

CRUK submission to the Science and Technology committee Science Budget inquiry

August 2015

Executive Summary

1. Cancer Research UK's vision is to bring forward the day when all cancers are cured. Over the last 40 years, cancer survival rates in the UK have doubled. In the 1970s just a quarter of people survived. Today that figure is half. Our ambition is to accelerate progress and see three-quarters of patients surviving the disease within the next 20 years.
2. In 2014/15, Cancer Research UK spent £434 million on research in institutes, hospitals and universities across the UK. We are aiming to increase our total spend on research in the UK by 50% over the next five to 10 years to improve cancer outcomes¹ – a vision shared by Government. Although we receive no Government funding for our research, we depend on Government's support for UK science to realise the impact of our investment and ultimately deliver benefits for patients.
3. Government's investment is critical for creating a supportive environment for research. It provides vital infrastructure needed for research to take place in UK universities and hospitals and supports the training of our scientists and clinicians. It leverages further investment in UK science by providing the foundations on which industry and charities can invest.
4. We welcome the opportunity to provide the Science and Technology committee with evidence to inform its Science Budget inquiry. In summary:
 - Government has recognised that science and innovation is key to driving growth and productivity in the UK². This should be reflected in the spending review through a firm commitment from Government to maintain the science budget in real terms across all Government departments.
 - By investing in science through the dual support system, Government leverages investment from charities and industry, generating further scientific and economic growth.
 - In addition to leveraging financial investment, Government funding through the Research Councils supports research partnerships that enhance progress through shared knowledge, resources and capabilities.
 - Long-term investments made by Government in both capital and resource are necessary to give other research funders the confidence to invest and ensure that the UK continues to develop and attract a highly skilled workforce.
 - The UK is currently a world-class centre for scientific research and, as recognised in the Government's productivity plan, is a vital national asset. Being a global leader in research is self-reinforcing; the more the UK is known for its research, the more investment and talent it will attract, supporting it to succeed further.
 - Science expenditure in other Government departments complements the science budget in the Department of Business, Innovation and Skills (BIS). Spending on research by the Department of Health helps us find new, more effective ways to prevent, diagnose and treat disease, often enabling commissioners to make savings while also improving outcomes.

¹ <http://www.cancerresearchuk.org/funding-for-researchers/how-we-deliver-research/our-research-strategy>

² HM Treasury, Fixing the Foundations: Creating a more prosperous nation, 2015

- Investing in clinical research infrastructure is crucial to promote healthcare innovation. Government should protect the National Institute for Health Research (NIHR) budget in the Department of Health to support the NHS' Five Year Forward View to improve its ability to undertake research and innovate.

Government expenditure on science

5. Since 2010, the science budget has had flat cash protection. This has maintained the UK's position as a place to do science during difficult economic circumstances. This policy has also given rise to an estimated additional £1.2 billion of private sector investment that would not have occurred if the budget had been cut in line with other departments³.
6. However, the erosion of the science budget in real terms has not been without consequence and although the research community has made large savings through efficiencies, such as equipment sharing and team science, this cannot continue indefinitely⁴.
7. Government has recognised that science and innovation is key to drive growth and productivity in the UK⁵. This should be reflected in the spending review through a firm commitment from Government to maintain the science budget in real terms across all Government departments.

Driving economic growth and productivity

8. The Government's productivity plan recognises the robust evidence linking R&D spending and national productivity and identifies science and innovation as key to raising the UK's productivity⁶. 51% of productivity growth between 2000 and 2008 was due to innovation⁷. If Government were to make a one-off increase in public spending on R&D of £450m, research suggests that market sector output would rise by £90m per year, every year⁸.
9. Government's investment in research supports the UK economy in a number of ways. It attracts private investment from overseas, builds a skilled workforce and contributes towards the generation of income from commercialised products. Research fundamentally improves the nation's health and, as such, delivers savings to Government by reducing the incidence of disease or limiting its impact.
10. Each £1 the public invests in cancer research returns 40p to the UK economy every year. This includes health benefits equivalent to around 10p plus a further 30p, which is the current best estimate of 'spillover' effects from research to the wider economy⁹. These findings build on those from similar research conducted in 2008, which found that every pound spent on cardiovascular and mental health research in the UK generated health benefits equivalent to an annual rate of return of 39 pence and 37 pence respectively¹⁰. Together, these studies show that investments in medical research produce substantial financial returns.

³ Economic Insight, What is the relationship between public and private investment in R&D?, 2015

⁴ Universities UK, Spending Round 2013: Universities: efficiency and value for money.

⁵ HM Treasury, Fixing the Foundations: Creating a more prosperous nation, 2015

⁶ Ibid

⁷ Department for Business, Innovation and Skills, Our plan for growth: science and innovation – Evidence Paper, 2014

⁸ Haskel, Hughes and Bascavusoglu-Moreau, [The Economic Significance of the UK Science Base](#), 2014

⁹ Health Economics Research Group (Brunel University), RAND Europe, and King's Policy Institute, medical Research: What's it Worth? Estimating the economic benefits of cancer-related research in the UK, 2014

¹⁰ Ibid

Driving private sector investment

11. By investing in science, the UK Government leverages investment from charities and industry, generating further scientific and economic growth. Estimates suggest that each additional £1 of public funding would give rise to an increase in private funding (industry and charity) of between £1.13 and £1.60¹¹.
12. In 2013, medical research charities funded £1.3 billion of health research, a third of all publically funded medical research¹². This shows the extent of public support for UK research; indeed, medical research is the UK's favorite charitable cause, with around 7.6 million people donating each month in 2014¹³.
13. The Charity Research Support Fund (CRSF) element of quality-related funding (case study 1) is an example of how Government funding leverages investment from the charity sector. The £198 million investment that Government made through the CRSF in 2014, leveraged £805 million spend by charities in English universities¹⁴. This funding stream is important to support institutions that are successful in winning charity grants and ensures that universities are incentivised to seek charity investment.

Case study 1 – The Charity Research Support Fund

Medical research charities spend their money directly on projects that support their stated objectives. Because some of the indirect costs of research are not covered by charity grants, universities can experience a shortfall in covering their overhead costs.

The Charity Research Support Fund (CRSF) was established to help plug this funding gap. It forms part of the quality-related research grants issued through the Higher Education Funding Council for England (HEFCE) and is allocated based on the amount of charitable research a university attracts.

This funding stream is important to support institutions that are successful in winning charity grants and ensures that universities are incentivised to seek charity investment.

14. In addition to leveraging financial investment, Government funding supports research partnerships that enhance progress through shared knowledge, resources and capabilities. The Francis Crick Institute (case study 2), the CRUK-EP SRC partnership (case study 3) and the Biomedical Catalyst¹⁵ are key examples of this concept.

Case study 2 – The Francis Crick Institute

The Francis Crick Institute, will be a world-leading biomedical research centre in central London. The partnership forged to develop the Francis Crick Institute includes Cancer Research UK, the Wellcome Trust, the Medical Research Council, University College London, King's College London, and Imperial College London.

The organisations in the consortium will invest a total of around £650 million to establish the Institute. When it is fully operational, it will employ 1,500 staff, including 1,250 scientists, and have an operating budget of over £100 million per year.

¹¹ Economic Insight, What is the relationship between public and private investment in R&D?, 2015

¹² [AMRC research expenditure database](#), [MRC annual report 2012/13](#) and [NIHR annual report 2012/13](#)

¹³ Charities Aid Foundation, UK Giving Report 2014, An overview of charitable UK giving in the UK in 2014, 2015

¹⁴ HEFCE, Quality Related Funding Data, QR Charity Support Funding, 2014/15

¹⁵ <http://www.mrc.ac.uk/funding/science-areas/translation/biomedical-catalyst/>

The core of world leading researchers and cutting edge technologies within the Francis Crick Institute will be a magnet for the brightest and best scientists from around the world. In addition, through these founding partners, the institute will build upon existing strong relationships with research centres across the globe, laying solid foundations for international collaboration.

Case Study 3 – CRUK-EPSRC multidisciplinary awards

It is becoming increasingly important to draw together scientists from different disciplines to solve today's biggest health challenges. To facilitate this, we established a Multidisciplinary Project Award Scheme¹⁶ in August 2014. The high level of interest in this scheme has shown us that there is a huge appetite among the scientific community to do more collaborative work.

To extend the reach of this scheme, in March 2015, we established a partnership with the Engineering and Physical Sciences Research Council (EPSRC). The new partnership increases the amount of funding for collaborative research to up to £37.5M over five years. Joint awards will be issued by Cancer Research UK, with the first awards decided in April 2015.

The EPSRC is the main UK funding agency for training and research in engineering and physical sciences. Working with the EPSRC will not only increase support for collaborative cancer research projects, but will also unite the expertise and scientific networks of both organisations, to ensure that the highest quality multidisciplinary work will be funded.

Diversity of research funders

15. The complexity of research funding in the UK can be seen in the number of publications that cite support from multiple funders. In 2011, two thirds of cancer research publications acknowledging external support relied on multiple funders, while just under half benefited from overseas funding and almost a fifth were also supported by industry¹⁷.
16. Case study 4 (see end of the document) shows the crucial investments made by Government, charity and industry throughout the development of Bowel Scope screening. Bowel Scope has the potential to prevent thousands of people in the UK from developing and dying from bowel cancer and could save the NHS around £300 million each year. Charity and industry funding for research that lead to Bowel Scope relied on Government investment in higher education institutions through the dual support mechanism and also its investment in NHS research infrastructure through the NIHR.
17. Government should continue to invest in science through the dual support system to ensure the high quality of infrastructure in UK higher education institutions (HEIs) and provide a stable research environment in which all funders can invest. Effectively leveraging funding from charities and industry enables researchers, and ultimately patients, to benefit from a thriving UK research environment.
18. We are strongly supportive of the Haldane principle. It is important that this principle is upheld to allow the Research Councils to consult with a range of stakeholders in the research community when developing their priorities. We would welcome greater transparency and an emphasis on excellence as the primary guiding principle for decision making within a wider strategic vision of investment.

¹⁶ <http://www.cancerresearchuk.org/funding-for-researchers/our-funding-schemes/multidisciplinary-project-award>

¹⁷ OHE and SPRU, Exploring the interdependencies of research funders in the UK, 2014

19. It is becoming increasingly important to draw together scientists from different disciplines to solve today's biggest health challenges, and research funders need to work together to achieve this. We have active partnerships with several of the Research Councils. We value these enormously and consider them to be crucial to achieving our vision of bringing forward the day when all cancers are cured. Based on our experience of collaborating with the Research Councils, we have made a number of recommendations to Paul Nurse's review of research councils that we believe would strengthen their effectiveness and further empower them to build partnerships with external organisations. In summary:

- Government should provide clearer guidance to ensure that Research Councils are confident to explore innovative partnership models with charities and industry, and can be proactive and flexible in their approach.
- Research Councils should share best practice models of collaboration with each other and external partners and have clear principles by which they engage with partners such as charities.
- Research Councils should be more open to developing coordinated research strategies with charities and other partners that enable better long-term planning by both sides.

Providing resource and capital investment

20. Long-term investments made by Government in both capital and resource are necessary to give other research funders the confidence to invest and ensure that the UK continues to develop and attract a highly skilled workforce. We welcomed Government's commitment to increase science capital investment, but an essential interdependency exists between capital and resource and it is important that Government effectively provides both. Without adequate investment in resource, Government and other funders will not be able to utilise the UK's research infrastructure to its fullest potential.

21. We are encouraged that this has been recognised in the Government's productivity plan, which also states that Government's commitment to excellence, facilitated through the dual support system is absolute¹⁸.

Ensuring our global standing

22. The UK is currently a world-class centre for scientific research and, as recognised in the Government's productivity plan, is a vital national asset. We produce 16% of top quality published research findings, with less than 1% of the world's population¹⁹, and rank 2nd in the world for the quality of our scientific research institutions²⁰. We were also successful in winning 16% of research funding from the recent European Framework Programme (FP7) with only 12.7% of the EU-28 population²¹.

23. The strength of our position attracts investment and encourages international collaboration. Nearly 50% of the UK's scientific publications have a non-UK co-author and the impact of these papers is significantly higher than the average impact of UK papers²². Being a global leader in research is self-reinforcing; the more the UK is known for its research, the more investment and talent it will attract, supporting it to succeed further.

¹⁸ HM Treasury, Fixing the Foundations: Creating a more prosperous nation, 2015

¹⁹ Elsevier, International Comparative Performance of the UK Research Base, 2013

²⁰ World Economic Forum, Global Competitiveness, report 2014-15

²¹ Building a Stronger Future: Research Innovation and Growth, UK National Academies, 2015

²² Elsevier, International Comparative Performance of the UK Research Base, 2013

24. An international reputation for excellence in science means that investments in projects such as the Francis Crick Institute (case study 2) can realise their full potential. Because of the UK's global standing the Crick will attract the best researchers from around the world to study and lead the institute's collaborative efforts to tackle the major health problems of the 21st century.

Spending on science and research in other Government departments

25. Science expenditure in other Government departments compliments the science budget in BIS, which is why we want to see Government commit to maintain the science budget in real terms across all Government departments.
26. Spending on research by the Department of Health supports the development of more effective treatments, allowing commissioners to make savings while also improving outcomes. It also enables us to develop and pilot more sophisticated screening techniques which allow us to diagnose diseases earlier and, in some cases, prevent them altogether. Research fundamentally improves the nation's health and, as such, delivers savings to Government by reducing the incidence of disease or limiting its impact.
27. Academics in the UK work closely with industry to leverage access to free drugs and/or educational grants, which enables more research to be carried out. For example, since 2008 over 30 pharmaceutical companies have provided over £136 million of financial support and free drugs to trials that have been supported by Cancer Research UK's Clinical Trials Awards and Advisory Committee. This research has offered patients the opportunity to access treatments that otherwise may not have been available.
28. Case study 4 (see end of document) shows the development of Bowel Scope screening. This case study details the investments made by the Department of Health in NHS research infrastructure, which enabled the development of Bowel Scope. These investments complimented the contributions made by BIS through the Higher Education Funding Council for England (HEFCE) and the Medical Research Council.
29. Government's continued support for the clinical research environment is crucial and we wish to see it maintained and strengthened. This infrastructure is necessary to ensure that the UK can efficiently run clinical trials; attracting investment from industry and charities and providing innovative treatments to patients faster.
30. An important component of this infrastructure is the Experimental Cancer Medicine Centres (ECMC) Network, which supports the operation of early phase cancer trials and encourages industry-academia collaboration. 75% of studies in the ECMC network are sponsored or funded by industry. In 2014/15, ECMCs in England alone leveraged over £72 million through partnering with industry, not including in-kind contributions. It is important that funders of the network maintain their investment in real terms so that it can continue to support its 27 centres of excellence that ensure effective coverage of trial sites across the UK. As one of the network funders, we have committed to continue our support and we now look to the NIHR and the Departments of Health in Scotland, Northern Ireland and Wales to follow suit.
31. Government has stated that it will prioritise spending according to a number of core outcomes, including to promote innovation in public services²³. Investing in clinical research infrastructure is crucial to promote healthcare innovation. In its Five Year Forward View (5YFV) the NHS states an ambition to improve its ability to undertake research and apply innovation. It recognises the vital

²³ HM Treasury, Spending Review 2015: A country that lives within its means, 2015

role of research in providing the evidence needed to transform services and improve outcomes and pledges to continue to support the work of the NIHR²⁴.

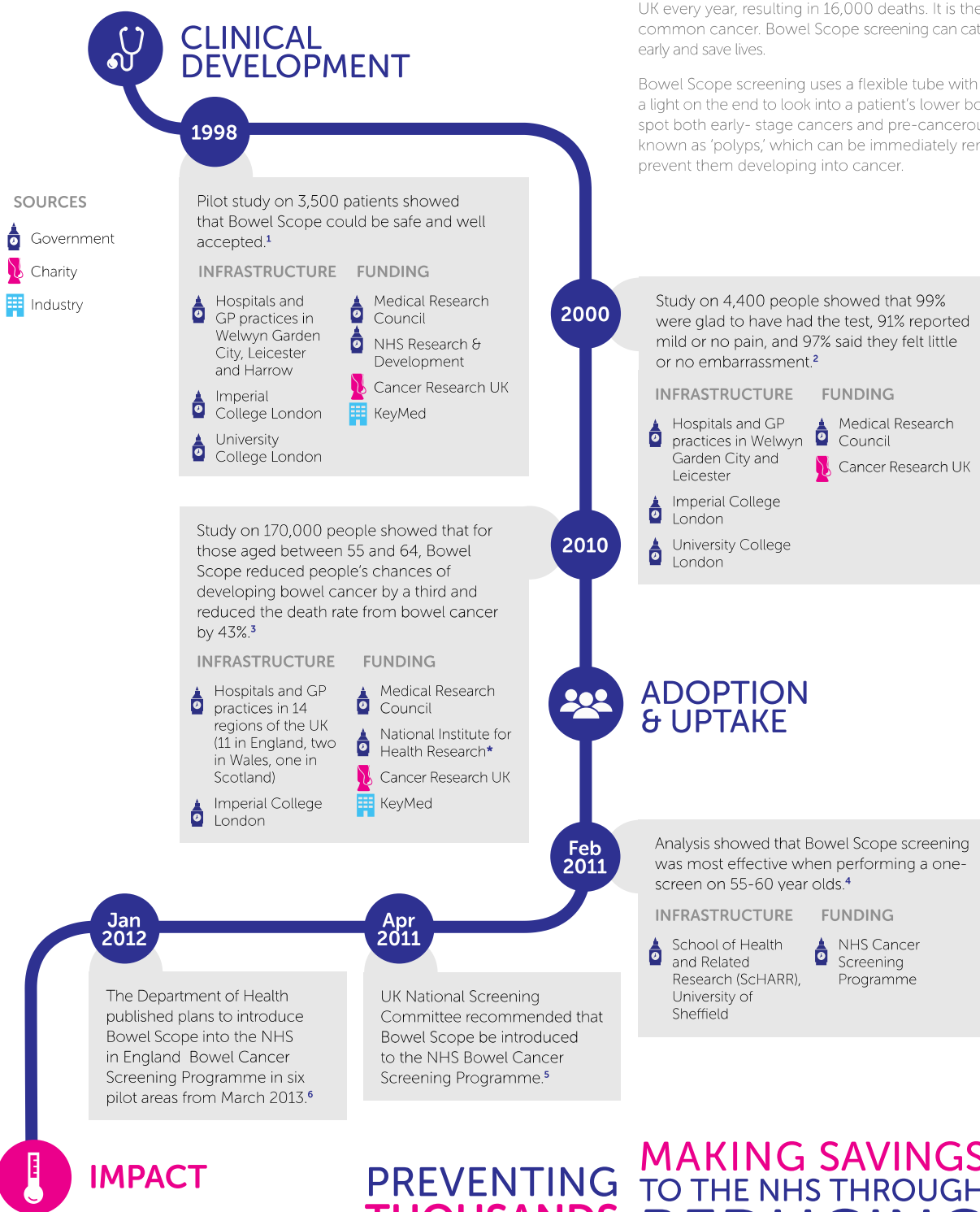
32. Government should protect the NIHR budget in the Department of Health to support the NHS' Five Year Forward View to improve its ability to undertake research and innovate.

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²⁴ NHS, Five Year Forward View, 2014

Case study 4 – Bowel Scope screening

THE DEVELOPMENT OF BOWEL SCOPE SCREENING FOR BOWEL CANCER



**PREVENTING
THOUSANDS
OF BOWEL CANCER
DEATHS IN THE UK**

**MAKING SAVINGS
TO THE NHS THROUGH
REDUCING
TREATMENT COSTS**

Case study 4 – Bowel Scope screening footnotes

REFERENCES

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 6. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/215205/dh_132468.pdf
- * along with equivalent funding bodies in devolved nations