

October 2017**Summary**

- Recent increases in public investment in Research and Development are welcome and provide a strong platform on which to build on in order to achieve the target of investing 3% of GDP in R&D that has been set by the national Academies and others;
- The investment of public funds must be appropriately balanced between basic and applied research; between disciplines and between different modes of distribution;
- Excellence must remain the key criteria for distribution of public funding for R&D;
- Support for geographical clusters, such as the life sciences clusters, can fund and nurture excellence wherever it exists across the country;
- Improving linkage and connectivity between clusters can help to build a national network and a single front door for international collaborators;
- The UK's exit from EU will influence future access to EU Regional Development Funds (ERDF) that support R&D activities.
- The creation of a national "Shared Prosperity Fund" as Government proposes to replace ERDF, can play a role in building regional research capacity.

Investment

1. The Academy of Medical Sciences, together with the other UK National Academies has called for the UK to achieve a target of 3% of GDP for combined public and private R&D spending.¹ This will be comprised of both public and private investment and the Academies have called for the UK Government to increase its investment in R&D to match the OECD average (which currently stands at 0.66%) by 2025.² In recent years a political consensus has emerged across the major parties in the UK around the need to invest a higher proportion of GDP in Research and Development (R&D). The Conservative Party's manifesto committed to a target of 2.4% of GDP to be invested in R&D by 2027, with a long-term target of 3%.³ This followed the announcement in autumn 2016 of an additional £4.7 billion investment in science, research and innovation by 2021. Nevertheless, even with this increase in funding, the UK spends well below the OECD average for public investment in R&D.

Balanced funding

2. The injection of fresh public funds into research and innovation in the UK is welcome, however in order to maximise this funding it must be appropriately balanced between different modes of funding and research topics.

From basic to applied

3. Investment in science, research and innovation must be provided across the whole research ecosystem to support research and ideas at all stages of development from fundamental discovery research to applied research. The UK must remain committed to its great strength in discovery science and should continue to increase investment in basic research through the research councils to ensure that the UK remains a world leader in this area.
4. The newly created Industrial Strategy Challenge Fund offers an exciting new opportunity for businesses to play an expanded role in the setting the challenges that will be funded. However, it remains unclear exactly how this fund will support the early sector deals, including the sector deal which is expected to implement the Life Sciences Industrial Strategy. The Government's response to this Committee's inquiry into the Industrial Strategy stated that the Government and UKRI are

¹ UK National Academies, (2016) Open for business <https://acmedsci.ac.uk/file-download/41610-582d965e166ae.pdf>

² OECD, Main Science and Technology indicators http://stats.oecd.org/Index.aspx?DataSetCode=MSTI_PUB

³ Forward Together, Our Plan for a Stronger Britain and a Prosperous Future; Conservative Party Manifesto 2017 <https://s3.eu-west-2.amazonaws.com/manifesto2017/Manifesto2017.pdf>

working in close partnership to deliver the early sector deals.⁴ Further clarity is required, for example, on how initiatives such as the Health Advanced Research Programme will be funded.

Interdisciplinary

5. Complex societal challenges, such as an ageing population with multiple morbidities, climate change or antimicrobial resistance cannot be addressed by a single discipline. Investment in science and research must be flexible enough to facilitate interdisciplinary approaches and the team science approaches that will be required.⁵ The creation of UK Research and Innovation which brings together the Research Councils (RC) should deliver on this requirement.

Dual support

6. The Higher Education and Research Act, enshrined the principles of dual support in legislation for the first time. The Academy strongly believes that this system has served the community well by providing institutions with block grants (QR funding) to deploy strategically alongside competitively-won RC grants, charitable and industry funding.
7. The balance between QR, responsive mode and challenge-led funding must be carefully managed to preserve the excellence of research which takes place in HEIs. For example, QR funding is often used to support investments in research infrastructure. Thus increases to funding directed towards specific challenges should be complemented by increases in the QR funding which supports the infrastructure on which these research projects will rely.
8. Beyond infrastructure, unencumbered QR funding is used for a diversity of purposes and represents an important support for the UK HEIs, allowing them to invest strategically in a breadth of disciplines and to develop relationships with external partners. Sustained support through QR funding plays an important role in maintaining the UK's excellent universities.
9. The formation of UKRI will bring together in one body the two arms of the dual-funding mechanism in England, the RCs and the Higher Education Funding Council England, the research functions of which will become Research England. Benefits may arise from coordination between the deployment of these streams of funding, and reduced administrative costs. However, this increased proximity must not encroach on the underlying principles of unencumbered dual-support. Furthermore the devolved funding bodies (Scottish Funding Council, Higher Education Funding Council for Wales and the Department for the Economy, Northern Ireland) will sit outside of UKRI and therefore a balance must be struck between the UK-wide remit of UKRI and the devolved funding Councils which distribute QR in Scotland, Wales and Northern Ireland.

CRSF

10. An additional element of the QR stream of funding is the Charity Research Support Fund (CRSF), which supports the research funding that HEIs derive from charities, particularly medical research charities. As highlighted in the AMRC's submission to the Industrial Strategy Green Paper inquiry, medical research charities are an integral part of the UK's funding landscape, funding £1.6 bn worth of research in the UK in 2016.⁶ Medical research charities often fund research into rare diseases, which is not always well funded via other means. Charities are also able to provide a vital link to the patient groups that they represent.
11. The majority of investment in research in the UK by medical research charities is directed into HEIs.⁷ The indirect costs of this research, which are borne by universities, are subsidised by the

⁴ House of Commons, Science and Technology Committee (2017) Industrial Strategy: Science and STEM skills Thirteenth Report of Session 2016–17
<https://publications.parliament.uk/pa/cm201617/cmselect/cmsstech/991/991.pdf>

⁵ Academy of Medical Sciences (2015). *Improving recognition of team science contributions in biomedical research careers*. <https://www.acmedsci.ac.uk/viewFile/56defebabba91.pdf>

⁶AMRC (2017). 'Building our Industrial Strategy' response
http://www.amrc.org.uk/sites/default/files/doc_lib/Industrial%20Strategy%20Green%20Paper%20consultation%20AMRC%20response.pdf

⁷ AMRC (2017). Medical Research Charities: Investing in research
http://www.amrc.org.uk/sites/default/files/doc_lib/Charities%20investing%20in%20research%202017.pdf

Charity Research Support Fund, provided by Higher Education Funding Council for England (HEFCE). This fund has remained static at £198 million per year since 2010. In the intervening years charitable funding in universities has increased and the impact of the fund has been diluted. An uplift to the CRSF would help to maximise charitable investment and ensure the viability of this important stream of investment for research in UK universities.

Departmental R&D funding

12. Whilst not within Science Budget, departmental funding for research activities must also be considered as part of Government investment in R&D. This will also include funding from the Department of Health for the National Institute of Health Research (NIHR), which funds clinical research. For example, the recently published life sciences industrial strategy recommended that funding for NIHR should be increased in line with Research Council funding.⁸

Place-based and economic growth

Excellence

13. The premise of distribution of public research funding, which has been instrumental in delivering the UK's globally recognised strength in research, is that this should be underpinned by peer-review to ensure excellence. Peer review must remain the key criteria for distribution of public funding for research and excellence should be funded wherever it is found.
14. The REF2014, identified excellence at HEIs across the UK. REF2014 also captured the case studies of the impact which derives from this research. Analysis of these case studies revealed that research conducted in HEIs has influence across the globe.⁹ However it also revealed that some clustering of impacts in their own localities, demonstrating the role that research in universities can play in their own regions. Recognition and reward for generating and demonstrating these impacts should be built upon in future exercises to measure research excellence. The decision to increase the weighting of impact in REF2021 may help to achieve this goal.

Geographical Clusters

15. Innovation clusters can play an important role in building regional centres of excellence, particularly those which bring together HEIs, industry (small and large) and the NHS. As well as supporting excellent research, the nucleating effect of clusters can provide access to the necessary talent for growing companies when they need it. The Academy of Medical Sciences, together with the Wellcome Trust, hosted a meeting in early 2017 to explore the role of geographical clusters and how they can fit within the Government's Industrial Strategy.¹⁰ Subsequently the Academy has played a convening role in supporting existing clusters to form a self-sustaining network.
16. Support for clusters must also occur in the context of improving connectivity and collaboration between clusters to provide a rich UK-wide offering to create a single 'front door' for engagement with stakeholders, including Government, industry, funders and international collaborators.¹¹
17. The benefits of working collaboratively within and between clusters can be seen in many examples, including; the Northern Health Science Alliance's (NHSA) role in coordinating multi-centre trials of an antimicrobial resistance diagnostic across different universities and NHS Trusts and the SETsquared partnership between the Universities of Bath, Bristol, Exeter, Southampton and

⁸ Bell (2017) Life Sciences Industrial Strategy– A report to the Government from the life sciences sector https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/650447/LifeSciencesIndustrialStrategy_acc2.pdf

⁹ <http://blog.hefce.ac.uk/2016/02/19/from-here-to-there-the-geographic-impact-of-research/>

¹⁰ Academy of Medical Sciences (2017). Geographical Clusters: a vision for the future <https://acmedsci.ac.uk/file-download/31821958>

¹¹ Academy of Medical Sciences (2017). Geographical Clusters: a vision for the future <https://acmedsci.ac.uk/file-download/31821958>

Surrey, a university business incubator which supports over 250 companies and has raised over £1 billion worth of investment since 2003.^{12,13,14}

18. Currently, funding for clusters is available in two or three year cycles. More long-term investment is needed in order for clusters to be able to fully integrate within their regions and provide sustainable support for the growth of small businesses and to spread the benefits of investment in research and innovation across the UK.¹⁵

Regional support for Research and Development

19. The UK's exit from the EU will have implications for the UK's access to European Structural and Investment Funds (ESIF). The ESIF supports economic development in regions across the EU with the aim to reduce inequalities. In the UK these funds support research and innovation via the "research and innovation priority" of the European Regional Development Fund (ERDF). In total the current ERDF 2014-2020 programme is expected to provide €1.5bn research and innovation in the UK's developing regions. Based on population size, Wales derived the most benefits from these funds in this period, receiving €125 per capita investment in activities supporting R&D from ERDF in this period (compared to a UK average of € 23 per person). Northern Ireland also receives significantly about the UK average at €60 per capita.¹⁶
20. In the UK, SMEs are the primary beneficiaries of ERDF research and innovation funding from the EU budget with more than 50% of planned funds to be spent on projects to benefit SMEs directly or indirectly. However, HEIs around the UK are also in receipt of substantial funds from ERDF, for example in the support or technology transfer and university enterprise.
21. The Conservative manifesto contained a commitment to use the funds returned from EU structural Investments to invest in a "Shared prosperity fund" which will drive growth and prosperity across the UK.¹⁷ Details on the nature of this fund have not yet emerged and it will be important to ensure that these funds maintain the focus on research and innovation embodied within ESIF.

Understanding the benefits of investment in R&D

22. The National Academies, the Academy of Medical Sciences, the British Academy, the Royal Academy of Engineering and the Royal Society, are working together to generate new evidence to ensure that future decisions on investment in research and innovation are informed by the best available analysis. With this project we aim to develop a better understanding of the ways in which research and innovation in the UK generates social and economic benefits, and the distribution of those benefits. The analysis will be commissioned in winter 2017 by an expert Steering Group, chaired by Lord David Willetts.

This response was prepared by Dr Tom Livermore (Senior Policy Officer) and was informed from previous consultation with Academy Fellows. For further information, please contact tom.livermore@acmedsci.ac.uk; +44(0)20 3141 3220.

Academy of Medical Sciences

41 Portland Place

¹² Northern Health Science Alliance (2017). *Portable technology to fight antimicrobial resistance brought into North Hospitals* www.thenhsa.co.uk/2017/01/portable-technology-fight-antimicrobial-resistance-brought-north-hospitals/

¹³ <http://www.setsquared.co.uk/global-1-university-business-incubator>

¹⁴ FORUM (2015). Geographical Clusters <https://acmedsci.ac.uk/file-download/38074-561783d0f179b.pdf>

¹⁵ FORUM (2017). Geographical clusters: A vision for the Future <https://acmedsci.ac.uk/file-download/31821958>

¹⁶ Technopolis (2017): The role of EU funding in UK research and innovation <https://acmedsci.ac.uk/policy/policy-projects/the-role-of-eu-funding-in-uk-research-and-innovation>

¹⁷ Forward Together, Our Plan for a Stronger Britain and a Prosperous Future; Conservative Party Manifesto 2017 <https://s3.eu-west-2.amazonaws.com/manifesto2017/Manifesto2017.pdf>

London, W1B 1QH
+44(0)20 3141 3223

info@acmedsci.ac.uk
www.acmedsci.ac.uk

Registered Charity No. 1070618
Registered Company No. 35202