Foreword

Dementia is the only one of the top ten causes of death that we cannot prevent, cure or even slow down. Figures released last year report that dementia is now the leading cause of death in England and Wales, with deaths from the condition rising year on year.

There has never been a greater need to increase investment into dementia research. With adequate and sustained funding, biomedical science will untangle the complex series of events that take place in the brain to cause dementia and, ultimately, we will find a cure. But drug development takes time and so equally important is an increased investment into care research. These studies will develop better models of dementia care to improve the quality of life of those who are currently living with condition, as well as those who support or care for them.

Alzheimer’s Society is rising to meet this challenge. This year marks the end of a five year strategy that saw our investment in research activity dramatically increase from less than £2 million a year in 2012 to £10 million in 2017. We also worked with government to help secure £150 million for the UK’s first dedicated dementia institute. As a founding partner, we’ve pledged £50 million to the UK Dementia Research Institute (DRI), our single biggest research commitment to date. By uniting with the MRC and Alzheimer’s Research UK against dementia we will help to realise the potential of the UK DRI to change the lives of millions affected by dementia.

As we enter a new strategy, research remains a top priority for Alzheimer’s Society and we will continue our work to build a diverse and strong dementia research community, one that can deliver the breakthroughs we need in both care and for a cure. Thanks to everyone who has supported and donated to our research programme so far, without you this vital work would not be possible.

Dr Doug Brown, Director of Research and Development

Care for today, cure for tomorrow

Since 1990 Alzheimer’s Society has invested over £50 million into dementia research, helping progress towards our mission of reducing the impact of dementia on lives today and creating a world without dementia tomorrow.

We’re unique among UK dementia research funders because our research programme has a dual focus: we support research to improve the care of people with dementia as well as research to improve diagnosis and treatments and to look for a cure.

Our research programme continues to go from strength to strength. This year we invested £9.2 million on 56 new research grants, split equally between biomedical and dementia care projects.

We smashed our previous annual records in terms of investment, the number researchers we are supporting and the number of peer-reviewed publications our research has generated.

We have 156 active grants worth over £30 million. That’s a lot of exciting new research that will advance our understanding of the causes of dementia and bring us closer to achieving our mission.

You can explore our current research projects on our website at: alzheimers.org.uk/currentprojects

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Alzheimer’s Society awarded Professor Steve Iliffe and Dr Nathan Davies at University College London (UCL) a project grant to address this gap in guidance. They worked with family carers and clinicians to co-design a set of simple decision making tools to enable more informed and confident end of life care decisions, both in the hospital and at home.

The research team drew on published literature and the rich personal experience of carers from the Alzheimer’s Society Research Network who had supported a loved one with dementia at the end of their life. Together they built decision-making flowcharts addressing four key areas: eating and swallowing difficulties, agitation and restlessness, ending life-sustaining treatment, and providing routine care such as bathing.

The flowcharts were refined by a mixed group of researchers, family carers and health professionals and then tested by five care teams working in general practice, the community and on an elderly hospital ward. Feedback from all five sites has been extremely positive and the tools are now being made widely available to support better end of life care decisions in dementia across the UK.

‘The tools have been very well received by dementia care teams, clearly filling a gap in existing guidance and serving as an educational aid for those less experienced in providing end of life care.’

Dr Nathan Davies, UCL

‘I can’t think of any care home that wouldn’t want to use a resource like this.’

Nurse practitioner

Closing the gap with other health conditions

Dementia is caused by diseases of the brain, which means research will find ways to defeat it, just like we have seen for diseases like cancer and HIV. But to make progress we need to significantly increase our capacity to do dementia research. This means attracting more people to the field to generate new ideas, to take forward new discoveries and deliver the best possible results for people affected by dementia.

A report in 2012 found far too few researchers were working on dementia – six times fewer than the number engaged in cancer research. Retention is poor too, with 70% of dementia researchers leaving the field within four years, due in part to limited funding and career prospects.

Developing the dementia research leaders of tomorrow

We began working hard on this issue and in 2014 we launched our Dementia Research Leaders programme to attract, develop and retain the brightest minds to work in dementia research. Since then we have:

- Funded 160 early career researchers to begin or advance their careers in dementia research
- Tripled the number of early career researchers that we fund each year
- Established eight dementia Doctoral Training Centres (DTC) at Universities to support 52 new PhD students
- Developed an undergraduate bursary scheme to give 50 students their first taste of dementia research
- Supported 15 rising stars with career guidance from expert mentors in their own research fields

Earlier this year, new figures showed that the number of UK dementia researchers has almost doubled. We are making good progress. However, compared to the cost of dementia to the economy, we still have a long way to go to close the gap with other health conditions.

For every £2m of disease costs there is

One dementia researcher  10 cancer researchers  Five heart disease researchers  Four stroke researchers

Our Doctoral Training Centres are supporting 52 PhD students and research fellows to tackle some of the most pressing issues in the field

- Emma Sigfridsson, Scotland DTC, Edinburgh
  ‘My project asks whether boosting the brain’s natural antioxidant system can reduce the harmful effects of reduced blood flow to the brain – something that can contribute to dementia. By increasing our understanding of dementia at the basic scientific level, we aim to help people learn how to keep their brain healthy in midlife to reduce their risk of the condition.’

- Bryony Porter, Cambridge DTC, Norwich
  ‘I’m using large data sets to estimate the benefits and potential harms of medicines prescribed for people with dementia who are also living with other health conditions. I want to understand how medicines are prescribed and monitored in practice, to help people with dementia manage the challenges of taking multiple medications.’

- Isabel Castanho, Exeter DTC
  ‘Little is still known about the specific mechanisms behind Alzheimer’s disease. I’m looking at changes in gene regulation as the disease progresses with the ultimate goal of contributing to the design of better treatments that could delay the devastating consequences for patients and their families.’

- Court Shaw, Bradford DTC
  ‘A hospital admission for someone with dementia can be a challenging time, and I hope my research will make the experience less taxing by developing tools and systems to facilitate effective communication between families, healthcare staff, and patients.’

For more information about the Doctoral Training Centres visit alzheimers.org.uk/dtc
New treatments in half the time

Our Drug Discovery programme takes a novel approach to finding new dementia treatments. Instead of starting from scratch, we test whether drugs already being used for other health conditions might also work for people with dementia. There is good scientific rationale for this approach and, because we already know a lot about these drugs, it can take half the amount of time for a new treatment to reach the people who desperately need it.

Controlling inflammation to tackle dementia

There is increasing evidence that activation of the immune system makes the progression of Alzheimer’s disease worse.

With a project grant from Alzheimer’s Society, Dr Catherine Lawrence and her colleagues at the University of Manchester have shown for the first time that an anti-inflammatory drug commonly used to treat period pain can reduce brain inflammation and stop memory loss in mice with Alzheimer’s disease.

The important findings were published at the end of 2016 in the journal Nature Communications and will pave the way for taking the drug into trials in people with Alzheimer’s.

The class of drugs identified in this study are not without side effects. Now that the research team have discovered a new mechanism to interfere with inflammation in the brain, they can also begin to look for more potent drugs that work in the same way.

Borrowing from arthritis

Even trivial infections such as a urinary tract infection can accelerate memory loss in people with Alzheimer’s disease. With Alzheimer’s Society funding, Professor Clive Holmes at the University of Southampton linked this effect to the release of a chemical called TNFα by cells of the immune system. TNFα is released to signal that an infection is taking place somewhere in the body.

Drugs that lower the levels of TNFα are already approved as a treatment for rheumatoid arthritis, a condition caused by a faulty immune system. A small clinical trial has already shown that one of these drugs, etanercept, is safe to use in people with Alzheimer’s disease.

‘Finding that this type of drug works to prevent people with mild cognitive impairment from developing Alzheimer’s disease in the first place would be the ultimate goal.’
Professor Clive Holmes, University of Southampton

We are now part-funding Professor Holmes and his collaborators to run a clinical trial for people with mild cognitive impairment. It is hoped that the anti-inflammatory effect of this drug will reduce the risk of people progressing to dementia.

‘Until now, no drug has been available to target this pathway, so we are very excited by our results.’
Dr David Brough, University of Manchester

Pioneering innovation in dementia care

Alzheimer’s Society provides over 3,000 support services to people living with dementia and their families across England, Wales and Northern Ireland. This means our staff and volunteers are well placed to identify new and creative ways in which we can improve people’s lives. The Innovation Fund provides grants to our staff and volunteers to develop and test innovative ideas for new products and services or improved ways of working.

Dementia Friendly GP Practices is one of 21 projects funded by the Innovation Fund so far. Alzheimer’s Society employees in the East Midlands have worked with the local Strategic Clinical Network, GP practice staff and people affected by dementia to co-produce a Dementia Friendly Practice Toolkit. The toolkit enables practice staff to become more aware of the needs of people with dementia and to modify their environment and processes to become more accessible.

The Dementia Friendly Practice Toolkit has been evaluated at eight GP practices in Derbyshire and it led to significant benefits for both staff and patients. These included:
- improved dementia diagnosis rates
- more positive attitudes of frontline staff towards people with dementia
- improved care planning
- better communication between staff and carers
- a more accessible physical environment.

Given the positive findings, Alzheimer’s Society is now working with commissioners to roll out the toolkit in other areas of the country.

Largest study of mid-life risk factors

This year our PREVENT study has expanded to become the largest research project in the UK looking at dementia risk factors during middle age. Led by Professor Craig Ritchie at the University of Edinburgh, the study will now recruit a total of 700 people aged 40 to 59 years who currently show no sign of dementia across sites in London, Oxford, Cambridge and Edinburgh.

Research has shown that changes in the brain in people with Alzheimer’s disease can begin up to 20 years before they first begin to develop dementia symptoms. This means mid-life is a critical time in which to identify people who are at the greatest risk of dementia and to understand what is happening in their brains.

Participants in the PREVENT study are split into high and low risk groups based on their genetics and family history of dementia. They then take part in several tests including providing samples of blood, saliva and spinal fluid, taking memory tests and having brain scans. This allows the researchers to look in unprecedented detail for biological changes that might be taking place decades before the onset of dementia.

The study has already recruited 210 people at the London site and followed them for two years. Initial results have found that those with a higher risk of dementia are already showing changes in their 40s and 50s, both in brain structure and in some aspects of memory. The size of their hippocampus – an area of the brain involved in memory – was reduced and they performed worse on tests of object recognition, compared to those in the low risk group.

Although these differences were subtle, the fact that they can be seen at all in mid-life gives us hope. If we can detect biological changes in people who could be in the very first stage of Alzheimer’s but still decades away from developing dementia, then we can develop and test strategies to stop the symptoms from ever appearing.

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‘Our Innovation Fund is driving forward improvements in dementia care and support.’

Colin Capper, Head of Research Development and Evaluation

‘Studies like this are essential for us to move in a meaningful way towards reducing risk and, ultimately, preventing dementia.’

Professor John O’Brien, University of Cambridge
Thanks to you

Our volunteers
We’re enormously grateful to all the people who volunteer their time and experience to help us deliver a successful programme of research each year. This includes the 282 carers, former carers and people with dementia who make up our Research Network and the 52 academics and clinicians that make up our Research Strategy Council and Grants Advisory Boards.

We give particular thanks to:
- Professors Nick Fox and Carol Brayne and all members of our Research Strategy Council
- Professor Roy Weller and all the members of our Biomedical Grants Advisory Board
- Professor John Gabbay and all the members of our Care, Services & Public Health Grants Advisory Board. Professor John Gabbay has now stepped down from the board following three years of service and the board has welcomed new Chair, Professor Steve Iliffe
- Professor Ruth Boaden and all the members of our Implementation Grants Advisory Board
- 382 peer reviewers who submitted 578 reviews providing expert commentary on grant applications
- 24 trained mentors that are offering career development support to our research fellows
- 14 Area Coordinators and Deputy Area Coordinators who help develop the Research Network
- 30 lay members of the Grants Advisory Panels
- 137 Research Network monitors who help our funded researchers deliver their research
- 69 Research Network members who support our Partnerships programme

Our donors and funders
Our research programme would not be possible without the generous support of all of our donors and funders. We would like to thank all those individuals who have donated to our research programme, our corporate partners, supporting trusts and those who remember us in their will.

We would specifically like to thank the following individuals and organisations for their support of our research programme:
- Adlib Foundation
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- The Barbour Foundation
- The Barcapel Foundation
- The Anthony and Pat Charitable Foundation
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- Deloitte
- Foster Wood Foundation
- Garfield Weston Foundation
- The Hartley Charitable Trust
- The Healthcare Management Trust
- The Ingram Trust
- The John and Sally Reeve Charitable Trust
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- The Trott Family Charitable Trust
- Marie Curie
- Medical Research Council
- MRC Technology
- National Institute for Health Research
- National Institute for Prevention Research
- Nesta
- Stroke Association


Our partners
Our research programme is delivered in partnership with several other organisations because united against dementia we can achieve much more. We give thanks to the following for working with us to fund and deliver high-quality dementia research:
- Asthma UK
- Alzheimer Nederland
- Alzheimer’s Drug Discovery Foundation
- Alzheimer’s Research UK
- BRACE
- British Council
- British Heart Foundation
- Cancer Research UK
- National Institute for Prevention Research
- Nesta
- Stroke Association
Alzheimer’s Society is the UK’s leading dementia charity. We provide information and support, improve care, fund research, and create lasting change for people affected by dementia.

To keep up to date on the latest news from our research programme, sign up to receive our research magazine at [alzheimers.org.uk/careandcure](http://alzheimers.org.uk/careandcure)

All of the dementia research we support is fully funded by voluntary income. You can donate to our research programme online at [alzheimers.org.uk/donate](http://alzheimers.org.uk/donate)