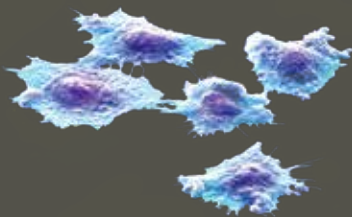


Summary Report

2011/12

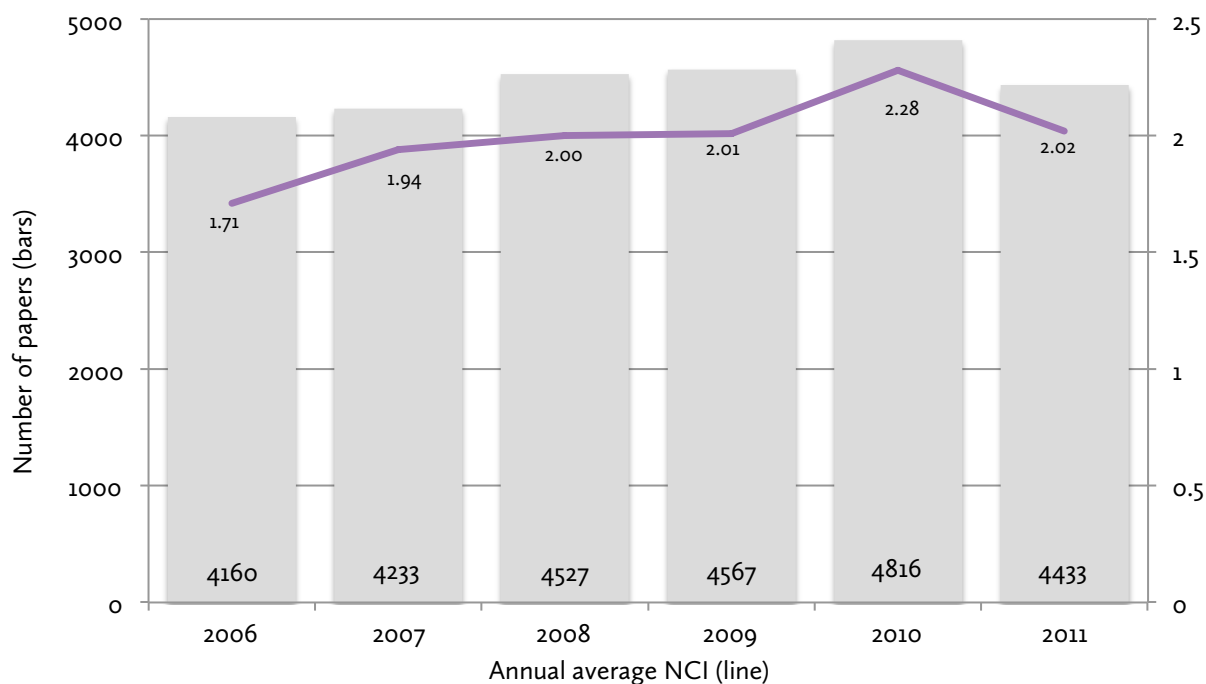


I. Discoveries

I.1 Significant advances in the generation of new knowledge and understanding

- In 2011, 4433 new scientific research papers associated with the Wellcome Trust were published, were indexed on PubMed and appeared on Thomson Reuters Web of Knowledge.¹
- Overall, there has been a gradual increase in the annual volume of Trust-associated publications since 2006, with a 16 per cent increase in annual papers between 2006 and 2010 compared to an overall increase of 13 per cent in all papers covered by the Web of Knowledge over the same period.²

Figure 1. Volume and impact of Wellcome Trust-associated papers, 2006–11



Source: Data drawn from Thomson Reuters Web of KnowledgeSM; analysis by Thomson Reuters.

- Thomson Reuters allocates papers to one or more of 253 research fields according to the journal in which they are published; the 2011 cohort of Trust-associated papers is published across 132 fields, from the field with the largest number, ‘biochemistry and molecular biology’ (780 papers), to ‘philosophy’ (one paper).³
- For all Trust-associated papers published in 2011, the normalised citation index (NCI, a measure of the citation performance of a paper) was 2.02, double the world average NCI of 1.00.⁴
- The NCIs of Trust-associated papers published in 2009–11 compare favourably to the world average across all the featured research fields, with the average NCIs for ‘genetics and heredity’ – 3.04 (2009), 3.49 (2010) and 2.80 (2011) – particularly noteworthy.
- The three institutions producing the most Trust-associated papers in 2011 were the University of Oxford (750), the University of Cambridge (596) and UCL (544).

¹ Although this represents a decrease of almost 8 per cent ($n = 383$) on the 2010 volume, it is known that PubMed processes mean that some papers are indexed as being Trust-associated a considerable length of time after publication, so the 2011 data is expected to rise over time.

² Figures as of 6 November 2012.

³ Papers published in major interdisciplinary journals (e.g. Nature, Science) are allocated to subject categories on an individual basis.

⁴ Citation impact can change significantly over time – the 2010 cohort of published papers had an average NCI of 1.94 at the end of 2010, below the 2009 level it now exceeds – so the 2011 level of NCI is also likely to change.

- In 2011, Trust-associated papers appeared most frequently in the journal *PLOS One*, which published 269 papers, an increase of 28 per cent on the previous year. In total, 428 Trust-associated papers were printed in the *PLOS* family of papers.

1.2 Discoveries with potential impacts on health

- Researchers at Novacta Biosystems, with support from a Wellcome Trust Strategic Translation Award, are testing the safety and tolerability of NVB302, a potential new antibiotic to treat the hospital superbug *Clostridium difficile*. It is expected that phase I and phase IIa clinical trials will be completed by the end of 2014.
- Professor Robert MacLaren from the University of Oxford is leading a multicentre trial testing a gene therapy treatment for choroideraemia – a progressive form of genetic blindness that appears in childhood. If the trial is successful, the therapy has the potential to halt the disease with a single treatment.
- Researchers in South-east Asia have identified a novel mechanism that allows *Burkholderia pseudomallei*, a bacterium that causes the neglected tropical infectious disease melioidosis, to develop resistance to ceftazidime (the standard antibiotic treatment). The work, led by Professor Sharon Peacock from Mahidol University and the University of Cambridge, is helping us to understand how resistance can occur, and it is hoped that it will lead to the better detection and treatment of drug-resistant forms of melioidosis.
- A team of scientists, led by researchers from the Wellcome Trust Sanger Institute and the University of Cambridge, have corrected a gene mutation in human induced pluripotent stem cells that is responsible for both cirrhotic liver and lung emphysema. It is hoped that this technique could ultimately be used to cure the diseases.
- Research from the Shoklo Malaria Research Unit, Thailand, showed that frequent screening of pregnant women to detect and treat the early stages of malaria results in a six-fold reduction of maternal death.

2. Applications of research

2.1 Contributions to the development of enabling technologies, products and devices

- Of the Wellcome Trust grants ending in 2011/12, 6 per cent of grantholders reported filing a patent associated with their research. This compares with 5 per cent of all grants between 2008 and 2011.
- 17 per cent of grants reported collaborating with commercial partners in 2011/2012, compared to 14 per cent of all grants between 2008 and 2011.
- Wellcome Trust-funded researchers secured £185 million in venture capital finance to support commercialisation of their R&D in 2011/12, up from £122 million in 2010/11.
- In 2011/12, the Trust consented to commercial exploitation of intellectual property in ten cases.

2.2 Uptake of research into policy and practice

- Overall, 29 per cent of Trust grants in 2011/12 reported engagement with policy makers and healthcare professionals. Grants in the Population and Public Health stream reported the highest levels of engagement (66 per cent).
- Professor Mike English and colleagues in the Health Services Research Group at the Kenya Medical Research Institute, Nairobi, have developed national, evidence-based guidelines for the care of severely ill children and newborns (www.idoc-africa.org) and established best practices within rural

government hospitals. Professor English received the Sir Rickard Christophers Medal in recognition of this work.

- Eurartesim, an artemisinin combination therapy, has been approved by the European Commission for the treatment of uncomplicated malaria caused by the parasite *Plasmodium falciparum*. Wellcome Trust-funded research played a key part in the early development of this combination drug.
- In 2012, the WHO recommended seasonal malaria protection to control malaria in the Sahel, a sub-Saharan region of Africa. The treatment sees courses of cheap antimalarials given to children under five years of age during the transmission season to prevent the disease. Much of the early research into seasonal malaria protection was carried out by Badara Cissé during his PhD, which was funded by the Gates Malaria partnership. Currently, Dr Cissé is working for a project funded by the Trust, the Medical Research Council and the Department for International Development, evaluating the effectiveness of targeted malaria control in Senegal.

3. Engagement

3.1 Enhanced level of informed debate on biomedical science issues

- Twenty-eight per cent of grants in 2011/12 reported some media coverage associated with their research, 47 per cent of grants reported presenting their work to non-academic audiences, and 35 per cent reported presenting to research participants and related communities.
- There has been extensive and positive media coverage of Wellcome Trust-associated media, including:
 - artemisinin resistance in South-east Asia (Channel 4 News, BBC's *Today* programme, BBC World Service, *TIME*)
 - brain scans suggesting that IQ levels rise or fall during adolescence (BBC News, Channel 4 News)
 - the Health Innovation Challenge Fund award to researchers at Newcastle University, who have developed a computer game to help stroke victims recuperate (ITV News, BBC News).
- 2012 saw the Trust partnered with the British Film Institute Film Fund to launch the Wellcome Trust Screenwriting Prize, an annual prize that aims to encourage the creation of high-quality feature films inspired by biology or medicine. Media coverage has included BBC Radio 4's *Film Programme*, the Guardian Science podcast, *Screen International* and *Science*.

3.2 Significant engagement of key audiences in biomedical science and increased audience reach

- Visits to Wellcome Collection continue to rise annually: 2011/12 has been the most successful year to date with almost 500 000 visitors. The exhibition *Brains: The mind as matter* attracted more than 100 000 visitors. The exhibition will increase its reach as it travels to the Manchester Museum of Science and Industry in 2013.
- In the Zone – inspired by the London 2012 Olympic and Paralympic Games – engaged people of all ages with the science of the movement of the human body. Nearly 30 000 science investigation kits were sent to primary and secondary schools and another 1300 kits were sent to schools serving children with special educational needs. The event also had a touring exhibition, which was visited by almost 55 000 people in locations throughout the UK. The Foreign and Commonwealth Office, the Brazilian Ministry of Education and the Brazilian Ministry of Science and Technology are exploring whether the school kits can be adapted for the 2016 Olympics.

- *Epidemic*, a musical created by Old Vic Voices, explored the public health issues surrounding mental illness and obesity. The play was performed for free in March 2012 and will be touring schools and community centres in 2012 and 2013.
- The Art and Health in Urban India project was designed to foster dialogue between formerly segregated communities in India: slum dwellers, professional artists and health scientists. The project culminated in an exhibition of creative works on the health of people who live in India's slums, which was displayed at the International Conference on Urban Health, held in India in 2011.

4. Research leaders

4.1 Development of a cadre of research leaders

- In partnership with the Royal Society, the Trust launched the Sir Henry Dale Fellowship scheme in 2011. These fellowships are aimed at outstanding postdoctoral scientists wishing to build their own UK-based independent research career. The first applications were considered in June 2012, and ten awards were made.

4.2 Evidence of significant career progression among those we support

- Wellcome Trust researchers have won a range of high-profile prizes in 2011/2012, including:
 - Sir John Gurdon, a Wellcome Trust researcher and former Governor, was awarded the Nobel Prize in Medicine and Physiology for his discovery that mature cells can be reprogrammed to become immature cells capable of developing into all tissues of the body.
 - Professor Margaret Scott Robinson, Professor Daniel M Wolpert and Professor John Aggleton were elected Fellows of the Royal Society. Professor Sarah Cleaveland was elected Fellow of the Royal Society of Edinburgh.
 - Professor Sadaf Farooqi from the University of Cambridge was awarded the 2012 Society for Endocrinology Medal in recognition of her studies into obesity.
 - Professor Peter Radcliffe, University of Oxford, won the Pasarow Award for Cardiovascular Research for his contributions to cardiovascular medical research.
 - Luke Fowler's film of RD Laing was nominated for the 2012 Turner Prize. Previously, Fowler extensively researched the RD Laing archive in Glasgow as part of a 2001 Trust grant.

5. Research environment

5.1 Key contributions to the creation, development and maintenance of major research resources

- Eleven per cent of Trust grants ending in 2011/2012 reported software or database development as part of their work, compared to 8 per cent of total grants between 2008 and 2011.
- An international team, led by researchers at the Sanger Institute, has sequenced the genomes of 21 breast cancers and analysed the mutations that emerged during the tumours' development. The Cancer Genome Project allows researchers to identify mutational patterns rather than individual mutations in specific genes.
- Data from the Wellcome Trust Case Control Consortium and the 1000 Genome Project have allowed an international team of researchers to identify ten more DNA regions linked to type 2 diabetes, bringing the total to more than 60.

- Researchers collaborating with the Structural Genomics Consortium have designed the first small molecule inhibitor selective for an enzyme in the jumonji subfamily and demonstrated the role this protein has in DNA transcription and the inflammation response.
- The ORCID (Open Researcher and Contributor ID) registry launched in October 2012. ORCID is a not-for-profit, multi-agency, community effort to create a global registry of unique researcher identifiers. ORCID aims to address some of the long-standing challenges faced by research funders, such as the ability to link researcher outputs and outcomes to funding streams. The Wellcome Trust has been a part of the ORCID endeavour since 2010; to date, more than 50 000 researchers across the globe have signed up.
- Through the Research Resources in Medical History scheme, the Trust has preserved and archived the collections of several important scientific and medical practitioners during 2011–12, including Professor Maurice Wilkins and the King's College London Biophysics Unit, the Addenbrooke's Hospital Casenotes (1878–1947), and records from the Peamount Sanatorium and the Women's National Health Association of Ireland.
- The Wellcome Library made significant progress towards the launch of the new digital library, with its infrastructure created and more than 1.2 million pages of books and archives digitised.
- In 2011/12 the Library received 41 875 user visits, and more than 1.3 million catalogue searches were undertaken.

5.2 Contributions to the growth of centres of excellence

- Between January 2002 and June 2012, the Wellcome Trust Centre for Neuroimaging was first in the world in terms of citations per paper in the field 'neuroscience and behaviour'. The Wellcome Trust Sanger Institute was fourth highest in the field 'biology and biochemistry' and sixth in 'microbiology'.
- UK Biobank, a resource that has collected samples and health data from 500 000 participants, was launched in March 2012. The resource is available to researchers investigating the causes of diseases that occur in middle age and later life. UK Biobank is one of the world's most detailed large-scale collections of health data.

6. Influence

6.1 Significant impact on science funding and policy developments

- In 2011/12, the Trust provided written evidence to eight Committee inquiries. The Trust also gave oral evidence at three Committee inquiries: one on science and international development, one on bridging the 'valley of death' (improving the commercialisation of research), and one on the administration of examinations for 15–19-year-olds.
- The Trust worked with a coalition of health research organisations to ensure that research is recognised in the Health and Social Care Act.
- The Trust contributed throughout the development of the Government's Life Sciences Strategy, responding to the consultations about the growth agenda, specifically on the topics of education, skills and open data. In addition, the Trust provided input to the NHS Innovation Review.
- The Trust continues to support open access and data sharing, establishing the Expert Advisory Group on Data Access for genetic and cohort studies with the Medical Research Council, the Economic and Social Research Council, and Cancer Research UK. The group aims to provide advice to funders and will analyse emerging scientific, ethical and legal issues raised by data access.
- The Education and Learning team worked with the Policy team on its submissions to the *Plan for Growth* and in making representations to HM Treasury for ongoing support for the National and Regional Science Learning Centres through Project ENTHUSE. In his Autumn Statement, the Chancellor of the Exchequer announced that £10 million would be committed to Project ENTHUSE from 2013 to 2018, alongside matched funding from the Trust.

6.2 Significant impact on global research priorities

- The Trust held several Frontiers Meetings in 2011/12, including:
 - Public Health Foundation of India Workshop
 - Joint Funders Workshop on Health Systems Research
 - Next Generation Brain Imaging Technologies Frontiers Meeting 2011
 - Understanding Bottlenecks in the Discovery of New Therapies for Respiratory Syncytial Virus (RSV) Infection
 - Scientific Challenge Area Meeting (#5): Impact of Global Environmental Change on Food/Nutrition, Water and Human Health.

Wellcome Trust

We are 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.

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