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# Trajectories of cognitive decline after incident stroke – a COSMIC Collaboration Study

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## INTRODUCTION

Poststroke cognitive impairment is common, but the trajectory and magnitude of cognitive change after stroke are unclear. **AIM:** to measure changes in the trajectory of cognitive function following a first stroke, controlling for pre-stroke cognitive performance using diverse population-based studies from the Cohort Studies of Memory in an International Consortium (COSMIC).

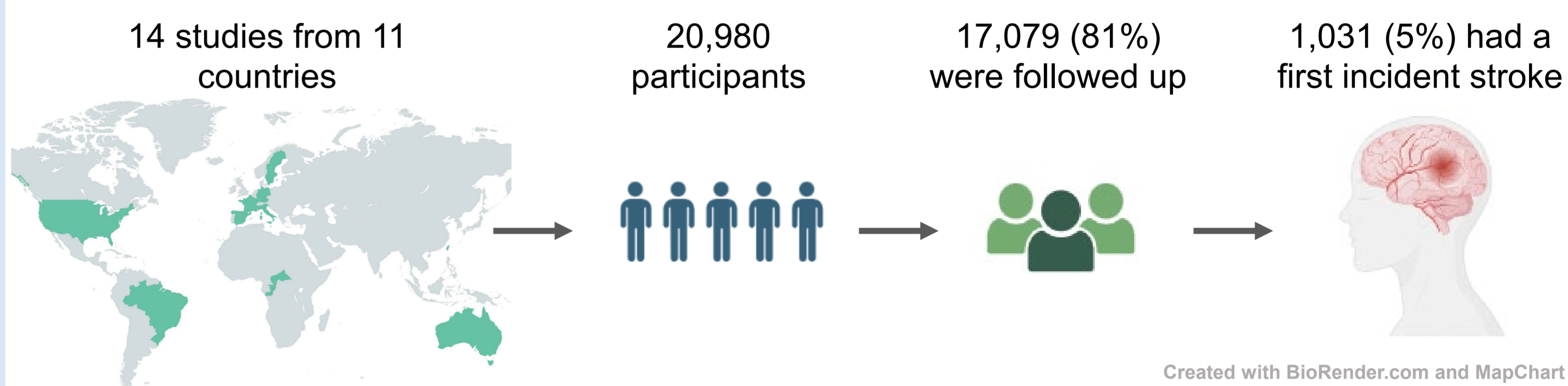
## METHODS

- 14 longitudinal cohorts from 11 countries from Asia, Africa, North America, South America, Europe, and Australia contributed data.
- Cognitive domain scores were formed by selecting the most common test administered amongst studies in each domain (memory, processing speed, language, and executive function) and the scores standardised; global cognition was the standardised average of the 4 domains and the primary outcome.
- One-stage IPD meta-analysis with linear mixed model and regression discontinuity design was used to model the change in cognitive function.
- Time-dependent incident stroke, age, time in study, and time since stroke were included in the basic model.
- The full model adjusted for sex, education, ethno-racial group, and potential confounders significant in the basic model at  $p < 0.1$ , which were history of diabetes, hypertension, cardiovascular disease, depression, smoking, alcohol use, and *APOE ε4* carrier.
- Multiple imputation was used to impute missing covariates.

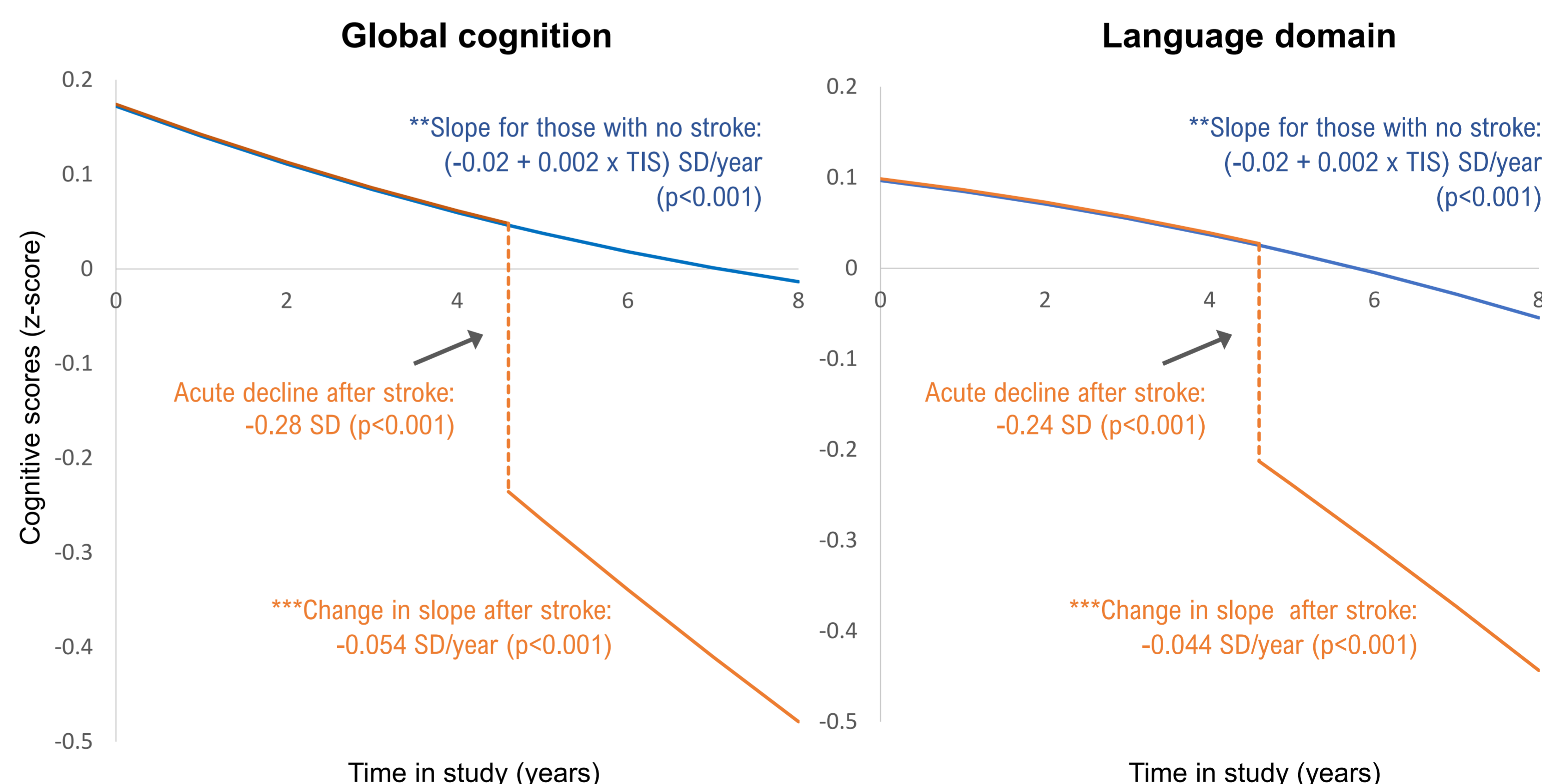
## CONCLUSION

Incident stroke is associated with acute decline in cognitive function and accelerated long-term cognitive decline.

## RESULTS



- Sample mean age (at baseline) = 73 years (SD=8.0); 57% were female.
- Mean follow-up time for all followed-up participants was 7.5 years (SD=4.1) and an incident stroke occurred after 4.6 years on average in those who had a stroke.
- Stroke was associated with acute decline (at time of stroke) and accelerated rate of decline after covariate adjustments in global cognition and in the 4 domains.
- The rate of cognitive decline before stroke was not significantly different from the rate of decline in those who did not experience a stroke over follow up.
- Predicted values (z-scores) of global cognition and language domain for a 73-year-old White woman with common values of covariates\* and an incident stroke occurring at 4.6 years into the study were used to plot the following:



Note: Model with global cognition included 7 studies and 10,396 participants; model with language included 9 studies and 10,571 participants. \*Common values of covariates at baseline: 12 years of education, no diabetes, hypertension present, non-smoker, <1 alcoholic drink per week, not depressed, not an *APOE ε4* carrier, no cerebrovascular disease, BMI=27, and baseline cognition score= 0SD). \*\*Slope = rate of cognitive change; TIS = time in study. \*\*\*Compared with the rate of change before stroke.