



Investigating brain structure and cultural factors to prevent dementia in First Nations communities



What is the focus of the research?

To understand the relationship between the brain and culturally relevant factors that might help protect against cognitive decline, with the aim of preventing dementia and improving outcomes for Aboriginal and Torres Strait Islander peoples in the future.



Why is it important?

Older Aboriginal and Torres Strait Islander peoples are highly respected members of their communities. They pass down traditional knowledge and provide strong leadership, particularly for younger generations.

Unfortunately, Aboriginal and Torres Strait Islander peoples are 3-5 times more likely to develop dementia than the broader population.

Despite this, very few dementia studies have been conducted with Aboriginal and Torres Strait Islander communities. No large neuroimaging studies have examined underlying brain changes, nor how protective life exposures (such as lifelong

learning and work opportunities) are related.

Dr Lavrencic hopes to uncover relationships between brain structure and the protective factors that contribute to healthy ageing and delay/prevent dementia.

She will work with older people from partnering communities to: co-design a culturally appropriate 'cognitive reserve' assessment that identifies protective factors; use Magnetic Resonance Imaging (MRI) to investigate relationships between brain health, cognitive reserve and dementia; and develop a telephone

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We hope to develop interventions that reduce dementia risk in Aboriginal communities and gain insight into doing this in a culturally meaningful way. ”

— Dr Louise Lavrencic

cognitive assessment tool to understand changes in people's cognitive ability over time.

This study will provide the first long-term evidence on links between protective factors, the brain and cognitive ability in older Aboriginal and Torres Strait Islander peoples.

? What is cognitive reserve?

It's the brain's ability to adapt to age, injury or neurodegenerative changes.

Brain changes are a normal part of getting older, but our cognitive function (memory and thinking skills) doesn't necessarily change in line with this. Two people with the same degree of brain changes may have different levels of cognition, which could be partly explained by their cognitive reserve.

We build our levels of cognitive reserve throughout our lives. Factors that contribute to increasing cognitive reserve (and may provide resilience to cognitive decline and dementia) are having good learning opportunities, meaningful work, and being involved in social and leisure activities.

We don't know if these ways of measuring cognitive reserve are relevant for Aboriginal and Torres Strait Islander peoples. There may also be other protective cultural factors that are relevant but aren't accounted for in existing cognitive reserve measures.



How will this happen?

Stage 1: compile and validate a series of cognitive tests that can be administered remotely, as well as a cognitive reserve measure that includes relevant protective factors for older Aboriginal and Torres Strait Islander people.

Stage 2: conduct MRIs with 200 participants aged 55 and older from partnering Aboriginal communities. Participants to also undergo a structured interview, medical assessment, and clinical diagnosis of cognitive decline or dementia.

Stage 3: follow up with participants one year later to re-perform cognitive assessments via telephone, to examine cognitive changes from baseline to follow-up.



What will it mean for First Nations people with dementia?

- A greater understanding of brain changes that relate to ageing and dementia.
- A culturally appropriate 'way of thinking' about cognitive reserve and factors that may protect against dementia.
- A way to track changes in cognitive ability over time that doesn't require in-person assessment.



Who's undertaking the research?

Dr Louise Lavrencic, Neuroscience Research Australia

Dr Lavrencic is a research fellow in the Aboriginal Health and Ageing Team at Neuroscience Research Australia. Her work focuses on understanding the factors that affect cognitive ageing and dementia in late life, and how we can help people to age well. Dr Lavrencic has received a number of research grants and awards during her career. In 2021, she received an Emerging Health Researcher Commendation from the Bupa Foundation, and an Early Career Award from the Alzheimer's Association Diversity & Disparities Professional Interest Group.

The title of Dr Lavrencic's project is *Understanding relationships between neuroimaging markers and culturally relevant protective factors in Aboriginal communities: A way to enhance dementia prevention and diagnosis?*