

April 2017

### **Arthritis Research UK response to Building our Industrial Strategy Green Paper**

1. Arthritis Research UK welcomes the opportunity to respond to Building our Industrial Strategy Green Paper from the Department for Business, Energy and Industrial Strategy.<sup>1</sup>
2. Arthritis Research UK invests in breakthrough treatments, the best information and vital support for everyone affected by arthritis. We combine cutting edge research and the expertise of people with arthritis to make everyday life better for all 10 million people with these conditions in the UK.<sup>2</sup>
3. This response addresses pillars for the industrial strategy of most relevance to our research to prevent, cure and transform the lives of people with arthritis:
  - **Pillar 1: Investing in science, research and innovation**
  - **Pillar 2: Developing skills**
  - **Pillar 5: Improving procurement**
  - **Pillar 8: Cultivating world-leading sectors**
  - **Pillar 9: Driving growth across the whole country**
  - **Pillar 10: Creating the right institutions to bring together sectors and places**
4. Arthritis Research UK is a member of the Association of Medical Research Charities (AMRC). We work collaboratively with the AMRC on policy issues relevant to science and medical research, and support their response to the current consultation.<sup>3</sup>
5. **Summary points:**
  - Arthritis and other musculoskeletal conditions affect around 10 million people in the UK. These are mainly long-term conditions with symptoms that fluctuate over time. The pain and functional limitations caused by musculoskeletal conditions can significantly impact people's quality of life, limiting independence and the ability to participate in family, social and working life. Arthritis Research UK current funds more than 300 research awards, worth in excess of £120 million across more than 70 institutions in the UK.
  - In response to the Green Paper, we seek that the Industrial Strategy takes into account the important role that Arthritis Research UK, and other medical research charities, play in supporting the life sciences sector and wider economy. Specifically:
    - **Medical research charities facilitate collaboration between industry and universities whilst uniquely representing and involving patients in developing outputs. This work should be supported by the Government by ensuring the Charity Research Support Fund (CRSF) keeps pace with increasing eligible charity spend.**
    - **The Industrial Strategy should recognise research into non-drug interventions as a vital component of innovation which should be supported through the upcoming Life Sciences sector-deal and 'Accelerated Access Partnership'.**
    - **The Industrial Strategy and Life Science sector-deal should recognise the essential contribution of the NHS in supporting the life sciences research sector and ensure it is adequately resourced and empowered to fulfil this role.**

- The Life Sciences sector-deal should recognise the strategic importance of patient data collected by the NHS and support the Government commitment to increase musculoskeletal data availability and collection.
- The contribution of medical research charities to the training and development of the UK research workforce must be acknowledged and represented in Industrial Strategy plans to address skills shortages.
- The UK's decision to leave the EU provides an opportunity to develop a simple immigration framework for skilled scientists and health professionals that recognises the collaborative nature of research and unlocks the full potential of the UK life sciences sector.
- The Industrial Strategy should identify universities and medical research charity investment as key assets and institutions in boosting local areas which should be supported through increases in the CRSF.

**Consultation questions:**

- 1. Does this document identify the right areas of focus: extending our strengths; closing the gaps; and making the UK one of the most competitive places to start or grow a business?**
- 2. Are the ten pillars suggested the right ones to tackle low productivity and unbalanced growth? If not, which areas are missing?**
- 7. What else can the UK do to create an environment that supports the commercialisation of ideas?**

6. We welcome the recognition of science, research and innovation as a pillar of the Industrial Strategy. Research and innovation further our knowledge economy and contribute to long-term economic growth by attracting investment, generating employment and improving health.
7. **However, the proposed Strategy does not address the important role that medical research charities play in supporting research and innovation and the wider economy.** Over 40% of publicly funded medical research in the UK is supported by medical research charities.<sup>4</sup> In 2015, this investment amounted to over £1.4 billion, with AMRC member charities investing more than £1 billion in research in each of the past eight years.<sup>5</sup> Public and charity investment in science and research drives economic productivity; every £1 of investment in medical research generates annual monetised health benefits of 10p in perpetuity and additional spill over benefits.<sup>6</sup>
8. Arthritis Research UK currently funds more than 300 research awards, worth in excess of £120 million across more than 70 institutions in the UK. Since 2013, each year we have invested around £20 million in high-quality cutting-edge research, careers and infrastructure. The latest figures for 2015/16 shows that for each £1 of funding received from Arthritis Research UK, an additional 72 pence has been secured from other funding organisations by those researchers: this approximates to £85 million of follow-on funding leveraged from these grant holders.<sup>7</sup>
9. Medical research charities are already creating collaborative opportunities for the development and commercialisation of ideas, bringing together key stakeholders including funders, Universities, pharmaceutical companies and patients. This work is often in areas of research where the UK has an opportunity to become a world-leader, such as genomics, regenerative medicine and stratified medicine (see box).<sup>8</sup>



The Arthritis Research UK and Medical Research Council (MRC) funded **MATURA consortium** is working at the cutting-edge of stratified medicine, led by universities in Manchester and London and linking 11 academic groups and nine industrial partners. The aim of this research and associated clinical trials is to use blood and synovial fluid tests to deliver stratified treatment for rheumatoid arthritis that could result in less drug wastage, reduction in drug prices and wider access for more people, estimated to have the potential to save the NHS £13–18m a year.

10. Medical research charities support a broad-base of investigation which often leads to first-in-class patient therapies and downstream, sustainable economic benefits, such as the Arthritis Research UK-supported discovery of novel biological treatments for inflammatory conditions (see box).

Rheumatoid arthritis causes severe inflammation of the joints and along with osteoarthritis represents a large cost to the UK economy, estimated to be £14.8 billion in indirect costs.<sup>9</sup> **Development of the first biological therapies** at the Arthritis Research UK-funded Kennedy Institute of Rheumatology in the 1990s has transformed the treatment of rheumatoid arthritis. These treatments target key proteins involved in inflammation, and the success of biological therapies continues to have a broad impact on the pharmaceutical industry: in 2015, globally, three of the five top-selling drugs were biological molecules blocking the action of TNF.<sup>10</sup>

11. In recognition of the need to enhance the underpinning strengths in the UK economy, and to ensure continued development of innovative treatments and their knock-on economic benefits, **government incentives that facilitate charity research should continue to be prioritised and appropriately resourced.** The Charity Research Support Fund (CRSF) element of quality-related funding supports universities by covering the indirect costs of charity funded research (overheads) which are outside charitable funding remits and so cannot be met by charity grants. In 2014, the £198 million invested through CRSF leveraged £805 million of research by charities in English universities.<sup>11</sup> However since 2010 the CRSF has been fixed at this level representing a real-terms decrease of £38.7 million over 6 years, whilst charity funding of research has increased from £1.14 billion to £1.44 billion. **It is essential that government support for CRSF keeps pace with increasing eligible charity spend through real-terms increases in funding.**

**Consultation questions:**

- 5. What should be the priority areas for science, research and innovation investment?**
- 24. What further steps can be taken to use public procurement to drive the industrial strategy in areas where government is the main client, such as healthcare and defence? Do we have the right institutions and policies in place in these sectors to exploit government's purchasing power to drive economic growth?**
- 31. How can the Government and industry help sectors come together to identify the opportunity for a 'sector deal' to address – especially where industries are fragmented or not well defined?**

12. We welcome the recognition of the life sciences as a priority area for an 'early sector deal' and the Industry Strategy recommendation to pursue an 'Accelerated Access Partnership'. Investment in medical research leads to improved health outcomes by delivering approaches to reduce disease incidence and to treat illness, improving quality and length of life. In turn, this generates economic benefits through reduced health and social care costs and increased productivity. As noted in the Strategy, and reported previously and in evidence to the House of Commons Science



and Technology Committee inquiry on the Industrial Strategy: “innovation is not just about a few people in labs making breakthroughs, but about adopting new and more productive ways of working.”<sup>12,13</sup> However, **the Strategy does not set out a clear vision of support for non-commercial ‘innovations’ and research that leads to increases in productivity.**

13. Productivity will be impacted by the changing UK demographic, with people living and working for longer. The prevalence of arthritis is forecast to increase due to the ageing population of the UK, and growing levels of obesity and physical inactivity which are all major risk factors in the development of a musculoskeletal condition.<sup>14</sup> These factors will act as a barrier to the ambitions of the Industrial Strategy if unaddressed, with over 30 million working days lost due to musculoskeletal conditions in the UK each year,<sup>15</sup> and the employment rate among people with arthritis already 20% lower than those with no condition or disability.<sup>16</sup>
14. However, research has demonstrated that targeted, early intervention can help to treat and prevent musculoskeletal conditions, increasing the rate at which people can return to work. Arthritis Research UK supported research focuses on improving health and producing wider societal savings. For musculoskeletal conditions, this often includes non-drug interventions. For example, the STarT Back Tool, developed by research in primary care, delivers better health outcomes for people with back pain at lower cost (see box). This is a clear illustration of non-commercial ‘innovation’ which improves the economic impact of research investment. Therefore, **the Industrial Strategy should recognise research into non-drug interventions as a vital component of innovation which should be supported through the upcoming Life Sciences sector-deal and ‘Accelerated Access Partnership’.**

Back pain is a major cause of ill-health, with around 9 million people in England having symptoms, and 5.48 million people reporting the pain as severe. **STarT Back** is a tool developed by the Arthritis Research UK’s Primary Care Centre. The tool stratifies people with back pain into three groups enabling clinicians to deliver more targeted interventions. This model has been demonstrated to result in greater health benefits alongside an average saving to the NHS of £34.39 per patient and societal savings of £657 per person.

15. As noted by the Industrial Strategy, the NHS is one of the biggest publicly-funded healthcare systems in the world, and is a key asset to the UK Life Sciences sector, providing a ‘real-world’ environment in which to carry out clinical trials, cohort studies and amass crucial longitudinal data. This is reflected in the recent publication of the NHS England Research Plan, which sets out its ambitions to build on its current research involvement and assets.<sup>17</sup> There are strong interdependencies across the UK life sciences sector, and the Department of Health research spend administered through the National Institute for Health Research (NIHR) is vital to a thriving clinical research community. NIHR support is particularly important to enable charities to fund clinical trials in NHS settings, for example Arthritis Research UK’s work to develop first-in-disease clinical trials of drugs for arthritis (see box).<sup>18</sup> **The Industrial Strategy and Life Science sector-deal should recognise the essential contribution of the NHS in supporting the life sciences research sector and ensure it is adequately resourced and empowered to fulfil this role.**

The **SYCAMORE** trial is jointly funded by Arthritis Research UK and the National Institute for Health Research Health Technology Assessment Programme (NIHR-HTA). SYCAMORE is a randomised controlled trial which investigated the clinical effectiveness, safety and cost effectiveness of the biological medicine Adalimumab for the treatment of uveitis (inflammatory swelling of the eye) associated with juvenile idiopathic arthritis. An early review of data from the trial deemed that that the drug was effective, and trial results are currently being finalised.

16. The collection and availability of long-term patient data through the activities of the NHS is a strategic advantage that could be leveraged to support the Industrial Strategy. There is huge



potential to use patient data to improve health, care and services across the NHS, to support delivery of the digital health agenda and to facilitate research studies. However, collection and availability of this data is sparse, and the need for increased collection of musculoskeletal patient data has been acknowledged through the Department for Work and Pensions' recent Green Paper and the NHS England mandate for 2017/18.<sup>19,20</sup> Arthritis Research UK has already pioneered the development of tools to increase the quality and availability of data about musculoskeletal conditions (see box). **The Life Sciences sector-deal should recognise the strategic importance of patient data collected by the NHS and support the Government commitment to increase musculoskeletal data availability and collection.**

The Arthritis Research UK the **Musculoskeletal Calculator** is a series of prevalence models developed in collaboration with Imperial College London and estimates the prevalence of back pain and osteoarthritis of the hip and knee in England. The bespoke data packs developed through the Calculator help clinical commissioning groups (CCGs) identify which patient pathways could offer the best improvement opportunities in terms of spend and outcomes by comparing their data with that of their peers. The tool is also useful for those conducting research into musculoskeletal conditions, policy makers at a local and national level and members of the public.

**Consultation questions:**

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

**13. What skills shortages do we have or expect to have, in particular sectors or local areas, and how can we link the skills needs of industry to skills provision by educational institutions in local areas?**

17. The Industrial Strategy has rightly acknowledged the achievements of the UK's higher education system, and the sustainability of the life sciences sector depends on the availability of a workforce with a range of skills. Medical research charities are substantial investors in career development, with AMRC members funding the salaries of over 15,000 researchers in the UK in 2015.<sup>21</sup> This included over 1,500 active PhD student grants worth just under £200 million, supporting the brightest minds at the earliest stages of their research careers. Arthritis Research UK has currently invested £23 million in a range of schemes to support training in research, clinical and allied health professional careers, across 24 different research locations in the UK. Our schemes promote the development of innovative interdisciplinary research careers, for example in arthritis and mental health.<sup>22</sup> **The contribution of medical research charities to the training and development of the UK research workforce must be acknowledged and represented in Industrial Strategy plans to address skills shortages.**
18. While addressing the domestic shortage in science, technology, engineering and maths (STEM) skills is a laudable goal, it should be acknowledged that much of the current research talent base draws on expertise and skills from overseas, mostly from the European Union.<sup>23</sup> Therefore, the continued migration and mobility of EU researchers is of utmost importance to ensure both the short- and long-term sustainability of the life sciences research sector.<sup>24</sup> However, the current immigration system available for UK research institutions to recruit non-EU students, researchers and technicians can lead to increased financial and administrative burdens for host institutions. This is in part due to the additional legal and monitoring responsibilities associated with specific work visas.<sup>25</sup> **The UK's decision to leave the EU provides an opportunity to develop a simple immigration framework for skilled scientists and health professionals that**



recognises the collaborative nature of research and unlocks the full potential of the UK life sciences sector.

**Consultation questions:**

- 9. How can we best support research and innovation strengths in local areas?**
- 34. Do you agree the principles set out above are the right ones? If not what is missing?**
- 36. Recognising the need for local initiative and leadership, how should we best work with local areas to create and strengthen key local institutions?**
- 37. What are the most important institutions which we need to upgrade or support to back growth in particular areas?**

19. While the Industrial Strategy sets out an overview of achievement and productivity across the UK, it does not focus on the existing pockets of science and innovation represented by medical research charity investment. Arthritis Research UK's approach to funding is to support exceptional UK research that aims to prevent, cure, and transform the lives of those with arthritis. Almost two-thirds of our research investment, £77 million, is in institutions located outside the 'golden triangle' of Oxford, Cambridge and London, across all three nations of the UK (see box). Furthermore, in 2015, 94% of medical research charity funding was spent in universities, which in themselves are strong economic drivers of local economies.<sup>26</sup>

Our research in **North East England** represents an investment of almost £4 million, across 13 different projects. Three Arthritis Research UK Centres of Excellence and an Experimental Arthritis Treatment Centre have sites at Newcastle University. This includes the Arthritis Research UK Tissue Engineering Centre which brings together leading academic doctors, with scientists in engineering, biology and material science with the aim of using patients' stem cells to restore joint damage caused by osteoarthritis. The Experimental Arthritis Treatment Centre aims to support the testing and early development of new drugs in the treatment of arthritis and related conditions, speeding up the timing it takes for new drugs to reach the clinic, accelerating patient and health service access to innovative medicines.

20. Our nationwide network of Experimental Research Centres facilitates and supports the testing and early development of novel interventions in the treatment of arthritis and related conditions. Each of these centres acts as a knowledge hub for the local, national and international musculoskeletal research sector, coordinating collaboration and expertise. The centres are aligned with the strategic objectives of the Department of Health and integrated with the NIHR supported Translational Research Partnership (TRP). Our investment in Clinical Studies has led to 54 major trials since 2007. **The Industrial Strategy should identify universities and medical research charity investment as key assets and institutions in boosting local areas which should be supported through increases in the CRSF.**



For further information on this submission please contact:

**Dr James O'Malley**

Policy Manager

Arthritis Research UK

t: 0207 307 2260

e: [j.omalley@arthritisresearchuk.org](mailto:j.omalley@arthritisresearchuk.org)

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