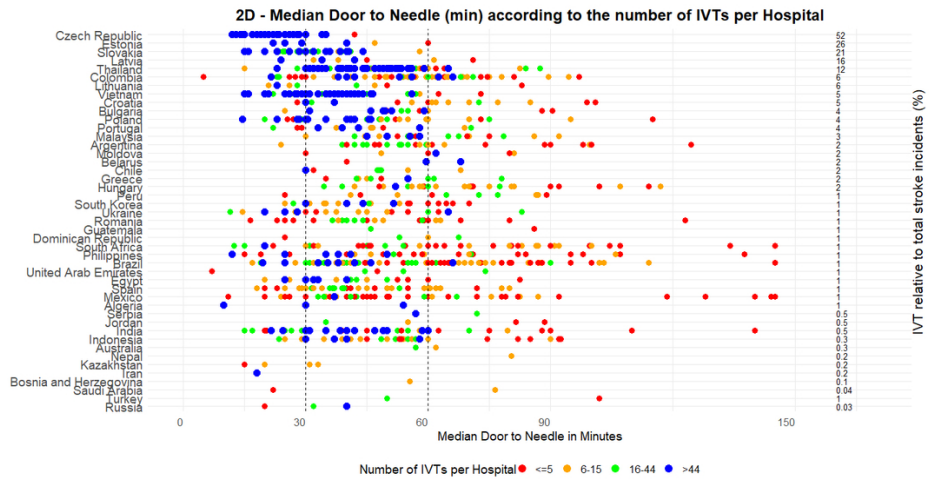


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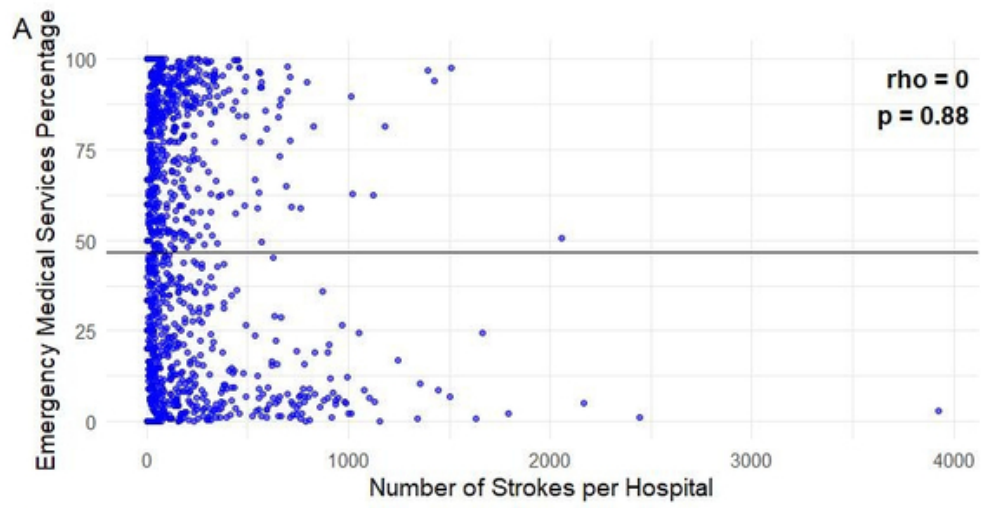


Figure 5A-D: Correlation between Number of Strokes/IVTs per Hospital and Stroke Quality Care Indexes
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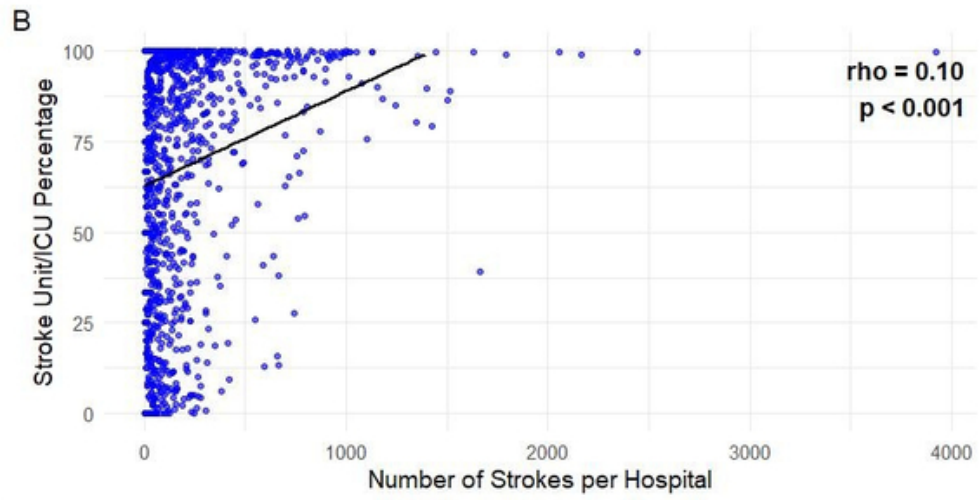


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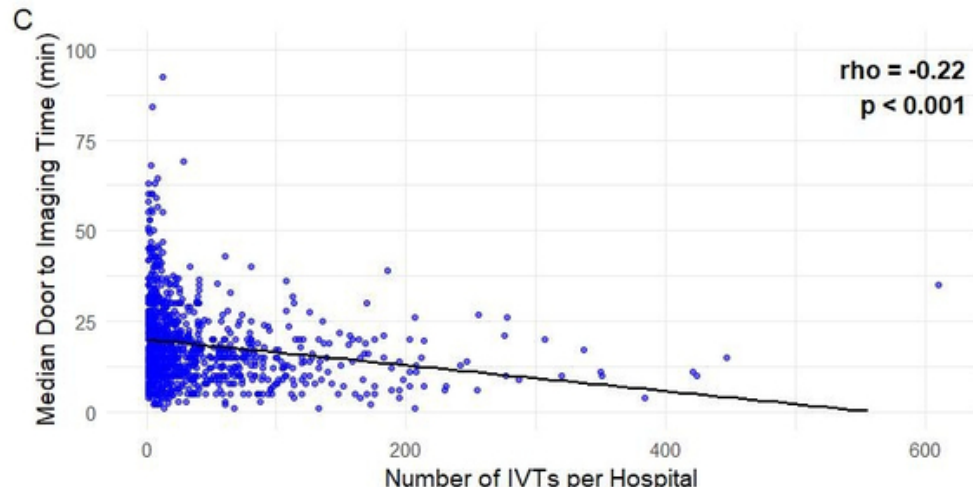


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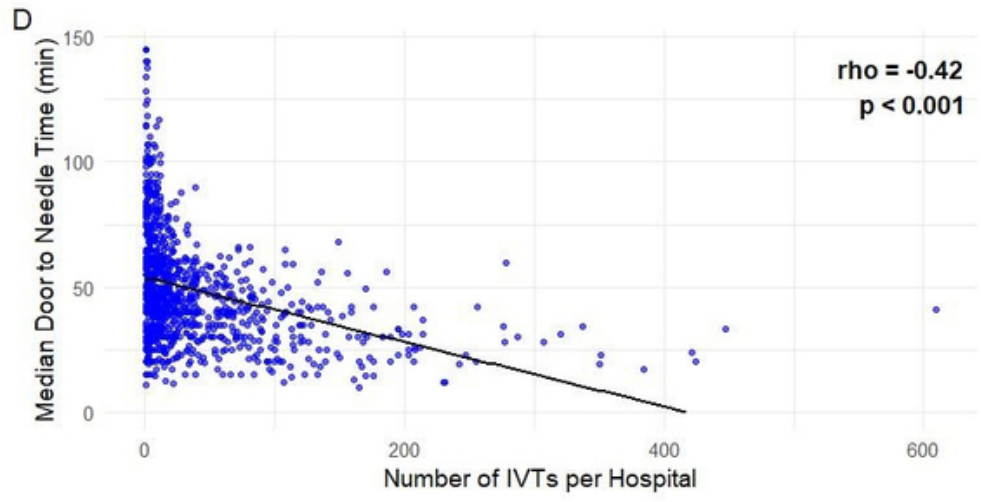


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