



'Building Our Industrial Strategy'
Response to Government's Industrial Strategy Green Paper
from Alzheimer's Research UK

April 2017

Background to Alzheimer's Research UK

Alzheimer's Research UK is the leading charitable funder of dementia research in the UK and at the forefront of the fight against dementia. Dementia is the greatest health challenge we face in the UK. Over 850,000 people are living with dementia with a cost to the economy of £26 billion per year. Unless a disease-modifying treatment can be found, by 2025 there will be over one million people in the UK living with dementia, and over two million by 2050. Only through research can we find new treatments and reduce the economic and social burden of this disease.

This huge challenge is why over the past year Alzheimer's Research UK awarded 64 new grants for research, and we are now funding 111 projects worth a total of over £28m. We are currently funding a range of strategic initiatives such as our Drug Discovery Alliance, a network of three flagship Drug Discovery Institutes based in Cambridge, Oxford and London, where scientists are working to fast-track the development of much-needed new treatments for dementia. We are also supporting several drug development projects through the Dementia Consortium, a partnership between Alzheimer's Research UK, MRC Technology and pharmaceutical companies AbbVie, Astex, Eisai, MSD and Lilly.

We also support the £2m Alzheimer's Research UK Stem Cell Research Centre – where researchers are using state-of-the-art stem cell technology to understand Alzheimer's disease and screen for potential treatments.

Our funding helps to build vital collaborations between researchers – our national Research Network supports 15 centres of excellence across the UK and now brings together over 1,200 researchers from 43 universities to share resources, ideas and expertise. We are also working with other organisations across the globe to fund research aimed at closing some of the key gaps in our understanding of dementia.

Alzheimer's Research UK as a member of the UK's medical research charity community

We are a member of the Association of Medical Research Charities (AMRC), a membership organisation of the leading medical and health charities funding medical research in the UK. AMRC represents 138 medical research charities. Other members include the Wellcome Trust, Cancer Research UK and the British Heart Foundation and together we work to ensure that our sector issues are well represented.

In 2015, AMRC's members:

- invested over £1.4 billion of research funding in the UK - more than either the Medical Research Council or National Institute for Health Research;
- made capital investments of £129 million in the UK;
- contributed to the knowledge economy by funding the salaries of over 15,000 researchers in the UK;
- funded around a quarter of non-commercial research in the NHS; and
- recruited 190,000 patients into charity funded trials, 10,000 more than in 2014.

PILLAR ONE

Investing in Science Research and Innovation

Question for Consultation:

What should be the priority areas for science, research and innovation investment?

Dementia: the scale of the challenge

- **The scale and impact of the challenge of dementia makes it important to increase investment in dementia research - this must be a priority area for R&D in the UK.**
- **By 2025, over one million people in UK will have dementia.**
- **Dementia is the leading cause of death in England and Wales.**
- **Dementia costs the UK economy over £26 billion a year.**

The scale and impact of the challenge of dementia makes it important to invest in dementia research and this must be a priority area for R&D in the UK. There are an estimated 850,000 people living with dementia in the UK today (1.3 per cent), a number forecast to rise rapidly as the population ages, including over 700,000 people in England, over 45,000 in Wales, 70,000 people in Scotland and nearly 20,000 in Northern Ireland. Over 40,000 people under 65 years of age have dementia. By 2025, the number is expected to rise to over one million. By 2050, it is projected to exceed 2 million.

Dementia is now the leading cause of death in England and Wales and is the leading cause of death among women in the UK. Dementia costs the UK economy over £26 billion a year, this is a combination of health and care costs and the contribution made by informal carers. By 2025 it is expected dementia will cost the UK economy £32.5 billion and by 2050 it could be costing the UK economy £59.4 billion at today's prices.¹

Innovative funding models: Alzheimer's Research UK can help bridge the gap between academic research and commercial outcomes

- **The UK's investment of 1.7% of GDP in R&D is below OECD average of 2.4% and is far behind countries that lead on innovation.**
- **The UK has historical weakness in translating innovation into commercial outcomes.**
- **Alzheimer's Research UK has unique offer to contribute to the Industrial Strategy on funding models – closing the gap between academic research and pharmaceutical drug discovery.**

¹ Office of Health Economics; Trajectory of Dementia in the UK by Lewis et al. June 2014

Alzheimer's Research UK welcomes the Government's increased investment in research and development. However, the UK's investment of 1.7% of GDP in public and private R&D is below the OECD average of 2.4% and far behind leading backers of innovation (e.g. South Korea, Israel, Japan, Sweden, Finland and Denmark).

The Industrial Strategy highlights that a key challenge for life sciences is around translating leadership in science into commercial outcomes and that the UK has a long-standing weakness in this area, relative to other countries. The Government recognises that the UK has too often pioneered discovery but not realised commercial benefits and acknowledges that in part this is due to the balance of funding. While the way we distribute funding across different stages of R&D is not out of line with other European countries, in leading innovation nations, such as Israel and countries in Asia, a greater proportion of total R&D investment is on later-stage, experimental development. China, for example, currently spends twice the share of the UK. This may amplify the industrial impact of such countries' funding commitments to R&D.

We recognise that there is a win-win opportunity from pioneering discovery and then realising commercial benefits. Alzheimer's Research UK has a unique offer to contribute to the Strategy on funding models. We are aiming to close the gap between academic research and pharmaceutical drug discovery, with the wider goal of accelerating research towards patient benefit. We do this through innovative public-private funding models that work particularly well to stimulate investment and research into under-funded disease areas. We believe that closing this gap between discovery and commercial benefit should be a priority for R&D investment.

Question for Consultation:

Which challenge areas should the Industrial Strategy Challenge Fund focus on to drive maximum economic impact?

ISCF needs to be accessible for charities and could be a springboard for innovative collaboration

- **We call on the Government to include medical research charities in ISCF.**
- **Government should ensure there are adequate mechanisms to enable charities to engage with the ISCF.**
- **Government should promote medical research charities as key collaborators and partners.**
- **Alzheimer's Research UK is undertaking ground-breaking partnership working between charities and industry which could be replicated by other disease areas via mechanisms such as ISCF.**

Alzheimer's Research UK welcomes the introduction of the Industrial Strategy Challenge Fund (ISCF) and plans for its use to distribute some of the £4.7 billion of new R&D funding that the Government has committed. However, we are concerned that there are inadequate mechanisms to enable charities, particularly small to medium size charities, to engage both directly and via partnership working with the ISCF.

We call on the Government to include medical research charities in the Industrial Strategy Challenge Fund. We ask that there be a clear route for charities to engage with such sources of funding, reflecting the important role they play in the medical research ecosystem. Where appropriate, medical research charities should be promoted as key collaborators and partners.

Alzheimer's Research UK has been doing ground-breaking work forming innovative partnerships between charities and industry. These could be reproduced by other charities and disease areas via mechanisms such as the ISCF. Alzheimer's Research UK is part of the **Dementia Discovery Fund**: a close collaboration between charity, industry and the government, to provide much-needed investment in innovative dementia research. It is a partnership between the Department of Health, Alzheimer's Research UK and 7 world-leading pharmaceutical companies including Biogen, GSK, Johnson & Johnson, Lilly, Pfizer and Takeda. The fund is managed by SV Life Sciences, a venture capital firm, providing the investment management skills needed for the project to meet its goals and succeed financially. The fund has now invested in Alector LLC and Gen2 Neuroscience Ltd as its first two investments for novel dementia treatments.

Alzheimer's Research UK's **Dementia Consortium** is an innovative international charity-industry partnership accelerating the development of therapies for novel dementia targets. Bringing together Alzheimer's Research UK, Medical Research Council Technology and the pharmaceutical

companies, AbbVie, Astex, Eisai, Lilly and MSD, the consortium aims to close the gap between fundamental academic research and the pharmaceutical industry's drug discovery programme to develop a new dementia treatment. The consortium provides funding, expertise and resources to support target validation studies of new drug targets emerging from academic research that hold the promise of patient benefit. The first five projects are underway and are scrutinising novel targets in a range of areas including inflammation, protein clearance and repair mechanisms.

Alzheimer's Research UK's **Drug Discovery Alliance** is a unique drug discovery venture in dementia research, tackling the lack of dementia medicines by embedding industry standard drug discovery in world-class academic institutions. The £30m Alliance unites three Drug Discovery Institutes at the Universities of Oxford, Cambridge and UCL and is one of the largest coordinated initiatives in the world to accelerate the search for new treatments for dementia. The aim of the Alliance is to grow and maintain a healthy pipeline of validated targets to take forward, bridging the gap between fundamental academic research and the pharmaceutical industry's drug development programmes.

Question for Consultation:

How can we best support the next generation of research leaders and entrepreneurs?

Ensure long-term investment, continued international collaboration and UK as an attractive global destination for high quality researchers

- **The UK needs strategic investment in people, projects and infrastructure to grow the dementia research base.**
- **The UK must enable international collaboration post-Brexit, with fit-for-purpose immigration system.**
- **The UK must foster innovative approaches to funding and infrastructure to remain a world-leader in medical research.**

While the recent increases in funding for dementia research and charity-led initiatives are expanding capacity in the UK dementia research landscape, we see clear evidence that long-term sustained investment is required to result in a greater step change to support the next generation of research leaders and entrepreneurs. In Alzheimer's Research UK's recent report "Keeping Pace: Progress in Dementia Research Capacity" (March 2017) we make a number of recommendations to Government to support research in the future. They are:

1. **Enhance Investment:** We call on all current dementia research funders (government, charity and industry) to continue to increase investment in dementia research. This should include strategic investment in people, projects and supporting infrastructure to grow the research base. Initiatives such as the Dementia Discovery Fund and the Dementia Research Institute start to address the much-needed step change, however stark differences in investment remain compared to other disease areas. For example, for every £2 million of disease costs there were 10 cancer researchers for every 1 dementia researcher. To address this gap we need to increase dementia research investment given the significant impact on people and the economy.
2. **Enable Collaboration:** We call on the UK Government, through and post Brexit negotiations, to ensure that the UK continues to participate in EU research programmes and venture capital schemes. Once the UK has left the EU it is vital to dementia research that the UK maintains and enhances its ability to collaborate with colleagues globally. In future the Government must ensure the UK's immigration system attracts high quality researchers, innovators, entrepreneurs, pharmaceutical R&D, legal and regulatory experts, skilled technicians and students. It is only through attracting and retaining this world-leading expertise, in conjunction with international collaboration, that we can grow dementia research and the UK can retain its standing as a global leader in medical research.

- 3. Increase Sector Support:** We call on the UK Government to support dementia research and broader medical research landscape through the industrial strategy and future policy decisions, so that the UK remains an attractive place to conduct research for the benefit of people. This could be done by increasing the Charity Research Support Fund; involving medical research charities in public R&D funds such as the Industrial Strategy Challenge Fund; maximising opportunities for research with patient data and ensuring the NHS is a world leader in medical research.

The future has new uncertainties and challenges for the research landscape. The impact of Brexit on the research community is unclear. There is understandable concern that as a net beneficiary of EU funding, the UK research field could lose significant levels of funding in the future. A recent survey of dementia researchers by Alzheimer's Research UK indicated that 60% of respondents had great concern that Brexit would result in a loss of access to EU research funding. There is uncertainty about how UK scientists can be involved in EU grant applications, and EU scientists who are currently carrying out valuable research in the UK may be concerned about their futures. The UK currently plays a leading role in many EU research projects – for example the UK has the highest number of managing entities of any EU country within the Innovative Medicines Initiative. This demonstrates the significant leadership role and contribution of UK institutions to the broader European research landscape.

Our “Keeping Pace” report highlights the current UK dementia strength in the range and diversity of international collaborations. European collaborations represent a significant component of these relationships, and support will be needed to ensure they are maintained after Brexit. However, there are numerous collaborations that extend beyond Europe, and which potentially could be strengthened due to Brexit. Ultimately international collaborations are likely to be a key aspect of finding a treatment or cure for dementia, and as such, need to be nurtured and supported regardless of the political landscape. See Figure 1, below, for a network map illustrating the growth in collaborations between countries within UK dementia publications between 2009 and 2015.

Recent and ongoing changes to the Higher Education sector may also impact on the dementia research landscape. It is important that the Government's reforms to higher education are mindful of the need to support dementia research capacity by promoting postgraduate education and early career research.

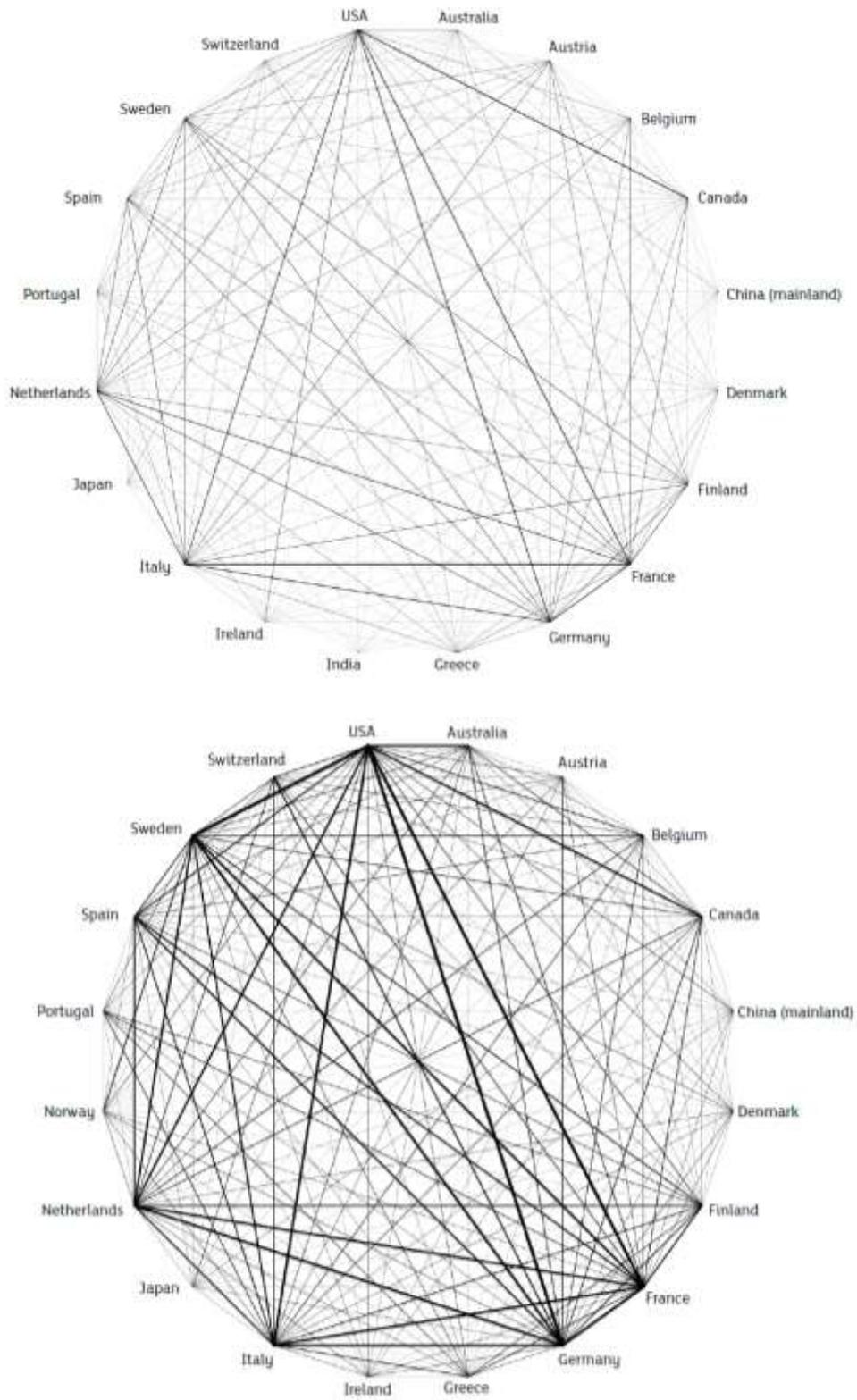


Figure 1: Network diagram of collaborations between countries within UK dementia publications in 2008-9 (top) and 2014-15 (bottom)

Question for Consultation:

How can we best support research and innovation strengths in local areas?

Increase the Community Research Support Fund (CRSF)

- **There are significant benefits to investing in medical research, including dementia – for every £1 spent by the Government on R&D increases private sector productivity by 20p every year.**
- **Public investment in dementia research drives other funders into the field and creates opportunities for economic benefit even before a treatment is found.**
- **CRSF urgently needs an uplift in line with inflation in order to ensure medical research in universities has a sustainable future and universities maintain their international reputations for research excellence.**

Combined public and charitable funding for health research in the UK has continued to increase in the last ten years, with an annual increase of almost £130 million². However, the pace of increased investment has slowed considerably in recent years. The threat of stalled growth could have significant negative impacts on the knowledge capital in the UK if global competitors become more attractive to researchers, but it could also slow the development of important treatments and delay their social and economic benefits.

In addition, there are significant near-term benefits to investing in medical research, including dementia. Every £1 spent by the Government on R&D increases private sector productivity by 20p every year³. In areas like dementia, where private investment has historically lagged due to increased risk and a higher clinical trial failure rate, public investment drives other funders into the field and creates opportunities for economic benefit even before a treatment is found.

The CRSF enables medical research charities, such as ourselves, to fund research in world-leading universities in England. Since 2010 the CRSF has been fixed at £198 million per annum; a real-terms decrease of £38.7 million over 6 years. This means that researchers in universities in receipt of charity-funding are facing significant shortfall and the sustainability of medical research charity funding is being put at risk.

We ask that the Government ensures the Charity Research Support Fund is increased in line with inflation. This would enable the CRSF to increase to £264 million by 2020/21.

² UK Health Research Analysis. 2015. www.hrcsonline.net/pages/uk-health-research-analysis-2014

³ Haskell, J. The Economic Significance of the UK Science Base. 2013. sciencecampaign.org.uk/CaSEUKScienceBaseReportBriefing.pdf

Extend the principles of R&D tax credit policies as a tool to drive medical research charity investment.

- **Government should introduce a new R&D tax credit scheme that recognises medical research charity investment in R&D, based on AMRC membership (therefore excluding university participation and addressing concerns over the ability to claim double relief).**
- **Government should promote industry-academia collaborations by reforming VAT on shared facility buildings.**

We know that R&D tax credit schemes for businesses have been successful in incentivising investment in R&D. However, these R&D tax credits are designed for businesses and not for charities. Charities, such as ourselves, are increasingly acting like businesses and collaborating with the private sector to fund vital work such as in the field of dementia prevention and treatment. Along with the AMRC, we are calling on the Government to extend the principles of its R&D tax credit policies as a tool to drive medical research charity investment. It is important to note that charities will reinvest any monies received back into research.

Leaving the EU provides the UK with the opportunity to amend VAT rules on sharing of facilities for research to promote industry-academia collaborations and attract further investment in UK science. Along with the AMRC, we are calling on the Government to reform VAT on these types of shared facility buildings.

PILLAR TWO

Developing Skills

Questions for Consultation

What skills shortages do we have, or expect to have, in particular sectors?

Attracting and retaining the best international talent

- **The Government must support mobility for those who contribute to the maintenance of the UK a world-leading nation in science and research.**
- **There must be a fit-for-purpose immigration system which will enable those involved in science and research including researchers, skilled technicians and healthcare professionals to live and work in the UK and other EU countries.**
- **We urge that PhD-level (level 8) apprenticeship standards be developed, particularly for medical researchers.**
- **Policies on transfer of levy funds should be reviewed to reflect the ways that medical research charities invest in skills.**

Some 26% of academic staff in UK universities are non-UK nationals, providing essential functions within the research environment. Academic and industry employer groups have voiced serious concern over current immigration policy for non-EU citizens, particularly in light of skilled worker caps and issues within the existing visa system. The UK must support mobility for those who contribute to the advancement of science and research to maintain the UK's world-leading environment. While there is an opportunity to address migration issues for both EU and non-EU staff in research settings, it must be achieved with minimal burden or disruption for those EU nationals already engaging in research in the UK.

Talent and expertise from outside the UK contributes to building the UK's skills pipeline, while time spent abroad can be vital in the development and training of UK researchers who ultimately return. Retaining and attracting well qualified researchers and health professionals must be prioritised.

The UK's decision to leave the EU provides an opportunity to re-address the immigration system. To unlock the full potential of the UK life science sector, an immigration system that recognises the collaborative nature of science and supports the thriving research and innovation base in the UK is necessary. The system must be fair, transparent and efficient, and sufficiently flexible to allow for the UK's changing skills needs and research priorities in the years ahead.

With the introduction of the Government's new Apprenticeship Levy, Alzheimer's Research UK will shortly begin contributing to the new tax. However, a number of overarching challenges may prevent us from making the most of the Apprenticeship Levy, contributing to upskilling the workforce and giving people the opportunity to undertake in-work training.

Much of our research work takes place in UK universities and hospitals; being able to transfer levy contributions to fund research apprenticeships in these settings would allow us to better utilise our levy contribution and to further our charitable objectives.

The current 10% limit on the levy funds which can be transferred from one organisation to another should be raised to allow medical research charities such as Alzheimer's Research UK to more fully utilise our contributions within universities and other research partners.

The nature of our medical research means that, if we were able to use our levy contributions to fund research apprenticeships, we would need high level (level 8, PhD level) apprenticeships standards to be developed.

PILLAR 5

Improving Procurement

Question for Consultation

Are there further steps that the Government can take to support innovation through public procurement?

Government must urgently address some issues to ensure UK's continued success as a world-leader in life sciences:

- **The recommendations of the Accelerated Access Review (AAR) should be implemented, including improved horizon scanning and early engagement across stakeholders to better understand what is coming through the innovation pipeline.**
- **The review's recommendation that a new strategic commercial unit should be established in NHS England should be explored as a means to ensure patient access to innovative treatments. As well as this, a range of funding models should be made available, including opportunities for conditional access should be established.**
- **Government must reconsider the new NICE/NHS England £20m Budget Impact Test which may stop patients having access to life-saving treatments and could present a significant risk to the life sciences sector by creating barriers to the uptake of innovation in the NHS.**
- **The NHS could be positioned as a go-to place to undertake research, bringing more investment into the UK.**
- **Transparency around the uptake of new treatments should be improved, ensuring it can be easily understood by patients and the public.**

Alzheimer's Research UK welcomes steps to better support the access and uptake of new treatments and products in the NHS.

It is important that the UK remains attractive as a place to launch new diagnostics, treatments and innovations, both for the benefit of patients and to drive life sciences in the UK.

Government should implement the recommendations of the Accelerated Access Review (AAR), including the recommendation to involve patients in horizon scanning and prioritisation along the innovation pathway, including establishing a common set of principles describing good partnership working with patients. Working with patients will be critical to the success of the

Accelerated Access Review, and patients' families, carers and the charities that advocate for them should also be included in this partnership working.

Mechanisms to improve horizon scanning such as the proposed Accelerated Access Partnership should also be a priority. This could help better prepare the NHS for new treatments and diagnostic tools coming through the pipeline, ensuring that these can be adopted by the NHS as quickly as possible.

Early engagement between industry and NHS decision-makers is essential in order to overcome adoption and uptake challenges, including affordability challenges, as early as possible. A balance will need to be struck between setting a price that rewards and incentivises innovative research, but is also affordable to the NHS. The Strategic Commercial Unit proposed in the AAR could help facilitate early discussions and support the development of a range of funding models.

Opportunities for conditional access to new treatments alongside the collection of real world evidence to understand longer term effects will be important for long term conditions. This will support early access to safe and innovative treatments for conditions such as dementia, where the slow progression the disease leads to challenges to measuring gradual change over the relatively short duration of a clinical trial, especially in the early stages of the disease. The NHS has unique potential in terms of collecting data, and with the right mechanisms and systems in place the NHS, and therefore the UK, could be positioned as the go-to place for doing research and launching new treatments. A "research-ready" NHS should be used as a selling point to attract investment into the UK.

As of 1st April, a new 'budget impact test' will apply to clinically and cost effective new treatments that meet or exceed the cost of £20 million during any of the first three years. These changes to arrangements for evaluating and funding drugs and other health technologies are likely to result in unacceptable delays in patients accessing new treatments. Especially new treatments that could benefit large patient populations and those with significant levels of unmet need, such as dementia. The test could also present a significant risk to the life sciences sector by creating barriers to the uptake of innovation in the NHS. Government must reconsider this approach.

PILLAR 8

Cultivating World Leading Sectors

- **When the UK exits the EU, the Medicines and Healthcare Products Regulatory Agency (MHRA) could develop accelerated regulatory frameworks for emerging and innovative areas of research.**

Alzheimer's Research UK welcomes the identification of UK life sciences as a priority area for the development of an 'early sector deal'. We are engaging with the Life Sciences Industrial Strategy Board and are feeding in to the development of the Strategy.

When the UK exits the EU, the Medicines and Healthcare Products Regulatory Agency (MHRA) may be able to develop accelerated regulatory frameworks for emerging and innovative areas of research. It may be helpful to review the MHRA guidance on risk management of clinical trials to enable an accelerated and innovative approach.

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