INVESTMENT AND IMPACT:
HOW GOVERNMENT SUPPORTS SCIENCE IN THE UK

WE WILL BEAT CANCER SOONER
Professor Nic Jones, Chief Scientist, Cancer Research-UK, Director, Manchester Cancer Research Centre

“The ultimate goal is to prevent, control and cure all cancers and the only thing that will get us there is research. We know more about cancer than ever before – and that’s why we’ve seen cancer survival rates double in 40 years.

That’s proof that research works but we want to do even more and get things moving even faster.

We want to create research environments that will attract the brightest scientific minds to work in the UK. And once we’ve got the critical mass you need, we’ll get people rubbing shoulders, swapping ideas and amazing things will start to happen”

Sue Spencer, patient

“I was diagnosed with breast cancer at the age of 47, three years before the age at which screening starts, and nine months after I had seen my mother in law die from the same disease. Her battle suddenly became my battle and I felt in a desperate struggle to survive for my 10 year old daughter.

Following two surgeries, I enrolled on the TACT2 chemotherapy trial and the SUPREMO radiotherapy trial.

My mother in law died 4 years after diagnosis but I have lived for 7 years. Research has created better treatments so that I have survived to see my daughter start university.”

Cancer Research UK is the world’s largest independent cancer charity dedicated to saving lives through research.

We support research into all aspects of cancer through the work of over 4,000 scientists, doctors and nurses. In 2013/14, we spent £386 million on research in institutes, hospitals and universities across the UK – including the £35 million contribution we made to the Francis Crick Institute.

We are a leading funder of clinical research in the UK, supporting around 250 clinical studies. This includes early diagnosis, prevention and epidemiological research, as well as clinical trials of investigational medicinal products. In 2013/14, over 27,000 cancer patients were enrolled onto Cancer Research UK supported trials.
Cancer Research UK does not receive any Government funding for our research; our work to bring forward the day when all cancers are cured is made possible due to the overwhelming generosity of our supporters. However, Government investment is critical for creating a supportive environment for research.

Government funding for science provides the 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.

At the forthcoming Spending Review, it is vital that Government continues to support UK science.

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. However, sustained investment is needed to maintain the UK’s world-leading reputation: grow our scientific community; and deliver both the health and economic benefits of scientific discovery to the whole population.

We call on the Government to commit to maintain the science budget in real terms across all Government departments at the next Spending Review.

This report showcases three examples of interventions that are preventing, treating and curing cancer. It outlines the road to their development and the contribution of the different sectors of UK science: from the underlying ‘basic’ research that tested the scientists’ original idea, through to the clinical studies that tested their safety and effectiveness, and finally, their adoption in the NHS.

Along this pathway, we highlight the crucial investments by Government that made the development of these interventions possible.

For more information please call us on 0203 469 8360, tweet @CRUK_Policy or email publicaffairs@cancer.org.uk
THE DEVELOPMENT OF BOWEL SCOPE SCREENING FOR BOWEL CANCER

There are around 40,000 new cases of bowel cancer in the UK every year, resulting in 16,000 deaths. It is the fourth most common cancer. Bowel Scope screening can catch this cancer early and save lives.

Bowel Scope screening uses a flexible tube with a camera and a light on the end to look into a patient’s lower bowel. It can spot both early-stage cancers and pre-cancerous growths known as ‘polyps,’ which can be immediately removed to prevent them developing into cancer.

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INFRASTRUCTURE
- Hospitals and GP practices in 14 regions of the UK (11 in England, two in Wales, one in Scotland)
- Imperial College London
- University College London

FUNDING
- Medical Research Council
- NHS Research & Development
- Cancer Research UK
- KeyMed

CLINICAL DEVELOPMENT

1998
- Pilot study on 3,500 patients showed that Bowel Scope could be safe and well accepted.

INFRASTRUCTURE
- Hospitals and GP practices in Welwyn Garden City, Leicester and Harrow
- Imperial College London
- University College London

FUNDING
- Medical Research Council
- Cancer Research UK
- KeyMed

2000
- Study on 4,400 people showed that 99% were glad to have had the test, 91% reported mild or no pain, and 97% said they felt little or no embarrassment.

INFRASTRUCTURE
- Hospitals and GP practices in Welwyn Garden City and Leicester
- Imperial College London
- University College London

FUNDING
- Medical Research Council
- Cancer Research UK

2010
- Study on 170,000 people showed that for those aged between 55 and 64, Bowel Scope reduced people’s chances of developing bowel cancer by a third and reduced the death rate from bowel cancer by 43%.

INFRASTRUCTURE
- Hospitals and GP practices in 14 regions of the UK (11 in England, two in Wales, one in Scotland)
- Imperial College London

FUNDING
- Medical Research Council
- National Institute for Health Research
- Cancer Research UK
- KeyMed

ADOPTION & UPTAKE

Feb 2011
- Analysis showed that Bowel Scope screening was most effective when performing a one-screen on 55-60 year olds.

INFRASTRUCTURE
- School of Health and Related Research (ScHARR), University of Sheffield

FUNDING
- NHS Cancer Screening Programme

Jan 2012
- The Department of Health published plans to introduce Bowel Scope into the NHS in England Bowel Cancer Screening Programme in six pilot areas from March 2013.

April 2011
- UK National Screening Committee recommended that Bowel Scope be introduced to the NHS Bowel Cancer Screening Programme.

IMPACT

Bowel Scope screening 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.

PREVENTING THOUSANDS OF BOWEL CANCER DEATHS IN THE UK

MAKING SAVINGS TO THE NHS THROUGH REDUCING TREATMENT COSTS
Researchers found that a significant proportion of skin cancer patients had a mutation in their BRAF gene. This mutation is called V600E. They speculated that a drug could be developed to target this mutation and treat these patients. The mutant BRAF gene was patented as a target for drug screens and patient tests. All 5 named inventors were UK-based scientists. 

Researchers published information about the structure of BRAF. This information enabled companies worldwide to design drugs that would be able to target BRAF.

The phase III BRIM3 trial found that Vemurafenib improved rates of overall and progression-free survival in patients with previously untreated melanoma with the BRAF V600E mutation.

The European Medicines Agency decided to conduct an accelerated assessment of Vemurafenib.

The Scottish Medical Consortium approved Vemurafenib in 2013.

Malignant melanoma is the fifth most common cancer in the UK and its incidence is increasing. Unlike most other cancers, around a quarter of cases are diagnosed in those under 50.

If detected at an early stage, simply removing the melanoma is likely to be curative. However, the outlook for patients with advanced melanoma - where the cancer has spread to other parts of the body - is less promising as there are few treatment options available. Research supports the development of new treatment options, such as Vemurafenib, for these patients.

Research has shown that Vemurafenib, a targeted treatment for patients with advanced melanoma, can prolong life by months and relieve the symptoms of disease. It’s estimated that globally over 12,000 patients were treated with Vemurafenib in the period from launch to 31st July 2013.
Several labs around the world developed different techniques to deliver IMRT.

The PARSPORT trial showed that head and neck cancer patients were less likely to experience side effects such as dry mouth when they received IMRT compared to traditional radiotherapy.

The National Radiotherapy Advisory Group (NRAG) noted the potential of IMRT in its report advising ministers on how to develop a world-class radiotherapy service in England.

Government launched the Radiotherapy Innovation Fund – initially £15 million, but later boosted to £23 million – to help NHS Trusts in England provide more patients with access to advanced radiotherapy.

Research has shown that IMRT can improve outcomes for cancer patients and cause less side effects when compared to traditional radiotherapy.

The Radiotherapy Innovation Fund has seen the number of patients in England receiving IMRT rise from 14% in 2013 to over 35% in 2014. This is still slightly short of the estimated number of patients that would benefit from receiving IMRT. IMRT is available in the devolved nations however data on its uptake is currently not available.
REFERENCES

EXECUTIVE SUMMARY

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BOWEL SCOPE

5. Maryor, S. 2011. UK Committee Recommends Flexible Sigmoidoscopy to Screen for Bowel Cancer. BMJ. Vol.342 pp 1

VENERAFINIB


IMRT

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