

Agenda 2030: One Nation Labour's Plan for Science

Response by the Wellcome Trust - August 2014

Key messages

- **Long-term commitment and funding for science is essential**, and will leverage support from charities, industry and investors.
 - A vision for science should be cross-governmental with an investment plan spanning at least 10 years to strengthen our world-leading research base.
 - The balance of the dual funding system must be maintained and the Charity Research Support Fund should be grown in line with charity investment.
- **Sustainable investment in infrastructure is at the heart of scientific excellence.**
 - While we are pleased to see a capital commitment to 2021, operational funding for world-class laboratories and national facilities is crucial.
- It is **critical that barriers to translation are removed** to promote innovation.
 - Academics should be able to access training and mentorship to equip them with the skills they need to collaborate with commercial partners.
 - Entrepreneurship should be rewarded and supported, with metrics and incentives that recognise the range of behaviours needed for translation.
 - Government must work with universities to ensure that Technology Transfer Offices focus on exploiting knowledge for public good rather than revenue.
 - We must address the lack of long-term 'patient' capital that companies need to develop research ideas into treatments, technologies and products.
 - The NHS should be 'research-friendly' and improve the uptake of innovation.
- The importance of the **underpinning research environment cannot be ignored.**
 - Today's grand challenges in health require collaboration across disciplines. Appropriate skills, platforms and networks are needed to facilitate this, particularly in the areas of genomics and 'big data'.
 - The regulatory environment must promote proportionate standards and safeguards, while protecting research participants and ensuring public trust.
 - The use of animals in medical research is essential and the Government must be explicit about its importance.
 - The outputs of research — including data and publications — should be freely accessible and used to advance knowledge and drive societal benefits.
 - It is vital to invest in public engagement to create an environment of trust, support and interest in science and its application.
- The **shortfall in the STEM workforce must be addressed.**
 - The STEM pipeline starts early and we must ensure that all young people have a high-quality and inspirational science education.
 - Researchers should be recognised as a core part of an organisation's workforce, and diversity and equality must be promoted.
 - Immigration policies should signal that the UK is 'open for business' and supportive of international science.

Introduction

1. The Wellcome Trust is a global charitable foundation dedicated to achieving extraordinary improvements in health. This year, we are planning to invest £750 million in biomedical research and the medical humanities. The majority of this will be spent in the UK as a direct result of both the excellence of the research base and the Government's commitment to science. Our breadth of support includes public engagement, education, and the application of research to improve health.
2. We are pleased to input into Labour's Plan for Science. For UK research to flourish, there must be a long-term, ambitious, overarching vision — this will also help ensure that we are the location of choice for international scientists, industry and investors.
3. The UK has a unique research ecosystem and a diversity of funders that support its strength and breadth. Medical research charities invest over £1.3 billion a year, and many have strong links to patients and a deep understanding of their needs, priorities and views about research. Labour's plan must recognise charities' important contribution to research and innovation.

Labour's Plan for Science

The importance of long-term, coordinated funding

4. We are pleased to see Labour's recognition of the need for long-term planning and investment in science, and its intention to develop a vision to 2030. The estimated time lag between research expenditure and realisation of health benefits is 15 years¹ — science is a 'long game' and Government support must reflect this. Stable funding also underpins the delivery of health, societal and economic benefits, and is essential to drive growth.
 - The 2014 *Medical Research: What's it worth?*¹ study — commissioned by the Trust, the Academy of Medical Sciences, Cancer Research UK and the Department of Health — found that each pound of public or charitable investment in cancer research returns around 40 pence to the UK every year.
 - This builds on a 2008 study which found that every pound spent on cardiovascular and mental health research generates benefits equivalent to an annual return of 39 pence and 37 pence respectively².
5. Public expenditure in science achieves huge leverage and sustained Government support will ensure continued confidence, partnership and investment from universities, medical research charities and industry.
 - Every pound spent by the Government on research increases private sector R&D output by 20 pence per year in perpetuity³.
 - Between 2003 and 2013, the Trust partnered with the Government to commit nearly £1.5 billion to medical research, training, education and innovation.
 - Between 2006 and 2013, Medical Research Council funding of £3.5 billion led to a further £1.5 billion commitment from charitable organisations⁴.

¹Matthew Glover, Martin Buxton, Susan Guthrie, Stephen Hanney, Alexandra Pollitt and Jonathan Grant (2014) *Estimating the returns to UK publicly funded cancer-related research in terms of the net value of improved health outcomes*. *BMC Medicine*, 12:99

<http://www.biomedcentral.com/1741-7015/12/99>

²Health Economics Research Group, Office of Health Economics, RAND Europe (2008) *Medical Research: What's it worth? Estimating the economic benefits from medical research in the UK* www.wellcome.ac.uk/economicbenefits

³Campaign for Science and Engineering (2014) *The Economic Significance of the UK Science Base* <http://sciencecampaign.org.uk/CaSEUKScienceBaseReportBriefing.pdf>

⁴Data gathered by a system called Researchfish which collects information about the outputs and outcomes of MRC research that have arisen since 2006.

6. The Government must maintain the balance of the dual support system given the complexity of the research funding ecosystem. The combination of Research Council grants alongside Funding Council block support allows institutions to take strategic decisions about their research activities, and provides flexibility to undertake blue skies research and respond to new opportunities. It also enables a range of organisations to invest in university research, contributing to the diversity and strength of the UK science base.
7. The Charity Research Support Fund (CRSF) is a particularly important element of the Higher Education Funding Council for England's quality-related (QR) support for universities. It enables charity investment to be leveraged and encourages donations by giving the public confidence that their money will be spent directly on research. While there has been a significant increase in charity funding for research in recent years, the CRSF has been maintained at £198 million until 2015 — this must be grown and protected against inflation.
8. World-class research requires state-of-the-art facilities and cutting-edge equipment. Sustainable capital funding is at the heart of scientific excellence. However, investment in infrastructure can only realise its full potential with appropriate operational funding and provisions to support a highly skilled workforce of researchers and technical staff. There must be mix of support at the project, institutional, national and international level to ensure that the UK's 'well-found laboratories' and large facilities are sustainably operated, upgraded where necessary and have access to cutting-edge technologies and equipment.

Identifying research priorities

9. There is a role for both response-mode and more targeted funding in the UK science portfolio, and research should be focused on expanding knowledge as well as for potential health and societal benefit. Nobel laureate Professor Lord Porter famously commented that "pure research was merely that research which has not yet been applied". This still holds true today.
10. While Government has an important role in deciding strategic areas of importance, identifying grand challenges for research, and setting broad priorities for funding, it should be informed by expert advice. Ultimately, funding decisions should be based on excellence and not politicised. Funding agencies also play a key role in identifying areas of unmet need, but should not be too directive — researchers need the flexibility to ask the right questions and put forward the best ideas.
11. Labour's Plan for Science includes a commitment to lay the foundations for a digital future. The volume of research data is doubling every three years, putting increasing pressure on the infrastructure available for storage and analysis. To support 'big data', we need robust platforms for data storage and networking, with a focus on interoperability and standardisation. Hardware, software, data curation and efficient networks are all essential, as well as a highly skilled workforce that brings together bio-informaticians, mathematicians and data scientists. A high degree of coordination in funding, joint initiatives and policy formulation is also critical to ensure that the UK maintains its competitive advantage.

A national system of innovation

12. The process for translating research must be improved. As a first step, we must ensure that there is an awareness and understanding of the commercialisation process across the research community, including the different players involved. Researchers must be able to access training and mentorship to equip them with the skills they need to collaborate with commercial partners. Entrepreneurship should be celebrated, rewarded and supported. Funding and incentives should also encourage a 'revolving door' between universities and companies.

13. Today's grand challenges in health will only be solved with multidisciplinary working across sectors and we must ensure that effective networks, platforms and facilities are in place to bring people from diverse areas together. R&D clusters provide one way to facilitate collaboration, promote knowledge sharing, accelerate innovation and foster local economic growth. They create an environment that helps cross-sector partnerships to flourish and the close proximity of organisations gives people a degree of career flexibility.
14. Government should give universities a clear steer on the appropriate mission and purpose of Technology Transfer Offices (TTOs) — their principle focus should be to exploit knowledge for public good rather than generate revenue. This lack of mission clarity impacts on their ability to meet the needs of their very different customers: academics, industry and investors. Part of their remit should be acting as a 'broker' between business and universities, catalysing successful collaborations and helping companies of all sizes to better access academic expertise. They should also better consider the decision to spin out companies versus incubating research to a point where it is less risky and more attractive to follow-on investors.
15. In the UK, there is a need for increased concept funding to enable researchers to develop innovative or high-risk ideas which could then go on to compete for larger awards. Ultimately, long-term capital underpins the translation of medical research. Traditional venture capital has underperformed in the UK and Europe, and there is a pressing need for additional incentives that will attract alternative sources of 'patient' funding. One example is 'evergreen' investment company Syncona Partners, which was founded in 2012 as an independent subsidiary of the Wellcome Trust, and takes a long-term view that focuses on the creation of sustainable healthcare businesses.
16. Research and innovation uptake across the NHS must be improved. The Association of Medical Research Charities' *Vision for research in the NHS*⁵ sets out a helpful framework in this area and describes how the Health Service can better support research, offer patients the opportunity to be involved in research, and improve the adoption of new treatments. Academic Health Science Networks should also play a key role in promoting the adoption of innovations across the NHS by bringing together academic and clinical expertise to develop and share best practice.

Strengthening British science

17. The regulatory environment for research must promote proportionate standards and safeguards that facilitate research and innovation, while protecting research participants and maintaining public trust. This is necessary to ensure we deliver benefit to patients as efficiently as possible and provide a competitive research environment by limiting costly regulatory requirements and delays. The establishment of the Health Research Authority has been an important first step in streamlining the regulatory framework in the UK. Effective European legislation is also a priority.
18. Research using animals has enabled major advances in our understanding of disease and led to the development of nearly every type of drug, treatment or surgical procedure in contemporary medicine. The Trust is a strong advocate of developing a more open dialogue between the research community and the public on the importance of animal research, how it is regulated in the UK and how animal care and welfare is maintained. Over 80 organisations from across the bioscience sector, including the Trust, have signed the *Concordat on Openness on Animal Research*⁶. We are also part of a coalition of funders that supports the important work of the National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs). We welcome recent Government moves towards greater

⁵Association of Medical Research Charities (2013) *Vision for research in the NHS* <http://www.amrc.org.uk/blog/our-vision-research-nhs>

⁶Understanding Animal Research (2014) *Concordat on Openness on Animal Research* <http://www.understandinganimalresearch.org.uk/policy/concordat-on-openness-on-animal-research>

transparency in this area, and Labour must also recognise the importance of animal research and an open dialogue between researchers and the public.

19. It is vital that the outputs of research are made freely available so that they can be accessed and used to advance knowledge, further our understanding of disease and drive societal benefits. Enabling greater access to research datasets can also spark economic growth and improve public services.
20. Government must promote a culture of public engagement, increasing people's trust, support and interest in science and its application, and fostering a shared sense of ownership about its contribution to quality of life, society and economic development. The Trust strives to be a leader in our approach to engagement, working in partnership with science and research, arts and other cultural groups to create inclusive and wide-ranging opportunities. We also support the Government's *Charter for UK Science and Society*⁷ and the *Concordat for Engaging the Public with Research*⁸.

The rungs on the ladder

21. A recent Campaign for Science and Engineering report⁹ highlights that the UK has an estimated annual domestic shortfall of around 40,000 new STEM skilled workers. Sustainably growing the workforce must be a key priority. The STEM pipeline starts early, and well-equipped and inspired students will form the next generation of science leaders, innovators, researchers, technicians and healthcare workers. For this reason, the Trust has a long-standing commitment to supporting high-quality, stimulating science education for young people. This will also enable all students to obtain the skills and knowledge needed to live in an increasingly technological world.
22. Science teachers should have annual entitlement to subject-specific, high-quality professional development. This enhances teacher knowledge, confidence, progression and retention, and boosts student performance. Primary teachers should also have access to professional development to help increase science expertise at this stage, and science graduates should be incentivised to train as primary teachers.
23. Government must ensure that all students study a balance of biology, chemistry and physics up until the end of Key Stage 4. Schools should also be accountable for the quality of their practical science provision — this is an essential part of training for university study, higher apprenticeships and jobs in science and engineering. This broad and rich knowledge is essential for progression in any particular science post-16 and will facilitate future 'discipline-hopping'. It also enables people to make more informed decisions in their lives, from healthcare to choices about new technologies or sustainable diets.
24. Careers guidance needs to be improved across schools and colleges so that all students appreciate the breadth of opportunities in science, and are not limited by their background or schooling.
25. We are a signatory of the *Concordat to Support the Career Development of Researchers*¹⁰ and expect organisations that hold our grants to adopt its principles. This sets out a vision to improve the attractiveness and sustainability of research careers, including the need for transparent recruitment procedures, recognising researchers as an essential part of the workforce, encouraging adaptability and flexibility, supporting development, and promoting diversity and equality.
26. Science is a global endeavour and it is critical that the UK's immigration policies attract and retain the very best researchers. While we have been pleased to see a

⁷BIS (2014) *UK Charter for Science and Society* <https://scienceandsociety.blog.gov.uk/uk-charter-for-society/>

⁸Research Councils UK (2010) *Concordat for Engaging the Public with Research* <http://www.rcuk.ac.uk/Publications/policy/perConcordat/>

⁹Campaign for Science and Engineering (2014) *Improving Diversity in STEM* <http://sciencecampaign.org.uk/CaSEEDiversityinSTEMreport2014.pdf>

¹⁰Vitae (2008) *Concordat to Support the Career Development of Researchers* <https://www.vitae.ac.uk/policy/vitae-concordat-vitae-2011.pdf>

streamlined endorsement process for the Tier 1 Exceptional Talent and Exceptional Promise visas, we are aware of a number of occasions when researchers from outside of the EU have had problems obtaining visas for team or family members, or have been refused visitor visas to attend scientific meetings and interviews in this country. This is detrimental to science and does not signal that the UK is 'open for business' or supportive of international research.

Conclusion

27. We look forward to seeing Labour's final Plan for Science. It is important that this sets out the direction of travel for UK research and outlines plans for future investment. We would be happy to give further input as it develops and would be pleased to discuss any of these points in more detail.

The Wellcome Trust is a global charitable foundation dedicated to achieving extraordinary improvements in human and animal health. We support the brightest minds in biomedical research and the medical humanities. Our breadth of support includes public engagement, education and the application of research to improve health. We are independent of both political and commercial interests.