

**Table 1 Patient and practice characteristics categorised by World Bank country income category (CIC)**

Category	Detail	World Bank Income CIC			Significance
		High	Upper-middle	Lower-middle or low	
Participant characteristics	Number	2576	5859	3907	N/A
Countries	Number	10	11	7	"
Centres	Number	38	50	20	"
<b>Patient characteristics</b>					
Age	Mean (SD)	65.8 (13.8)	62.7 (13.3)	59.1 (13.5)	P<0.0001
Sex	n (%) male	1543 (60%)	3331 (57%)	2359 (60%)	P=0.001
Education	None/primary	449 (17%)	3832 (66%)	2234 (58%)	P<0.0001
	High school, trade college or university	2127 (83%)	2025 (34%)	1673 (42%)	
Charleston Index Comorbidity	None	730 (28%)	1886 (32%)	1430 (37%)	P<0.0001
	One or more	1845 (72%)	3972 (68%)	2477 (63%)	
Independent Pre-stroke	Modified Rankin Scale 0-2	2481 (96%)	5794 (99%)	3871 (99%)	P=0.001
Stroke classification	Intracerebral haemorrhage	258 (10%)	1666 (28%)	1275 (32%)	P<0.0001
	Infarct – Total Anterior Circulation	111 (4%)	280 (5%)	208 (5%)	
	Infarct – Partial Anterior Circulation	1022 (40%)	1927 (33%)	1319 (34%)	
	Infarct – Posterior Circulation	406 (16%)	549 (9%)	311 (8%)	
	Infarct – Lacunar	706 (27%)	1149 (20%)	574 (15%)	
	Unclassified	70 (3%)	288 (5%)	219 (6%)	
Level of consciousness	Reduced	189 (7%)	1640 (28%)	2116 (54%)	P<0.0001
Baseline dependency (modified Rankin score; mRS)	Mild (mRS 0-2)	1605 (62%)	2180 (37%)	894 (23%)	P<0.0001
	Moderate (mRS 3)	472 (18%)	1636 (28%)	994 (25%)	
	Severe (mRS 4)	373 (15%)	1391 (24%)	1076 (28%)	
	Very severe (mRS 5)	126 (5%)	651 (11%)	942 (24%)	
Length of stay in hospital	Mean (days)	9	16	6	P<0.0001
<b>Investigations performed in hospital</b>					
Investigations	CT scan on day 1	2460 (96%)	5567 (95%)	3455 (89%)	P<0.0001
	MRI scanning	503 (20%)	611 (10%)	43 (1%)	P<0.0001
	Holter monitoring	608 (24%)	94 (2%)	2 (1%)	P<0.0001
	Carotid Doppler	1653 (64%)	1175 (20%)	76 (2%)	P<0.0001
<b>Treatments given in hospital</b>					
Treatments	Antiplatelet drugs for cerebral infarct	2344 (91%)	5121 (87%)	3116 (85%)	P<0.0001
	Lipid lowering for cerebral infarct	1865 (72%)	4222 (72%)	3140 (80%)	P<0.0001
	Thrombolysis (iv) for infarct <sup>(a)</sup>	463 (20%)	168 (4%)	73 (3%)	P<0.0001
	Carotid intervention for infarct <sup>(a, b)</sup>	79 (3%)	16 (<1%)	2 (<1%)	P<0.0001
	BP lowering for any stroke	1818 (71%)	3881 (66%)	2972 (76%)	P<0.0001
<b>Services available at centre</b>					
Hospital type	Tertiary (versus secondary or local)	1839 (72%)	3090 (53%)	2690 (69%)	P<0.0001 *
Medical stroke specialist availability	Any stroke specialist available	2397 (96%)	5155 (88%)	2410 (62%)	P<0.0001 *
	Capacity to look after >50% of patients	2259 (90%)	4805 (82%)	1512 (39%)	P<0.0001 **
Stroke unit availability	Any stroke unit available	2370 (92%)	1323 (23%)	2362 (61%)	P<0.0001 **

	Capacity to look after >50% of patients	2236 (89%)	1297 (22%)	1334 (34%)	P<0.0001 **
	Unit meets all key characteristics <sup>(c)</sup>	1767 (71%)	1088 (19%)	783 (20%)	P<0.0001 **
	Unit meets all staffing benchmarks <sup>(d)</sup>	475 (18%)	408 (7%)	723 (18%)	P<0.0001 **
Post-discharge rehabilitation	Any service available	2357 (92%)	2170 (37%)	1214 (31%)	P<0.0001 **
Family training in rehabilitation	Any education of family reported	2169 (84%)	4418 (75%)	2509 (64%)	P<0.0001 *

The table summarises regional variations in the patient characteristics, services investigations and treatments available for stroke participants recruited to INTERSTROKE and grouped according to World Bank Income Category. Note all patients recruited were expected to have brain imaging (usually CT scan) and a 12 lead ECG.

Key: mRS = modified Rankin Scale; CT = Computerised Tomography; MRI = Magnetic Resonance Imaging; BP=blood pressure.

a) Substantial missing data which were assumed to indicate non-treatment.

b) Usually carotid endarterectomy (a small number had carotid stenting).

c) The stroke unit characteristics included<sup>26</sup>; discrete ward, staff who specialise in stroke, regular multidisciplinary team (MDT) meetings, protocols for care in place, programmes of education and training for staff, information provided for patients and carers.

d) Basic stroke unit staffing was benchmarked <sup>26</sup> at a staff complement (to cover all shifts) of 1.0 whole time equivalent of nursing staff per bed, 0.1 whole time equivalent of therapist, and 0.1 whole time equivalent of doctor.

All comparisons are at the level of the patient. As the services available were clustered at centres we also compared at the level of the centres: \* Proportions differ at P<0.01; \*\* at P<0.0001.

**Table 2 Patient outcomes at one month by country wealth: univariate and multivariate analyses**

Outcome category at one month	Odds of a better outcome for each increase in ranking of country GDP				
	Univariate analysis (OR and 95% CI)	Multivariate analysis <sup>i</sup> (OR and 95% CI)	Multivariate analysis <sup>ii</sup> (OR and 95% CI)	Multivariate analysis <sup>iii</sup> (OR and 95% CI)	Multivariate analysis <sup>iv</sup> Clustered by centre (OR and 95%CI)
Full recovery (mRS 0-1) vs worse	<b>1·05 (1·04-1·05)</b> <b>P&lt;0·0001</b>	1·01 (0·99-1·01) P=0·72	1·00 (0·99-1·01) P=0·91	1·01 (0·99-1·00) P=0·07	1·01 (0·99-1·00) P=0·08
Independent (mRS 0-2) vs worse	<b>1·05 (1·05-1·06)</b> <b>P&lt;0·0001</b>	1·00 (0·99-1·01) P=0·95	1·00 (0·99-1·01) P=0·99	1·00 (0·99-1·01) P=0·99	1·01 (0·99-1·01) P=0·43
No major dependency (mRS 0-3) vs worse	<b>1·06 (1·05-1·08)</b> <b>P&lt;0·0001</b>	1·00 (0·99-1·01) P=0·59	1·00 (0·99-1·01) P=0·47	0·99 (0·99-1·02) P=0·07	1·00 (0·99-1·01) P=0·70
Without very severe dependency (mRS 0-4) vs worse	<b>1·10 (1·09-1·10)</b> <b>P&lt;0·0001</b>	<b>1·02 (1·01-1·04)</b> <b>P&lt;0·0001</b>	<b>1·03 (1·02-1·04)</b> <b>P&lt;0·0001</b>	<b>1·02 (1·01-1·03)</b> <b>P=0·0005</b>	<b>1·03 (1·02-1·04)</b> <b>P&lt;0·0001</b>
Alive (mRS 0-5) vs dead	<b>1·12 (1·11-1·14)</b> <b>P&lt;0·0001</b>	<b>1·05 (1·04-1·06)</b> <b>P&lt;0·0001</b>	<b>1·05 (1·04-1·06)</b> <b>P&lt;0·0001</b>	<b>1·05 (1·03-1·06)</b> <b>P&lt;0·0001</b>	<b>1·06 (1·04-1·07)</b> <b>P&lt;0·0001</b>

Data are Odds Ratio (95% CI); p value. Exploration of the association between country wealth and odds of patients having a better outcome (graded by the modified Rankin Scale; mRS) and the gross domestic product (GDP) ranked from lowest to highest income. The univariate analysis includes only country GDP ranked from the highest to lowest of the 28 included countries. i) Outcomes adjusted for country GDP ranking plus participant age, sex, education, pre-stroke disability, stroke type (haemorrhage or Oxfordshire Community Stroke Project category of infarct), number of comorbidities (Charleston comorbidity index), level of consciousness, and modified Rankin score at baseline (always recorded within 5 days of stroke onset). ii) Outcomes adjusted for all of the above plus common drugs given (antiplatelet, lipid-lowering, blood pressure-lowering treatment, and thrombolysis). iii) Outcomes adjusted for all of the above plus accounting for services available (medical stroke specialist, stroke unit, and rehabilitation post discharge). iv) Outcomes adjusted for those in ‡ plus clustering by centre.

**Table 3 Association of treatments available with patient outcomes at one month: univariate and multivariate analyses**

Outcome at one month	Treatment provided or service available at the recruiting centre	Univariate analysis Odds Ratio (95% CI) P value	Multivariate analysis (i) Odds Ratio (95% CI) P value	Multivariate analysis (ii) Odds Ratio (95% CI) P value	Multivariate analysis (iii) Odds ratio (95% CI) P value
Alive without severe dependency (mRS 0-3)	Antiplatelet therapy for infarct	<b>1.84 (1.61-2.10)</b> <b>P&lt;0.0001</b>	<b>1.28 (1.08-1.51)</b> <b>P=0.0050</b>	<b>1.29 (1.09-1.53)</b> <b>P=0.0030</b>	1.12 (0.95-1.34) P=0.19
	Thrombolysis for infarct	1.13 (0.91-1.41) P=0.28	1.09 (0.83-1.43) P=0.54	1.06 (0.80-1.39) P=0.69	0.90 (0.68-1.18) P=0.44
	Medical stroke specialist available *	<b>1.79 (1.61-1.98)</b> <b>P&lt;0.0001</b>	1.04 (0.91-1.18) P=0.61	0.97 (0.82-1.14) P=0.69	0.91 (0.77-1.08) P=0.93
	Stroke unit available *	<b>1.25 (1.14-1.36)</b> <b>P&lt;0.0001</b>	<b>1.42 (1.27-1.59)</b> <b>P&lt;0.0001</b>	<b>1.42 (1.27-1.60)</b> <b>P&lt;0.0001</b>	<b>1.29 (1.14-1.44)</b> <b>P&lt;0.0001</b>
	Post-discharge rehabilitation available *	<b>1.55 (1.43-1.70)</b> <b>P&lt;0.0001</b>	<b>1.20 (1.06-1.35)</b> <b>P=0.0030</b>	<b>1.37 (1.20-1.57)</b> <b>P&lt;0.0001</b>	<b>1.18 (1.03-1.35)</b> <b>P=0.0210</b>
Alive (mRS 0-5)	Antiplatelet therapy for infarct	<b>2.47 (2.07-2.96)</b> <b>P&lt;0.0001</b>	<b>1.65 (1.34-2.03)</b> <b>P&lt;0.0001</b>	<b>1.62 (1.32-1.99)</b> <b>P&lt;0.0001</b>	<b>1.39 (1.12-1.72)</b> <b>P=0.0030</b>
	Thrombolysis for infarct	<b>1.67 (1.15-2.43)</b> <b>P=0.0070</b>	1.43 (0.94-2.17) P=0.09	1.10 (0.72-1.69) P=0.66	0.85 (0.55-1.31) P=0.46
	Medical stroke specialist available *	<b>1.62 (1.32-2.00)</b> <b>P&lt;0.0001</b>	1.22 (0.97-1.54) P=0.09	1.26 (0.99-1.59) P=0.05	1.20 (0.94-1.52) P=0.14
	Stroke unit available *	<b>1.23 (1.09-1.39)</b> <b>P=0.0010</b>	<b>1.17 (1.01-1.34)</b> <b>P=0.0340</b>	<b>1.18 (1.03-1.36)</b> <b>P=0.0200</b>	1.00 (0.86-1.16) P=0.99
	Post-discharge rehabilitation available *	<b>3.79 (3.28-4.38)</b> <b>P&lt;0.0001</b>	<b>2.26 (1.91-2.66)</b> <b>P&lt;0.0001</b>	<b>1.90 (1.58-2.28)</b> <b>P&lt;0.0001</b>	<b>1.54 (1.28-1.85)</b> <b>P&gt;0.0001</b>

Data are Odds Ratios (95% CI); p value. The multivariate analysis used multivariate regression to show case-mix adjusted outcomes. mRS=modified Rankin Scale. i) Outcomes adjusted for participant age, sex, education, pre-stroke disability, stroke type (haemorrhage or Oxfordshire Community Stroke Project category of infarct), number of comorbidities (Charleston comorbidity index), level of consciousness, and modified Rankin score at baseline (always recorded within 5 days of stroke onset). ii) Outcomes adjusted for all of the above plus country income (GDP ranking). iii) Outcomes adjusted for all those in iv) plus centre. §Service available at the recruiting centre but not necessarily received by every patient.

**Table 4 Association of access to stroke unit care with processes of care and patient outcomes at one month: univariate and multivariate analyses**

Outcome category at one month	Stroke unit available		Association with stroke unit availability		
	Yes	No	Univariate analysis OR (95% CI)	Multivariate analysis <sup>i</sup> OR (95% CI)	Multivariate analysis <sup>ii</sup> OR (95% CI)
<b>Process measures</b>					
CT scan conducted on day of admission	5727 (95%)	5754 (92%)	<b>1.69 (1.45-1.95)</b> P<0.0001	<b>1.66 (1.43-1.94)</b> P<0.0001	<b>1.35 (1.10-1.66)</b> P=0.0040
Antiplatelet for infarct	4148 (86%)	3554 (80%)	<b>1.49 (1.31-1.63)</b> P<0.0001	<b>1.40 (1.24-1.58)</b> P<0.0001	1.16 (0.99-1.34) P=0.06
Lipid lowering for infarct	3366 (70%)	2772 (63%)	<b>1.35 (1.23-1.47)</b> P<0.0001	<b>1.33 (1.21-1.47)</b> P<0.0001	1.17 (0.76-1.81) P=0.48
Thrombolysis for infarct	580 (12%)	123 (3%)	<b>4.74 (3.88-5.78)</b> P<0.0001	<b>3.65 (2.96-4.50)</b> P<0.0001	Insufficient data
BP lowering therapy given for any stroke	4357 (72%)	4313 (69%)	<b>1.17 (1.09-1.27)</b> P<0.0001	<b>1.29 (1.18-1.41)</b> P<0.0001	0.93 (0.73-1.17) P=0.52
Post-discharge rehabilitation provided	4564 (75%)	1198 (19%)	<b>13.0 (11.9-14.2)</b> P<0.0001	<b>18.2 (16.4-20.3)</b> P<0.0001	<b>86.7 (66.4-113)</b> P<0.0001
<b>Clinical outcomes at one month</b>					
Alive without severe dependency (mRS 0-3)	4936 (82%)	4907 (79%)	<b>1.25 (1.14-1.36)</b> P<0.0001	<b>1.41 (1.26-1.58)</b> P<0.0001	<b>1.29 (1.14-1.44)</b> P<0.0001
Alive (mRS 0-5)	5492 (91%)	5588 (89%)	<b>1.23 (1.09-1.39)</b> P=0.0010	<b>1.30 (1.12-1.49)</b> P<0.0001	1.00 (0.86-1.16) P=0.99

The table shows the number (percent) of patients in both service groups in each category of process measure (care received up to one month) and outcome measure (degree of recovery at one month post-stroke). Univariate analyses show the unadjusted odds ratio (OR) and 95% confidence interval (CI) for the association between access to stroke unit care and a better clinical outcome. The multivariate analysis used multivariate regression to show case-mix adjusted outcomes that were adjusted for; i) participant age, sex, education, pre-stroke disability, stroke type (haemorrhage or Oxfordshire community stroke project category of infarct), number of comorbidities (Charleston comorbidity index); level of consciousness, and modified Rankin score at baseline (always recorded within 5 days of stroke onset), plus country income (GDP ranking), ii) all of ii) plus centre.

Key: BP=blood pressure; mRS = modified Rankin Scale.