
Last year Cancer Research UK spent £432 million on research across the UK, including our £28 million contribution to the building of the Francis Crick Institute. Our ambition is to accelerate progress and see three in four cancer patients survive their disease by 2034. Research is at the heart of our plan to reach this ambition. This is why it is so crucial that the UK maintains its excellent science base and that cancer researchers across Europe and around the world can continue to work together to make the best use of our pooled talent and resources.

The cancer strategy for England, ‘Achieving world-class cancer outcomes’ sets out a clear vision for improving NHS cancer care across the patient pathway. This strategy runs until 2020. It is vital that NHS England and the arms-length health bodies are able to implement the strategy in full, so as to meet the ambition of saving an additional 30,000 lives each year. The recent annual progress report highlights that many of the foundations for implementing the strategy are in place. We now need to see changes take effect ‘on the ground’ to deliver improvements in outcomes that matter to patients.

Health and science are global. Collaboration between the UK and countries in Europe and beyond enables the discoveries that benefit patients everywhere. In leaving the EU, the UK must explore opportunities to strengthen its world-class science base, building on and developing new global collaborations. It must also seek to ensure that the NHS is in a strong position to deliver on commitments such as implementation of the cancer strategy in England.

To achieve this, UK Government should:

- Build the UK’s position as a global leader in clinical research
- Develop a regulatory framework that support global collaboration
- Ensure the UK is an attractive market for companies to launch innovative treatments
- Pursue regulation in the interest of public health
- Attract and recruit the best scientific talent from across the globe and recruit the staff needed for our NHS
- Grow overall investment in UK science to strengthen our research base

**Building the UK’s position as a global leader in clinical research**

The UK has an opportunity to set itself apart as the top global destination for industry to conduct clinical trials, securing crucial investment and enabling patient access to innovative treatments. It must seize this opportunity by realising the research potential of our NHS.

The existence of our historic, universal healthcare puts the UK in a strong position to conduct clinical trials, promote the uptake of innovation and fully realise the value of our wide ranging and comprehensive datasets, for example the cancer registries. By optimising research in the NHS and marketing the UK as a single research hub, we will be in a strong position to attract industry investment and world-leading researchers, allowing us to provide innovative treatments to patients faster.

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In its Five Year Forward View\(^1\), the NHS stated an intention to improve its ability to undertake research and adopt innovation. To achieve this, Government must continue to invest in clinical research infrastructure through the National Institute of Health Research and to maintain this budget in real terms. The UK excels in recruiting cancer patients to clinical trials because of this infrastructure, which provides the foundations on which academia and industry can invest.

Patient data plays a vital role in improving outcomes for people affected by cancer and is at the heart of the cancer strategy. Access to this data has historically been problematic and has led to significant delays in the progress of research, although this has been improving recently. To ensure that this improvement continues, and that NHS Digital can achieve its ambition of a truly digital NHS, it must be adequately resourced. Developments in data and digital health are also crucial for the future sustainability of the NHS; investment is required in order to ensure the success of new Government initiatives.

**Developing a regulatory environment that supports global collaboration**

Being a leader in clinical research will require the UK to have a regulatory framework that supports global collaboration. The UK should explore opportunities to create a regulatory environment that more effectively supports research whilst enabling the UK to participate in and lead international research projects.

Cancer Research UK supports over 250 clinical trials by providing funding, expertise and facilitating partnerships. These trials recruit more than 25,000 patients each year. Of the trials that we directly fund – currently over 200 – more than a quarter involve at least one other EU country\(^4\).

The UK’s involvement in pan-EU projects attracts industry investment to the UK and increases the trial opportunities available to patients. To set up and run pan-EU trials efficiently and effectively, it is important that the legislation, guidance and standards governing their approval and conduct is aligned across member states. Such trials are especially important for rarer cancers and childhood cancers, where trials are often only feasible because they are able to recruit from a large pool of patients across the EU (case study 1).

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**Case study 1 – Pan-EU pancreatic cancer trial**

Pancreatic cancer is one of the hardest cancers to treat and has one of the lowest survival rates\(^5\). The European Study Group for Pancreatic Cancer (ESPAC) wants to change this. ESPAC formed in 1989 and their research has contributed to accelerated improvements in survival and quality of life for patients. Since the 1980s, short term survival has increased by around 60%.

But ESPAC know there is more to do. Just 1% of people diagnosed with pancreatic cancer in England and Wales survive for ten years or more. In the UK in 2014 alone, there were around 9,400 new cases of pancreatic cancer, and 8,800 deaths.

In 2008 they set up the ESPAC-4 clinical trial. By 2014 it had recruited 732 patients from the UK, Germany, Sweden and France\(^6\). Around half of trial participants received an innovative combination of chemotherapy drugs. The other half received the standard chemotherapy treatment.

An extra 13% of patients on the trial lived for five years when given the combination of chemotherapy drugs. This brings five year survival to almost a third, which is a huge result for patients. The ESPAC is spearheaded by Professor John Neoptolemos from Liverpool University and the team includes experts from all over Europe\(^7\).

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\(^4\) Statistics from CRUK’s internal databases and include clinical trials from our Clinical Research Committee, New Agents Committee and Centre for Drug Development.


\(^6\) CRUK trial shows improved 5 year survival for pancreatic cancer patients – CRUK Press Release (2016)

The new EU Clinical Trials Regulation (CTR), due to come into force at the end of 2018, represents a significant improvement on the current Directive. The UK’s influence has ensured that the CTR will improve the set-up and conduct of clinical trials in the UK and also allow for increased collaboration with countries across Europe.

UK Government should consider the importance of aligning with the new EU Clinical Trials Regulation, which the UK has played a key role in shaping for the benefit of UK research. In particular, it should seek agreements that allow for the UK’s participation in the central review process for approving clinical trials, which will provide our researchers with access to the new EU portal and database.

**Ensuring the UK is an attractive market for companies to launch innovative treatments**

The UK must build a regulatory framework that promotes the UK as an attractive market for pharmaceutical companies to launch innovative treatments. This is crucial to ensure that UK patients have timely access to the most effective treatments for their disease. UK Government should explore agreements with the EU that would enable the UK to benefit from the EMA’s centralised processes for authorising drugs and molecular diagnostics. These centralised processes enable companies access to a larger market than individual member states alone could provide, making the EU an attractive place for companies to file for marketing authorisation.

The knowledge, expertise and contribution of the UK’s Medicines and Healthcare Products Regulatory Agency (MHRA) to the European Medicines Agency (EMA)\(^8\) has benefitted patients in the UK and across Europe. We must ensure the UK plays a key role in influencing future EU regulations and pushes for the development of new licensing pathways that will provide patients with earlier access to innovative drugs. UK Government should explore agreements with the EU that strengthen our relationship with the EMA and enable the UK to contribute to and inform its decision making processes.

**Pursuing regulation in the interest of public health**

An end to EU membership should not compromise people’s health. As the UK develops new trading partners it must continue to ensure that health of people living in the UK remains a core and unwavering priority. New trade agreements made with the EU, and other nations, must allow the UK to pursue regulation in the interest of public health.

The food, alcohol and tobacco industries may seek to exploit trade deals to protect their interests through investor-state dispute settlements (ISDS), which can have both a ‘chilling effect’ on the willingness to introduce new public health legislation and generate new legal barriers to implementation. Such mechanisms have been used by the tobacco industry in other countries to challenge public health legislation. This is why it is crucial that public health objectives in any new trade agreements are clear to protect UK Government from challenges by industry.

**Attracting and retaining the best scientific talent globally recruit the staff needed for our NHS**

A strong science base requires a skilled workforce. The international make-up of the UK’s research community is vital for the sharing of best practice, expertise and skills, and to promote important international collaborations. The UK must develop an immigration system that enables us to attract and retain the best scientific talent from across the globe and recruit the staff needed for our NHS.

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\(^8\) European Medicines Agency, Annual Report 2015; EUDRA, GMP database July 2016
Cancer Research UK recruits post-graduate students and researchers from an international pool to ensure that we are working with the very best minds to conduct the highest quality research. 33% of our PhD students and 39% of our research fellows are non-UK EU nationals9.

The UK must develop an immigration system that enables us to attract and retain the best scientific talent from across the globe. In addition to securing mechanisms that allow for the recruitment of future talent, the UK must ensure that it retains current scientific expertise and supports important collaborations. To do so, all current EU-national researchers working in the UK, and UK-nationals working in the EU, should be given the opportunity to live and work in their present location following the UK’s exit from the EU. The rights of their partners and dependents should also be protected. A positive message should be sent to researchers globally, including those already based in the UK, to reassure them that their contribution to UK science is valued and encouraged.

The UK plays a key role in training young researchers; many of whom go on to set up labs elsewhere but maintain important collaborative relationships with research groups in the UK. The UK also benefits from recruiting talented researchers who have received specialist training from centres outside of the UK. Such recruitment is particularly important and sometimes necessary in areas of science where we have a national skills shortage, such as researchers working in computational biology and big data10,11.

In addition to the valuable contribution that international scientists make to our workforce, the movement of researchers between countries develops valuable networks. Networks are crucial for the building of collaborative partnerships which are commonplace and often necessary in many fields of science. Nearly 50% all UK cancer research involves international collaboration12. In February 2016, CRUK researchers were partnering with over 400 different organisations based in EU countries13.

These collaborations enable the sharing of knowledge and expertise, as well as research materials, equipment and data. They also support training, the running of pan-EU clinical trials and the establishment of consortia set up to inform policy. The importance of such collaboration is evidenced by its impact on the UK’s research outputs: nearly 50% of the UK’s scientific publications have non-UK authors and the impact of these papers is significantly higher than the average impact of UK papers14.

The UK must also develop an immigration system that enables us to effectively recruit the staff needed for our NHS. Having enough staff in the NHS is vital to deliver on the ambitions of the cancer strategy to improve patient outcomes and experience. The NHS workforce is already experiencing a shortfall in staffing levels in key areas such as diagnostics, impeding the NHS’s ability to diagnose patients as quickly as possible. In England in 2014 there was a 5.9% staffing shortfall in the NHS, equivalent to 50,000 clinical staff15. The lack of qualified staff for NHS vacancies is often mitigated by the recruitment of doctors, nurses and others from abroad: more than 10% of the total NHS workforce in England are from outside of the UK, with staff from the EU making up 4.5% of the total workforce, 9% of doctors and 6% of nurses16.

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9 The PhD student figure is based on data from Researchfish, a self-reporting tool for researchers, including those receiving CRUK funding
10 ‘Bio-informatician’ and ‘informatician’ are included on the Shortage Occupation List, valid from 6th April 2015
11 Medical Research Council and Biotechnology and Biological Sciences Research Council (2014) Vulnerable Skills Survey 2014
12 https://www.ohe.org/publications/exploring-interdependencies-research-funders-uk
13 Based on data from Researchfish, a self-reporting tool for researchers, including those receiving funding from CRUK
Growing investment in UK science to strengthen our research base

The EU contributes significantly to science investment in the UK. In addition to their financial contribution, EU grants promote global recognition of UK science and support important pan-EU research collaborations. In 2015, the UK received £40 million\(^{17}\) investment in cancer research from the EU. Although Cancer Research UK does not receive any direct funding for research, in 2015/16, Cancer Research UK’s institutes across the UK received £7.5 million income from EU grants; this was more than 4% of their total research funding\(^{18}\). Furthermore, universities at Cancer Research UK centres are currently supported by EU grants, totalling more than £110 million\(^{19}\). This funding provides important support for individual labs and promotes research collaborations with other EU countries.

In leaving the EU, UK researchers should be encouraged to further develop international collaborations and should have access to infrastructure and funding that supports these; the EU Funding Programme 9, for example, which will replace Horizon 2020. The UK should influence the future of such programmes to ensure they align with UK priorities and are awarded based on scientific excellence.

Government should ensure that with a UK exit from the EU, overall levels of investment in UK science and the diversity of funding are protected and grown in the longer term. Government’s new industrial strategy is an opportunity for the UK to put science at the heart of its plan for growth. Government’s investment in science supports further investment by industry and charities\(^{20}\) and brings benefits to patients through enabling the development of new ways to prevent and treat disease. Science and innovation are key drivers of growth and productivity in the UK\(^{21}\). Every pound invested in cancer-related research by the taxpayer and charities returns around 27p to the UK economy each year\(^{22, 23}\). It is vital that UK Government seizes the chance to create a strategy that enables the UK to grow its investment in science; strengthening the global standing of our research base.

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\(^{17}\) This includes all grants given to cancer-specific and cancer-related research. NCRI analysis using data derived from the Global Grants Award Database and corresponding Dimensions Software platform, provided by UberResearch.

\(^{18}\) Funding data reported directly to us from CR-UK institutes, including the Francis Crick Institute

\(^{19}\) Self-reported data from universities at current CR-UK centre locations. Includes total award of active grants in August 2016

\(^{20}\) Economic Insight, What is the relationship between public and private investment in R&D?, 2015

\(^{21}\) HM Treasury, Fixing the Foundations: Creating a more prosperous nation, 2015

\(^{22}\) 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

\(^{23}\) http://www.kcl.ac.uk/sspp/policy-institute/publications/SpilloversFINAL.pdf