

Table S1: International Stroke Genetics Consortium-Intracranial Aneurysm Groups (in alphabetical order of the cohort's name)

COHORTS	Coordinating Institution
@neurIST_EMC_NL	Erasmus Medical Center, Rotterdam, The Netherlands
@neurIST_GVA_CH	Neurosurgery Division, Department of Clinical Neurosciences, Geneva University Hospitals, Geneva, Switzerland
@neurIST_HBAR_ES	Hospital clinic Barcelona and Barcelona hospital General de Catalunya, Barcelona, Spain
@neurIST_MUP_HU	University of Pecs, Pecs, Hungary
@neurIST_UOXF_UK	Radcliffe Infirmary, Oxford, United Kingdom
@neurIST_USFD_UK	Royal Hallamshire Hospital, Sheffield, United Kingdom
ACROSS_AUS	Australasian Cooperative Research on Subarachnoid Hemorrhage Study, Australia/New Zealand
BASICMAR_ES	IMIM and Hospital del Mar, Barcelona, Spain
CCC_USA	University of Cincinnati, College of Medicine, Cincinnati, Ohio, United States of America
FIA1_USA and FIA2_USA	University of Cincinnati, College of Medicine, Cincinnati, Ohio, United States of America Departments of Neurology and Public Health Sciences, University of Virginia School of Medicine, Charlottesville, Virginia, United States of America
FRCAN_CA	Montreal Neurological Institute and Hospital, McGill University, Montréal, Quebec, Canada
GERFHS1_USA and GERFHS2_USA	University of Cincinnati, College of Medicine, Cincinnati, Ohio, United States of America
GOSH_UK	Stroke Research Centre, University College London Queen Square Institute of Neurology, London, United Kingdom
GSA_NL	Department of Neurology and Neurosurgery, University Medical Center, Utrecht Brain Center, Utrecht University, Utrecht, The Netherlands
HUCH_FI	Department of Neurosurgery, Helsinki University Hospital, University of Helsinki, Finland
ICAN_FR	Université de Nantes, CHU Nantes, INSERM, CNRS, l'institut du thorax, Nantes, France CHU Nantes, Department of Neuroradiology, Nantes, France
JUMC_PL	Department of Neurology, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland
KIAD_FI	Neurosurgery NeuroCenter Kuopio, University Hospital Kuopio, Finland
UCSF_USA	Department of Neurology, University of California at San Francisco, San Francisco, United States of America
UMCU2_NL	Department of Neurology and Neurosurgery, University Medical Center, Utrecht Brain Center, Utrecht University, Utrecht, The Netherlands.

Table S2: Characteristics of the different cohorts

COHORTS	Cohort basis recruitment	Cohort's inclusion and exclusion criteria
@neurIST_EMC_NL	Aneurysmal SAH oriented cohort	Patients were recruited based on the diagnosis of IA by angiographic appearance (3D-DSA, 3D-MRA, or 3D-CTA) and by surgical documentation. SAH was verified by CT/MRI or by lumbar puncture. Patient had to be older than 14 years and had to provide consent. Patients with known genetic syndromes predisposing to IA (e.g., polycystic kidney disease or Ehlers-Danlos syndrome Type IV) were excluded from the study.
@neurIST_GVA_CH	Population-based cohort	
@neurIST_HBAR_ES	Aneurysmal SAH oriented cohort	
@neurIST_MUP_HU	Family-oriented IA cohort	
@neurIST_UOXF_UK	Aneurysmal SAH oriented cohort	
@neurIST_USFD_UK	Aneurysmal SAH oriented cohort	Australasian Cooperative Research on Subarachnoid Hemorrhage cohort. None of the patients could be included due to lack of phenotypic patient and aneurysm location and size information.
ACROSS_AUS		
BASICMAR_ES	Aneurysmal SAH oriented cohort	Since 2007, all consecutive patients with aSAH confirmed by cerebral angiography who were admitted and treated in Hospital del Mar in Barcelona, Spain were considered for inclusion in the study. Exclusion criteria were nonaneurysmal SAH, SAH due to another cerebral vascular malformation, lack of angiography data, or absence of genetic samples.
CCC_USA		Cincinnati control cohort. Data were used to verify the reference population.
FIA1_USA and FIA2_USA	Family-oriented IA cohort	Families with at least 2 members who had IA were ascertained through 26 clinical centers (41 sites) in North America, New Zealand, and Australia. Exclusion criteria included (i) fusiform-shaped unruptured IA of a major intracranial trunk artery; (ii) IA that is part of an arteriovenous malformation; (iii) family or personal history of polycystic kidney disease, Ehlers Danlos syndrome, Marfan's syndrome, fibromuscular dysplasia, or Moya-Moya disease; or (iv) failure to obtain informed consent from the patient or family members.
FRCAN_CA	Population-based cohort	Participants were recruited in Montréal and Québec City, Canada. Diagnoses were confirmed either by magnetic resonance angiography or by surgical confirmation (clipped or coiled).
GERFHS1_USA and GERFHS2_USA	Aneurysmal SAH oriented cohort	Patients in three counties in southwest Ohio and two counties in northern Kentucky (greater Cincinnati, Ohio region) whose SAH was confirmed by imaging and who consented to a detailed interview were included.
GOSH_UK	Aneurysmal SAH oriented cohort	Multicentre UK-wide study involving 20 neurosurgical centres. Included patients with proven IA, including angiographically-proven ruptured IA (irrespective of severity) and unruptured IA. Consent from subject(s) or nominated consultee(s) was obtained for all participants. Excluded patients with known inherited connective tissue disorders, such as Marfan's, Ehlers-Danlos syndrome, and adult polycystic kidney disease, as well as those with non-aneurysmal SAH (e.g., from arterio-venous malformations, trauma, mycotic aneurysms, and peri-mesencephalic SAH where no aneurysm was detected).

COHORTS	Cohort basis recruitment	Cohort's inclusion and exclusion criteria
GSA_NL	Aneurysmal SAH oriented cohort	Diagnosis of an IA was made either with computerized tomography angiogram, magnetic resonance angiogram, or cerebral digital subtraction angiogram; and was confirmed at surgery when applicable. Rupture of an aneurysm was defined by identification of acute subarachnoid or intracranial hemorrhage (through computerized tomography or magnetic resonance imaging) from a proven aneurysm. Subjects with SAH without saccular IA, non-saccular IA (such as fusiform aneurysms), and those with known genetic syndromes that are believed to predispose to IA (e.g., polycystic kidney disease or Ehlers-Danlos syndrome Type IV) were excluded from the study.
HUCH_FI		Rupture of an aneurysm was defined by identification of acute subarachnoid or intracranial hemorrhage (through computerized tomography or magnetic resonance imaging) from a proven aneurysm. Subjects with subarachnoid hemorrhage without saccular IA, non-saccular IA (such as fusiform aneurysms) and those with known genetic syndromes that are believed to predispose to IA (e.g., polycystic kidney disease or Ehlers-Danlos syndrome Type IV) were excluded from the study.
ICAN_FR	Population-based cohort	Sporadic and familial IA patients were collected. Exclusion criteria were fusiform or dissected IA, or IA related to an arteriovenous malformation. Patients were excluded if they had a family history of ADPKD, ED, Marfan's syndrome, fibromuscular dysplasia, or Moyamoya disease.
JUMC_PL	Aneurysmal SAH oriented cohort	IA cases were recruited from patients of the Department of Neurology and the Department of Neurosurgery and Neurotraumatology of the Jagiellonian University in Krakow, Poland. Subjects with ruptured or unruptured IA were recruited. Presence of IA was confirmed by intra-arterial angiogram, CTA, MRA, or intraoperatively.
KIAD_FI		Rupture of an aneurysm was defined by identification of acute subarachnoid or intracranial hemorrhage (through computerized tomography or magnetic resonance imaging) from a proven aneurysm. Subjects with subarachnoid hemorrhage without saccular IA, non-saccular IA (such as fusiform aneurysms) and those with known genetic syndromes that are believed to predispose to IA (e.g., polycystic kidney disease or Ehlers-Danlos syndrome Type IV) were excluded from the study.
UCSF_USA	Aneurysmal SAH oriented cohort	The University of California, San Francisco recruited a prospective cohort of adult patients with spontaneous SAH due to IA who were admitted to a tertiary-care referral center in San Francisco during 2003 to 2008. Cases were confirmed by non-contrast CT and cerebral angiogram. Exclusion criteria were the same as for the FIA cohort.
UMCU2_NL	Aneurysmal SAH oriented cohort	Patients diagnosed with an unruptured IA or aneurysmal SAH after 2011 in the University Medical Center Utrecht, The Netherlands, were recruited. Inclusion and exclusion criteria are identical to those of the GSA_NL cohort.

Table S3: Categories and definitions of the descriptors used to characterize patients and intracranial aneurysms

Data were collected prior to definitions established by the Common Data Elements project supported by the National Institute of Health.

Each raw data response was mapped to the appropriate element and standardized to the Common Data Elements definitions.

Descriptors	Categories	Definitions
Basis of recruitment	Subarachnoid hemorrhage	Patient diagnosed with subarachnoid bleed as a consequence of intracranial aneurysm rupture
	Symptomatic intracranial aneurysm	Patient diagnosed initially with a symptom associated with an intracranial aneurysm
	Incidental intracranial aneurysm	Patient incidentally diagnosed with intracranial aneurysm
	Case	Patients diagnosed with intracranial aneurysm(s) with unknown status of rupture
Sex	Female	Self-reported sex of the patient. Phenotype female
	Male	Self-reported sex of the patient. Phenotype male
Family History of IA	Yes	One or more 1st-degree relative(s) with intracranial aneurysm
	No	No 1st-degree relative with intracranial aneurysm
	Probably	A relative had a stroke but there is no definite diagnosis on the type of stroke
	Unknown	Unknown familial history of intracranial aneurysm
Hypertension status	AnyType	Yes – Untreated blood pressure greater than 140/90 mm Hg, and the patient does not take any antihypertensive treatment Yes – Treated and controlled blood pressure greater than 140/90 mm Hg, the patient takes antihypertensive treatment, and the blood pressure is in normal range Yes – Treated and uncontrolled blood pressure greater than 140/90 mm Hg, the patient takes antihypertensive treatment, but the blood pressure stays higher than normal blood pressure values
	Never	No – Blood pressure less than 120/80 mm Hg, or patient reports never having been diagnosed with high blood pressure
	Unknown	Hypertension status unknown
Smoking status	Current	Smoked (more than 300 cigarettes) and has smoked cigarettes with 6 months prior to recruitment
	Former	Smoked (more than 300 cigarettes), but stopped smoking at least 6 months ago
	No	Never smoked, or smoked fewer than 300 cigarettes in lifetime
	Unknown	Smoking status unknown
Age at time of aneurysm rupture	Age in years	Age of patient when intracranial aneurysm ruptured

Descriptors	Categories	Definitions
Multiplicity status	N number	Number of diagnosed intracranial aneurysms. In case of multiple aneurysms, the number of aneurysms was recorded if this information was available.
	Unknown	Unknown number of aneurysm
	Multiple aneurysm	Yes / No. In case of multiple aneurysms, the ruptured or the most critical aneurysm was identified by the recruiting investigator for the dataset.
Ruptured status	Yes	Patient known to have a ruptured intracranial aneurysm
	No	Patient known to never have a ruptured aneurysm
	Unknown	Rupture status of the aneurysm unknown
Maximum aneurysm diameter at rupture	Decimal	Maximum diameter size in mm
	Unknown	Maximal diameter unknown
Aneurysm location	<i>Abbreviation used in the manuscript</i>	<i>Location names given in the different cohorts</i>
	Acom	Anterior communicating artery, Acomm, ACoA, ACOM, Anterior circulation others, Comm anterior CoA forward, Comm anterior CoA forward-upward, Comm anterior CoA upward, Comm anterior CoA backward, Comm anterior CoA down
	A2	Distally to the Acom, Pericallosal cerebral artery, A2 segment ant, ACA-Anterior Cerebral Artery, A1-A2, PericalA, Pericallosal proximal, Pericallosal typical
	MCA	Middle cerebral artery, Sylvian bifurcation, M1 segment middle cerebral artery, M1 perforator artery, Middle cerebral bifurcation, Middle cerebral MCA main trunk
	Pcom	Posterior communicating artery starting proximal to the implantation of the posterior communication artery and extending up to the anterior choroidal artery, Posterior Comm, Pcomm, PcoA, PCOM
	ICA	Internal carotid artery extending from the anterior choroidal artery up to the ICA bifurcation including it, Anterior and superior wall carotid, Carotid bifurcation, Ant Choroidal segment carotid, other location carotid artery, Superior wall ICA, Lateral wall ICA CoP, Lateral wall ICA ChA
	cav-ICA	Intracavernous portion of ICA, Cavernous ICA
	ophthI-ICA	Ophthalmic segment of ICA starting immediately proximal to the ophthalmic artery departure and ending immediately proximal to the implantation of the posterior communication artery,

		Medial wall carotid, Ophthalmic Artery, OphtA, AOA, OA, ICA-opht, Medial wall ICA ophthalmic, Medial wall ICA distal, Inferior wall ICA
	A1	A1 anterior segment: aneurysms located on the anterior cerebral artery distal to the ICA bifurcation but proximal to the anterior communicating artery
	Basilar	Basilar artery, Basilar Tip, basilar artery bifurcation, BA, P1 posterior cerebral
	VB	Vertebro-basilar artery, vertebro-basilar junction, V4 segment vertebral artery, Basilar trunk, AICA, Superior cerebellar artery, PICA, vertebral artery, VB-Other Basilar and Vertebral, VA, SCA, Vertebral trunk, Basilar others, Basilar SCA, Vertebral = PICA origin, PICA distal
	PCA	Posterior cerebral artery, P1 Posterior cerebral artery, P2 posterior cerebral artery, P1-P2 junction posterior cerebral artery. Aneurysms located distally to the basilar bifurcation.
	Other	Distal to sylvian bifurcation, Distal ant cerebral artery, Distal posterior cerebral artery, other location, Middle cerebral peripheral, Pericallosal distal, P3 posterior cerebral distal
	Infundibulum	Vessel calibre irregularities that could not be clearly identified as aneurysms
	Unknown	Unknown

Table S4: Number of patients with ruptured intracranial aneurysm enrolled in the study following coherent recruitment and known location of their intracranial aneurysm

COHORTS	Number of patients with IA	% of patients in the global cohort	Number of patients with ruptured IAs, N (%)
@neurIST_EMC_NL	53	0.7	36 (67.9)
@neurIST_GVA_CH	266	3.3	146 (54.9)
@neurIST_HBAR_ES	89	1.1	70 (78.7)
@neurIST_MUP_HU	40	0.5	17 (42.5)
@neurIST_UOXF_UK	67	0.8	52 (77.6)
@neurIST_USFD_UK	33	0.4	24 (72.7)
BASICMAR_ES	98	1.2	98 (100)
FIA1_USA	360	4.5	158 (43.9)
FIA2_USA	675	8.4	290 (43.0)
FRCAN_CA	9	0.1	7 (77.8)
GERFHS1_USA	12	0.2	12 (100)
GERFHS2_USA	32	0.4	32 (100)
GOSH_UK	2275	28.5	1679 (73.8)
GSA_NL	945	11.8	653 (69.1)
HUCH_FI	496	6.2	366 (73.8)
ICAN_FR	898	11.2	354 (39.4)
JUMC_PL	497	6.2	423 (85.1)
KIAD_FI	264	3.3	189 (71.6)
UCSF_USA	127	1.6	127 (100)
UMCU2_NL	756	9.5	701 (92.7)
TOTAL	7992	-	5434 (68.0)

aSAH-oriented cohorts: @neurIST_EMC_NL, @neurIST_HBAR_ES, @neurIST_UOXF_UK, @neurIST_USFD_UK, BASICMAR_ES, GERFHS1_USA, GERFHS2_USA, GOSH_UK, GSA_NL, JUMC_PL, UCSF_USA, and UMCU2_NL.

Family-oriented IA cohorts: @neurIST_MUP_HU, FIA1_USA, FIA2_USA, HUCH_FI, and KIAD_FI.

Population-based cohorts that recruited IA, aSAH, and familial cases: @neurIST_GVA_CH, FRCAN_CA, and ICAN_FR.

Table S5 – Consortium members

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