

# St George and Sutherland Clinical School Research in Progress Meetings 2019

## Profile and Risk Factors of Post-Stroke Cognitive Impairment in Diverse Ethno- Regional Groups: the STROKOG consortium

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# St George and Sutherland Clinical School Research in Progress Meetings 2019

- About STROKOG
- Results from our first project



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# Consortia at CHeBA

- Combine data from cohort studies from around the world
- Provide larger sample sizes necessary to address important research questions
- Provide the ability to replicate findings in different geographical areas and ethnic groups
- Develop a research community

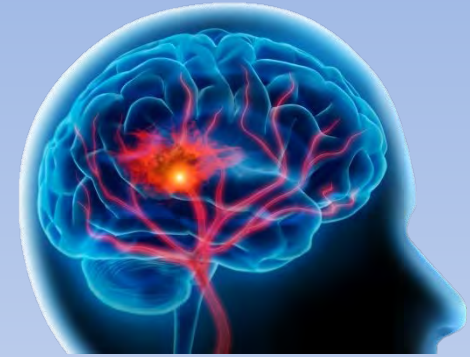


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# STROKOG

- a **consortium** which brings together international studies of cognitive decline and dementia following stroke or TIA
- **Led by** Perminder Sachdev
- **Established** in 2015



## Aims:

- Facilitate a better understanding of the determinants of vascular contributions to cognitive disorders;
- Help improve the diagnosis and treatment of vascular cognitive disorders.



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# Membership criteria

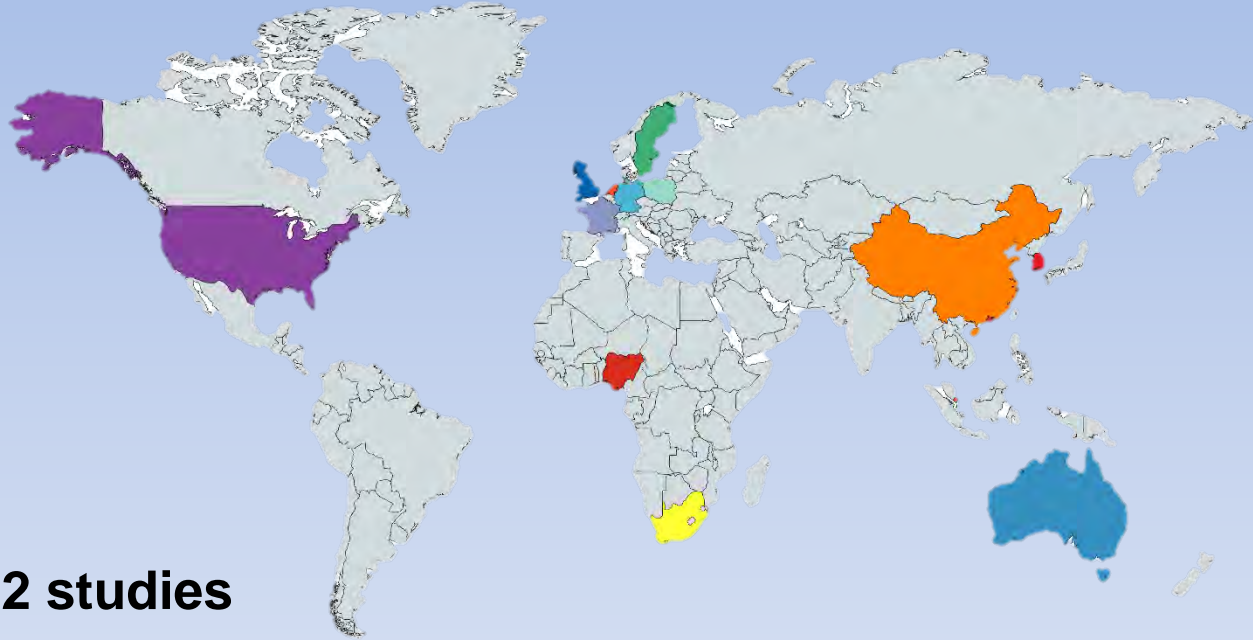
- **Prospectively** recruited patients with stroke/TIA
- **Longitudinal** (at least 1 follow-up)
- **N > 75**
- Major outcome measures include **dementia / CI**
  
- Willing to **share data**
- Willing to **contribute intellectually**



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# Our members



- **Currently 32 studies**
- **18 countries**
- **Total N >17,000**



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# STROKOG data

## Types of data

- Hospital + community based
- Various age ranges (18+, 40+, no limit)
- Follow-up: median 5 yr, up to 21 yr
- Sample size: 80 to 6000 (median 250)



## Assessments:

- ✓ neuropsychological test battery
- ✓ stroke-related data
- ✓ functional tests
- ✓ blood tests
- ✓ MRI (22 studies)
- ✓ PET (6 studies)
- ✓ GWAS (a few studies)

# Projects

- **First project** on the profile of and risk factors for post-stroke CI completed
- Welcome members and external researchers to propose and conduct projects. E.g.:
  - *External validation of dementia risk models in stroke-survivors*
  - Stroke recovery associated with cognitive impairment

Eugene Tang,  
Newcastle University, UK

Clare Flach  
King's College London,  
UK



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# First project

**Title: Profile of and risk factors for post-stroke cognitive impairment in diverse ethno-regional groups**

**Aim:**

- 1) To examine the profile of cognitive impairment at 1 – 6 months after stroke/TIA
- 2) To examine the relationship of vascular risk factors with post-stroke/TIA cognitive function



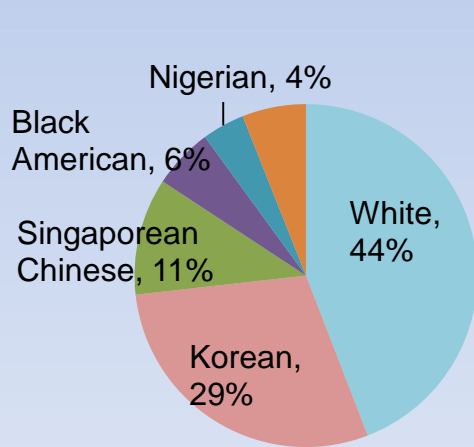
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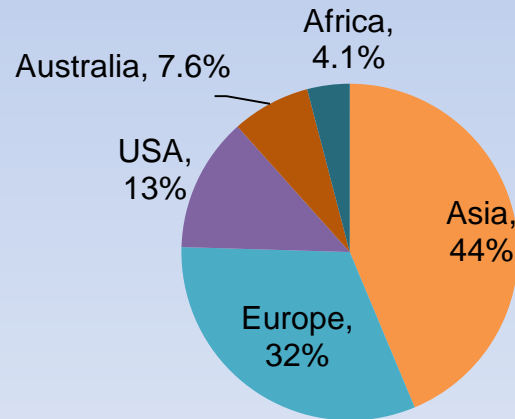
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# First project - demographics

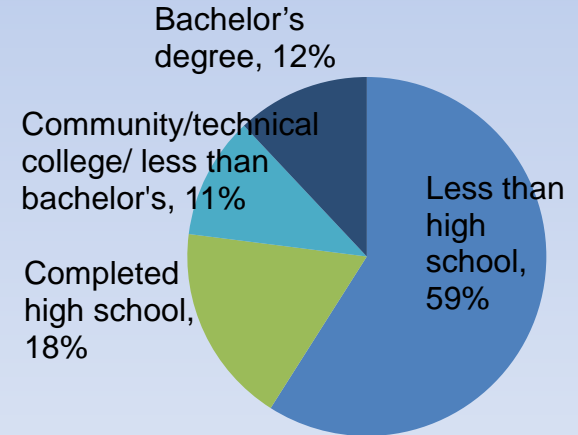
- **13 studies** from 8 countries
- **3,520** participants
- 39% female, 61% male
- Mean age: 67.0 years (SD=11)



**Race/ethnicity**

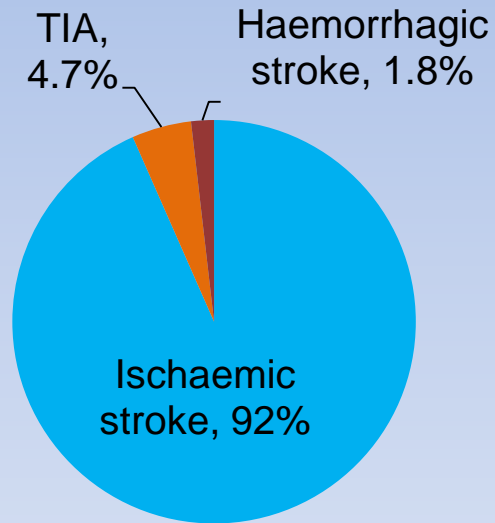


**Study location**

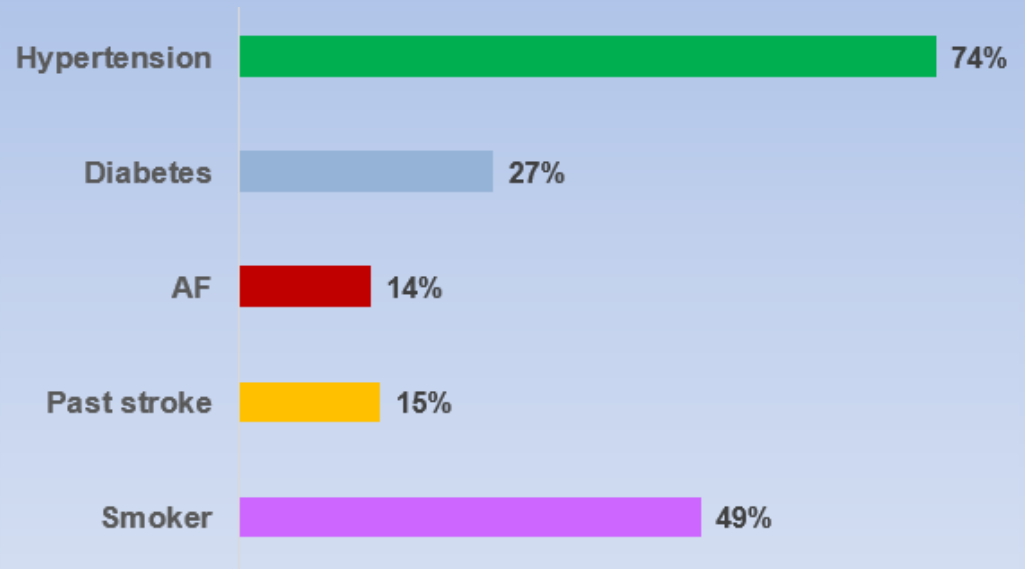


**Education level**

# First project - medical history



Index event

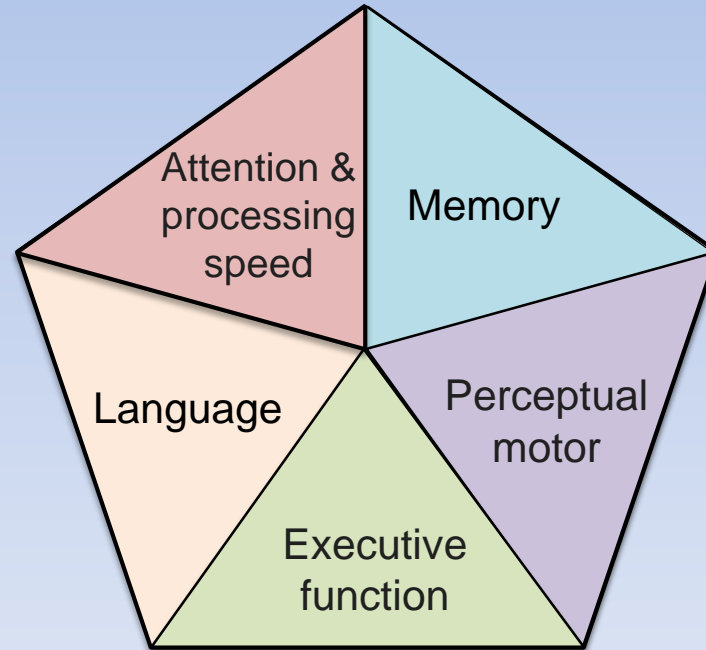


History of medical conditions

# First project – methods

## Harmonising neuropsychological test scores

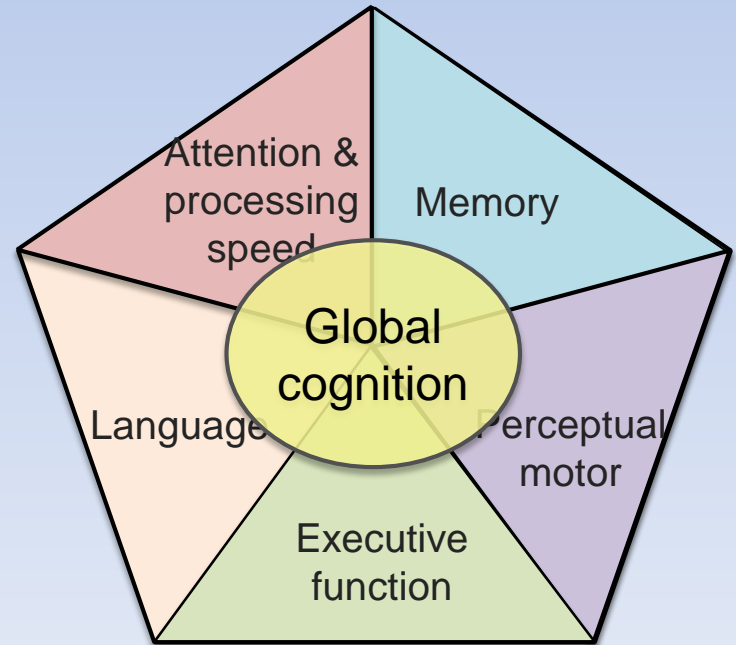
- Assign each test to one of 5 cognitive domains



# First project – methods

## Harmonising neuropsychological test scores

- A regression method was used to calculate **standardised** z-scores **adjusted** by sex, age, education, using control or appropriate normative data
- **Domain z-score** is the standardised average of all available tests in a domain
- **Global cognition z-score** is the standardised average of the 5 domain scores

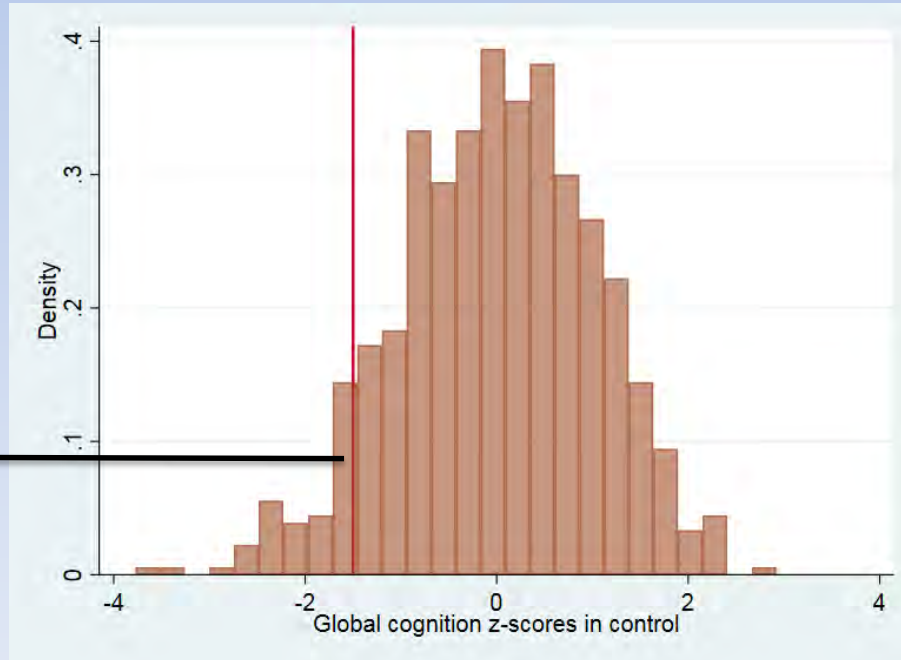


# First project – methods

## Assessing domain impairment

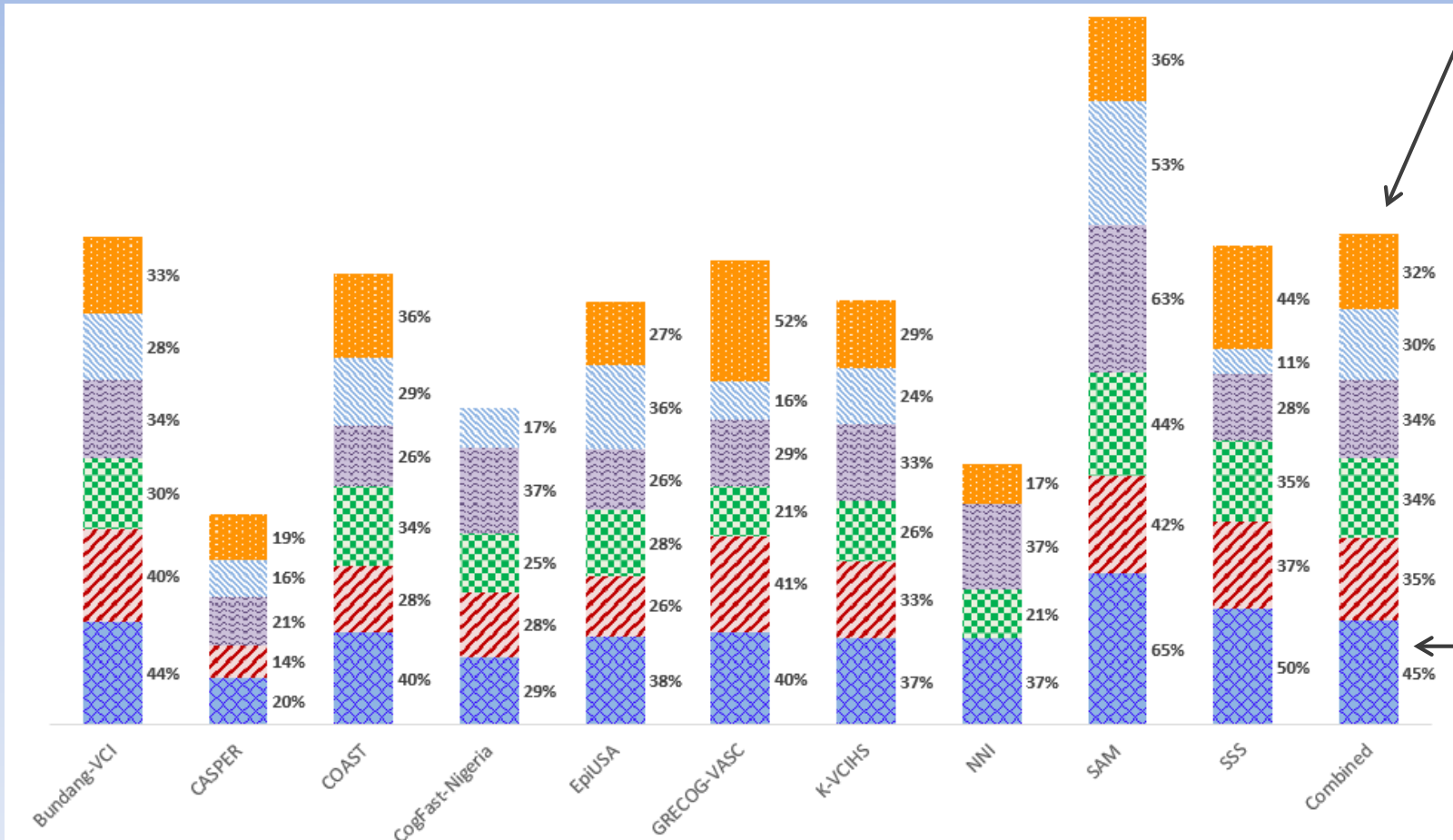
- Use the -1.5 SD cut point in the control group

**< -1.5 SD =  
impaired**



# Results: Domain impairment in each study

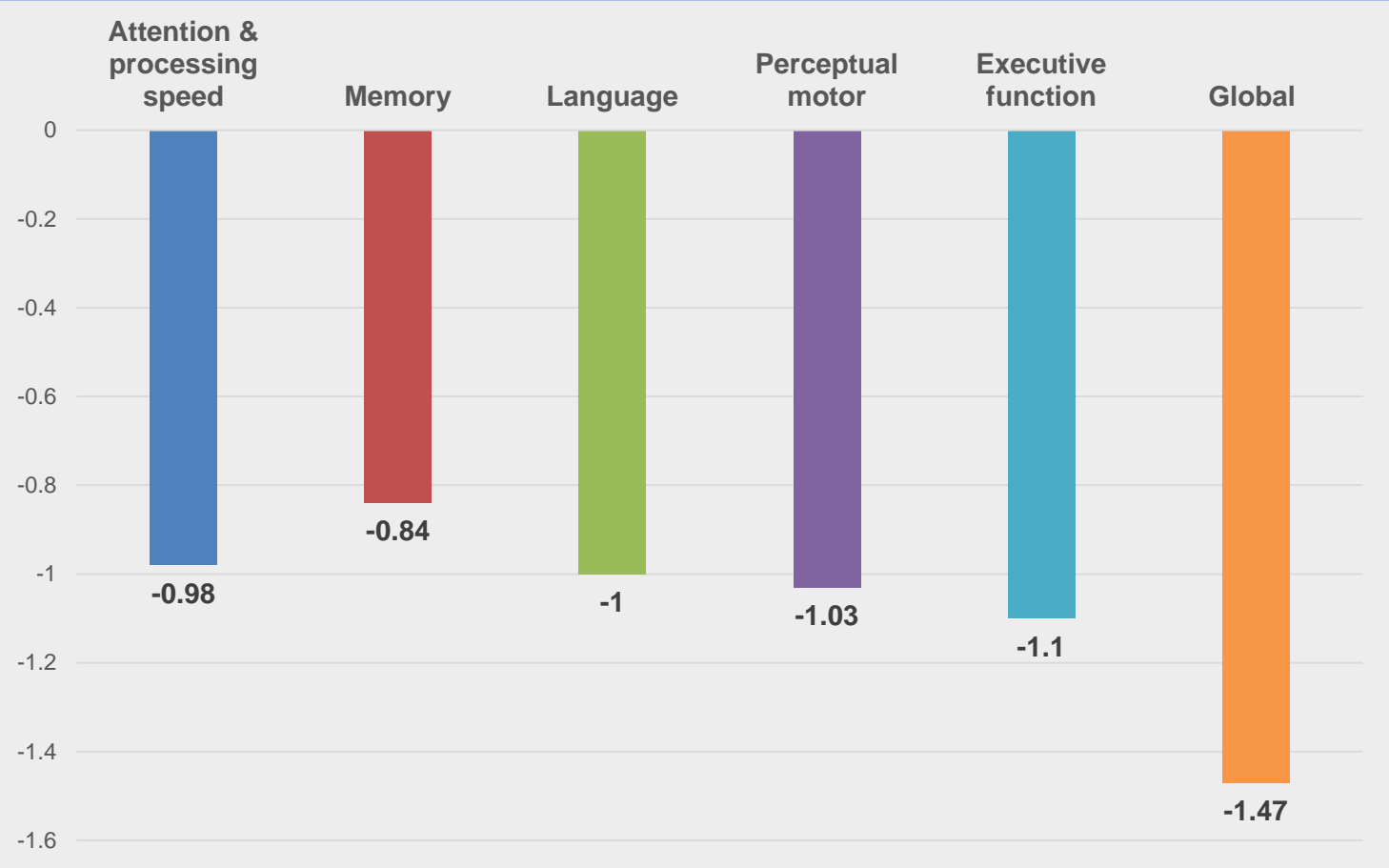
Combined group



Global cognition  
**45%**

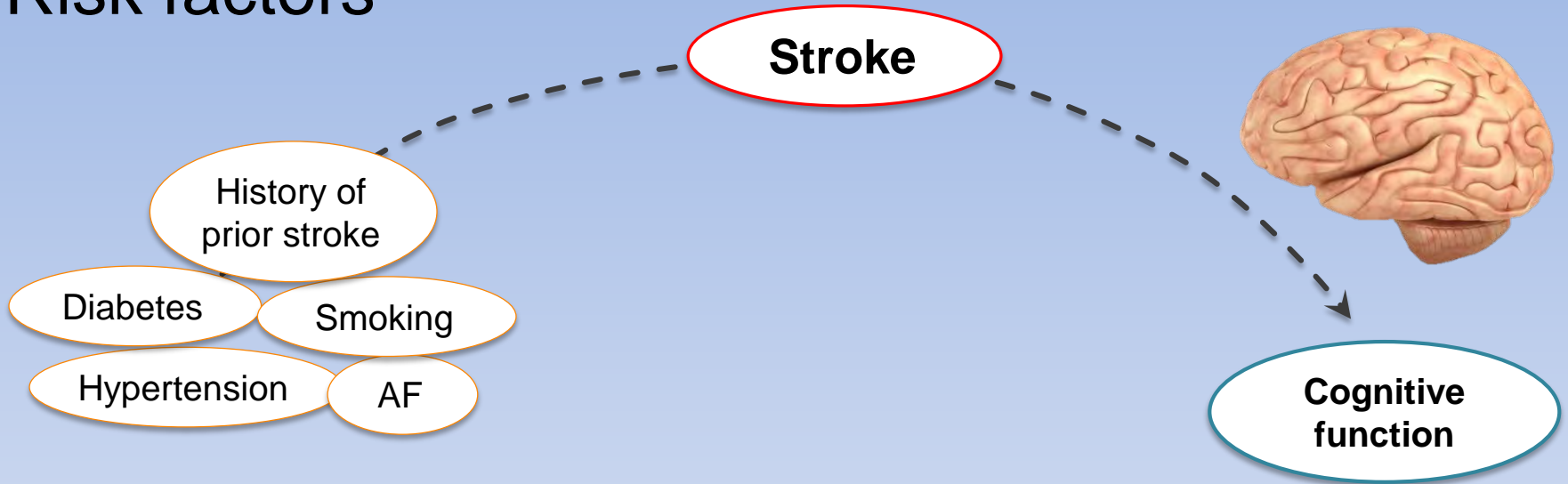
Global Frontal Executive Function Perceptual Motor Language Memory Attention & Processing Speed

# Mean z-scores in combined cohort





# Risk factors



## Key analyses

- Linear mixed models (1-step IPD meta-analysis)
- Outcome: domain and global cognition scores
- Adjusted for sex, age, education, risk factors

## Association of risk factors and cognitive domain scores

Risk factor	Attention & Processing Speed	Memory	Language	Perceptual Motor	Frontal Executive Function	Global Cognition
	<i>Effect size; p-value</i>	<i>Effect size; p-value</i>	<i>Effect size; p-value</i>	<i>Effect size; p-value</i>	<i>Effect size; p-value</i>	<i>Effect size; p-value</i>
Hypertension	-0.09; 0.21	-0.06; 0.30	-0.14; 0.012	-0.13; 0.07	-0.12; 0.07	<b>-0.16; 0.02</b>
Diabetes	<b>-0.46; &lt;0.001</b>	<b>-0.23; &lt;0.001</b>	<b>-0.16; 0.004</b>	<b>-0.31; &lt;0.001</b>	<b>-0.29; &lt;0.001</b>	<b>-0.47; &lt;0.001</b>
Smoking (ever)	-0.08; 0.25	-0.13; 0.023	-0.01; 0.93	<b>-0.24; 0.001</b>	-0.01; 0.87	-0.13; 0.06
Atrial Fibrillation	<b>-0.31; 0.001</b>	-0.03; 0.66	-0.07; 0.38	-0.17; 0.07	<b>-0.26; 0.004</b>	<b>-0.26; 0.005</b>
History of past stroke	<b>-0.44; &lt;0.001</b>	-0.17; 0.017	<b>-0.25; &lt;0.001</b>	<b>-0.36; &lt;0.001</b>	<b>-0.35; &lt;0.001</b>	<b>-0.45; &lt;0.001</b>

Linear mixed model, adjusting for sex, age, education

# Project 1 key conclusions

- We conducted the first large-scale examination of the cognitive profile of stroke survivors in a diverse international setting
- We found a high prevalence of cognitive impairment in stroke patients across different ethno-regional groups internationally
- All domains were equally affected
- Diabetes was strong and independent risk factor for cognitive impairment

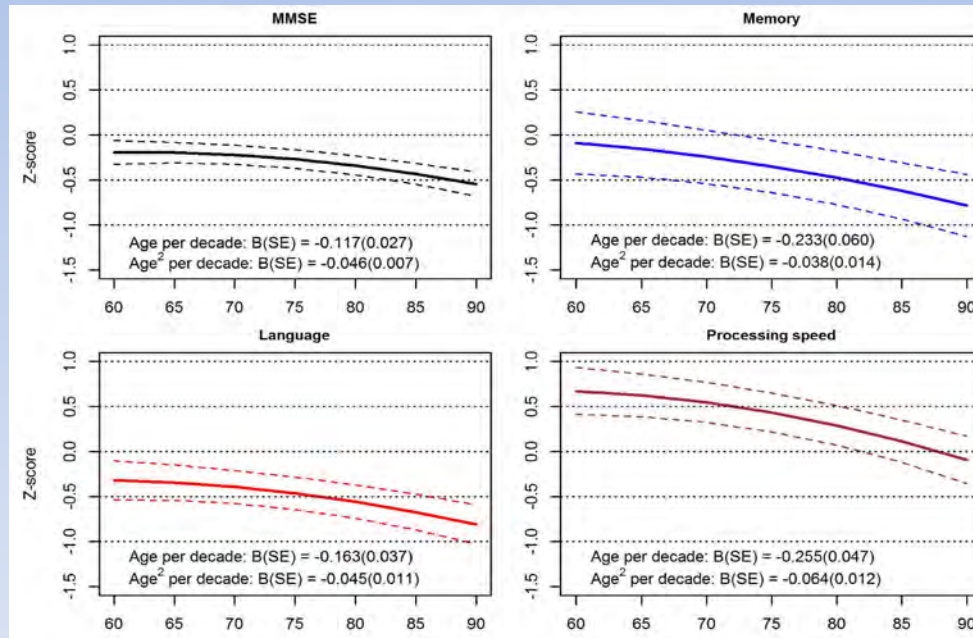


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# Next/current projects

## ➤ Trajectory of cognitive decline in stroke patients



# Next/current projects

- > **Papers focused on a risk factor (e.g. diabetes, AF, hypertension)**
  - For diabetes: to examine the relationship between pre-diabetes (as defined by fasting blood glucose levels) and CI



# For more information

## ➤ Methodology paper

Sachdev PS, Lo JW, et al. *Alzheimer's & Dementia: DADM*. 2017;7:11-23.

## ➤ Contact us:

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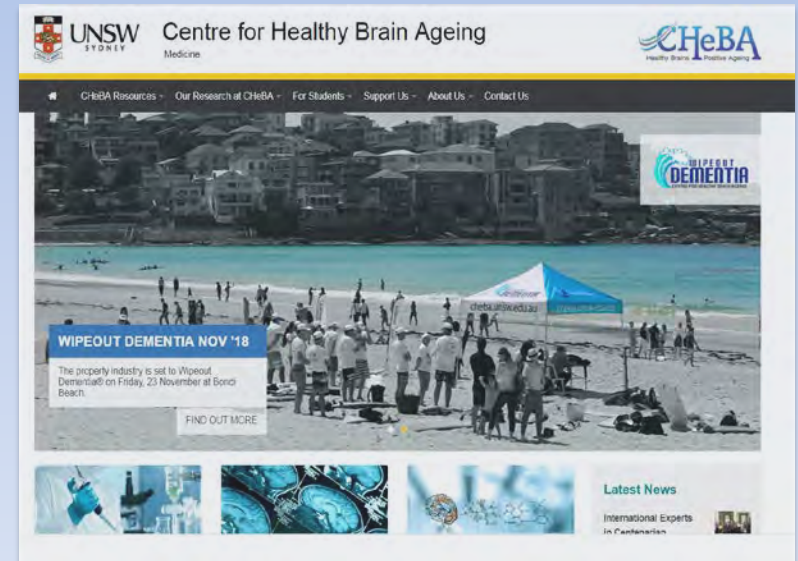
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## ➤ Website

<https://cheba.unsw.edu.au/group/strokog>



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