

## **Versus Arthritis response to the House of Commons Sciences and Technology Committee Inquiry into the role of technology, research and innovation in the COVID-19 recovery**

September 2020

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1. Versus Arthritis welcomes the opportunity to provide input into the House of Commons Sciences and Technology Committee Inquiry into the role of technology, research and innovation in the COVID-19 recovery.
2. Versus Arthritis is the charity formed by Arthritis Research UK and Arthritis Care joining together. We work alongside volunteers, healthcare professionals, researchers and friends to do everything we can to push back against arthritis. Together, we develop breakthrough treatments, campaign for arthritis to be a priority and provide support. Our remit covers all musculoskeletal (MSK) conditions which affect the joints, bones and muscles including osteoarthritis, rheumatoid arthritis, back pain and osteoporosis.<sup>1</sup>
3. Arthritis and related MSK conditions affect 18.8 million people in the UK and are the single biggest cause of pain and disability in the UK. Cumulatively, the healthcare costs of osteoarthritis and rheumatoid arthritis will reach £118.6 billion over the next decade.<sup>2</sup> MSK conditions account for a fifth of all sickness absence and resulted in the loss of around 27.8 million working days in the UK economy last year.<sup>3</sup>
4. **Summary points:**
  - As a contributing charity to the Life Sciences-Charity Partnership Fund (LS-CPF) initiative, Versus Arthritis considers this opportunity for Government to have a lasting impact on economic growth and recovery by securing the unique role medical research charities play in the UK's research and innovation ecosystem as highly significant.
  - The Government has an opportunity to prioritise investment in research that delivers innovation in employment practices, including for those with arthritis and related MSK conditions, to increase in-work productivity, job satisfaction and resilience.
  - We call on Government in the light of COVID-19 to promote research which addresses the complex interdependencies of multiple long-term conditions and prioritises their prevention.
  - Continued Government support for partnership-building with and between charities will help develop and deliver the range of funding mechanisms required to drive successful outcomes from complex research challenges.
  - Versus Arthritis welcomes the Government's stated commitment to increase public R&D investment to £22 billion per year by 2024-25 and asks that the Government continue to prioritise R&D investment as a central pillar of the UK's post-COVID economy.
  - There is an urgent need for Government to ensure that universities are supported to address immediate and longer-term issues arising from COVID-19 and have the necessary financial support required to avoid any reduction in the breadth and diversity of research activity and engagement.
  - As part of its comprehensive R&D plan and focus on research sustainability brought about by COVID-19, the Government should renew its commitment for the CRSF to

protect the unique partnerships between universities and charities. The Government should commit to an increase in the CRSF to keep pace with charity investment.

- We ask Government to ensure the unique position of charitable is recognized and reflected in future discussions or reviews relating to FEC of university research.
  - In the short term, the Government must ensure a balanced combination of funding strategies continue to be made available, to support basic discovery science, incremental, progressive R&D and high risk, high return R&D through a variety of funding mechanisms offering both responsive and challenge-led funding.
  - The Government should involve medical research charities in developing its comprehensive R&D plan, harnessing their understanding of the system, their expertise in talking to the public and patient communities about R&D and the public's trust in charities.
  - The opportunity for Government to ensure that the views of patients and the public are sought out and included in any decision-making processes in the comprehensive R&D plan will have wide-ranging benefits for individuals, society and the economy.
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Question 1: What role can technology, research and innovation play in supporting the UK's economic recovery from COVID-19 and how can it best be supported in this?

5. **Medical research charity investment in high-quality cutting-edge research, careers and infrastructure has a significant and direct benefit to the UK economy. Without this continued investment, the pace of economic recovery from COVID-19 through technology, research and innovation will be reduced.**
6. Versus Arthritis was the fourth largest charitable funder of medical research in the UK in 2018 and the largest public funder of research into MSK conditions.<sup>4</sup> We have £132.4 million currently invested in cutting-edge research across the UK, from lab-based projects to clinical trials, to projects impacting on health services. Figures demonstrate that for each £1 of funding received from Versus Arthritis, an additional 72 pence has been secured from other funding organisations by those researchers, approximating to £85 million of follow-on funding leveraged from these grant holders.<sup>5</sup>
7. Charities are often the only funders in early-stage, discovery research which de-risks complex research questions and facilitates investment from industry and other funders. Versus Arthritis is a member of the Association of Medical Research Charities (AMRC) whose members invested £1.9 billion in medical research in 2019, representing half of all UK publicly funded medical research.<sup>6</sup> AMRC charities play a vital and unique role in the UK's research sector but have projected an average 41% decrease in their medical research spend over the next year, leaving a £310 million shortfall. This will result in less funding to support researchers, NHS staff, patient communities, and research that saves and improves lives.<sup>7</sup>
8. The proposed Life Sciences-Charity Partnership Fund (LS-CPF) will help bridge the projected £310 million shortfall in medical research charities' research spend over the next year and protect the contribution charities can make to the Government's vision for UK R&D as independent, strategic funders of high-quality science and innovation.
  - **As a contributing charity to the LS-CPF initiative, Versus Arthritis considers this opportunity for Government to have a lasting impact on economic growth**

**and recovery by securing the unique role medical research charities play in the UK's research and innovation ecosystem as highly significant.**

Question 2: Does the current or post-COVID situation lead to any particular opportunities or challenges for economic growth driven by technology, research and innovation?

9. **The COVID-19 crisis has clearly demonstrated that there are new and innovative methods of ensuring people are supported to work remotely.** In April 2020, 46.6% of people in employment did some work at home with 86% doing so as a result of the coronavirus (COVID-19) pandemic. Of those who did some work from home one-third worked more hours than usual (30.3%).<sup>8</sup> **It is essential that the efficiency and work satisfaction gains achieved during the pandemic as a result of employer flexibility and innovation are not lost.**
10. MSK conditions were the second largest cause of days lost in work in the UK in 2018/19<sup>9</sup> and preliminary data from a survey of home workers within the first month of lockdown which found a significant increase in MSK complaints being reported, especially in the neck, shoulder and back, compared to their normal physical condition.<sup>10</sup>
11. Versus Arthritis and the Medical Research Council jointly fund the Centre for MSK Health and Work with the objective of developing cost-effective ways to reduce the impact of MSK conditions in the workplace and act as a national resource for information and advice on MSK health and work issues. Outputs from the Centre include the internationally-renowned Health Employment After Fifty (HEAF) study which has been used to inform UK Government and NHS policies.
  - **The Government has an opportunity to prioritise investment in research that delivers innovation in employment practices, including for those with arthritis and related MSK conditions, to increase in-work productivity, job satisfaction and resilience.**
  - **This should include committing to an uplift in NIHR funding in line with uplifts in R&D expenditure.**
12. **There is an opportunity to build on existing research expertise and datasets to rapidly address emerging questions about the long-term impact of COVID-19.** For example, profound and persistent fatigue with muscle aches has emerged as a frequent symptom of COVID-19. In partnership with the Kennedy Trust, Versus Arthritis is funding new research into this symptom which utilizes existing data. Participants enrolled in studies at King's College London who have previously had their immune systems studied will be encouraged to use the King's Covid19 Symptom Tracker App to help identify COVID-19 cases and associated symptoms. The aim of this research is to determine whether pre-existing differences in the immune system predict the onset of fatigue, its intensity and persistence both in COVID-19, and in MSK conditions.
13. In a second example, researchers funded by Versus Arthritis were able to respond rapidly to refocus their research efforts and review the safety of hydroxychloroquine and azithromycin in the light of concerns raised through COVID-19. Hydroxychloroquine is most commonly used as the first-line treatment in patients with autoimmune diseases such as rheumatoid arthritis and systemic lupus erythematosus. A multinational, retrospective study provided reassurance that short-term use of

hydroxychloroquine did not appear to confer increased risk in COVID-19 patients with rheumatoid arthritis. The study also found that hydroxychloroquine, when used in combination with azithromycin appeared to be associated with serious cardiovascular adverse events and should therefore be used with caution.<sup>11</sup>

14. **Versus Arthritis welcomes the Government's commitment to improve healthy life expectancy by 5 years by 2035**, especially in the light of COVID-19, which has shown this to be fundamental to the health of society and its economic wellbeing.<sup>12</sup> MSK conditions were consistency ranked second for Years Lost to Disability globally over a 15 year period<sup>13</sup>, while low back and neck pain are the greatest cause of Years Lost to Disability in England<sup>14</sup>. A specific focus on R&D which promotes healthy life expectancy and management of multiple conditions is essential to underpin economic growth.<sup>15</sup>
15. There is an opportunity to achieve efficiencies of scale and maximise the impact of research investment by prioritising research which addresses complex health challenges such as healthy ageing. Whilst funding research to understand and tackle individual diseases will remain important, the Government must continue to invest in the important cross-sector partnerships that can address common platforms and mechanisms.
  - **We call on Government in the light of COVID-19 to promote research which addresses the complex interdependencies of multiple long-term conditions and prioritises their prevention.**
  - **Continued Government support for partnership-building with and between charities will help develop and deliver the range of funding mechanisms required to drive successful outcomes from complex research challenges.**
16. **In a post-COVID world, there are a number of opportunities resulting from a broader understanding of and engagement with technology platforms.** As a charity, this has presented Versus Arthritis with opportunities to scale up the involvement of people with arthritis and related conditions in shaping our research. Previously, many people were unable to commit to face to face meetings due to mobility issues, severity of disease, fatigue, caring responsibilities or employment. Utilising technology to involve people has allowed us to increase the number of people and widen the range of experience represented in our engagement activities.
17. Rapid implementation of technological innovation has been transformative during COVID-19 as health services have moved online at a dramatic pace<sup>16</sup>. Digital solutions have been critical to continued, effective health service delivery, and COVID-19 innovations have demonstrated the ability to pivot existing technology to meet new needs<sup>17</sup>. For example, Versus Arthritis rapidly developed Virtual Assistant 'COVA'<sup>18</sup> after experiencing unprecedented demand through our helpline, website, online community and social media channels. COVA was the first coronavirus chatbot to be developed specifically for people with a long-term health condition in the UK<sup>19</sup>.
18. Versus Arthritis recently partnered with technology company Razor to deliver new and innovative AI technologies, building upon existing business intelligence that exists around the Versus Arthritis research portfolio and revolutionising the way that the charity maximises its research investment to improve the quality of life for people living with arthritis<sup>20</sup>.

19. 'Tech for good' efforts across the sector have benefited from renewed interest in recent months<sup>21</sup> and it is essential that Government capitalise on this opportunity to support the UK economic recovery through continued rapid implementation of technology solutions.
20. **UK R&D depends on a highly networked research ecosystem. Post-COVID, there is an opportunity to preserve the UK's science interconnectedness through an R&D-led economic recovery, but this requires the Government to provide support to the whole system and its' networks.**<sup>22</sup>
21. The NHS Long Term Plan acknowledges the benefits research and innovation can make to patients and the critical importance of research and innovation to drive future medical advance.<sup>23</sup> However, a recent analysis estimated an underinvestment in R&D of £222 billion since 1985 when compared to OECD averages, despite the life sciences outperforming the UK economy on productivity over the previous 20 years<sup>24</sup>.
22. The BioIndustry Association estimates that private investment in R&D needs to increase by 70% to meet government targets towards R&D spend at a rate of 2.4% of GDP by 2027 and argues that partnership is essential to bridge the 'valley of death'.<sup>25</sup> There is an opportunity for Government to capitalise on the UK's highly networked research system and consider how public funding should be used to crowd in private funding, help incentivise industry co-investment and sustain the flow of ideas from the research base into commercial uses.<sup>26</sup>
23. It is important that the Government takes a holistic approach to R&D policy, looking far beyond the research ecosystem to ensure the business environment – from tax incentives to immigration – is optimised to support the UK's innovative industries to translate academic research into economic, environmental and societal benefit.
24. Furthermore, we ask Government to recognize the essential role that medical research charities play within the UK's research system. Medical research charities act as a direct link between the public and R&D, supporting a pipeline from basic research to translation and implementation.<sup>27</sup> UK charities often fill a funding gap left by Government and industry and address unmet patient need through early-stage research.<sup>28</sup> We are well placed to work with Government as facilitators of implementation and maximise the economic impact of research.
  - **Versus Arthritis welcomes the Government's stated commitment to increase public R&D investment to £22 billion per year by 2024-25 and asks that the Government continue to prioritise R&D investment as a central pillar of the UK's post-COVID economy.**
  - **We call on Government to work with representatives from across the R&D sector including medical research charities, to ensure R&D effectively and optimally supports economic growth post-COVID.**<sup>29</sup>

Question 3: What lessons can be learnt from the role of technology, research and innovation in recoveries from previous economic downturns, and how relevant are these to the current situation?

25. Versus Arthritis does not wish to submit a response to this question.

Question 4: How have research and innovation in UK universities, businesses and other settings been affected by the COVID-19 pandemic, and how might they be affected by any lasting changes post-COVID?

26. **Versus Arthritis-funded researchers responded flexibly and creatively to COVID-19, from joining the frontline response to pausing, adapting or re-focusing their research. However, charity-funded research has been profoundly affected.**
27. Versus Arthritis currently has £132.4 million currently invested in cutting-edge research across the UK, the majority of which is undertaken in university settings. Our research portfolio was severely impacted in March by social distancing measures as universities closed and all face to face meetings stopped. In late March, we estimated that between 75% and 100% of our awards had either been paused or research had been delayed. At that time, approximately 80% of clinical researchers paid from our funding awards had been seconded to patient care with the impact appearing to be greatest for more junior researchers. A number of research students and staff funded by our awards volunteered their time to COVID testing efforts.
28. A large proportion of our researchers were able to use the initial period of lockdown to undertake data analysis and write manuscripts. Research protocols were adapted where possible to collect data remotely and some researchers have returned to work over the summer, with some universities operating at reduced capacity using rota systems. At the present time, we calculate that approximately 35% of our research portfolio remains paused.
29. **We are aware of a number of longer-term impacts for our funded researchers.** Recruitment of patients to trials is still severely impacted, and only a few studies have been able to make amendments or restart. A number of trials funded by our awards have paused in the set-up phase and the slow return of elective surgery will continue to impact both patient recruitment and the supply of human tissue for research. There will be unavoidable costs and delays to re-establish other essential biological resources.
30. **We are particularly concerned about the long-term impact for early career researchers.** The career progression of junior researchers will be greatly impacted for years to come by a reduced capacity to generate the preliminary data necessary to secure future funding through lost laboratory time<sup>30</sup>. Versus Arthritis is building a world-class workforce by supporting research careers and increasing skills capacity within the MSK research community. We currently support a portfolio of 79 live fellowship awards across five core fellowship schemes (current value £22.7 million). We are committed to funding key research and sustaining our existing research commitments but it is clear that COVID-19 will continue to have a substantial impact on medical research careers across the sector<sup>31</sup>. There is a risk of long-term inequality as the specific impact for individuals will vary dependent on personal circumstance, including when they are able to return to full-time lab work<sup>32</sup>.
31. **It is too early to fully predict the lasting impact of COVID-19 on the research sector. But we are concerned that investment in remaining, urgent, non-COVID-19 health-related research may be reduced through a potential narrowing of priorities.** Pre-COVID, there were inequalities to address in funding across underserved health conditions, including MSK health.<sup>33</sup> We call on Government to

catalyse investment and fund research where it is likely to be most impactful to address health inequalities and support economic recovery post-COVID.

32. We are also concerned about potential impact on current efforts to level up research activity geographically, to increase diversity and inclusion across the sector and address concerns about research culture, all of which are rightly recognized as important issues in the BEIS UK Research and Development Roadmap<sup>34</sup>.
- **There is an urgent need for Government to ensure that universities are supported to address immediate and longer-term issues arising from COVID-19 and have the necessary financial support required to avoid any reduction in the breadth and diversity of research activity and engagement.**

Question 5: How effective have measures adopted by the Government to support research and innovation, such as the support packages for innovative firms and university researchers, and the 'Ministerial University Research and Knowledge Exchange Sustainability Taskforce', been?

33. **Charity-funded research in universities faced several weeks of uncertainty after the announcement of the Government's Coronavirus Job Retention Scheme (CJRS). This had a direct impact on charity financial commitments.** It was not immediately clear whether university researchers whose salaries were funded by charities were eligible to take advantage of CJRS. Understanding of the scheme varied between universities and this directly impacted the researchers we fund. The higher education sector was not as well placed to take advantage of the scheme as swiftly as others<sup>35</sup> and this required funders including Versus Arthritis to continue to provide financial support to our funded researchers at a time when research activity was paused.
34. After eligibility was confirmed, approximately 15% of our funding awards were able to take advantage of the scheme. Versus Arthritis along with some other charities chose to 'top up' the shortfall in researcher salaries from the 80% provided through the CJRS. This 20% top up came directly from the award granted to the researcher. This is in addition to the immediate provision of a three-month no-costs extension offered to all of our active awards. This unplanned expenditure creates a funding 'gap' which needs to be met by charities from their existing research allocations, reducing the amount of funds available going forward to support all new activity, including career support, trial delivery, new research studies or infrastructure.
35. **Along with other medical research charities, Versus Arthritis welcomes the immediate support for research in universities provided by the university research support package announced in June 2020.** However, while the package may be used by universities to cover some of the increased costs associated with their current charity-funded research, it will not help address the significant shortfall expected in spending by AMRC charities and is not a long-term solution to the challenges currently facing medical research charities.
36. 87% of all AMRC charity funded research takes place in universities and the sector estimates that it will take approximately 4.5 years for their medical research spend to recover to normal levels.<sup>36</sup> During this period when medical research charities are facing a substantial reduction in income, charities will need to balance safeguarding existing research investment against new investment. It remains unclear how the

research support package directed towards universities could protect the future pipeline of charity-funded research.

- **As a contributing charity to the aforementioned LS-CPF initiative, Versus Arthritis considers this opportunity for Government to have a lasting impact on economic growth and recovery by securing the unique role medical research charities play in the UK's research and innovation ecosystem as highly significant.**

Question 6: In the context of the Government's 'Research and Development Roadmap', what shorter-term measures can best support UK research and innovation in recovering from the disruption of the COVID-19 pandemic and adapting to the post-COVID environment?

37. **We ask the Government to consider carefully the deployment and timing of the review of Quality-Related funding and Full Economic Cost (FEC).** Versus Arthritis acknowledges the Government's commitment in the BEIS UK Research and Development Roadmap to review the mechanisms used to support university research in England and the incentives that these create within the R&D system including Quality-Related funding [which includes the Charity Research Support Fund; CRSF] and the payment of Full Economic Cost (FEC)<sup>37</sup>.
38. The CRSF underpins charity investment in university research across England and enables researchers who receive charitable funding to recover costs of research that charities do not pay. The Government has a responsibility to ensure that universities are funded in a sustainable way. For universities, particularly those in receipt of high proportions of charity funding, the CRSF is a key part of this.
39. Furthermore, it is important to recognise that COVID-19 has resulted in a challenging time for medical research charities. Any increase in the proportion of FEC which charity funders are required to pay could exacerbate this.
  - **As part of its comprehensive R&D plan and focus on research sustainability brought about by COVID-19, we ask that the Government renew its commitment for the CRSF to protect the unique partnerships between universities and charities. The Government should commit to an increase in the CRSF to keep pace with charity investment.**
  - **We ask Government to ensure the unique position of charitable is recognised and reflected in future discussions or reviews relating to FEC of university research.**
40. **Disease-specific research funded over many years underpins emerging understanding of COVID-19 and other serious health conditions.** In the late 1980s, ground-breaking research showed that a molecule called Tumour Necrosis Factor (TNF) which occurs naturally in the body plays a key role in inflammation. Early, innovative trials funded by Versus Arthritis led to the introduction of a new class of game-changing treatments known as biological therapies, with the first anti-TNF therapy licensed in 2000.
41. The output from this research, which initially focussed on a single condition – rheumatoid arthritis - has since been shown to be beneficial for a range of common



medical conditions known as inflammatory-mediated immune diseases (IMIDs). These conditions share some common genetic features, environmental triggers and inflammatory mechanisms and in total are arguably as significant in scale as cancer. Versus Arthritis is a charity partner of IMID-BIO<sup>38</sup> a national consortium which seeks to enable more precise treatment of IMIDs including arthritis, psoriasis, liver and kidney disease, and identify common mechanisms which drive them.

42. Anti-TNF and other biologics are also being studied for the prevention and/or treatment of COVID-19. Preliminary findings from the COVID-19 Global Rheumatology Alliance found that patients who were already receiving anti-TNF therapies for rheumatic diseases had lower odds of hospitalisation.<sup>39</sup> There is a growing understanding of the potential of biological therapies but further work is needed to confirm their value in treating COVID-19.

43. Arthritis research into the role of the anti-inflammatory and healing properties of mesenchymal stromal cells (MSCs) in the treatment of osteoarthritis is also helping COVID-19 research. Researcher expertise at the Tissue Engineering Centre & Regenerative Therapies Centre Versus Arthritis led by orthopaedic surgeon Professor Andrew McCaskie seeks to determine whether MSCs can reduce the overreaction of the body's immune system to the COVID-19 infection<sup>40</sup>. Recent temporary MHRA flexibilities in the regulation of medicines and medical devices<sup>41</sup> supported swifter application of this existing knowledge to COVID-19. The improved speed of activity driven by the application of this research to COVID-19 has in turn provided a related positive facilitation of the speed of osteoarthritis research in this area.

- **In the short term, the Government must ensure a balanced combination of funding strategies continue to be made available, to support basic discovery science, incremental, progressive R&D and high risk, high return R&D<sup>42</sup> through a variety of funding mechanisms offering both responsive and challenge-led funding.**

44. **The involvement of medical research charities is essential to the development of the Government's comprehensive R&D plan.** Public awareness of R&D is high, with 72% of people saying they know what it is and 86% able to identify the most straightforward examples.<sup>43</sup> However, a sometimes narrow perception of R&D was identified as a risk for the sector. Supporting researchers to tell their story will be an essential factor in increasing public awareness of the tangible benefits R&D can offer for economic recovery and throughout society. Medical research charities increasingly put the patient's voice at the core of their mission and use the delivery of patient outcomes as the touchstone of every decision.<sup>44</sup>

45. Charity funders offer unique opportunities for people with lived experience of their condition and their representatives to contribute to the co-design and prioritisation of publicly-funded research activities; for example Versus Arthritis published A Research Roadmap for Pain – a paper co-produced by people with arthritis, healthcare professionals and researchers.<sup>45</sup>

- **The Government should involve medical research charities in developing its comprehensive R&D plan, harnessing their understanding of the system, their expertise in talking to the public and patient communities about R&D and the public's trust in charities.**

- **The opportunity for Government to ensure that the views of patients and the public are sought out and included in any decision-making processes in the comprehensive R&D plan will have wide-ranging benefits for individuals, society and the economy.**

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