Australian Government

NHMRC National Institute for Dementia Research

THE BOOSTING DEMENTIA RESEARCH INITIATIVE

2014–2019

Accelerating research. Enhancing collaboration. Creating change.

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CONTENTS

MINISTERIAL FOREWORD

Dementia is a powerful and devastating disruptor. It is not a normal part of ageing and, contrary to common perception, it doesn't just affect older people.

Nearly 450,000 Australians are currently living with dementia. Dementia is one of our greatest health challenges. It is the second leading cause of death in Australia and already the leading cause of death for women in Australia. Providing support to the increasing number of people affected by dementia is a priority for the Morrison Government.

The dementia journey can be lonely, confusing and difficult for everyone in the family and community — emotionally, financially and in dealing with the new responsibilities that loved ones, friends and neighbours begin to experience in their already demanding daily lives.

Currently there is no cure, but there is great hope for one. The worldwide effort is bringing us closer to simple, non-invasive screening tests that will lead to early identification of risk, accurate and timely diagnosis, earlier and more effective interventions, and better care.

Australia has invested an additional $200 million into dementia research over the last five years. People like young Isabelle Burke, whose mum was first diagnosed when she was just 19, know the importance of this. Her message to us all is 'never give up'. Being able to envisage a future where people are diagnosed in time to save cognitive function, and where early preventative measures can be taken by us all, keeps Isabelle and others focussed on furthering the quest for a cure.

This report provides Australians with a complete account of the investments made under the Government's Boosting Dementia Research Initiative. The Initiative took a bold, strategic approach to medical research funding — one that we are taking for major health challenges and one that is achieving significant progress in lock-step with the international effort.

The report also sets priorities for the future. You can be assured that the Australian Government is committed to advancing the quest for a cure, building the evidence-base to inform policy that will improve the lives of the many people who experience cognitive decline, and all of those who care for, and about, them.

We commend all of the researchers, health services providers and community members who have been involved in the delivery of the Boosting Dementia Research Initiative. Your contributions are greatly appreciated.

The Hon Greg Hunt MP
Minister for Health

Senator the Hon Richard Colbeck
Minister for Aged Care and Senior Australians

INTRODUCTION

Over the last five years I have seen the $200 million Boosting Dementia Research Initiative transform Australia's rapidly developing and highly competitive dementia research sector. It is now operating as a focused, coherent and collaborative research workforce — one that can more effectively accelerate the national and international dementia research effort.

The Government's significant investment has also provided a unique opportunity for the chronic disease peak body, Dementia Australia, to extend the reach of the National Health and Medical Research Council (NHMRC) into the community of people living with dementia, their families and carers, and the many service providers who strive to meet their needs. Dementia Australia has had stewardship of a vital part of the initiative — the NHMRC National Institute for Dementia Research. This has provided new and exciting opportunities for research impact.

Dementia is arguably Australia's greatest current health challenge. As we live longer and our population ages, we will reach the point where most of us will either be diagnosed with dementia, or become a carer and/or family member of someone with dementia at some time in our lives. Some of us will be all three.

In the past decade, the number of deaths from dementia has risen 68 per cent. It is now Australia's second leading cause of death overall, and the leading cause of death for women.[1] It is the most feared disease for older Australians.[2] The need for targeted, coordinated research has never been more pressing. The Government's response has been both timely and effective.

This is the second public report on outcomes from the Boosting Dementia Research Initiative, providing an update on current and emerging research priorities, including why they are important, notable progress and desired outcomes for each area.

It leaves no doubt about the value of the Government's strategically focused investment. Australia's researchers are not only breaking new ground scientifically, they are expanding international collaborations and producing positive impacts well beyond the initial funded activities.

These outcomes would not be possible without the researchers, stakeholders and colleagues, both national and international, who have joined together to improve the lives of people with dementia and their carers and families through research.

The NHMRC National Institute for Dementia Research Board, Expert Advisory Panel, staff and growing Membership Network must also be acknowledged for their significant input and collective efforts.

The Initiative has helped embed collaboration among all those involved, which is critical for the continued strategic expansion of dementia research.

Professor Graeme Samuel AC
Chair, NHMRC National Institute for Dementia Research Board
President, Dementia Australia

PROGRESS OF THE BOOSTING DEMENTIA RESEARCH INITIATIVE

2014

- $200 million allocated to the Boosting Dementia Research Initiative through the 2014–15 Federal Budget
- Stakeholder consultation on research priorities
- $9 million awarded to the Clem Jones Centre for Ageing Dementia Research

2015

- NHMRC National Institute for Dementia Research established with $7.7 million funding over five years
- $44.8 million awarded to early career researchers for 78 NHMRC-ARC Dementia Research Development Fellowships across all priority areas
- $32.5 million awarded through six Dementia Research Team Grants
- Australia joins the European Union Joint Programme for Neurodegenerative Disease (JPND)
- $2.6 million awarded to or Australian participation in two JPND programs
- Coordination and Collaboration Framework established, guiding a cohesive national research effort
- NHMRC National Institute for Dementia Research Membership Network founded as a national platform for collaboration and coordination in dementia research

2016

- Australia's Strategic Roadmap for Dementia Research and Translation released
- NHMRC National Institute for Dementia Research website launched
- First Australian Dementia Forum held in Brisbane

2017

- First National Public Lecture Tour held
- International Research Network on Dementia Prevention launched
- $22.6 million awarded for 32 Boosting Dementia Research Leadership Fellowships
- $17.6 million awarded for 13 Boosting Dementia Research Grants for research into clinical care and practice
- $0.85 million awarded for European Joint Program Multinational Research Project: Pathway Analysis Across Neurodegenerative Diseases
- Second Australian Dementia Forum held in Melbourne

2018

- $14.1 million awarded for five projects through a Targeted Call for Research into Dementia in Aboriginal and Torres Strait Islander Australians
- $18 million awarded to establish the Australian Dementia Network
- $2.9 million awarded for four JPND Multinational Projects on Health and Social Care for Neurodegenerative Diseases
- Outcomes of Dementia Care Forum released: Involving Consumers in Research Towards Better Care Outcomes
- Fellows Accelerator Working Group established and career development programs launched
- Third Australian Dementia Forum held in Sydney
- Special Interest Groups formed to address specific research questions

2019

- $18.3 million awarded for 11 large-scale projects to advance the evidence base for dementia prevention and risk reduction for Australians
- $2.8 million awarded for two grants to improve dementia data and methods
- 2019 Strategic Roadmap for Dementia Research and Translation launched
- Australian Brain Banking arrangements reviewed ($0.3 million)
- Aboriginal and Torres Strait Islander Dementia Research Roadmap finalised
- Dementia Research Action Plan for Culturally and Linguistically Diverse communities finalised
- Second National Public Lecture Tour held
- Fourth Australian Dementia Forum held in Hobart

ABOUT THE NHMRC NATIONAL INSTITUTE FOR DEMENTIA RESEARCH

Vision: To fund and support high quality, high impact research and translation initiatives that produce genuine, positive short and long term outcomes for people living with dementia, their families, carers and the broader community.

Mission

To target, coordinate and translate the strategic expansion of dementia research in Australia.

Boosting Dementia Research Initiative

In 2014–15 the Australian Government allocated $200 million over five years for the Boosting Dementia Research Initiative. As at 30 June 2019 up to $200 million has been committed, including 156 grants to 374 Australian researchers across 28 institutions.

Funded research focuses on the five priority areas of prevention, assessment and diagnosis, intervention and treatment, living with dementia, and care.

The NHMRC National Institute for Dementia Research is a key element of this Initiative — coordinating this effort and encouraging dementia research collaboration, while also drawing on the expertise of consumers, health professionals, industry and policy makers to translate research findings into policy and practice.

Objectives

The NHMRC National Institute for Dementia Research aims to:

- identify essential dementia research priorities for Australia across the full spectrum from basic research to implementation
- bring together Australia's dementia research effort, including existing NHMRC dementia-related programs and other national initiatives, to ensure stronger coordination and collaboration
- synthesize information provided from current research and develop strong linkages with community groups, practitioners and other service providers to rapidly and flexibly translate research outcomes
- develop partnerships between researchers, industry and philanthropic organisations to help embed dementia research into the health system and stimulate the translation and implementation of research findings into policy and practice
- ensure Australian participation in major international collaborations relevant to dementia research.

> **What we've created through this Initiative is a classic articulation of the innovation cycle. It has been described as a bold experiment in 'top down' funding. It has the capacity to bring everyone involved in achieving the translation and commercialisation of dementia research into an enterprise that extends well beyond the production and publication of research results.**
>
> **Janice Besch**
> Director NNIDR

COLLABORATION AND PARTNERSHIPS

The Boosting Dementia Research Initiative has created new partnerships between dementia research stakeholders, including collaboration and coordination among researchers, and between researchers, consumers, industry, health professionals and philanthropic organisations.

The NHMRC National Institute for Dementia Research has a membership of more than 1300 people from all sectors of the dementia research and broader community.

The institute works with key stakeholders to develop and implement research programs, including:

- **Yulgilbar Foundation** and **Equity Trustees** have provided significant financial resources to help establish the Australian Dementia Network, which is the single largest co-investment from philanthropic partners under the Boosting Dementia Research Initiative.
- **Dementia Centre for Research Collaboration.** The institute and the centre share membership and a range of joint programs and functions.
- **Cognitive Decline Partnership Centre.** The institute's Director chairs the centre's Governance Authority.
- **Dementia Training Australia.** The institute works with Dementia Training Australia to develop new knowledge translation tools and capabilities for the Australian dementia research sector.
- **National Ageing Research Institute.** The two institutes have partnered to develop an Action Plan that identifies research priorities to address the needs of people from culturally and linguistically diverse communities who are living with dementia, their families and carers.

The institute leads important national strategic consultations and meetings, such as:

- **Aboriginal and Torres Strait Islander Roadmap for Dementia Research and Translation.** A total of 253 community members, including Aboriginal and Torres Strait Islander people living with dementia, their carers and families, community support workers and community health workers, participated in roadmap consultations in 26 urban, regional and remote communities around Australia.
- **Culturally and Linguistically Diverse (CALD) Dementia Research Action Plan.** A total of 340 community members in 19 communities around Australia provided their advice on the dementia-related issues facing their communities. Their perspectives provide valuable guidance on the research needs of culturally and linguistically diverse Australians living with, or at risk of, dementia, their families and carers.
- **Australian Dementia Forum.** This annual forum covers the full spectrum of dementia research in Australia, advancing discoveries on multiple fronts. The Initiative's fourth forum in June 2019 in Hobart attracted more than 400 attendees and involved 15 round table sessions and side meetings. Diverse research areas discussed included quality use of medicines, exercise for prevention, and using organoids to test the efficacy of new drug compounds.

> **'There is so much exciting work going on: within a year, a blood biomarker could be available to detect amyloid protein in the brain; within three years, a regular eye test could detect physiological changes in the brain associated with Alzheimer's; and within five years, a disease-modifying therapy could be discovered.'**
>
> **Ita Buttrose AC OBE**
> Dementia Australia Ambassador,
> at the Australian Dementia Forum 2019

The institute advances international collaboration and partnerships through:

- **European Union Joint Programme — Neurodegenerative Disease Research.** The institute contributes to international strategic decision-making, including determining research priorities and developing funding calls, through membership on the Board of this European Framework Program.
- **International Research Network for Dementia Prevention.** The institute supported the development of this network through the Dementia Centre for Research Collaboration.
- **World Health Organization.** The institute contributed to, and provides implementation updates for, the World Health Organization's Dementia Action Plan 2017–2025, towards cure and care worldwide.
- **International Alzheimer's and Dementia Research Funding Consortium.** This consortium comes together twice yearly to identify shared priorities for research funders across the globe, with the purpose of information sharing, collaboration and the establishment of strategic dementia research partnerships.
- **International Conference of the United States Alzheimer's Association.** The institute supports the Alzheimer's Association's international research sponsorship efforts by collaborating on the Association's 2019 Satellite Symposium in Sydney.

COMMUNITY AND CONSUMER INVOLVEMENT IN RESEARCH

There is increasing recognition of the important contribution consumers and community members can make to health research when they are involved as active partners in all stages of the research process.[3]

In July 2018 the NHMRC National Institute for Dementia Research set in place the Community and Consumer Involvement in Research Action Plan. It brings people with dementia, their carers and families, as well as the wider community, researchers and research organisations together to achieve the best possible outcomes for Australians living with, or at risk, of dementia, their carers, and families.

In late 2018, the institute established a Community and Consumer Involvement Reference Group to help guide this work.

The institute is finalising learning materials for consumers for release in early 2020.

Community and Consumer Involvement Action Plan

This action plan involves the NHMRC National Institute for Dementia Research:

- working with Dementia Australia to engage with people with dementia, their carers and families and the wider community to encourage their involvement across all stages and types of dementia research
- developing the institute's Membership Network to include more consumers and community representatives as a core membership category
- using a variety of communication channels to encourage public involvement in dementia research and provide education about the research process
- finding more ways to communicate research findings to people with dementia, their carers and families and the wider community, to improve knowledge sharing and implementation
- working to provide readily available and ongoing training for:
  - > researchers — on how to proactively involve people with dementia, their carers and families, and the wider community across all stages and types of dementia research, recognising that the type of involvement will differ for different research programs
  - > people with dementia, their carers and families and the wider community — on how to be actively involved across all stages and types of dementia research
- providing advice to government and funding bodies on funding guidelines to support the involvement of people with dementia, their carers and families and the wider community in dementia research.

'Research is the sum of many parts, including those who live with this condition. As with all things, we must start with the foundations. The shared experience of people living all over the world with this condition has helped me answer and advise on research programs and policy.'

Kevyn Morris
Living with dementia advocate,
at the Australian Dementia Forum 2019

Consumers and community members can be, and are, involved at various levels of research, at various stages of the research cycle and in the institutions in which research is conducted, including but not limited to:

- as a member of the institution's governing board
- as a member of a strategic research advisory group advising on research priorities
- as a chief investigator on a research project or a grant application
- providing their perspective on specific research programs or projects over the course of the research cycle, and
- being provided with public information on research being conducted.[4]

DIAGNOSIS AND PREVENTION

Accurate diagnosis

Diagnosis of dementia currently takes an average of three years[5] but can take much longer. There is no single, reliable and conclusive diagnostic test for dementia because there are many different diseases that may cause dementia, the onset of symptoms is slow, and dementia manifests in many forms, overlapping with other chronic medical conditions.[6, 7]

People diagnosed with dementia and their families want advice much earlier. Accurate diagnosis is the most important first step for decisions about clinical treatment, prevention and care.

Australian researchers have led the way in detecting signs of Alzheimer's disease at the earliest possible stage, decades before clinical onset. Similar approaches are now needed for other dementias, including using information about the principal associated conditions such as vascular disease (with clinical onsets over the age of 75) and neurodegenerative processes (like hippocampal sclerosis) occurring after the age of 85. The connections need to be identified in the laboratory, through collaboration between researchers across disease areas, and then translated to care in clinical settings.

The Australian Government's $200 million investment has already assisted in the development of new diagnostic tools arising from genetic and biomarker research, neuroimaging studies, brain stimulation techniques, psychometrics and computer modelling. This research has focused on understanding the pathology as well as the progression of various dementias to identify the most appropriate, relevant and reliable ways of identifying signs of dementia. Results to date show great promise, however, these studies require a long follow-up period to confirm their usefulness. Biomarker research is also expanding from focusing on the role of beta-amyloid plaques and neurofibrillary tangles in dementia development, to exploring other peripheral factors and determining genetic vulnerability.

Improved diagnostic tests may incorporate multiple newly identified factors, biomarkers, technologies and models. To ensure rapid diagnosis and equity of access, it is important for new methods to be applied in the primary care setting. This requires partnerships with industry to develop new screening tools, and engagement across the health system to deliver evidence-based models of care.

Prevention of dementia

Prevention of dementia is a worldwide health priority. Countries around the globe are investigating various intervention targets, strategies and timing to find effective risk reduction regimes. Australian dementia researchers have identified many of the potential risk modifiers for the causes of vascular damage to the ageing brain. Researchers are exploring similar genetic and lifestyle risk factors for Alzheimer's disease and other neurodegenerative disorders to help inform effective prevention strategies.

With amyloid accumulation now shown to produce cognitive and functional deficits well before symptoms are reported, earlier diagnosis will provide greater opportunity for risk reduction and prevention. The ability to detect pre-clinical amyloid and associated initial cognitive changes opens the door for ever earlier-stage secondary and even primary prevention studies that are being initiated internationally.[8] The desirable outcome is that people living with pre-clinical dementia will be able to take evidence-based preventative action, maintaining brain function for much longer and improving quality of life.

Challenges in the primary prevention of dementia are highlighted by the distinctions between the most common causes of dementia, Alzheimer's disease and vascular dementia. There are established links between vascular disease and modifiable risk factors. However, no data are available currently that reliably link Alzheimer's disease to modifiable environmental factors. The most likely way of slowing of disease progression for Alzheimer's disease is through new treatments that reduce the deposit of toxic proteins in the brain, while prevention for vascular dementia may involve both biomedical and lifestyle interventions. Both require investment as part of the international dementia research effort.

Delaying dementia onset not only lessens the average number of years spent living with the disease, but also represents substantial economic savings at population level. In Australia, research shows that a five per cent reduction in the number of people with dementia over the age of 65 could lead to savings of $5.7 billion from 2016–2025, increasing to $120.4 billion by 2056.[9] The United States has also estimated that medical advances delaying the onset of Alzheimer's disease by five years will result in significantly lower prevalence and cost. For older people who acquire Alzheimer's disease, a five-year delay in onset would lead to an average of 2.7 additional life years.[10]

Continued research efforts are needed to understand how genetics, interventions and environmental exposures interact to increase or reduce vulnerability. Creating this evidence base will inform the health system measures and population-level behavioural change needed to prevent dementia by reducing risk.

Importantly, a more precise understanding of the major modifiable risk factors for dementia (Alzheimer's disease, vascular disease, other neurodegenerative conditions) will offer new opportunities for interventions to prevent or reduce the onset of dementia. The Australian Government has recently invested $18.3 million in 11 large-scale, collaborative projects to advance these opportunities through the Boosting Dementia Research Initiative.

Partnerships to target the modifiable risk factors common to other chronic diseases will significantly strengthen the potential for positive health and economic impacts from this work.

Delaying dementia onset not only lessens the average number of years spent living with the disease but also represents substantial economic savings.

EYE SCANS MAY REVEAL ALZHEIMER'S

'Changes in the eyes can tell us a lot about changes also happening in the brain'

Dr Mojtaba Golzan
NHMRC-ARC Dementia Research Development Fellow
University Of Technology Sydney

Vision scientist Dr Golzan is tracking how particular characteristics in the eyes correlate with changes in the brain.

He and his team are creating a panel of specific signs that clinicians can look for to identify different dementias through an eye scan alone.

'Changes in the eyes can tell us a lot about changes also happening in the brain. Through eye scans, we can extract information that indicates brain changes characteristically linked with dementia or other cognitive conditions,' Dr Golzan explains.

The research focuses on specific characteristics — known as optical biomarkers — situated in the retina at the back of the eye.

Three markers of particular interest are:

- structural—eye tissue
- functional—eye operation
- vascular—eye blood circulation.

By tracking and comparing changes in the retina with changes in brain tissue, scientists can map distinctive links between various biomarkers and cognitive pathologies such as Alzheimer's disease.

Through his NHMRC-ARC Dementia Research Development Fellowship, Dr Golzan is cataloguing a series of optical biomarkers to help with early screening and diagnosis of Alzheimer's disease.

If successful, this research will provide a model for creating similar screening tools to assist with early detection of other cognitive pathologies in the future.

Dr Golzan aims to create an eye scan that can help health care professionals screen for and identify Alzheimer's disease — even predicting the stage of the disease and how quickly it is likely to progress.

Since 2017, Dr Golzan and his team have concluded animal trials, which have shown for the first time that retinal dysfunction precedes retinal structural damage in Alzheimer's disease.

The team has demonstrated that retinal functional and structural damage occurs in parallel with pathological changes in the brain and that dysfunction in the inner retina is apparent within six months of the first signs of retinal damage appearing.

Since beginning his NHMRC-ARC Dementia Research Development Fellowship, Dr Golzan has successfully transitioned from an early to mid-career researcher, while also establishing valued links and collaborations with national and international experts.

> By tracking and comparing changes in the retina with changes in brain tissue, scientists can map distinctive links between various biomarkers and cognitive pathologies such as Alzheimer's disease.

GREEN SPACES AND HEALTHY AGEING

‘When you add up all the benefits… you start to wonder: can green spaces help prevent dementia?’

Professor Thomas Astell-Burt
Boosting Dementia Research Leadership Fellow
University of Wollongong

Professor Thomas Astell-Burt is enthusiastic about the public health benefits of green spaces in cities.

'We all have an instinct that the natural environment — trees, parks and other types of green space — is good for us. Studies have shown that they shield us from the sun, they are nice places to meet, they create a sense of community, and they clean the air. Research has also shown that if you spend time in a green space or have a view of a park or trees, it improves your mental acuity and reduces the risk of some diseases, such as type 2 diabetes,' Professor Astell-Burt explains.

'So when you add up all the benefits for mental health, social life, respiratory health and physical health, all of which may be related to cognition, you start to wonder: can green spaces help prevent dementia?'

That's the question driving Professor Astell-Burt's latest research. The NHMRC Boosting Dementia Leadership Fellow is conducting the first large-scale longitudinal studies to examine if green spaces may help reduce, and narrow socioeconomic inequities in the risk of, Alzheimer's disease by improving mental health, promoting physical activity and social support, reducing social isolation, preventing depression, reducing mid-life obesity and cardiometabolic disease risk, and buffering harms from traffic-related air pollution.

'All these factors may have an influence on Alzheimer's disease according to previous research, but we need to find large-scale, equitable and sustainable ways to support physically and socially active lifestyles, to breathe fresh air and to enable people to do the things they find nourishing. Urban greening could be part of a solution that enriches lives and supports healthier ageing for everyone.'

Professor Astell-Burt is examining this using big data on individuals tracked across a 15-year timespan. Some evidence already looks promising.

'Evidence is showing us that some folks who live in cities with green areas have slower rates of cognitive decline than others who live in the same conditions but not near a park.'

To test this, Professor Astell-Burt is reviewing environmental and geospatial data on the location of trees, parks and other forms of green space, and blue spaces such as rivers and lakes, to understand where people live and if they have easy access to these spaces. This is blended with health data and analysed using advanced statistical models. This study will help Professor Astell-Burt track over time the amount of green space more than a quarter of a million Australians have access to, and whether those populations with more access to green space have lower rates of Alzheimer's disease diagnosis.

'And in between we can look at a heap of intermediary factors that might connect where we live to our risk of developing Alzheimer's disease, such as how socially and physically active we are, our weight, mental health and non-communicable diseases like type 2 diabetes.'

With a background in environmental epidemiology and urban geography, Professor Astell-Burt has always been interested in the relationship between nature and human health. At the University of Wollongong he directs the Population Wellbeing and Environment Research Lab (PowerLab), which includes 16 researchers and students.

'I'm really thankful for the Fellowship that has supported me to follow up on this work and build up the capacities of my lab. It's not just an investment in one person — we're nurturing the next generation of environmental epidemiologists and urban data scientists. It's about building a healthier environment, not just now but for many generations to come.'

“”

'Evidence is showing us that some folks who live in cities with green areas have slower rates of cognitive decline than others who live in the same conditions but not near a park.'

NEW TARGETS, NEW TECHNOLOGIES, NEW DRUG CANDIDATES

The national dementia research effort must operate at the frontline of modern neuroscience research by incorporating scientific advances into studies of dementia disorders and neurodegenerative disease.

It has now become possible to explore more fully the complexity of the brain using more sophisticated, high precision approaches, such as gene editing, stem cell models, genome wide mapping and the large-scale collective quantification of biological data through bioinformatics and other advanced molecular approaches. New technologies to visualise biological processes and the brain are bringing further innovation to the field and revolutionising research in neurodegeneration.

The international drug discovery effort has potential to generate significant financial returns for those countries in the lead — it is advancing rapidly, and requires further investment.

This work also requires increased collaboration and partnerships between researchers in basic science, neurodegeneration, ageing, genetics, neurology clinics and industry. Equally important is maintaining an efficient and robust environment for dementia clinical trials, and continued access to the necessary dementia research infrastructure.

To date, the Boosting Dementia Research Initiative has made significant investments in genetic, epidemiological and biomolecular research to explore the mechanisms underlying neurodegeneration and accelerate the discovery of new treatment targets, therapeutic strategies, drug delivery methods and drug candidates. This has included support for research programs and teams, and a major investment in the Clem Jones Centre for Ageing Dementia Research, which focuses on the development of therapies, tests and tools to help prevent and treat dementia. This investment is vital to support the medical breakthroughs needed to prevent and treat dementia.

A number of new drug candidates are beginning to show promise in international clinical trials.[11] By partnering with international programs and the pharmaceutical industry, Australian researchers can play a key role in these drug development programs, and accelerate research efforts to identify, test and validate new drug candidates and therapeutics in clinical trials. It is important to foster partnerships with international programs, industry and other commercial entities to support and promote Australian participation in these international research efforts.

Drug discovery and development activities

People underestimate how long science takes,
but they also underestimate how revolutionary it will be.
Professor Bob Williamson

Basic research

Over forty investigations into the actual mechanisms by which cognitive decline manifests at the cellular level

In vitro and in vivo studies, models

Six new drug development platforms, including Australian participation in international databanks which will allow access to massive datasets for the purposes of understanding and predicting dementia, and the National Dementia Network (ADNeT) which will facilitate Australian access to international drug development trials

Clinical trials, drug repurposing

Three novel means of delivering drugs across the blood-brain barrier

Commercial partnerships

Two promising new candidates for drug development

SOLVING THE MICROGLIA MYSTERY

Ultimately, researchers could reprogram any cell into any other cell, or change diseased cells into healthy ones, by turning on the right genes.

Dr Alexandra Grubman
NHMRC-ARC Dementia Research Development Fellow
The Florey Institute of Neuroscience and Mental Health

Dr Alexandra Grubman is piecing together clues to understand the role of the brain's immune cells, microglia, in Alzheimer's disease. Her fascination with these cells sparked when she began to work in neuroscience in 2012.

'As I attended seminars and read papers, it seemed like every time an unbiased computational analysis was performed, microglia emerged as key players,' says Dr Grubman.

While Alzheimer's research has long focused on how neurons die, Dr Grubman noticed growing evidence from mathematical analyses of large cohort studies that microglia were also vulnerable cells in Alzheimer's.

'Microglia are known to change in Alzheimer's, but this has mainly been looked at in terms of inflammation. I try to look broader, at the networks that control various aspects of microglial cell identity, and at the part these cells play in maintaining and recycling our synapses, which are the connections between our neurons that are required for neuronal signalling and help us form memories," she says.

Dr Grubman, an NHMRC-ARC Dementia Research Development Fellow, was intrigued by research that showed what happened when microglial genes were turned off in Alzheimer's mice. In one half of the studies, the mice got better and in the other, the mice got worse. At the same time, a paper came out showing microglia in the front of the brain were different to those in the back.

'The back of the brain is relatively resistant to Alzheimer's pathology. So I thought maybe some of these diverse microglia could be helpful and some harmful for Alzheimer's.'

Dr Grubman began investigating how to manipulate microglia to control their function to perform a protective role against Alzheimer's. At Monash University's Australian Regenerative Medicine Institute she joined Professor Jose Polo's cutting-edge lab, which focuses on understanding cell identity and cell fate changes by studying the dynamics of reprogramming to unlock the body's regenerative capabilities.

'The lab has a unique way of looking at cells, really trying to understand the 'soul of the cell' — studying cell identity in terms of how cells are controlled, in order to change a cell's fate," Dr Grubman explains.

Ultimately, researchers could reprogram any cell into any other cell, or change diseased cells into healthy ones, by turning on the right genes. Dr Grubman is using a special computer program to help identify which genes out of 100 billion possible combinations may change a dysfunctional microglia cell into a functional one.

Dr Grubman's research also involves mouse models and use of post-mortem tissue donated from the brains of Alzheimer's patients. Among other things, she hopes the work will help build better models of the disease. Dr Grubman's research has brought together world-class researchers in epigenetics, bioinformatics and computational biology to apply their skills to Alzheimer's.

'We collaborate as widely as we can. It's inspiring to be surrounded by passionate, brilliant people who bounce off each other's excitement. Every time you get new data, you need to reinterpret the old data in light of that. It's exciting to take your next experiment from the results of your last one, and ask lots of questions that lead to the next discovery.'

SPOTLIGHT ON NON-ALZHEIMER'S DISEASE DEMENTIAS

'This could help identify people who are at high risk and contribute to finding a treatment.'

Professor Glenda Halliday
Lead Investigator — Boosting Dementia Research Initiative Team Grant
The University of Sydney

Non-Alzheimer's disease dementias, including those overlapping with Alzheimer's disease, occur in more than 50 per cent of people diagnosed with dementia. However, little is known about their impact and whether they can be predicted before symptoms emerge.

Past research has revealed early biomarkers of Alzheimer's disease, leading to improved diagnosis and treatment. Now, Professor Glenda Halliday is heading a large team of researchers hoping to use similar methods to achieve the same for non-Alzheimer's disease dementias.

A Boosting Dementia Research Initiative Team Grant has enabled the team to focus on identifying the earliest changes associated with dominantly inherited non-Alzheimer's dementias, in particular dementia with Lewy bodies and frontotemporal dementia, and related disorders such as Parkinson's disease and motor neuron disease.

Around 300 affected families have volunteered to take part in the research, which involves three days of blood tests, brain and body scans, and providing sleep, diet and metabolism data.

'We're extremely grateful to these families. It's hard enough to have a family with a strong history of dementia, so it's really appreciated that so many have signed up for this research because it will make a difference, especially for non-Alzheimer dementias,' says Professor Halliday.

A dominantly inherited condition means children of affected parents have a 50 per cent chance of inheriting the same condition.

'We're aiming to study brain changes over time and determine how the diseases develop before there are any symptoms. This could help identify people who are at high risk and contribute to finding a treatment and perhaps even preventative therapy in the longer-term.'

Current treatments and drug trials often involve older people with mixed Alzheimer's and non-Alzheimer's pathology.

'There are difficulties with this overlap as people get older and they get a bit of everything. It can mean that we are giving drugs for Alzheimer's to people with other things.'

Identifying people with non-Alzheimer's dementias earlier could make a difference, including more targeted drug trials for pre-symptomatic treatments.

From her school days as a 'curious kid', Professor Halliday has always been interested in 'people science'.

She describes this research as 'part of the worldwide effort to conquer dementia'.

'My vision is to continue to develop significant research capacity in non-Alzheimer's dementias and motor syndromes, and to coalesce Australian research capacity in these areas so that significant medical advances can be made.'

IMPROVING QUALITY OF LIFE AND PROVISION OF CARE

Dementia has a significant impact not only on individuals living with dementia, but also on their carers, families, communities and society more broadly. Until effective treatments for the symptoms of dementia are found, many Australians will experience life with dementia, or provide care to their loved ones. Innovative research is needed to inform health care and social support processes that recognise and respond to the individual needs of people living with dementia, and to drive these quality improvements.

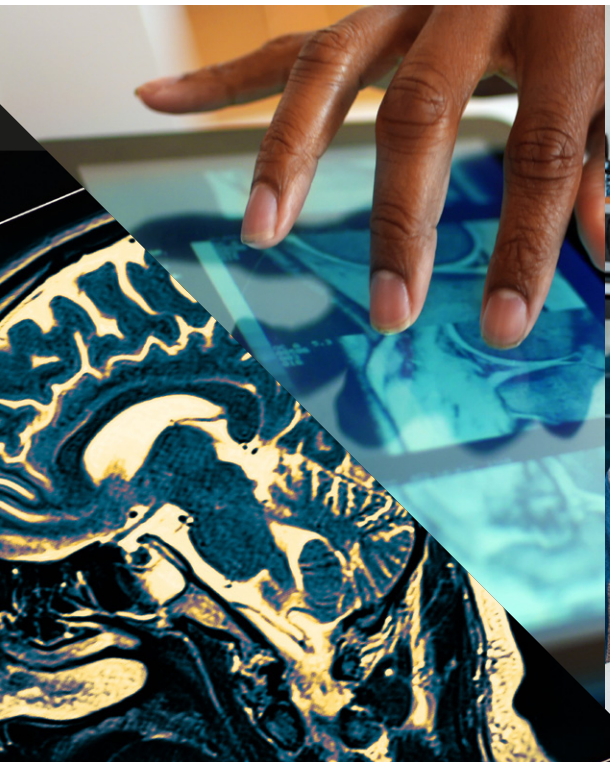
A holistic approach to research that addresses the physical, social, cultural and mental wellbeing of those living with dementia, their families and carers is essential to achieve the best outcomes.

Improvements to quality of life and provision of care requires shifting the focus of health and social care programs to what people can contribute towards their own health and care outcomes, and how their environment can support this process. Developing new, evidence-based ways to preserve dignity, independence and social participation is central to this shift in focus and could help to reduce excess disability in each stage of the disease.

Research funded through the Boosting Dementia Research Initiative in this area aims to identify and develop:

- new and improved health care models
- supports that facilitate living well with dementia at home, for longer
- more robust ways to address changing needs over the disease course
- allied health interventions to support quality of life
- efficiencies between the health and social care systems, and
- strategies to make environments more dementia-friendly.

The 2018 Productivity Commission report, *Interventions to Support Carers of People with Dementia*,[12] highlights the crucial role of carers if older people with dementia are to stay at home. This report also notes the limited effectiveness of current interventions to support carers in preventing or delaying entry into residential care and highlights research gaps (in particular, studies for respite services). Supporting carers of people with dementia may have important benefits beyond keeping people with dementia at home, with many older Australians (including those with care needs) preferring to 'age in place' at home, where they are able to maintain their family and social networks and enjoy a higher quality of life.[13]



Implementing research into clinical care and practice

Studies related to dementia care that have been supported by the Boosting Dementia Research Initiative to date range from addressing the efficacy and cost-effectiveness of treatment and care packages to building the capacity and resilience of the care workforce, and identifying the impact of medications and hospitalisation on quality of life in the aged care setting.

A program by the Dementia Centre for Research Collaboration will increase the number of Australian care professionals with knowledge and capacity to lead the implementation of research findings, to improve dementia care, in the home and in formal care.

In addition, the Australian Dementia Network represents a new and important investment in achieving continuous improvement of formal dementia care through research, through the establishment of a Dementia Clinical Quality Registry. The Registry will support continuous monitoring, leading to improvements in the quality of support provided to people with dementia across the health system.

Even with the current investment, dementia care quality and interventions lag significantly behind progress in other chronic disease areas, despite the fact that people with significant cognitive decline and dementia make up more than half of Australians in formal care.[14]

There remain many recognised knowledge gaps that must be addressed by future research investment. These include: research to inform the development of tools and practice guidelines to help and support formal and informal carers; the need to improve transitions between care providers and living arrangements; new trials of different techniques to prevent expressions of unmet need; and identifying and trialling innovative ways to support people living at home and in the community.

There is also a clear need to develop models for a more personalised approach to treatment and care, including reviewing the use of existing mood-altering or anti-psychotic medications and how this can be tailored to an individual's changing circumstances.

Care pathways and services

The Australian Government's investment in dementia research has funded much-needed research to develop, implement and evaluate new technologies and tools that reflect and respond to the individual needs, abilities and preferences of people living with dementia, their carers and families.

However, there is still an internationally recognised need for research to improve and operationalise care pathways and services. This involves considering the important transitions along the disease trajectory that impact on quality of life and a carer's capacity to provide support. Increased national recognition of these changing needs will help with the timely provision of appropriate clinical and emotional supports to people living with dementia and their carers.

Cost-effective, affordable, equitable and ethical access to care

Research has revealed the need to overcome socio-economic, cultural, gender, geographical and contextual barriers to implementing new evidence-based models of care, to ensure equitable access to care.

Addressing these barriers, while assessing the cost-effectiveness of new strategies, is a key consideration of any new research. The aim is to support the creation of services that meet the needs of a diverse population, and support greater uptake and a more rapid translation of research outcomes into practice.

IMPROVING BEHAVIOURAL AND PSYCHOLOGICAL SYMPTOMS OF DEMENTIA

Dementia Centre for Research Collaboration Flagship Program

The Behavioural and Psychological Symptoms of Dementia Flagship Program of the Dementia Centre for Research Collaboration aims to improve the standards of care and treatment of the behavioural symptoms of dementia, reduce their prevalence and severity, and upskill the aged and health care workforce. The program will establish enduring patterns of care and service that achieve the standards of care outlined in the *Clinical Practice Guidelines and Principles of Care for People with Dementia*.[15]

Many people living with dementia experience behavioural and psychological symptoms, or changed behaviours. These can include agitation, sleep disturbance, depression, wandering and psychosis.

Mounting evidence shows these symptoms can be prevented through use of non-pharmacological approaches. Despite this, evidence-based strategies for such approaches are yet to be widely adopted. The incorrect or over-medication of people living with dementia remains a challenge in acute and residential care, and person-centred care is not commonly adopted across the aged care sector.

The standards and required culture change set out in the *Clinical Practice Guidelines and Principles of Care for People with Dementia* can only be achieved through partnership between researchers, service providers, clinicians and policy makers.

To support this, the flagship program will:

- trial innovative strategies
- promote the implementation and adoption of new prevention and care management strategies
- promote the quality use of medications.

The Dementia Centre for Research Collaboration has a strong track record of research and knowledge translation and has developed unique expertise and clinical networks in this area.

In addition, the Dementia Centre for Research Collaboration will scope a separate national registry, focusing on formal care settings, and modelled on a registry operating in Sweden. The Swedish experience shows that a registry can help reduce the frequency and severity of the behavioural symptoms of dementia, and reduce medication use in affected residents. It allows health professionals to work in an evidence-based manner, evaluate their care interventions, and provide support and reassurance to people living with dementia in their care.

Fellow Profile:
Associate Professor Lee-Fay Low

Associate Professor Lee-Fay Low is an Associate Professor in Ageing and Health at the University of Sydney and a Boosting Dementia Research Leadership Fellow. Associate Professor Low is developing a series of rehabilitative interventions for people living with dementia to support communication, function and quality of life following diagnosis.

She is also working in the areas of dementia literacy and stigma, and supporting people from culturally and linguistically diverse backgrounds to live well with dementia.

'Understanding the cultural diversity of Australia is vital to ensuring that care, and especially the aged-care system, meets the emotional needs of people living with dementia,' says A/Prof Low.

In addition to her research, Associate Professor Low has taken on a leadership role with NHMRC-ARC Dementia Research Development Fellows, coordinating a program to support Development Fellows as they transition into the next phase of their careers. A/Prof Low and 'the NNIDR Accelerator Working Group are working to ensure the capacity and momentum built through the Boosting Dementia Research Initiative is continued into the future.

'In creating this program, we've responded to Development Fellows' requests for greater engagement with the Institute, and we're now workshopping ideas for the future of dementia research in Australia. They're passionate about ensuring the impact of their work is felt by those living with dementia. It's wonderful to see.'

Fellow Profile:
Dr Tuan Anh Nguyen

Dr Tuan Anh Nguyen is an NHMRC-ARC Dementia Research Development Fellow and researcher based at the University of South Australia. He is researching the development and implementation of national dementia strategies in low- and middle-income countries, and the development of culturally tailored interventions to improve the lives of people with dementia and their carers.

Dr Nguyen is also the founder and leader of a large dementia research collaborative in the Asia-Pacific region. This research collaborative is investigating issues around quality use of medicines for people with dementia in low- and middle-income countries in the region, where dementia is a new and emerging health problem.

'The Boosting Dementia Research Initiative and the NHMRC National Institute for Dementia Research have helped me to focus my expertise in quality use of medicine and drug safety to the area of dementia research,' says Dr Nguyen.

Being a Development Fellow also means Dr Nguyen has been supported to attend the Australian Dementia Forum annually, which opens opportunities for collaboration. An example is the connection with Alzheimer's Disease International, facilitated by the NHMRC National Institute for Dementia Research, which led to Dr Nguyen taking a leadership role in developing a National Action Plan for Dementia in Vietnam, and holding first Vietnamese National Dementia Conference in 2018.

THE ROLE OF MEDICINES IN COGNITIVE IMPAIRMENT

‘We found that use of these medicines increased the risk of people going to hospital with dementia’

Dr Lisa Kalisch Ellett
NHMRC-ARC Dementia Research Development Fellow
University Of South Australia

Work experience at a pharmacy as a teenager set Dr Lisa Kalisch Ellett on the path to becoming a registered pharmacist, gaining her PhD, and moving into pharmacoepidemiology to research patterns of medicines use in populations. An NHMRC-ARC Dementia Research Development Fellow, Dr Kalisch Ellett is looking into the role of medicines in causing or worsening cognitive impairment.

Several studies have shown an association between the use of anticholinergic or sedative medicines and increased risk of dementia. However, questions remain about whether these medicines cause dementia (or are just used by people already at risk), whether or not cognitive function improves if the medicines are stopped or the dose is reduced, and the characteristics of patients most likely to use these medicines. Dr Kalisch Ellett’s research aims to answer these questions.

Since 2004, she has been involved in the Veterans’ Medicines Advice and Therapeutics Education Services (Veterans’ MATES) project to improve the use of medicines, and subsequent outcomes, for older veterans.

‘We succeeded in reducing the use of these medications in older veterans. The side effects can include confusion and memory issues, and we found that use of these medicines increased the risk of people going to hospital with dementia. It’s unusual for dementia to be the main reason for going to hospital, so it was really striking to see that association,’ says Dr Kalisch Ellett.

This sparked a deeper interest in dementia research.

‘Working in this field, it’s becoming clear that you need a really long study period to look at the use of these medicines — going back 10 to 15 years and then forward 10 to 15 years.’

Dr Kalisch Ellett is reviewing anonymised veterans’ data dating back to around 2005. She is also using anonymised government prescription claims databases, hospital admissions data and medication data to help identify patterns over time. In addition, she is working with SA Health to try to reduce the use of these medications in hospital patients in South Australia.

‘Reducing the use of these medications can help reduce confusion in patients. It’s like doing a risk benefit analysis. For example, anticholinergics are sometimes used to treat urinary incontinence, but if they may cause confusion, is it worth running the risk of that side effect?’

The Development Fellowship has enabled Dr Kalisch Ellett to dedicate her time to dementia research. It has also created opportunities to meet and collaborate with other dementia researchers.

‘It really gets the ideas bubbling. Sometimes as researchers we work in silos. For example, I’m a pharmacist so I focus on the medicine, but when we can bring our research together, it’s brilliant.

‘One of the things with dementia medication trials is that they can be heartbreaking when the trial fails. Some of the drug companies have decided it’s not financially viable to stay in the race. So it’s really important that we help to make life better for people with dementia and minimise the unpleasant effects of medicines that are not helpful.’

“”

‘Working in this field, it’s becoming clear that you need a really long study period to look at the use of these medicines — going back 10 to 15 years and then forward 10 to 15 years.’

DEMENTIA AND ABORIGINAL AND TORRES STRAIT ISLANDER AUSTRALIANS

Aboriginal and Torres Strait Islander Australians experience dementia at a much higher rate and with an earlier onset than the broader community.[16] Research indicates the higher rates of cardiovascular disease, stroke, adverse early life events, frailty, falls and brain injury in Aboriginal and Torres Strait Islander people may account for this difference.[17] However, there is a relative lack of research targeting dementia in Aboriginal and Torres Strait Islander people directly,[18] and poor recognition of the disease within communities and among health care workers and service providers.[19]

These factors have affected the provision of timely and culturally appropriate health services. Addressing the challenge of dementia for Aboriginal and Torres Strait Islander Australians is critically important in delivering the *National Aboriginal and Torres Strait Islander Health Plan (NATSIHP) 2013–2023*,[20] which includes the goal that 'older Aboriginal and Torres Strait Islander people are able to live out their lives as active, healthy, culturally secure and comfortably as possible'.

The NHMRC National Institute for Dementia Research worked with NHMRC's Principal Committee Indigenous Caucus to establish a Working Group that considered how to meet the dementia research needs of Aboriginal and Torres Strait Islander communities. The Working Group recommended stakeholders be brought together to advise on a consultation process to develop an Aboriginal and Torres Strait Islander Roadmap for Dementia Research and Translation.

The consultation process was comprehensive, involving urban, regional and remote communities around Australia, led by Aboriginal and Torres Strait Islander people. Results highlighted the need to facilitate collaboration, build the Aboriginal and Torres Strait Islander dementia researcher workforce, and improve participation of Aboriginal and Torres Strait Islander communities in setting priorities for research.

The work ahead will build on the Boosting Dementia Research Initiative's $14.1 million targeted investment to tackle the rising challenge of dementia for Aboriginal and Torres Strait Islander people. It will further expand capacity to support research and translation into better and more culturally appropriate care for people living with dementia in urban, regional and remote Aboriginal and Torres Strait Islander communities.

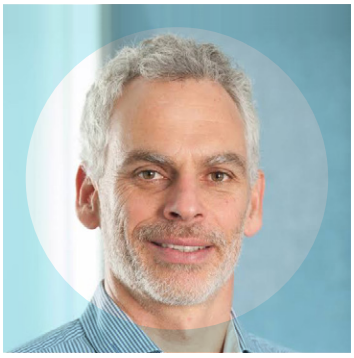
Fellow Profile:
Dr Kate Smith

Dr Kate Smith is an NHMRC-ARC Dementia Research Development Fellow at the University of Western Australia. She is working on three research projects funded by the Boosting Dementia Research Initiative, and co-lead the consultation process with Bard/Yjindjabandi woman Professor Dawn Bessarab, to develop the Aboriginal and Torres Strait Islander Roadmap for Dementia Research and Translation.

Dr Smith is focusing on culturally appropriate models of care for Aboriginal and Torres Strait Islander people living with dementia including for assessment, treatment and prevention.

'The NHMRC National Institute for Dementia Research has facilitated so many opportunities and built vital connections. In particular, the Roadmap work has allowed me to learn more about policy, and influencing Indigenous health policy,' says Dr Smith.

'Researchers rarely get together other than at conferences. It's been great to talk in detail with each other and collaborate. For example, another collaboration has come from the Roadmap — we're now looking into data sovereignty and data linkage, as we want community elders to influence what is done with that data.'



Team Grant Leader Profile:
Professor Michael Breakspear

Professor Michael Breakspear is Senior Scientist of the Systems Neuroscience Group at QIMR Birghofer, Chief Investigator of a Boosting Dementia Research Initiative Team Grant project — the Prospective Imaging Study of Ageing (PISA): Genes, Brain & Behaviour, and a Program Leader of the Australian Dementia Network (ADNeT).

Speaking about the impact of the NHMRC National Institute for Dementia Research and the Boosting Dementia Research Initiative, Professor Breakspear says that the Initiative has built capacity for experts in basic science to focus their efforts in dementia research. 'Before NNIDR funding became available for the PISA study, I wasn't working in dementia research — I was focused on brain imaging and it's applications to psychological disorders, particularly bipolar,' says Professor Breakspear.

'NNIDR funding encouraged people to work in the dementia space and built capacity for dementia studies.' More dedicated funding has had an effect on Professor Breakspear's research and has facilitated new collaborations within the dementia research landscape. Professor Breakspear is now using his expertise in brain imaging on the newly-announced ADNeT, along with Chief Investigator Professor Chris Rowe. ADNeT is a research program which will bring dementia researcher, clinicians, health service providers and industry together with people living with dementia to develop a national dementia registry and research program. A cornerstone of the program is providing better access to advanced diagnostic methods across the country. The ADNeT team, including Professor Breakspear's team at QIMR Berghofer, is now working across capital cities to set up memory clinics and undertake largescale brain imaging diagnostics.

RETAINING AND BUILDING AUSTRALIA'S DEMENTIA RESEARCH CAPACITY

Research capacity

More than 100 researchers received four-year Fellowships at early to mid-career levels as part of the Government's $200 million Boosting Dementia Research Initiative investment, representing more than a million hours of research activity from 2016 to 2024.

This investment has strengthened research teams and led to new collaborations across Australian universities and medical research institutes. It has ensured Australia keeps pace with, and makes a significant contribution to, the international dementia research effort, from prevention to cure and care. The 2019 Strategic Roadmap for Dementia Research and Translation recognises the importance of retaining and building on these foundations.

A total of 45 NHMRC-ARC Dementia Research Development Fellows will complete their Fellowships by 31 March 2020. The remaining 32 Fellows will progressively complete their fellowships between January 2020 and August 2024*.

Dementia data and methods

The Boosting Dementia Research Initiative has also invested in improving dementia data and methods to inform and support dementia research, innovation and policy. This work will include considering the safe and ethical use of electronic medical records and routine administrative data to monitor dementia frequency, risk factors and management. These capabilities are essential for Australia to contribute to new prevention, treatment and care measures both nationally and internationally.

Australian Dementia Network

The launch of the Australian Dementia Network — the largest single investment through the Boosting Dementia Research Initiative — will significantly increase Australia's dementia clinical trial capabilities.

Through this new network, Australia will be a strong contributor to, and an early beneficiary of, the continuing search for dementia treatments, delivering both health and economic benefits. The Australian Dementia Network is an Australian first in size, scope and extent.

Brain banking

A significant proportion of dementia research in Australia relies on well-characterised samples from brain banks to complete the proposed research. Post-mortem information is vital for determining diagnosis and validating treatment, and accurate diagnosis is essential for research into prevention, and the development of new treatment options and care interventions.

Independent consultants have reviewed whether Australia's current brain banking arrangements are able to advance world-leading dementia research. The consultants found that brain banks underpin Australia's dementia research capabilities and reputation, and that effective brain banks need to have the capacity to respectfully involve the community in brain donation. They have put forward a clear vision and delivery strategy for effective and sustainable access to well-characterised brain tissue resources from dementia and healthy control brain donors, that will inform future government and sectoral actions.

> **"**
>
> **'Before Boosting Dementia Research Initiative funding became available for the Projective Imaging Study of Ageing, I wasn't working in dementia research.**
>
> **The NHMRC National Institute for Dementia Research is making this nation-building approach to brain diseases possible.'**
>
> **Professor Michael Breakspear**
> University of Newcastle

*78 grants were awarded, one grant was declined

AUSTRALIAN DEMENTIA NETWORK

'We have two main objectives for the Australian Dementia Network: ensure the best care for people with a diagnosis, and find a treatment,' says the network's Chief Investigator, Professor Christopher Rowe, of Austin Health in Melbourne.

'Apart from the obvious thing — that we don't have a treatment for dementia — the number one deficiency is supporting people living with dementia to stay at home as long as possible.'

Having a coordinated network will provide a ready pool of people to participate in studies and fast-track preparation for trials, as well as making it easier for Australia to collaborate on international research.

The network brings together dementia researchers, clinicians, health service providers and industry, together with people living with dementia to deliver its Dementia Clinical Quality Registry and research program, enabling high quality research and clinical care.

The network will track, benchmark and report on the quality of clinical care of those living with dementia. This will support the research program's participants and produce valuable data sets to improve understanding of the causes of dementia, including progression, risk factors, opportunities for new treatments, and quality care — helping to improve quality of life.

In addition, the national network of memory clinics established through the program will better assess cognitive disorders and improve specialist access for all Australians.

Australians interested in participating in clinical trials and other research programs will be prepped and provided with state-of-the-art diagnosis, as well as tracking their disease trajectory over time.

The Australian Dementia Network will provide a network of 'one-stop shops' around the country to diagnose, advise and connect patients and their families with relevant services to begin treatment. Professor Rowe hopes this will help remove some of the confusion and difficulty in accessing services.

Professor Rowe's team will consider the two biggest questions in dementia research: whether removing amyloid build-up from the brain can halt disease progression; and whether available drug treatments are doing this effectively.

This is the single largest investment through the Boosting Dementia Research Initiative, as well as the largest investment in dementia research in Australia. The Australian Government's investment has been more than doubled by support pledged from philanthropic organisations the JO and JR Wicking Trust, the Yulgilbar Foundation, as well as industry, universities, research institutes and state governments.

> **We must remember the reason why we invested in dementia research, and how a major driver for our investment was to achieve a collaborative national approach. The Australian Dementia Network's national set up of clinics and researchers is starting to deliver on that promise and is an excellent example of Government joining forces with philanthropy to deliver real impact for people living with dementia, their families and carers.'**
>
> **Grant Hooper,**
> Senior Manager, Granting, Equity Trustees

WHERE TO FROM HERE: 2019 STRATEGIC ROADMAP

The Strategic Roadmap for Dementia Research and Translation guides the dementia research sector in meeting the urgent challenge that dementia presents to Australia's health, economy and society. The Roadmap is a living document that takes account of progress to date, research gaps and emerging priorities. In 2018, the Strategic Roadmap was reviewed and revised, before being launched by Federal Minister for Aged Care and Senior Australians, Senator the Hon. Richard Colbeck at the Australian Dementia Forum in June 2019. Following five years of significant investment and activity, and extensive stakeholder consultation, these principles and priorities have been given sharper focus in the 2019 revision of the Strategic Roadmap.

Priorities

Diagnosis and Prevention

Diagnosis: The 2018 Roadmap Review found that diagnosis is foundational to all aspects of dementia research. Prevention and risk reduction measures will be very different across different types of dementia, as will new treatments. Accurate and timely diagnosis is also critical for improved life outcomes and quality care. The 2019 Roadmap prioritises the development of new personalised, less invasive diagnostic approaches for use in the primary care setting to achieve more robust characterisation of research participants, and to provide more reliable information on dementia incidence and prevalence, by sub-type.

Prevention: The 2018 Review told us we should strive to develop a more complete understanding of how genetics, interventions, and environmental exposures interact to increase or reduce vulnerability, as these factors apply across the dementia sub-types. With robust evidence, actions can be taken that will achieve impact at both the individual and the whole of population level.

New targets, new technologies, new drug candidates

Review findings on intervention and treatment have sharpened the Roadmap's focus toward developing a much deeper understanding of the molecular and cellular mechanisms underlying neurodegeneration. The Roadmap now also prioritises ensuring health system readiness for a cure, and partnering with major international drug development programs.

Improving quality of life and provision of care

Interventions directed at improving the lives of people with dementia in the community are also likely to contribute to quality care. The care pathway and transitions between levels of care are not always linear. Care provision may be formal or informal, delivered in the community, in the family or in care organisations. Consultations brought these factors to the forefront to establish a Roadmap research work program that recognises the interdependencies between levels of care and strives to allow people with dementia to live well for longer in all settings.

Dementia and Aboriginal and Torres Strait Islander Australians

The 2018 Review brought together researchers currently funded through the Initiative, and involved national consultations across urban, regional and remote communities. A new priority has emerged from this work — to take a strengths-based and healing-centred approach, and to coordinate the current effort to deliver optimal access to the highest standards of diagnosis, treatment and care for Aboriginal and Torres Strait Islander communities. Research should involve and engage communities, build capacity within communities and within the research workforce, and be responsive to culture and the importance of the role of, and respect for, elders with dementia. This priority and Roadmap for Aboriginal and Torres Strait Islander Dementia Research and Translation advances NHMRC Road Map 3 and the Australian Government's National Aboriginal and Torres Strait Islander Health Plan.

Retaining and building Australia's dementia research capacity

The Boosting Dementia Research Initiative has greatly expanded the Australian dementia research workforce. NNIDR has brought together Australia's national research funding agency and Australia's peak body addressing the needs of people with dementia, their families and carers. Significant progress has been made toward prevention, cure and care. This new priority draws attention to the need to embed this growth and development within the Australian innovation system for the longer term.

Roadmap guiding principles

- Address all stages — causes, prevention, cure and care
- Involve people living with dementia, carers and families in all aspects of research
- Recognise and respond to Australia's cultural and linguistic diversity
- Ensure international collaborations
- Innovate and discover
- Achieve impact
- Partner across sectors and disciplines
- Determine and respond to vital dementia research infrastructure needs
- Provide open access to dementia research data.

TOTAL INVESTMENT

As at 30 June 2019, the Government had fully allocated the $200 million BDRI, including establishing the NNIDR and undertaking an evaluation of the BDRI. More than 95 per cent of the BDRI investment directly funded research to boost and accelerate research, including fellowships, projects, international collaboration grants, team grants, centres and the establishment of the Australian Dementia Network (ADNeT).

The wide-ranging investments include a major boost to dementia research capacity in Australia, together with advances across the spectrum of diagnosis and drug discovery, clinical treatment and quality care and risk reduction and prevention. BDRI funding was progressively mobilised over the five years from 2014.

YEAR	SCHEME NAME	GRANTS AWARDED*	TOTAL FUNDING
2014–15	Clem Jones Centre for Ageing Dementia Research	1	$9.0 million
	Dementia Research Team Grants	6	$32.5 million
2015–16	Priority Round 1 (JPco-fuND): Risk and protective factors	2	$2.6 million
	NHMRC-ARC Dementia Research Development Fellowships	78	$44.8 million
2017–18	Priority Round 1: Implementation of Dementia Research into Clinical Practice and Care	13	$17.6 million
	Priority Round 2: JPND Call for Multinational Research Projects for Pathway Analysis Across Neurodegenerative Diseases	1	$0.8 million
	Priority Round 3: National Dementia Network	1	$18.0 million
	Boosting Dementia Research Leadership Fellowships	32	$22.6 million
	Targeted Call for Research to address Dementia in Indigenous Australians	5	$14.1 million
2018–19	Priority Round 4: JPND Multinational research projects on Health and Social Care for Neurodegenerative Diseases	4	$2.9 million
	Priority Round 5: Implementing Dementia Risk Reduction and Prevention Research	11	$18.3 million
	Priority Round 6: Improving Dementia Data and Methods	2	$2.8 million
	Subtotal Research Grants	**156**	**$186.0 million**
	Plus indexation (approximate) over the life of the grants		$5.9 million

YEAR	ACTIVITY DESCRIPTION	TOTAL FUNDING
2014–15	NNIDR establishment , operation and sector coordination (eg. ADF, special interest groups, etc., (through Dementia Australia)	$7.7 million
2018–19	Evaluation of the Boosting Dementia Research Initiative	$0.1 million
	Review of brain banking arrangements for Australian dementia research	$0.3 million
	Subtotal Coordination and Evaluation	**$8.1 million**
	BDRI Grand Total	**$200 million**

*Number and value of grants is as announcement and may include some grants that were relinquished or not taken up

BDRI funding targeted the five priorities outlined in NNIDR's Strategic Roadmap for Dementia Research and Translation. Chart 1 shows the distribution of funding to the five priorities based on the main priority area.

Chart 2 provides a more nuanced account by taking into account the fact that most research projects address multiple priority areas and allocating to priority areas proportionally based on the research project description and intended outcomes. This representation is approximate.

Figure 1: Funds distribution across strategic priorities: main priority addressed by each grant

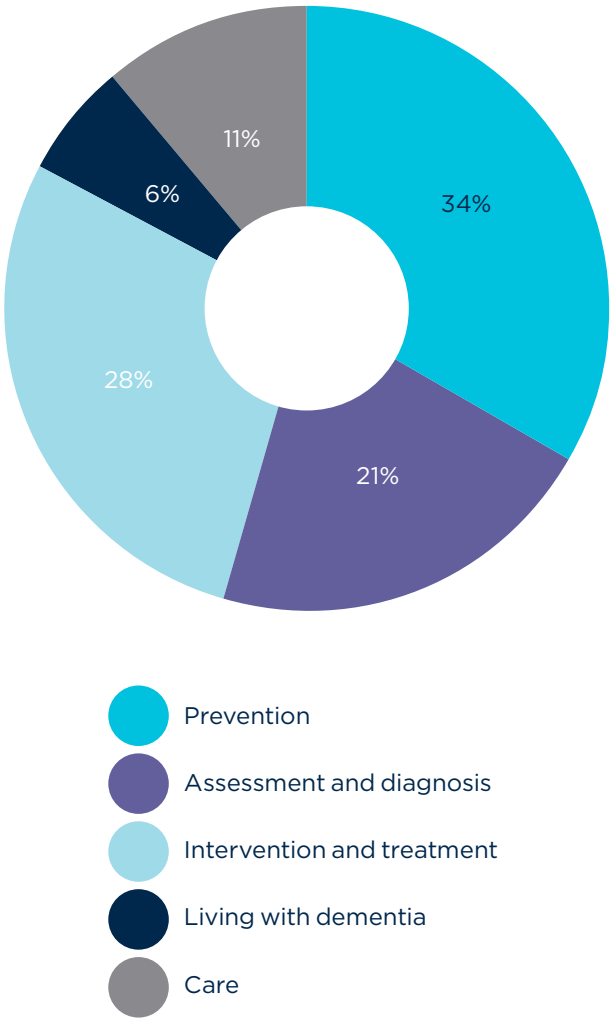
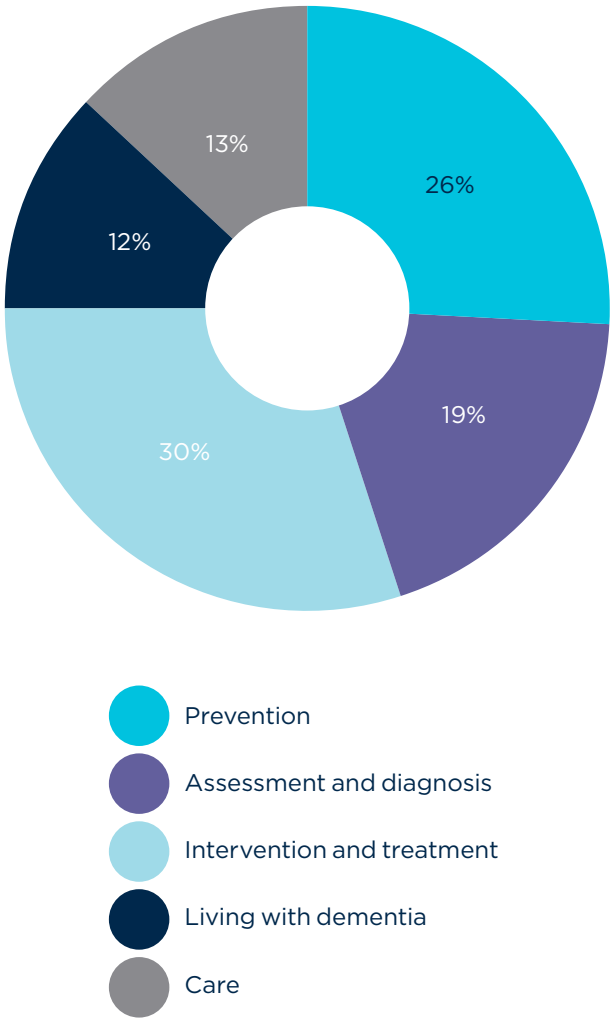


Figure 2: Funds distribution across strategic priorities: taking into account all priorities addressed by each grant



GRANTS AWARDED

All grants awarded and accepted under the Boosting Dementia Research Initiative are listed in the tables that follow. In instances noted, researchers relinquished their grants after commencement, for instance when accepting a position in another country or in industry. Grants relinquished prior to commencement have not been included.

Some grants address multiple priorities. In these instances, the grant appears under its area of primary research focus.

A number of researchers have changed their title and/or institution since the date of their award. Researcher title and affiliated institution is as at the date of award.

The award amount shown is the total dollar value on award and does not include CPI increases or reflect changes in amount received due to relinquishment.

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Prevention	Public Health	Translating the evidence on dementia risk reduction to generate assessments, advice and training for health professionals, policy makers, patients and public	Professor Kaarin Anstey University of New South Wales	Projects	2019–2024	$1,995,480.60
Prevention	Public Health	Do urban green spaces help to reduce incidence of Alzheimer's and associated risk factors? Multilevel longitudinal study of 267,153 adults with 15 years of follow-up	Associate Professor Thomas Astell-Burt University of Wollongong	Fellowships	2017–2020	$719,840.80
Prevention	Basic Science	Developing insight into the molecular origins of familial and sporadic frontotemporal dementia and amyotrophic lateral sclerosis	Associate Professor Ian Blair Macquarie University	Projects	2015–2019	$6,377,279.00
Prevention	Public Health	Maintain Your Brain	Professor Henry Brodaty AO University of New South Wales	Projects	2015–2019	$6,467,015.66
Prevention	Clinical Medicine and Science	Vascular mechanisms of neurodegeneration: drivers and determinants of dementia	Dr Amy Brodtmann University of Melbourne	Projects	2015–2019	$6,421,722.00
Prevention	Clinical Medicine and Science	Cardiovascular exercise to prevent cognitive decline in high risk patient populations: a post-ischaemic stroke exercise intervention study	Associate Professor Amy Brodtmann University of Melbourne	Projects	2019–2024	$1,613,508.00

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Prevention	Clinical Medicine and Science	The role of intense physical activity in protecting the ageing brain	Dr Belinda Brown Edith Cowan University	Fellowships	2016–2019	$600,079.15
Prevention	Clinical Medicine and Science	Improving the health of older Australians at risk of dementia — the role of physical function and exercise	Dr Michele Callisaya University of Tasmania	Fellowships	2017–2020	$533,119.60
Prevention	Public Health	Improving Australia's Dementia Statistics	Professor Annette Dobson University of Queensland	Projects	2019–2021	$2,154,096.00
Prevention	Clinical Medicine and Science	Sleep, plasticity and neurodegeneration: Targeting sleep to improve cognition in Mild Cognitive Impairment (MCI)	Dr Angela D'Rozario University of Sydney	Fellowships	2016–2019	$525,116.00
Prevention	Clinical Medicine and Science	Neuroimaging insights into sleep-wake dysfunction in older adults 'at risk' of developing dementia	Dr Shantel Duffy University of Sydney	Fellowships	2016–2019	$548,235.20
Prevention	Health Services Research	Multifactorial, multidisciplinary nurse led Aboriginal dementia prevention through cardio-metabolic risk reduction, behaviour change and other strategies: a pragmatic RCT	Professor Sandra Eades Baker Heart and Diabetes Institute	Projects	2018–2023	$2,811,179.80
Prevention	Public Health	Medicine-associated dementia and cognitive impairment: identifying the problem, reducing the harm	Dr Lisa Kalisch Ellett University of South Australia	Fellowships	2016–2019	$513,116.00
Prevention	Clinical Medicine and Science	Predicting perioperative cognitive disorders in the elderly based on cardiovascular risk, AD risk and new biomarkers	Associate Professor Lisbeth Evered University of Melbourne	Fellowships	2016–2019	$471,826.40
Prevention	Clinical Medicine and Science	The PROTECT Trial: PeRiOperaTive Enhancement of Cognitive Trajectory	Associate Professor Lisbeth Evered University of Melbourne	Projects	2019–2024	$1,615,118.80

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Prevention	Public Health	Stand up to dementia: Reducing prolonged sitting to improve cognitive function in older adults	Dr Paul Gardiner University of Queensland	Fellowships	2016–2019	$603,900.60
Prevention	Public Health	Taking a whole of day approach to optimising activity to prevent dementia in people with type 2 diabetes	Dr Paul Gardiner University of Queensland	Projects	2019–2024	$1,480,827.10
Prevention	Health Services Research	Holistic Approach in Primary care for PreventIng Memory Impairment aNd Dementia (HAPPI MIND)	Dr Johnson George Monash University	Projects	2019–2024	$1,999,499.84
Prevention	Basic Science	Investigating the iron proteome in Alzheimer's disease	Dr Amy Heffernan University of Melbourne	Fellowships	2016-2018* Relinquished	$514,644.00
Prevention	Clinical Medicine and Science	Sleep-wake disturbances and cardio-metabolic dysfunction in at risk dementia: a novel pathway in neurocognitive decline	Dr Camilla Hoyos University of Sydney	Fellowships	2016–2019	$558,305.00
Prevention	Clinical Medicine and Science	Vascular contributions to dementia: prevention in those at high-risk	Dr Hannah Keage University of South Australia	Fellowships	2017–2020	$718,104.80
Prevention	Clinical Medicine and Science	BetterBrains: Person-Centred, Multi-Domain, Primary Prevention Strategies to Delay Memory Decline	Dr Yen Ying Lim University of Melbourne	Projects	2019–2024	$1,568,806.80
Prevention	Clinical Medicine and Science	A multi-faceted intervention to enhance cognition in older people at risk of cognitive decline	Dr Helen Macpherson Deakin University	Fellowships	2016–2019	$600,224.20

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Prevention	Clinical Medicine and Science	Cognitive interventions for older adults at-risk of dementia and with early-stage neurodegenerative disease	Dr Loren Mowszowski University of Sydney	Fellowships	2016–2019	$544,347.74
Prevention	Clinical Medicine and Science	REducing Sleep Apnoea for the PrEvention of Dementia (REShAPED): a multi-site feasibility RCT	Professor Sharon Naismith University of Sydney	Projects	2019–2023	$1,468,684.80
Prevention	Public Health	Development of a unified list of drugs associated with drug-induced cognitive impairment	Dr Tuan Anh Nguyen University of South Australia	Fellowships	2016–2019	$443,572.80
Prevention	Basic Science	The effect of chronic intermittent alcohol consumption on the precipitation of dementia	Dr Christina Perry University of Melbourne	Fellowships	2016–2019	$604,644.00
Prevention	Clinical Medicine and Science	Improving sleep to reduce dementia risk	Dr Craig Phillips University of Sydney	Fellowships	2017–2020	$709,585.00
Prevention	Public Health	Mediterranean diet and exercise to reduce cognitive decline and dementia risks in independently living older Australians: the MedWalk randomised controlled trial	Professor Andrew Pipingas Swinburne University of Technology	Projects	2019–2023	$1,772,616.00
Prevention	Public Health	Ageing and dementia in Aboriginal Australians: promoting vitality, identifying decline and supporting communities	Dr Kylie Radford University of New South Wales	Fellowships	2016–2019	$603,410.70
Prevention	Public Health	Our MOB (Mind Our Brain): Dementia prevention across the life course with Aboriginal Australians	Dr Kylie Radford University of New South Wales	Projects	2018–2023	$3,020,383.20

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Prevention	Public Health	Comprehensive risk prediction models and presymptomatic biomarkers for dementia	Dr Joanne Ryan Monash University	Fellowships	2017–2020	$720,144.00
Prevention	Basic Science	Dementia associated to diabetes: prevention through the modulation of cerebrovascular integrity	Dr Ryusuke Takechi Curtin University of Technology	Fellowships	2017–2020	$719,770.00
Prevention	Clinical Medicine and Science	Preventing cognitive decline with metformin: a randomised controlled trial	Professor Katherine Samaras The Garvan Institute of Medical Research	Projects	2019–2024	$1,998,024.60
Prevention	Clinical Medicine and Science	Optimising exercise prescription for brain health in older adults at risk of dementia	Dr Ashleigh Smith University of South Australia	Fellowships	2016–2019	$594,122.60
Prevention	Clinical Medicine and Science	Living your best day — Optimising activity and diet compositions for dementia prevention	Dr Ashleigh Smith University of South Australia	Projects	2019–2024	$1,234,805.00
Prevention	Clinical Medicine and Science	Dementia prevention and risk Management Program for Aboriginal Australians (DAMPAA)	Dr Kate Smith University of Western Australia	Projects	2018–2023	$2,543,423.30
Prevention	Clinical Medicine and Science	An investigation into the neural substrates of cognitive deficits in Mild Cognitive Impairment, and the mechanisms of action of a novel treatment	Ms Genevieve Steiner University of Western Sydney	Fellowships	2016–2019	$574,644.00
Prevention	Public Health	Reducing dementia risk in Aboriginal and Torres Strait Islander Communities	Associate Professor Edward Strivens James Cook University	Projects	2019–2024	$1,515,145.00

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Assessment and diagnosis	Clinical Medicine and Science	Novel mechanisms and diagnostic applications for iron in Alzheimer's disease	Dr Scott Ayton University of Melbourne	Fellowships	2016–2019	$599,644.00
Assessment and diagnosis	Clinical Medicine and Science	Prospective Imaging Study of Ageing: Genes, Brain & Behaviour	Professor Michael Breakspear Queensland Institute of Medical Research	Projects	2015–2019	$3,401,918.40
Assessment and diagnosis	Clinical Medicine and Science	What can tau deposition tell us about the appearance of subjective and objective cognitive decline in older adults?	Dr Rachel Buckley University of Melbourne	Fellowships	2016–2019* Relinquished	$674,076.85
Assessment and diagnosis	Basic Science	Discovery of novel neurodegeneration genes via next-generation sequencing technologies and high-throughput cellular assays	Dr Carol Dobson-Stone University of Sydney	Fellowships	2017–2020	$715,144.00
Assessment and diagnosis	Health Services Research	Dementia in people with Intellectual Disability: A longitudinal study with focus on translatable outcomes	Dr Elizabeth Evans University of New South Wales	Fellowships	2016–2019	$468,151.20
Assessment and diagnosis	Clinical Medicine and Science	Early detection of Alzheimer's disease using ocular biomarkers	Dr Shaun Frost Commonwealth Scientific and Industrial Research Organisation (CSIRO)	Fellowships	2016–2019	$602,501.60
Assessment and diagnosis	Clinical Medicine and Science	Spatial learning and memory in Huntington's disease	Dr Yifat Glikmann-Johnston Monash University	Fellowships	2016–2019	$475,968.80
Assessment and diagnosis	Basic Science	Combined TMS-EEG for early diagnosis of Alzheimer's disease	Dr Mitchell Goldsworthy University of Adelaide	Fellowships	2016–2019	$603,767.05

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Assessment and diagnosis	Basic Science	From brain maps to mechanisms: Modelling the pathophysiology of dementia	Dr Leonardo Gollo Queensland Institute of Medical Research	Fellowships	2016–2019	$604,512.97
Assessment and diagnosis	Basic Science	Implications of retinal neurodegeneration in Alzheimer's disease	Dr Mojtaba Golzan Macquarie University	Fellowships	2016–2019	$602,213.20
Assessment and diagnosis	Clinical Medicine and Science	Establishing a blood-based biomarker panel for pre-clinical Alzheimer's disease	Dr Veer Bala Gupta Edith Cowan University	Fellowships	2017–2020	$716,778.00
Assessment and diagnosis	Clinical Medicine and Science	What is the effect of Alzheimer's disease on eye and can ocular changes be used as biomarker for Alzheimer's disease?	Dr Vivek Gupta Macquarie University	Fellowships	2017–2020	$718,002.40
Assessment and diagnosis	Clinical Medicine and Science	Non-Alzheimer's disease degenerative dementias: Identifying prodromal genetic/ familial phenotypes, modifying factors, and protein variations involved in progression	Professor Glenda Halliday University of New South Wales	Projects	2015–2019	$6,449,246.30
Assessment and diagnosis	Clinical Medicine and Science	Cognition in Motion: Characterization and Evolution of Cognitive Dysfunction in Motor Neurodegeneration and Frontotemporal Dementia	Dr Sharpley Hsieh University of Sydney	Fellowships	2016–2019* Relinquished	$604,105.50
Assessment and diagnosis	Clinical Medicine and Science	Detecting biomarkers of brain health in dementia	Associate Professor Anna King University of Tasmania	Fellowships	2017–2020	$720,144.00
Assessment and diagnosis	Clinical Medicine and Science	Cross-comparison, validation and performance of computerised neuropsychological assessment devices in the evaluation of mild cognitive impairment and dementia	Dr Nicole Kochan University of New South Wales	Projects	2017–2019	$700,482.00

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Assessment and diagnosis	Clinical Medicine and Science	Identifying novel markers to differentiate frontotemporal dementia from Alzheimer's disease	Dr Fiona Kumfor University of New South Wales	Fellowships	2016–2019	$603,912.10
Assessment and diagnosis	Clinical Medicine and Science	Predicting Dementia and Parkinson's in the Clinic	Associate Professor Simon Lewis University of Sydney	Fellowships	2016–2019	$625,572.80
Assessment and diagnosis	Clinical Medicine and Science	Disentangling aphasic syndromes in Alzheimer's disease	Dr Cristian Leyton University of New South Wales	Fellowships	2016–2019	$682,935.50
Assessment and diagnosis	Clinical Medicine and Science	Genetic mechanisms that moderate effects of Aß accumulation in preclinical Alzheimer's disease	Dr Yen Ying Lim University of Melbourne	Fellowships	2016–2019	$603,525.30
Assessment and diagnosis	Clinical Medicine and Science	Improving Detection and management of dEmentia in older Aboriginal and Torres Strait Islanders attending Primary Care (IDEA-PC)	Associate Professor Dina LoGiudice University of Melbourne	Projects	2017–2019	$2,172,421.95
Assessment and Diagnosis	Clinical Medicine and Science	Let's CHAT (Community Health Approaches To) — Dementia in Indigenous Communities	Associate Professor Dina LoGiudice University of Melbourne	Projects	2018–2023	$2,661,502.00
Assessment and diagnosis	Basic Science	Genetic Investigations for Prodromal Alzheimer's disease	Dr Michelle Lupton Queensland Institute of Medical Research	Fellowships	2017–2020	$719,373.70
Assessment and diagnosis	Basic Science	Self-assembled hydrogels as a model for neurodegeneration	Dr Adam Martin University of New South Wales	Fellowships	2016–2019	$594,644.00

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Assessment and diagnosis	Clinical Medicine and Science	Lewy bodies in patients with dementia — Determining common and unique mechanisms in relation to Alzheimer's disease	Dr Sivaraman Purushothuman University of New South Wales	Fellowships	2016–2019	$604,644.00
Assessment and diagnosis	Basic Science	Development of blood-based biomarkers for the early detection of brain amyloid and the investigation of the natural history of Alzheimer's disease	Dr Blaine Roberts Florey Institute of Neuroscience and Mental Health	Fellowships	2017–2020	$720,144.00
Assessment and diagnosis	Clinical Medicine and Science	Early diagnosis and intervention for dementia	Associate Professor Gail Robinson University of Queensland	Fellowships	2017–2020	$720,554.50
Assessment and diagnosis	Basic Science	Uncovering the Function of Susceptibility Variants in Alzheimer's disease: From GWAS to Cell-Type Specific eQTLs and mQTLs	Dr Miguel Renteria Rodriguez Queensland Institute of Medical Research	Fellowships	2016–2019	$647,804.00
Assessment and diagnosis	Clinical Medicine and Science	BRIDGET: BRain imaging, cognition, Dementia and next generation GEnomics: a Transdisciplinary approach to search for risk and protective factors of neurodegenerative disease	Professor Perminder Sachdev University of New South Wales	International Collaborations	2016–2018	$1,081,489.00
Assessment and diagnosis	Clinical Medicine and Science	A European DNA bank for deciphering the missing heritability of Alzheimer's disease (EADB)	Professor Perminder Sachdev University of New South Wales	International Collaborations	2016–2018	$1,556,995.00
Assessment and Diagnosis	Public Health	Addressing health and care needs of Aboriginal and Torres Strait Islander people living with dementia and their communities: A cluster RCT	Professor Robert Sanson-Fisher University of Newcastle	Projects	2019–2023	$3,046,293.90
Assessment and diagnosis	Basic Science	Investigation of zinc dyshomeostasis associated with aging and dementia-related disorders using novel nanodiamond-based markers	Dr Olga Shimoni University of Technology Sydney	Fellowships	2016–2019	$604,644.00

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Assessment and diagnosis	Public Health	Leveraging electronic medical records and routine administrative data towards a population approach for monitoring dementia frequency, risk factors and management	Professor Velandai Srikanth Monash University	Projects	2019–2021	$617,335.60
Assessment and diagnosis	Basic Science	Dual and multiple proteinopathies in neurodegenerative dementias — risk factors, prognostic indicators and clinical ramifications	Dr Rachel Tan University of New South Wales	Fellowships	2016–2019	$604,644.00
Assessment and diagnosis	Clinical Medicine and Science	Optimising speech assessment and treatment in frontotemporal dementia	Associate Professor Adam Vogel University of Melbourne	Fellowships	2017–2020	$722,210.40
Assessment and diagnosis	Clinical Medicine and Science	Vascular Cognitive Risk Score: quantifying the vascular burden in Alzheimer's Disease	Dr Nawaf Yassi University of Melbourne	Fellowships	2016–2019	$627,179.60
Intervention and treatment	Basic Science	Targeting GPCRs to Treat and Prevent Dementia	Dr Alaa Abdul-Ridha University of Melbourne	Fellowships	2016–2019	$598,912.10
Intervention and treatment	Clinical Medicine and Science	Cognition-oriented treatments for older adults on the spectrum from cognitive health to dementia: Improving methodologies and outcomes	Dr Alex Bahar-Fuchs University of Melbourne	Fellowships	2017–2020	$716,620.00
Intervention and treatment	Clinical Medicine and Science	Can music mend minds? Investigating the mechanisms underlying the beneficial effects of music on persons with dementia	Dr Amee Baird Macquarie University	Fellowships	2016–2019	$411,108.40
Intervention and treatment	Basic Science	The Role of Oligodendrocytes in Frontotemporal Dementia	Ms Samantha Barton Monash University	Fellowships	2016–2019	$625,292.00

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Intervention and treatment	Public Health	Optimising medicine regimens for people with dementia: maintaining function, maximising quality of life and preventing adverse events	Associate Professor Simon Bell Monash University	Fellowships	2017–2020	$715,017.10
Intervention and treatment	Basic Science	Neuroprotective functions of autophagy regulators in Alzheimer's disease	Dr Prashant Bharadwaj Edith Cowan University	Fellowships	2016–2019	$434,644.00
Intervention and treatment	Basic Science	Role of Apolipoprotein D in Alzheimer's disease and Frontotemporal Dementia	Dr Surabhi Bhatia University of New South Wales	Fellowships	2016–2019	$575,612.00
Intervention and treatment	Basic Science	L1 retrotransposition: the missing link between genetics and environmental factors in Parkinson's disease?	Dr Gabriela Bodea University of Queensland	Fellowships	2016–2019	$604,644.00
Intervention and treatment	Basic Science	The role of the neuronal epigenome in natural brain ageing and the progression of Alzheimer's disease	Dr Sam Buckberry University of Western Australia	Fellowships	2016–2019	$584,644.00
Intervention and treatment	Basic Science	The missing link: mGluR5 as a therapeutic target for cognitive decline in dementia	Dr Emma Burrows University of Melbourne	Fellowships	2016–2019	$563,622.00
Intervention and treatment	Basic Science	Discovering novel molecules that regulate axonal degeneration	Dr Sean Coakley University of Queensland	Fellowships	2016–2019	$588,622.00
Intervention and treatment	Basic Science	Myelin lipid breakdown affected by Apolipoprotein E genotype: implications for Alzheimer's Disease pathogenesis	Dr Timothy Couttas University of New South Wales	Fellowships	2016–2019	$534,644.00

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Intervention and treatment	Basic Science	Targeting neuroinflammatory pathways as novel treatments for dementia	Dr Daniel Croker University of Queensland	Fellowships	2016–2017* Relinquished	$600,116.00
Intervention and treatment	Health Services Research	Treatment of anxiety and depression in dementia	Dr Nadeeka Dissanayaka University of Queensland	Fellowships	2017–2020	$528,857.60
Intervention and treatment	Basic Science	Investigating the synergistic role of brain-derived neurotrophic factor (BDNF) and estradiol on parvalbumin-mediated cognitive function: relevance to dementia	Dr Xin Du University of Melbourne	Fellowships	2016–2019	$589,644.00
Intervention and treatment	Clinical Medicine and Science	Team Approach to Polypharmacy Evaluation and Reduction for General Practice patients with dementia: the Australian TAPERdem study	Associate Professor Christopher Etherton-Beer University of Western Australia	Projects	2017–2019	$586,840.40
Intervention and treatment	Basic Science	Towards Targeting The Endosome In Neurodegenerative Disease	Dr Rajesh Ghai University of Queensland	Fellowships	2016–2018* Relinquished	$601,958.60
Intervention and treatment	Basic Science	Clem Jones Centre for Ageing Dementia Research	Professor Jürgen Götz University of Queensland	Centres	2014–2019	$9,000,000.00
Intervention and treatment	Basic Science	The role of copper in Ubiquitin-dependent protein degradation in Alzheimer's disease	Dr Mark Greenough University of Melbourne	Fellowships	2016–2019	$588,622.00
Intervention and treatment	Basic Science	Anti-inflammatory copper complexes for treatment of Alzheimer's disease	Dr Alexandra Grubman University of Melbourne	Fellowships	2016–2019	$603,622.00

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Intervention and treatment	Clinical Medicine and Science	Development of novel therapeutics for dementia: investigating tailored brain stimulation approaches for dementia prevention and treatment	Associate Professor Kate Hoy Monash University	Fellowships	2017–2020	$723,104.80
Intervention and treatment	Basic Science	Forging a new understanding of iron in neurodegenerative disease	Dr Simon James University of Melbourne	Fellowships	2016–2019	$598,572.80
Intervention and treatment	Basic Science	Novel targeted degradable multifunctional poly (vinyl-co-ester) nanoparticles for Alzheimer's disease applications	Dr Kristian Kempe Monash University	Fellowships	2016–2019	$601,940.00
Intervention and treatment	Clinical Medicine and Science	Longitudinal transcriptome profiles for people with dementia	Associate Professor Clement Loy University of Sydney	Fellowships	2016–2019	$475,913.20
Intervention and treatment	Clinical Medicine and Science	Investigating biometal dyshomeostasis in dementia with Lewy bodies	Ms Erin McAllum University of Melbourne	Fellowships	2016–2019	$554,644.00
Intervention and treatment	Basic Science	Targeting inflammation as a biomarker and treatment for Alzheimer's disease	Dr Rodrigo Medeiros University of Queensland	Fellowships	2017–2020	$718,920.48
Intervention and treatment	Clinical Medicine and Science	Dementia in Type 2 Diabetes — studying causal mechanisms	Dr Christopher Moran Monash University	Fellowships	2016–2019	$514,786.40
Intervention and treatment	Basic Science	Protecting synaptic connectivity in Alzheimer's disease	Dr Kathryn Munro University of Melbourne	Fellowships	2016–2019	$573,572.80

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Intervention and treatment	Clinical Medicine and Science	Novel assessment and intervention for dementia: an inter-disciplinary translational approach	Professor Sharon Naismith University of Sydney	Fellowships	2017–2020	$720,021.20
Intervention and treatment	Basic Science	Treating Parkinson's disease dementia with nanoscaffolds	Associate Professor David Nisbet Australian National University	Fellowships	2017–2020	$665,144.00
Intervention and treatment	Basic Science	The role of proteoglycans in neurodegeneration	Dr Rachel Okolicsanyi Queensland University of Technology	Fellowships	2016–2023	$569,644.00
Intervention and treatment	Basic Science	Neuronal membranes and connections in dementia: targets for intervention	Dr Lezanne Ooi University of Wollongong	Fellowships	2017–2020	$720,144.00
Intervention and treatment	Basic Science	How do mutations in autophagy receptors cause FTD and ALS?	Dr Sarah Rea University of Western Australia	Fellowships	2016–2019	$566,966.00
Intervention and treatment	Basic Science	Gene-environment interactions in dementia	Dr Thibault Renoir Florey Institute of Neuroscience and Mental Health	Fellowships	2017–2020	$720,144.00
Intervention and treatment	Clinical Medicine and Science	The Australian Dementia Network (ADNeT): Bringing together Australia's dementia stakeholders	Professor Christopher Rowe University of Melbourne	Projects	2018–2023	$18,000,000.00
Intervention and treatment	Basic Science	Targeting G protein-couples receptors GPCRs to treat and prevent dementia	Dr Daniel Scott Florey Institute of Neuroscience and Mental Health	Fellowships	2017–2020	$720,451.20

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Intervention and treatment	Basic Science	New Nanoparticle Strategies for Efficient Delivery and Controlled Release into the Brain	Dr Bingyang Shi Macquarie University	Fellowships	2016–2019	$571,633.00
Intervention and treatment	Basic Science	Targeting G-quadruplex DNA as a novel therapeutic strategy for Alzheimer's and Frontotemporal Dementia	Dr Nicole Smith University of Western Australia	Fellowships	2017–2020	$720,144.00
Intervention and treatment	Basic Science	Pericyte dysfunction limiting energy supply in Alzheimer's disease	Dr Brad Sutherland University of Tasmania	Fellowships	2017–2020	$717,707.95
Intervention and treatment	Basic Science	Restoring defective protein homeostasis in frontotemporal dementia	Dr Bradley Turner Florey Institute of Neuroscience and Mental Health	Fellowships	2017–2020	$720,144.00
Intervention and treatment	Clinical Medicine and Science	Vasoactive nutrients to promote healthy ageing in postmenopausal women	Dr Rachel Wong University of Newcastle	Fellowships	2016–2019	$598,030.80
Intervention and treatment	Basic Science	BRAIN-MEND: Biological Resource Analysis to Identify new mechanisms and phenotypes in Neurodegenerative Diseases	Professor Naomi Wray University of Queensland	Projects	2018–2020	$849,967.40
Living with dementia	Health Services Research	Music therapy interventions for dementia: Cluster randomised control trial	Professor Felicity Baker University of Melbourne	Projects	2017–2019	$1,014,430.20
Living with dementia	Health Services Research	Increasing rates of Advance Care Planning for individuals with Dementia	Dr Jamie Bryant University of Newcastle	Fellowships	2016–2019	$574,420.70

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Living with dementia	Public Health	Improving outcomes for community dwelling people with dementia and their support persons	Associate Professor Mariko Carey University of Newcastle	Fellowships	2017–2020	$719,339.80
Living with dementia	Public Health	Mood Regulation Using Music: A Community Health Strategy for Improving Quality of Life in People With Mild Dementia	Dr Sandra Garrido University of Western Sydney	Fellowships	2016–2019	$601,540.40
Living with dementia	Clinical Medicine and Science	Moving Behavioural Neuroscience & Neuroeconomics into Dementia Prevention: Spatial tracking and economic decision-making as new sensitive measures of daily function	Dr Amit Lampit University of Sydney	Fellowships	2016–2019	$595,588.00
Living with dementia	Health Services Research	A telehealth intervention to delay functional decline in community-dwelling people with dementia	Dr Kate Laver Flinders University	Fellowships	2016–2019	$476,398.50
Living with dementia	Health Services Research	'Agents of Change': Improving post diagnosis care for people with dementia and their carers through the establishment of a National Quality Collaborative to implement guideline recommendations	Dr Kate Laver Flinders University	Projects	2017–2019	$770,517.80
Living with dementia	Clinical Medicine and Science	Visual exploration in dementia	Dr Tobias Loetscher University of South Australia	Fellowships	2017–2020	$712,505.60
Living with dementia	Health Services Research	Rehabilitation for people with dementia	Associate Professor Lee-Fay Low University of Sydney	Fellowships	2017–2020	$722,358.00

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Living with dementia	Health Services Research	A multi-component web-based intervention to improve the wellbeing of people with dementia and their carers: a randomised controlled trial	Professor Robert Sanson-Fisher University of Newcastle	Projects	2017–2019	$1,312,455.40
Living with dementia	Public Health	Rolling it out: Targeted translation intervention to improve driving cessation outcomes for people with dementia across metropolitan and regional areas	Dr Theresa Scott University of Queensland	Fellowships	2016–2019	$594,644.00
Living with dementia	Public Health	Supporting older adults with dementia with driving cessation and mobility: An innovative telehealth approach	Dr Theresa Scott University of Queensland	Projects	2017–2019	$1,868,907.00
Living with dementia	Health Services Research	Choir participation to improve wellbeing and relationship quality for community-dwelling people with dementia and their primary care-givers	Dr Jeanette Tamplin University of Melbourne	Fellowships	2016–2019	$569,698.20
Living with dementia	Public Health	Optimising the management of comorbidities in dementia: reducing disparities and improving clinical outcomes	Dr Edwin Tan Monash University	Fellowships	2016–2019	$603,894.00
Living with dementia	Public Health	Understanding and preventing physical and cognitive decline and falls in older people with dementia	Dr Morag Taylor University of New South Wales	Fellowships	2016–2019	$509,625.52
Care	Health Services Research	Improving Dementia Education Access (the IDEA study) for clinical hospital staff in regional and district hospitals: a cluster randomised study to improve knowledge and patient outcomes.	Dr Michael Annear University of Tasmania	Fellowships	2016–2017* Relinquished	$599,758.40
Care	Health Services Research	Self-management and HeAlth Promotion in early-stage dementia with E-learning for carers — A randomised controlled trial	Professor Kaarin Anstey University of New South Wales	Projects	2019–2022	$746,997.00

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Care	Public Health	A HOME-based spousal caregiver-delivered music intervention for people living with dEmentia: A Randomised Controlled Trial	Professor Felicity Baker University of Melbourne	Projects	2019–2022	$707,598.80
Care	Health Services Research	Implementing the Tailored Activity Program for people with dementia and their family living at home: i-TAP (Australia)	Associate Professor Sally Bennett University of Queensland	Projects	2017–2019	$1,060,719.10
Care	Clinical Medicine and Science	CO-desiGning demeNtia dIagnoSis ANd post-diagnostic CarE (Cognisance)	Professor Henry Brodaty AO University of New South Wales	Projects	2019–2021	$742,041.30
Care	Health Services Research	Ensuring the sustainability of care for people with dementia now and into the future	Associate Professor Tracy Comans University of Queensland	Fellowships	2017–2020	$717,062.80
Care	Health Services Research	Promoting Independence Through quality dementia Care at Home (PITCH)	Associate Professor Briony Dow National Ageing Research Institute	Projects	2017–2019	$1,541,610.85
Care	Health Services Research	Work4Dementia: Development of an evidence-based intervention to build capacity and resilience for the Australian dementia care workforce	Dr Kate-Ellen Elliott University of Tasmania	Fellowships	2016–2019	$595,219.60
Care	Clinical Medicine and Science	Depression in Dementia	Dr Andrew Ford University of Western Australia	Fellowships	2016–2019	$474,794.50
Care	Public Health	Optimising medication use to maintain or improve quality of life in aged care facility residents with and without dementia	Dr Julia Gilmartin-Thomas Monash University	Fellowships	2016–2019	$600,627.00
Care	Clinical Medicine and Science	Optimising pharmaceutical care for people with dementia in acute care settings	Dr Danijela Gnjidic University of Sydney	Fellowships	2017–2020	$719,636.60

PRIORITY AREA	BROAD RESEARCH AREA	PROJECT TITLE	RESEARCHER	GRANT CATEGORY	TIMEFRAME	$ AWARDED
Care	Health Services Research	Optimising functional independence of older persons with dementia: Implementation and Evaluation of the Interdisciplinary Home-bAsed Reablement Program (I HARP)	Professor Yun-Hee Jeon University of Sydney	Projects	2017–2019	$1,864,344.80
Care	Health Services Research	Improving quality of care for people with dementia in the acute care setting	Dr Melinda Martin-Khan University of Queensland	Projects	2017–2019	$1,859,854.65
Care	Health Services Research	A pilot dementia clinical quality registry to improve dementia clinical care	Professor John McNeil Monash University	Projects	2017–2019	$1,571,501.10
Care	Clinical Medicine and Science	BPSD-CARE: A person-centred approach to managing behavioural and psychological symptoms of dementia in residential care	Dr Moyra Mortby Australian National University	Fellowships	2016–2019	$600,627.00
Care	Health Services Research	Consumer Directed Care: Understanding and promoting participation and care outcomes for people living with dementia in receipt of a Home Care Package	Dr Lyn Phillipson University of Wollongong	Fellowships	2016–2019	$571,648.00
Care	Clinical Medicine and Science	Development and implementation of evidence-based deprescribing guidelines to guide person-centred care for people with dementia	Dr Emily Reeve University of Sydney	Fellowships	2016–2019	$623,362.50
Care	Health Services Research	An Australian Community Of practice in Research in Dementia (ACcORD) to improve health outcomes for people with dementia and their carers	Professor Robert Sanson-Fisher University of Newcastle	Projects	2015–2019	$3,382,819.00
Care	Clinical Medicine and Science	Development and validation of the first culturally based quality of life tool for Aboriginal Australians living with dementia or cognitive impairment	Dr Kate Smith University of Western Australia	Fellowships	2016–2019	$602,435.00

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