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The Academy of Medical Sciences is the independent body in the UK representing the diversity of medical science. Our mission is to promote medical science and its translation into benefits for society. The Academy's elected Fellows are the UK's leading medical scientists from hospitals, academia, industry and the public service. We work with them to promote excellence, influence policy to improve health and wealth, nurture the next generation of medical researchers, link academia, industry and the NHS, seize international opportunities and encourage dialogue about the medical sciences.

Summary

We welcome this Government's strong commitment to investing in R&D, signalled by the objectives for this Comprehensive Spending Review (CSR), the March Budget and the R&D Roadmap. Achieving these ambitions will only be possible if the conditions are in place for our research base to flourish. This will mean enhancing support for our existing world-leading health research ecosystem. This must include the dual support system, UK Research and Innovation (UKRI) and the National Institute for Health Research (NIHR). It must also mean mitigating the destabilising effect that COVID-19 has had on the sector, in particular on medical research charities.

The economic context has clearly changed since the Chancellor's March Budget, however the case for fulfilling the Government's commitment to double public investment remains at least as strong now as it was then. Increasing investment in R&D will be critical to our ability to overcome the challenge posed by COVID-19, as well as to offering a long-term strategy to improve our productivity by placing research and innovation at the heart of our economy.

Therefore, the Academy of Medical Sciences believes that the priorities for this Spending Review must include:

- Ensuring that the Government makes funds available to reach the target of doubling public investment in research by 2024/25.
- Balancing funding available for the breadth of research across discovery, applied and translational research, with sizeable uplifts to the budgets of the Research Councils, Quality-Related research funding (QR) and the NIHR
- Providing tailored support for medical research charities through the Life Sciences Charity Partnership Fund to enable them to overcome the financial impacts of COVID-19 and fulfil their vital role in nurturing the next generation of talent and addressing unmet patient need.
- Providing additional funding to deliver the Government's commitment to associate to Horizon Europe so that UK researchers can continue to benefit from access to prestigious schemes such as the European Research Council (ERC) and the Marie Skłodowska-Curie Actions (MSCA), as well as participation in multilateral international consortia.
 - If this cannot be achieved, then additional investment must be made available to support third country participation in Horizon Europe where

this is possible and to develop domestic alternatives of comparable scale, independence and ambition to the ERC and MSCA.

- Delivering investment that provides opportunities to talented people from all backgrounds to build rich and rewarding research careers in our universities, healthcare settings and businesses.
- Enhancing research in the NHS to empower the NHS to participate in, and benefit from, the delivery of the R&D Roadmap thereby improving outcomes for patients.
 - This should include funding a pilot scheme where a proportion of consultants are offered a contract that includes dedicated time for research.
- Ensuring that R&D contributes to the levelling-up agenda by enhancing support for the UK Strength in Places Fund and developing a UK Shared Prosperity Fund which supports R&D activities and facilitates collaboration across and between regions.
- Providing the funding for schemes through which the UK can demonstrate global leadership, including through renewing funding for the Global Challenge Research Fund (GCRF).
- Creating an immigration system that attracts international talent and is of commensurate cost to comparable visas in other leading science nations.

The Academy of Medical Sciences benefits from Government funding and has submitted its own proposal to the CSR exercise, which aligns to the delivery of the Government's R&D Roadmap and its ambition to make the UK a science superpower. Our proposal harnesses the expertise in our Fellowship, our extensive network of early career researchers and our cross-sector partnerships to deliver holistic and innovative packages of career support and policy expertise and insight shaped by public and patient views.

Introduction

1. Research and innovation is one of the UK's great strengths. With just 2.7% of the world's R&D expenditure, the UK generate 15.2% of the world's most highly-cited articles.¹ Yet, this is an area in which the UK has historically underinvested, spending less than 1.7% of GDP on R&D in 2017, well below the OECD average.² Therefore, the Academy of Medical Sciences welcomes this Government's commitment to double public investment in R&D and invest 2.4% of GDP in R&D by 2027.^{3,4} We hope that this will continue to form part of the Government's ambition to reach 3% of GDP invested in R&D in the long term.
2. Achieving these targets will not only be good for UK R&D, but will also deliver benefits to the UK's health and wealth; providing new treatments, improving care for patients and supporting the UK's highly productive life sciences sector. **Box 1** outlines some of the key benefits of investing in health research and the important role that the Life Sciences sector plays in the UK economy.
3. However, the 2020 Comprehensive Spending Review takes place at an extraordinarily challenging time for the UK economy. In this context, it is more important than ever to recognise that investing in R&D is not a luxury; recent events have demonstrated the critical role that health research plays in responding to global challenges such as the COVID-19 pandemic. Health research has been critical to improving patient outcomes by identifying effective treatments, leading progress towards developing a vaccine as well as providing key evidence that will help us to kick-start our economy safely.
4. The Chancellor has recognised this link and this is reflected in the aims for this Spending Review of both supporting the UK's economic recovery from COVID-19 and "making the UK a scientific superpower".
5. This submission will set out the Academy of Medical Sciences' view on how this can be best achieved, but also the critical role that research and innovation, and in particular medical research, can play in delivering additional objectives for this Spending Review, including improving outcomes in public services; levelling up opportunity across all nations and regions of the UK; and strengthening the UK's place in the world.

¹ <https://www.elsevier.com/research-intelligence?a=507321>

² Academy of Medical Sciences, The British Academy, Royal Academy of Engineering and the Royal Society (2019) Investing in UK R&D <https://acmedsci.ac.uk/file-download/50058404>

³ <https://assets-global.website->

files.com/5da42e2cae7ebd3f8bde353c/5dda924905da587992a064ba_Conservative%202019%20Manifesto.pdf

⁴ <https://www.gov.uk/government/publications/budget-2020-documents>

Box 1: Health Research and the Life Sciences Sector contribution to the UK economy

- Every £1 invested in medical research delivers a return equivalent to around 25p every year, forever.⁵
- Between 2016/17 and 2018/19, research activity funded by the NIHR Clinical Research Network has generated:⁶
 - £8 billion in Gross Value Added
 - average revenue of £9,189 per patient for NHS Trusts England from life sciences companies
 - a pharmaceutical cost saving of between £4,143 and £7,483 per patient
- The UK's pharmaceutical sector is the largest R&D investor
 - In 2018, the sector invested almost £4.5 billion in R&D in the UK ⁷
 - In 2019 the UK life sciences industry employed over 250,000 people and generated a turnover of £80.7bn. ⁸

⁵ <https://acmedsci.ac.uk/file-download/54792223>

⁶ [https://www.nihr.ac.uk/documents/partners-and-industry/NIHR Impact and Value report ACCESSIBLE VERSION.pdf](https://www.nihr.ac.uk/documents/partners-and-industry/NIHR_Impact_and_Value_report_ACCESSIBLE_VERSION.pdf)

⁷ <https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/datasets/ukbusinessenterpriseanddevelopment>

⁸ https://www.gov.uk/government/statistics/bioscience-and-health-technology-sector-statistics-2019?utm_source=3b438c88-36c2-4dd4-b658-8f4ebb4a5fd6&utm_medium=email&utm_campaign=govuk-notifications&utm_content=immediate

Making the UK a scientific superpower and delivering on the R&D Roadmap

6. The Government has made welcome commitments to **raise our ambition in research and innovation, by doubling public investment in research and innovation by 2024/25**. The recently published R&D Roadmap sets out a blueprint for reaching this target.
7. The Government must use this Spending Review to **provide financial certainty over how this commitment will be delivered**. It must set a trajectory for how public investment will be doubled between now and 2024/25, such that the UK can reach its target to invest 2.4% of our GDP in R&D by 2027 and 3% in the long term.
8. Delivering this level of investment has the potential to transform UK science, bringing the UK public investment in line with other leading science nations.⁹
9. To deliver the full benefits, investment must be balanced to support the whole eco-system: between basic and applied research; between investing in our existing research and innovation institutions such as UK Research and Innovation (UKRI) and the National Institute for Health Research (NIHR) as well as establishing new funding infrastructure such as the proposed Advanced Research Projects Agency (ARPA)-like body. Investment must also be guided through meaningful engagement with the public and patients to ensure that research decisions are informed by the needs of patients and that the outputs will address these.
10. It must also recognise that COVID-19 has caused profound disruption for the research eco-system. Medical research in particular has been integral to the response to COVID-19, but has also been badly affected by the COVID-19 pandemic. Our world-leading institutions and medical research charities have all been severely impacted, as have many researchers who have had to pause their work to return to clinical duties or have been unable to continue existing projects due to university and laboratory closures (see **Box 2** for further details of these impacts).
11. Urgent action is required to ensure that the research base emerges from this crisis in good health and able to contribute to the ambitious agenda laid out by this Government. Protecting and enhancing the research base so that we can continue to support the current and emerging generation of research talent is vital to achieving the ambition set out in the R&D Roadmap and maximising the impact of public investment which was committed at the March 2020 budget.

⁹ <https://acmedsci.ac.uk/file-download/50058404>

Box 2: Impacts of COVID-19 on the medical research base

Medical Research Charities

- Due to COVID-19 the ability of medical research charities to secure fundraising income has been dramatically affected. As a result, members of the Association of Medical Research Charities (AMRC) reported a loss of 38% in income during March–May 2020 compared to the same period last year.¹⁰
- AMRC's members are therefore planning for an average decrease of 41% in their research spend in FY20/21, resulting in a projected reduction in UK medical research investment of more than £300m.¹¹
- This will impact both current research funding, but also the ability of research charities to fund over the long term.
- The acute effects of this have meant that up to 70% of charity-funded clinical trials and studies were paused or delayed.¹²
- AMRC's member charities anticipate that it will take between 2.5 and 4.5 years for their research spend to return to pre-COVID-19 levels.¹³

Higher Education Institutions (HEIs)

- Universities UK estimates that the immediate financial impacts in academic year 2019-20 (including the loss of income from accommodation, catering and conference in the final term and Easter and summer vacations) amounted to £790 million in the UK.¹⁴
- HEIs predict further shortfall may arise as a result of a decline undergraduate and postgraduate international students in the FY 2020/21.

Impacts on clinical research

- From March 2020, virtually all non-essential clinical research was paused, with NIHR Clinical Research Network pausing the site set up of any new or ongoing studies at NHS and social care sites that were not nationally prioritised COVID-19 studies.¹⁵

Impacts on researchers

- Virtually all medical researchers will have been affected by the pandemic in some shape or form due to paused or redirected research, changes in professional duties, return to frontline clinical services, increasing caring responsibilities or other personal circumstances.
- The net effect has been a substantial disruption to academic careers that will have a long-lasting tail beyond the acute phase of the pandemic.¹⁶

¹⁰ <https://www.amrc.org.uk/Handlers/Download.ashx?IDMF=359e3762-05ee-46fa-90ed-c7169a925a33>

¹¹ <https://www.amrc.org.uk/Handlers/Download.ashx?IDMF=3916cef3-3f16-437e-9cb7-7dbcbd5c0c33>

¹² <https://www.amrc.org.uk/Handlers/Download.ashx?IDMF=359e3762-05ee-46fa-90ed-c7169a925a33>

¹³ <https://www.amrc.org.uk/Handlers/Download.ashx?IDMF=359e3762-05ee-46fa-90ed-c7169a925a33>

¹⁴ https://www.universitiesuk.ac.uk/news/Documents/uuk_achieving-stability-higher-education-april-2020.pdf

¹⁵ <https://www.nihr.ac.uk/news/dhsc-issues-guidance-on-the-impact-on-covid-19-on-research-funded-or-supported-by-nihr/24469>

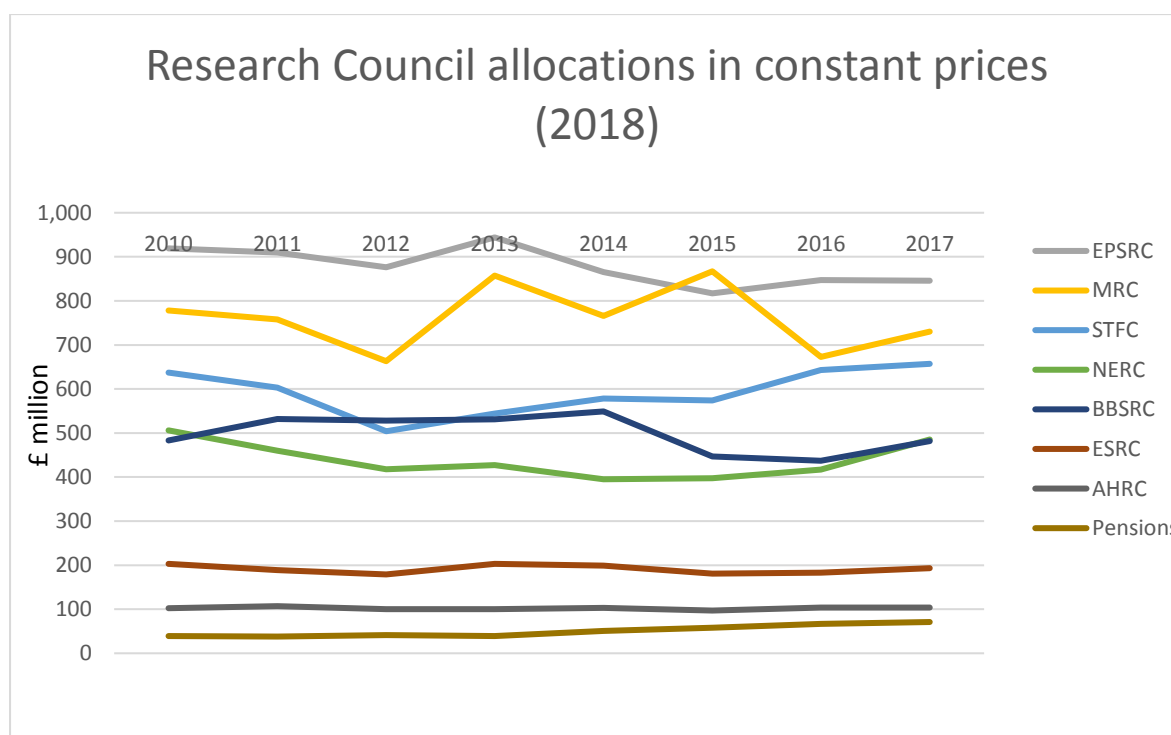
¹⁶ <https://acmedsci.ac.uk/more/news/covid-and-careers-what-does-the-future-hold>

Investing to deliver the R&D Roadmap and support the research base

UK Research and Innovation

12. Doubling public investment in R&D must be underpinned by increased support for UKRI and in particular the dual support model for R&D in HEIs, including both the budget for the Research Councils and quality-related research funding (QR). Whilst the overall science budget has increased in recent years, Research Councils budgets have not increased in line with overall investment (see Figure 1).¹⁷ In particular the Medical Research Council has seen its budget remain flat overall between 2010 and 2017. This Spending settlement must ensure that **Research Council budgets receive a long overdue uplift** so that they can continue to support response-mode funding and nurture the talent that will be critical to developing both the ideas and talented individuals who will be the foundation for our future success in R&D.

Figure 1: Research Council expenditure in constant prices between 2010 and 2017



13. Meanwhile, QR funding, the second branch of the UK's dual support system, has seen a real-terms decline in funding between 2009 and 2016, followed by small increases in recent years.^{18,19} QR funding plays a critical role in empowering Universities to make strategic decisions about investing in talent and infrastructure.²⁰ **Increasing the level of support through this fund will be**

¹⁷ <https://acmedsci.ac.uk/file-download/3249147>

¹⁸ <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee/balance-and-effectiveness-of-research-and-innovation-spending/written/90739.pdf>

¹⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/731507/research-innovation-funding-allocation-2017-2021.pdf

²⁰ <https://wellcome.org/sites/default/files/empowering-uk-universities-how-strategic-institutional-support-helps-research-thrive.pdf>

vital to securing the long-term sustainability of research in HEIs and overcoming the damaging impacts of COVID-19 on these institutions.

National Institute for Health Research

14. Public investment in health research is not solely delivered through UKRI, in England the National Institute for Health Research plays a critical role in investing in clinical research infrastructure, for example through Biomedical Research Centres (BRCs) and the Clinical Research Network (CRN).²¹
15. The R&D Roadmap rightly highlights the role that applied research plays in addressing issues such as healthy ageing, ensuring that resilience, efficiency and effectiveness of public services is improved and healthcare outcomes are advanced. Increasing investment in NIHR is central to fully delivering on these ambitions and to doing so in a way that engages patients. It is also critical to supporting the clinical research infrastructure that will deliver the Conservative Party manifesto pledge to make the UK the leading global hub for life sciences.²²
16. Recent economic analysis has demonstrated that between 2016/17 and 2018/19, research supported by the NIHR CRN generated an estimated £8bn of gross value added (GVA) and 47,467 full time equivalent (FTE) jobs for the UK.²³ In addition, in 2018/19, every single NHS Trust in England took part in research, with over 1 million clinical research participants, demonstrating the key link between health research and the health of patients across the country.
17. These impressive figures took place in the context of several years of flat cash budget.²⁴ However, more can be achieved and this **Spending Review should build on this investment and ensure that the NIHR budget is uplifted in line with other parts of the research budget** to enable them to deliver an improved environment for clinical trials and industry investment; increased investment in research on prevention of ill health; enhanced efficiency and effectiveness of NHS – by delivering better evidence to support decision-making; and supporting the UK’s response to Covid-19.
18. Working through the Office for the Strategic Coordination of Health Research (OSCHR) funders, Government departments and devolved administrations can ensure that a truly cross Government and four nations approach is taken to maximise the impact of Government investment in health research.²⁵

Medical Research Charities

19. Medical research charities play an enormously important role in the life sciences eco-system, providing more than £14 billion of funding over the last decade.

²¹ https://assets-global.website-files.com/5da42e2cae7ebd3f8bde353c/5dda924905da587992a064ba_Conservative%202019%20Manifesto.pdf

²² https://assets-global.website-files.com/5da42e2cae7ebd3f8bde353c/5dda924905da587992a064ba_Conservative%202019%20Manifesto.pdf

²³ https://www.nihr.ac.uk/documents/partners-and-industry/NIHR_Impact_and_Value_report_ACCESSIBLE_VERSION.pdf

²⁴ Office for National Statistics (2019). Government expenditure on science, engineering and technology, UK: 2017. <https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/ukgovernmentexpenditureonscienceengineeringandtechnology/2017>

²⁵ <https://www.nihr.ac.uk/about-us/our-contribution-to-research/our-place-in-the-UK-research-landscape/oschr.htm>

Charities fill a unique niche: funding research into specific, sometimes rare conditions; providing a vital link to patient and carer communities; and playing an essential role in the training of the next generation of medical researchers.

20. In 2019, AMRC members provided stipends for more than 1,700 PhD students as part of their wider support for the salaries of over 17,000 researchers.²⁶ Through this function, the medical research charities are key partners in sustaining the pipeline of talent that will be required to deliver the ambitions in the R&D Roadmap.
21. However, the financial impacts of COVID-19 on charities (as outlined in **Box 2**) are severely hampering their ability to invest and will take several years to recover from. The University Support Package highlights the importance of charities in the HEI funding landscape, however it does not address the impact of the pandemic on the charities themselves. Meanwhile, the extra £750 million coronavirus funding for frontline charities announced by the Chancellor in April has not benefitted medical research charities.
22. Therefore, **urgent and tailored support is required to address this shortfall**. We are aware that BEIS have been working closely with the medical research charity sector to develop a robust and credible set of proposals for a **Life Sciences Charity Partnership Fund** that will address the shortfall in fundraising income in the short term and provide long-term support over a period of years whilst charitable income rebounds. **We support this bid and encourage the Government to use the opportunity of this Spending Review to ensure that appropriate and tailored support is made available to support the medical research charities, thereby preserving this critical component of the medical research landscape.**

Talent and Culture

23. The Academy has welcomed the focus on talent and research culture in the Government's R&D Roadmap. To achieve the ambition in this Roadmap it is clear that we will need more people working in R&D. As one former Science Minister put it:

*"if we need to increase R&D spending by more than double our current investment levels by 2027, then we are also going to have to substantially increase the numbers of people we have working in R&D in the same period – perhaps by as much as 50%."*²⁷
24. This takes on added significance due to the disruption outlined above and in **Box 2**, which will have significant impacts on individual researchers and the pipeline of talent.
25. This Spending Review provides the opportunity to deliver investment in our people, so that they are able to sustain and grow their careers in research, and to protect the pipeline of talent. We must also ensure that we are providing

²⁶ <https://www.amrc.org.uk/Handlers/Download.ashx?IDMF=359e3762-05ee-46fa-90ed-c7169a925a33>

²⁷ <https://www.gov.uk/government/speeches/reaching-24-securing-the-research-talent-of-tomorrow>

people with the skills they need to excel and become leaders of the future in our universities, businesses and healthcare settings. The measures outlined above to increase investment in Research Councils, QR, NIHR and to provide tailored support to the medical research charities will all help to achieve this goal.

26. As part of this, we must ensure that our research culture is accessible and welcoming, providing everyone with the opportunity to pursue a career in research and innovation. We look forward to continuing to contribute to the government's R&D People and Culture Strategy.

Leveraging Private Investment

27. Achieving the 2.4% target will require a substantial increase in private sector investment in R&D. The life sciences industry is already one of the UK's most productive and highest investors in R&D, employing over 250,000 people and delivering enormous economic benefits to the UK.²⁸ This Comprehensive Spending Review must set out **measures to encourage and support businesses to invest in R&D and for innovative SMEs to scale and grow**, from renewing investment in highly valued schemes such as the Biomedical Catalyst, to enhancing R&D tax credits, to unlocking pension funds to invest in innovative early stage life sciences firms.

Improving outcomes in public services

28. The NHS is unique and COVID-19 has demonstrated it is a national asset to be treasured. The RECOVERY trial, which identified dexamethasone as the first effective treatment for patients suffering severe COVID-19, has shown the enormous power of the NHS as an engine for research.²⁹ **Box 3** provides further case studies of how research in the NHS has delivered health and care benefits over the last 50 years. And yet this potential is not fully realised.
29. Investing in and valuing research in the NHS and wider healthcare system could improve patient outcomes; enhance the use of evidence in decision-making; enable the UK to remain globally competitive in the life sciences; and increase job-satisfaction, thereby improving recruitment and retention, and decreasing locum bills. Furthermore delivering commercial clinical trials can generate revenue and savings for the NHS – in the financial year 2018/19, commercial clinical trials generated an estimated income of **£355 million**, and an estimated **cost saving of £28.6 million** (where trial drugs were used in place of standard).
30. These benefits will be facilitated by a close interface between academia and the NHS. However, the Academy is concerned that the gap between these institutions is widening. In our recent report on “Transforming health through innovation: Integrating the NHS and academia”, we made a series of recommendations that will be essential to enhance this interface.³⁰
31. In this report, we recommend that to spread the benefits of research-active clinicians and to fully understand how protected time for research can enhance these, **a pilot should be established where a proportion of consultants is offered a contract that includes dedicated time for research.**
32. This pilot, which we recommend should take place in a mixture of large teaching NHS Trusts or Health Boards and district general hospitals across the UK, can provide comprehensive evidence on the impact of a range of factors – including research activity, staff recruitment and retention, and patient outcomes. Ultimately, we hope that this will provide the evidence base for a longer-term approach to protected-time for research for the health and social care workforce.
33. We estimate that the costs of conducting such a pilot using one scenario³¹, would be between £21.7 million and £25 million per year. However, over time, we anticipate that the pilot would be cost-neutral or even cost-saving by improving recruitment and retention, reducing expenditure on locums, and increasing research funding from life sciences companies.

²⁹ <https://www.recoverytrial.net/news/low-cost-dexamethasone-reduces-death-by-up-to-one-third-in-hospitalised-patients-with-severe-respiratory-complications-of-covid-19>

³⁰ <https://acmedsci.ac.uk/policy/policy-projects/nhs-academia-interface>

³¹ We have estimated the cost of a scenario in which 20% of consultants have 20% of their time protected for research in ten NHS Trusts (five teaching NHS Trusts or Health Boards and five district general hospitals) across the UK. <https://acmedsci.ac.uk/file-download/68338531>

34. We recognise that the demands imposed on the NHS by COVID-19 are substantial and long-term, however we believe this crisis has demonstrated the value of research involvement by clinical staff and the need to protect their time to participate.

Box 3: Examples of some of the UK's most significant contributions to advances in patient care since the inception of the NHS

The UK's NHS was launched on 5 July 1948. Since then, the UK has made many significant contributions to medical science resulting in ground-breaking advances in patient care. The case studies in the timeline below present a selection of some of the UK's most significant research contributions to the advancement of patient care since the inception of the NHS.

1970s

The first 'test tube baby'

In Vitro Fertilisation (IVF) is a technique where an egg is fertilised outside the body before being implanted in a woman's uterus and is available to people experiencing fertility problems. UK scientists were at the forefront of the development of this procedure. The world's first human after conception by IVF was born in the UK.

1990s

Practice-changing clinical trials in radiotherapy and imaging

The Institute of Cancer Research and The Royal Marsden have led major clinical trials in radiotherapy and imaging, which have changed standard clinical practice for cancer treatment, forming the basis of National Institute for Clinical Excellence (NICE) and international guidelines and helping set standard care in the UK. Patients all over the world are benefiting from these changes in clinical practice.³²

2000s

Brain cooling treatment for newborns starved of oxygen

Imperial College London researchers pioneered the implementation of a brain cooling treatment to improve the survival of newborns starved of oxygen during birth.^{33,34,35} It is now recommended by NICE guidelines and is the standard of care in most resource-rich and -intermediate countries.

2010s

Nurse staffing numbers in hospitals

³² <https://www.icr.ac.uk/about-us/our-achievements/our-scientific-discoveries/practice-changing-clinical-trials-in-radiotherapy-and-imaging>

³³ <https://www.imperial.ac.uk/media/imperial-college/medicine/dept-medicine/Cooling-Babies-Limits-Brain-Injury.pdf>

³⁴ <https://www.imperial.ac.uk/department-of-medicine/research/impact/increasing-the-survival-rate-of-oxygen-starved-babies/>

³⁵ <https://www.nice.org.uk/guidance/ipg347/chapter/2-The-procedure>

Researchers in the UK contributed to the Registered Nurse Forecasting (RN4CAST) consortium, which studied how organisational features of hospital care impact on nurse recruitment and retention, and patient outcomes.^{36,37,38} This work directly influenced national policy decisions and underpinned 'safe nurse staffing' guidelines and legislation in Wales, Ireland, Scotland, Germany, and beyond Europe in Australia and Chile.³⁹

Chimeric antigen receptor (CAR) T-cell therapy

CAR T-cell therapy is an innovative new treatment type that involves reprogramming a patient's own T-cells to target their cancer.^{40,41} The NHS now provides CAR T-cell therapies for children and young people with B-cell acute lymphoblastic leukaemia, marking a new era of personalised cancer treatments.^{42,43,44} Children at Great Ormond Street Hospital and adults at UCLH have been the first in Europe to receive this ground-breaking treatment.⁴⁵

2020s

COVID-19 and Dexamethasone

In March 2020, the RECOVERY (Randomised Evaluation of COVid-19 thERapY) trial was established as a randomised clinical trial to test a range of potential treatments for COVID-19, including low-dose dexamethasone (a steroid treatment). Over 11,500 patients were enrolled from over 175 NHS hospitals in the UK. In June, the RECOVERY trial was the first study to identify a drug (Dexamethasone) shown to improve survival in patients with severe respiratory complications of COVID-19.⁴⁶

³⁶ <http://www.rn4cast.eu/about1.html>

³⁷ [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(13\)62631-8/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(13)62631-8/fulltext)

³⁸ <https://www.bmj.com/content/344/bmj.e1717>

³⁹ <https://www.rcn.org.uk/professional-development/publications/pub-003860>

⁴⁰ <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/car-t-cell-therapy>

⁴¹ <https://www.england.nhs.uk/cancer/cdf/car-t-therapy/>

⁴² <https://www.england.nhs.uk/cancer/cdf/car-t-therapy/>

⁴³ <https://www.england.nhs.uk/2018/11/first-children-with-cancer-to-begin-treatment-with-revolutionary-car-t-therapy/>

⁴⁴ <https://www.longtermplan.nhs.uk/wp-content/uploads/2019/01/nhs-long-term-plan.pdf>

⁴⁵ <https://www.qosh.nhs.uk/news/qosh-patient-first-receive-ground-breaking-new-cancer-therapy-nhs>

⁴⁶ <https://www.recoverytrial.net/news/low-cost-dexamethasone-reduces-death-by-up-to-one-third-in-hospitalised-patients-with-severe-respiratory-complications-of-covid-19>

Levelling up

35. Research and Innovation has a role to play in driving economic growth across the UK. The planned R&D Place Strategy will provide a welcome blueprint for how support for research and innovation activities across the country can ensure that the benefits of investment accrue to all regions and nations of the UK.
36. Cross UKRI schemes such as the Strength in Places Fund have begun to prove their value in supporting interdisciplinary research, driving collaboration between public and private sectors and promoting research across the country. Opportunities to expand and streamline these schemes should be taken.
37. In addition, the Government must ensure that the proposed **UK Shared Prosperity Fund (UKSPF) can support research and innovation across the UK to promote regional growth.**
38. Following the UK's departure from the EU, the UK will lose access to EU structural funds. One such fund, the European Regional Development Fund (ERDF), is expected to provide €1.5bn in research and innovation income to regions in each of the UK's four nations between 2014 and 2020.⁴⁷
39. To fully address this loss and enable R&D to drive regional growth, the UKSPF must provide adequate support for regional investment in R&D activities, enabling collaboration within and between regions.

⁴⁷ <https://acmedsci.ac.uk/file-download/70343877>

Strengthening the UK's place in the world

40. Science is an international pursuit and the UK's strength in research is globally recognised. Investing in international scientific collaboration, participation in multinational programmes and showing global leadership can all play an important role in strengthening the UK's place in the world.

Horizon Europe

41. As the UK R&D roadmap highlights, the UK is a top 5 collaboration partner for 26 of the 27 EU countries participating in the EU's flagship Research and Innovation Programme, Horizon 2020.⁴⁸ Moreover, countries participating in this Programme are our most frequent and amongst our fast growing partners.⁴⁹

42. We believe that the best way to maintain and strengthen these relationships, built up over many years, with our research partners in the EU would be through the closest possible association to the next EU Research and Innovation Programme, Horizon Europe.

43. **The Government should make funds available to ensure that the UK can achieve the closest possible association to Horizon Europe.**

44. If association to Horizon Europe cannot be achieved, the R&D Roadmap commits to the development of a UK Discovery Fund and that funding will be made available to allow UK partners to participate in European schemes open to third countries.

45. Confidence in these approaches will be paramount to their success and will require that the Discovery Fund is afforded the appropriate level of independence. Meanwhile, the mechanism for supporting third country participation will require clarity at the earliest possibility, as consortia are already being built and UK participation will be negatively impacted by ongoing uncertainty. **An arbitrary financial cap on UK participation would be a significant disincentive to this kind of collaboration and must be avoided.**

46. In doing so, it is important to note that at present, investment in R&D delivered through the current Framework Programme (Horizon 2020) is not considered in Office for National Statistics (ONS) Science, Engineering and Technology (SET) figures for public investment in R&D.

47. To ensure that the Government's commitment to double investment in R&D is truly additive, funding for association to Horizon Europe should be considered as part of the baseline for the commitment to double public investment in R&D, as set out at the March 2020 budget.

⁴⁸ <https://www.gov.uk/government/publications/uk-research-and-development-roadmap/uk-research-and-development-roadmap>

⁴⁹ The Royal Society (2019) submission to the Sir Adrian Smith call for evidence on future frameworks for international collaboration on research and innovation <https://royalsociety.org/-/media/policy/Publications/2019/31-05-19-royal-society-submission-to-sir-adrian-smith-review.pdf>

Showing global leadership

48. Renewing funding commitments to existing schemes where the UK shows international leadership, such as the Global Challenges Research Fund.

Building new partnerships

49. The UK enjoys fruitful and productive collaborations, built up over many years, with researchers from across the globe. Boosting collaborations with new international partners must be in addition to maintaining these relationships with existing partners (including in Europe) and not at their expense.

Attracting Global Talent

50. Mobility of researchers supports high-quality and impactful research.⁵⁰ Welcoming talented people to the UK can also help to build collaborative networks and strengthen international relationships. To remain an attractive destination for international researchers, **our visa and immigration system must work for researchers and their families.**

51. The development of the Global Talent Visa (GTV) is an extremely welcome first step. The Academy looks forward to working with the Government to ensure that the GTV offer continues to improve, including to cover researchers who work in industry, and as the Office for Talent is established.

52. **As a next step, the Government should consider the overall cost of the visa system, which is significantly more expensive than other leading research nations (see Table 1).**⁵¹

Table 1: Upfront cost of obtaining a five-year UK Global Talent Visa (exceptional talent) compared with other leading science nations^{52,53}

Country and Visa Category	Total Cost to Employee
Japan - Researcher Visa	£0
Spain - Residence Permit for Researchers	£64
S. Korea - E3 Research Visa	£99
Netherlands - Researcher	£145
Australia - Temp Activity Visa - Research (408)	£154
Australia - Research Student	£154
Sweden - Residence Permit for Visiting Researchers	£160
Germany - Scientific Visa for Researchers	£170
Italy - Research Permit	£207
US - J1 Research Scholar	£258
France - Talent Passport - Researcher	£313
India - Research Visa for all levels	£608
UK – Global Talent Visa	£2608

⁵⁰ <https://royalsociety.org/~media/policy/projects/international-mobility/researcher-mobility-report-review-literature.pdf>

⁵¹ <https://acmedsci.ac.uk/file-download/36324703>

⁵² <https://royalsociety.org/~media/policy/Publications/2019/international-visa-systems-explainer-july-2019.pdf>

⁵³ <https://www.gov.uk/global-talent>

The Role of the Academy of Medical Sciences

53. The Academy of Medical Sciences benefits from Government funding and has submitted its own proposal to the CSR exercise. Our proposal builds on our existing portfolio and harnesses the expertise in our Fellowship, our extensive network of early career researchers and our cross-sector partnerships to achieve the Government's ambition to make the UK a science superpower. Our proposal is highly compatible with the overall priorities for the sector, which we have outlined in this representation and will enable the Academy to play a central role in the delivery of the Government's R&D Roadmap.
54. Using our experience and track record in delivering holistic and innovative packages of career support, our policy expertise and insight shaped by public and patient views, and our proven capabilities to convene diverse partnerships, we have developed proposals that will allow us to:
- a. Develop, inspire and enable scientific talent by providing targeted interventions and programmatic support that will allow researchers from diverse backgrounds to flourish and develop the cross-disciplinary and leadership skills needed to build on this Government's transformative investment
 - b. Level-up by developing regional hubs, forging links between diverse organisations and networks and promoting collaboration and mobility across sectors at local and national level
 - c. Support evidence-based policy and communications work across the UK and ensure that our advice is informed by and responds to public, patient and carer views
 - d. Strengthen our collaborative working arrangements with partners in existing and emerging research nations and international networks and associations, harnessing these relationships to identify shared research priorities, seed lasting collaboration and amplify the UK's reputation internationally.

This response was prepared by Dr Tom Livermore (Tom.Livermore@acmedsci.ac.uk; 020 3141 3220), please contact Dr Livermore for any further details:

Academy of Medical Sciences

41 Portland Place

London, W1B 1QH

+44(0)20 3141 3205

info@acmedsci.ac.uk

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