

# Volume I: Report

2012/13



## **ACKNOWLEDGEMENTS**

The Strategic Planning and Policy Unit would like to thank the many people across the Trust involved in providing the information for this report.

The team responsible for compiling this report were Liz Allen, Adam Dinsmore, Kevin Dolby, Lily Ickowitz-Seidler, David Lynn, Jo Marsh, Briony Rayfield, Joanna Scott and Halina Suwalowska

## **NOTES**

A small number of figures have been removed from this version of the report as they are for internal purposes only such as grants assurance/audit and/or are commercial in confidence.

# INTRODUCTION AND BACKGROUND

## INTRODUCTION

1. This is the eighth Assessment Framework Report; it reports against the Indicators of Progress set out in the Strategic Plan 2010-2020 'Extraordinary Opportunities'.

## BACKGROUND

2. The Assessment Framework (see **Appendix A**) was developed following consultation across the Trust in 2005/06 and sets out the types of quantitative and qualitative information that the Trust should collate and analyse to indicate it is making progress towards its aims. In 2010 the Assessment Framework was revised to support reporting against the newly updated **Outcomes** and **Indicators of Progress** outlined in the 2010-20 Strategic Plan (see below).

Outcome	Indicators of Progress
Discoveries	<ul style="list-style-type: none"><li>• Significant advances in the generation of new knowledge and understanding</li><li>• Contributions to discoveries with tangible impacts on health</li></ul>
Applications of research	<ul style="list-style-type: none"><li>• Contributions to the development of enabling technologies, products and devices</li><li>• Uptake of research into policy and practice</li></ul>
Engagement	<ul style="list-style-type: none"><li>• Enhanced level of informed debate on biomedical science issues</li><li>• Significant engagement of key audiences in biomedical science, and increased audience reach</li></ul>
Research leaders	<ul style="list-style-type: none"><li>• Development of a cadre of research leaders</li><li>• Evidence of significant career progression among those we support</li></ul>
Research environment	<ul style="list-style-type: none"><li>• Key contributions to the creation, development and maintenance of major research resources</li><li>• Contributions to the growth of centres of excellence</li></ul>
Influence	<ul style="list-style-type: none"><li>• Significant impact on science funding and policy developments</li><li>• Significant impact on global research priorities</li></ul>

3. The Assessment Framework Report predominantly describes outputs and achievements associated with Trust activities though, where appropriate, inputs are also included where considered a major Indicator of Progress. Through successive Assessment Framework Reports, we have been able to build trend data and develop benchmarks that allow us to assess our progress as an organisation. In addition, there are a number of external benchmarks that help to provide context to Trust-specific data.
4. The primary audience for this report is intended to be the Trust itself: the Board of Governors, the Executive Board and its staff, though we make the report available to the wider community via the website and use of our 'stories of impact' to inform learning and evaluation more generally. The report has a number of key uses, including:
  - input to the Trust's Annual Report and Summary Information Return filed with the Charity Commission;
  - to complement the Trust's Annual Review;
  - to support the work of the Trust's Challenge Development Groups;
  - to inform the Strategic Plan Update;
  - to inform and provide evidence for Spending Review discussions; and
  - to help inform future Wellcome Trust strategy.

## DATA SOURCES & METHODOLOGY

5. The information included in this report is drawn from a wide range of internal and external sources. The information gathering and production of the report is led by the Evaluation Team in the Strategic Planning and Policy Unit (SPPU), though it is reliant on the contributions of many staff from across the Trust.
6. To complement the more quantitative and metric-based information contained in Volume 1 of the Assessment Framework Report, Volume 2 contains a series of Research Profiles which describe the story (to date) of a particular outcome or impact associated with Wellcome Trust funding; these Research Profiles are again reported according to the relevant Trust Outcome goal. Case studies and stories have gained increasing currency as tools to support impact evaluation, and are a core component of institution submissions within the UK Research Excellence Framework.
7. The Wellcome Trust Research Profiles - taking the form of **Highlights** and **Histories** - have been agreed with the researchers involved and validated by senior Trust staff. A 'Profile Bank' containing all Research Profiles produced to date (since 2005), has been created by the Evaluation Team; over time Profiles are updated and revised as research progresses.
8. Unless otherwise stated, **all information and data refer to outputs and achievements arising and reported during the Trust's financial year: 1 October 2012 to 30 September 2013.**
9. End of Grant forms contain outputs (e.g. publications, books and other outputs) associated with a grant throughout the entirety of its life and not just those delivered in the year the End of Grant report is submitted (for this Assessment Framework Report, 1 October 2012 to 30 September 2013).
10. Publications (and other outputs) are also commonly the result of collaborations; where more than one individual is cited as an author on a paper (or contributor to an output) AND has a grant from the Wellcome Trust, the same paper (or output) may be associated with more than one individual and more than one grant. The use of median number of papers linked to a specific grant, for example, helps to provide a good indicator of the volume of outputs associated with a specific grant (though the papers may not be unique).
11. In future years, as the Trust further integrates its online grant progress reporting system throughout its funding activities (through Wellcome Trust e-Val and MInet) it will be easier to provide access to, and updates on grant-associated outputs throughout their lifecycle.

## REPORT STRUCTURE

12. The report is structured according to the specific Outcome area and associated Indicators of Progress - and colour coded.
13. Due to the nature of much of the research supported by the Wellcome Trust, many of the outputs and achievements presented in this report could have been reported against more than one Outcome area. For presentation purposes, they have been reported against the Outcome area to which, currently, they are most closely aligned.

# REPORT AGAINST THE INDICATORS OF PROGRESS 2012/13

1. DISCOVERIES	Page 11
<p><b>SIGNIFICANT ADVANCES IN THE GENERATION OF NEW KNOWLEDGE AND UNDERSTANDING</b></p> <ul style="list-style-type: none"> <li>In 2012<sup>1</sup>, <b>4711</b> new scientific research papers associated with the Wellcome Trust were published, indexed on PubMed and appeared on Thomson Reuters Web of Knowledge<sup>2</sup>. Overall, there has been a gradual increase in the annual volume of Trust-associated publications since 2006, although the 19% increase in annual papers between 2006 and 2011 is slightly less than the overall increase of 20% in all papers covered by the Web of Knowledge over the same period<sup>3</sup>.</li> <li>The 2012 cohort of Trust-associated papers is published across 145 fields, from the field with the largest number, 'Biochemistry &amp; Molecular Biology' (838 papers), to 'Religion' and 'Robotics' (both 1 paper).</li> <li>For 2012 papers, the Normalised Citation Impact<sup>4</sup> (NCI), for all Trust-associated papers at the end of 2012 was <b>1.98</b>; almost double the world average NCI of 1<sup>5</sup></li> <li>The NCIs of Trust-associated papers published in 2010-2012 compare favourably to the world average across all major biomedical research fields, with the 2012 papers in 'Tropical Medicine' and 'Oncology' having particularly high average NCIs.</li> </ul>	P11
<p><b>CONTRIBUTIONS TO DISCOVERIES WITH (POTENTIAL) TANGIBLE IMPACTS ON HEALTH</b></p> <ul style="list-style-type: none"> <li>A number of Trust-funded research projects have yielded results with the potential for tangible impacts on health, including: <ul style="list-style-type: none"> <li>Professor Peacock and colleagues have used advanced DNA sequencing technologies to confirm the presence of an ongoing outbreak of methicillin-resistant Staphylococcus aureus (MRSA) in a Special Care Baby Unit in real time. This helped the outbreak to be stopped earlier, preventing possible harm to patients and revealed that the outbreak had extended into the wider community – thus opening the opportunity for more rapid diagnostic techniques. They also used sequencing to link the outbreak to an unsuspecting carrier, who was treated to eradicate MRSA.</li> <li>Professor Todd and colleagues have begun a clinical trial for a potential new treatment for type 1 diabetes that could eventually mean patients are able to reduce insulin treatment from several times a day to once or twice a week. The new treatment is a direct result of previous research which identified variants of one particular gene - known as interleukin-2, or IL2 - that seem to have a prominent role in the disease. IL-2 is important in helping to regulate the immune system.</li> <li>A new study led by Professor Weber has added to the evidence that early initiation of HIV treatment benefits individuals by preventing severe disease and reducing the danger of transmitting the infection. The SPARTAC study was funded by the Trust, and coordinated by researchers from Imperial College London and the Medical Research Council Clinical Trials Unit.</li> </ul> </li> </ul>	P38

<sup>1</sup> To enable the Wellcome Trust to draw on international benchmarks, unless otherwise stated, all bibliometric analysis refers to scientific research papers – defined as articles and reviews, and excluding editorials, letters and other publication types - published within a specific calendar year (so for this report January – December 2012).

<sup>2</sup> Although this represents a decrease of almost 5% (n=248) on the 2011 volume, it is known that PubMed processes mean that some papers are indexed as being Trust-associated a significant time after publication, so the 2012 data is expected to rise over time.

<sup>3</sup> Figures as of 18 October 2013. Increase measured on 2006 to 2011 data, and not 2012 data, due to the time-lag on PubMed processing mentioned above.

<sup>4</sup> This standardised metric assesses the citation performance of a research paper in relation to the performance of the average paper published in the same research field at the same time.

<sup>5</sup> Citation impact can change significantly over time — the 2011 cohort had an average NCI of 2.02 at the end of 2011, below the 2010 level it now exceeds — so the 2012 level of NCI is also likely to change

**CONTRIBUTIONS TO THE DEVELOPMENT OF ENABLING TECHNOLOGIES, PRODUCTS AND DEVICES**

P40

- 6% of grants ending during 2012/13 reported filing a patent associated with their research and 17% reported engaging with commercial collaborators during their research. These are slight increases on previous years (proportions over 2009/10-2011/12 = 5% and 14% respectively).
- Trust-funded investigators secured £218 million in venture capital finance to support the commercialisation of their R&D during 2012/13, an increase for the fourth year in a row (2009/10: £107 million, 2010/11: £122 million, 2011/12: £185m).
- Twenty-five Translation Awards received follow-on funding in 2012/13, compared to 18 in 2011/12.
- Forty inventions arose from Wellcome Trust Translation Awards during 2012/13 compared to 11 in the previous year. These included:
  - software for an image-guided surgery system for localised prostate cancer.
  - devices for screening and the diagnosis of diabetic retinopathy.
  - a cardio-pulmonary resuscitation device.

**UPTAKE OF RESEARCH INTO POLICY AND PRACTICE**

P43

- Similar to previous years, 28% of Trust grants ending during 2012/13 reported engagement with policy makers and healthcare professionals. As in previous years, grants from the Populations and Public Health funding stream are most likely to have engaged in this way (76%).
- Trust-funded researchers have impacted upon policy and practice in a variety of ways:
  - Professor Wilkinson’s research on the ethics of modern genetics, along with other Trust funded researchers Professors Scott and Savulescu, was cited several times in the report of the UK Parliament Inquiry into Abortion on the Grounds of Disability. Their work provided evidence to support the Inquiry’s recommendation to keep the current time limit for abortion on the grounds of disability at birth.
  - Professor Schmidt’s work on the ethical, political and legal dimensions of Britain’s chemical and biological warfare programme during the Cold War has helped inform the discussion between the Ministry of Defence and the Porton Down Veterans’ Support Group. This resulted in a comprehensive compensation scheme for the Porton Veterans by the Government, and an apology in the House of Commons.

<b>3. ENGAGEMENT</b>	<b>Page 50</b>
<p><b>ENHANCED LEVEL OF INFORMED DEBATE ON BIOMEDICAL SCIENCE ISSUES</b></p> <ul style="list-style-type: none"> <li>• Overall, 30% of Trust grants ending during 2012/13 reported some media coverage associated with their research (the proportion over 2009/10-2011/12 = 27%).</li> <li>• The Trust has received extensive media coverage both on the research it funds and to facilitate its Policy and Engagement work. Examples include: <ul style="list-style-type: none"> <li>○ Research stories, comment pieces, and leader articles were co-ordinated by the Trust and partners to make the case for continued investment in research in the Government Spending Round and against the proposals to transfer medical research and training to the Department of Health.</li> <li>○ A Q&amp;A session with Professors Turnbull and Golombok about the implications of the new techniques to prevent the transmission of mitochondrial diseases on the website Mumsnet.</li> <li>○ Professor Hattersley and colleagues in Exeter identified the genetic cause of an extremely rare condition that affected only eight individuals worldwide. As a direct result of coverage on <a href="#">BBC online</a>, three new cases were identified.</li> </ul> </li> <li>• The Trust has also increased its social media presence in 2012/13, now having 43,000 Twitter followers (up from 25,000 last year) and 5,100 Facebook 'likes' (up from 2,000 last year).</li> </ul> <p><b>SIGNIFICANT ENGAGEMENT OF KEY AUDIENCES IN BIOMEDICAL SCIENCE, AND INCREASED AUDIENCE REACH</b></p> <ul style="list-style-type: none"> <li>• 2012/13 has been the Wellcome Collection's busiest year so far, with total visits numbering over half a million for the first time. Exhibitions included the last weeks of <i>Superhuman</i>, <i>Death: A Self-Portrait</i> and Japanese outsider art: <i>Souzou</i>.</li> <li>• 44% of Trust grants ending during 2012/13 reported presenting their work to non-academic audiences and 31% to research participants and related communities (the proportion over 2009/10-2011/12 = 43% and 35%, respectively).</li> <li>• In 2012/13 the Trust collaborated with the British Neuroscience Association and the Barbican Centre to convene <i>Wonder: Art and Science on the Brain</i>, bringing together neuroscience and the arts. <ul style="list-style-type: none"> <li>○ Around 15,000 people attended events as part of <i>Wonder</i>, which included <i>Consciousness</i>, <i>The Salon Project</i>, <i>I'm a Neuroscientist</i>, <i>Ruby Wax</i>, <i>Packed Lunches</i> and a three day 'Wonder' Street Fair.</li> <li>○ Over 200 neuroscientists were directly involved in delivering public events at the Barbican, as speakers, stall holders and event guides.</li> <li>○ The Barbican integrated neuroscience into its film, theatre, and creative learning programmes and is now using the project as a model for working across both creative programming and corporate hire teams.</li> </ul> </li> </ul>	<p>P50</p> <p>P53</p>
<b>4. RESEARCH LEADERS</b>	<b>Page 61</b>
<p><b>DEVELOPMENT OF A CADRE OF RESEARCH LEADERS</b></p> <ul style="list-style-type: none"> <li>• Support was renewed for 12 Basic Science and 4 Clinical PhD Programmes in the recent PhD Programme competition. Additionally, 2 new Programmes were also recommended for support (at Imperial College London and University College London).</li> <li>• The Research Leadership Development Programme, was established in 2013 aiming 'to provide a world-class, innovative and immersive programme to enhance the leadership style, impact and resilience of researchers'.</li> </ul>	<p>P61</p>

<p><b>EVIDENCE OF SIGNIFICANT CAREER PROGRESSION AMONG THOSE WE SUPPORT</b></p> <ul style="list-style-type: none"> <li>• Researchers who have received Trust-funding<sup>6</sup> have been awarded a range of high profile prizes during 2012/13, including: <ul style="list-style-type: none"> <li>○ Professor Mike Stratton was awarded the Louis-Jeantet Prize and a Knighthood for his services to medical science.</li> <li>○ Professor Gero Miesenböck was awarded the Brain Prize and The Jacob Heskel Gabbay Award in Biotechnology and Medicine.</li> <li>○ Dr Tracey Gloster and Dr Katie Hampson were awarded L’Oreal-UNESCO for Women in Science Awards.</li> <li>○ Phil Winfield won the Best Immersive Cinema (Fulldome) category at the Jackson Hole Science Media Awards in the US for his film Cell! Cell! Cell!</li> <li>○ Professor Kevin Brindle won the European Society of Molecular Imaging Award.</li> </ul> </li> </ul>	P61
<p><b>5. RESEARCH ENVIRONMENT</b></p>	<p><b>Page 69</b></p>
<p><b>KEY CONTRIBUTIONS TO THE CREATION, DEVELOPMENT AND MAINTENANCE OF MAJOR RESEARCH RESOURCES</b></p> <ul style="list-style-type: none"> <li>• 14% of grants ending during 2012/13 reported the production of software and/or databases during their research, this represents an increase on previous years (proportion over 2009/10-2011/12 = 9%).</li> <li>• Professor Swedlow and colleagues have further developed and released the open source Open Microscopy Environment (OME) used by thousands of labs worldwide for imaging research.</li> <li>• This year has seen a significant expansion in the interest and engagement with ORCID (Open Researcher and Contributor ID), the global registry of unique researcher identifiers. In its first year, more than 300,000 researchers across the world have signed up for an ORCID id and are increasingly able to use this in aspects of the research ecosystem.</li> <li>• The new Library website was launched in November 2012, with the subsequent launch of ‘Codebreakers: Makers of Modern Genetics’ in March 2013. This online resource represents the first release of content from the Library’s digitisation programme, which so far has seen over two million pages of books and archives digitised.</li> <li>• Through the Research Resources in Medical History (RRMH) grant scheme, the Trust has preserved and archived the collections of a number of significant scientific and medical practitioners for future generations, including: <ul style="list-style-type: none"> <li>○ Cataloguing the personal papers of Professor Sir Aaron Klug, Nobel Prize winning chemist and biophysicist, and former Director of the Medical Research Council Laboratory of Molecular Biology and President of the Royal Society.</li> <li>○ Cataloguing and preserving The Scottish Women’s Hospital Archives, 1911-1922.</li> <li>○ Cataloguing and Preservation of the HIV/AIDS Collections at the London School of Hygiene and Tropical Medicine.</li> </ul> </li> </ul> <p><b>CONTRIBUTIONS TO THE GROWTH OF CENTRES OF EXCELLENCE</b></p> <ul style="list-style-type: none"> <li>• In the field of ‘Neurosciences and Behaviour’, the Wellcome Trust Centre for Neuroimaging at University College London continues to be a world leader in the field; over the last 10 years, the Centre has received more citations per paper than any other institution.</li> </ul>	<p>P69</p> <p>P75</p>

<sup>6</sup> It should be noted that these prizes are often awarded for a body of work and so not solely for Trust-funded work.



6. INFLUENCE	Page 77
<p><b>SIGNIFICANT IMPACT ON SCIENCE FUNDING AND POLICY DEVELOPMENTS</b></p> <ul style="list-style-type: none"> <li>• In 2012/13, the Trust submitted written evidence to 14 Parliamentary Committee inquiries and gave oral evidence at three Committee inquiries (clinical trials; regenerative medicine; and the Joint Committee scrutiny of the Care and Support Bill). The Trust worked with other research organisations to brief peers on key aspects of the Care Bill.</li> <li>• In the lead-up to the Government’s Spending Round review, the Trust submitted evidence to HM Treasury and the Department for Business, Innovation and Skills (BIS), and worked with a cross-sector group of stakeholders and the Biomedicine Forum to ensure consistent messages about the importance of investment in science. The resulting announcement was positive for science, with a flat-cash settlement and additional long-term investment for infrastructure. Importantly, proposals to transfer medical research and training to the Department of Health were abandoned.</li> <li>• The Trust is taking forward a range of work in partnership with others to address key cultural, professional and infrastructural barriers to research data sharing. Activities include: providing the secretariat for the Expert Advisory Group on Data Access (EAGDA) and holding a cross-sector workshop on clinical trial data transparency.</li> <li>• The Trust has undertaken a range of work to influence European policy and legislation in the areas of: Physical Agents Directive, Data Protection Regulation and Clinical Trials Regulation.</li> <li>• The Trust has had some significant influences on science education policy, examples include: <ul style="list-style-type: none"> <li>○ The Wellcome Trust Monitor uses a robust sampling methodology to ensure that its results are representative of the UK population. BIS has now adopted this same methodology for its next Public Attitudes to Science survey.</li> <li>○ The Trust’s statement of Recommended Practice for Boards of Governors has been widely disseminated and referred to in the Education Select Committee’s report in this area.</li> <li>○ A joint paper produced with the Gatsby Foundation on assessing practical science, discussed with the Council for Technology and Ofqual, has been influential in retaining direct assessment of science practical work in GCSE proposals (and is referenced in Ofqual documentation).</li> </ul> </li> </ul>	P77
<p><b>SIGNIFICANT IMPACT ON GLOBAL RESEARCH PRIORITIES</b></p> <ul style="list-style-type: none"> <li>• The Trust has hosted/convened a number of Frontiers meetings and workshops during 2012/13, including: <ul style="list-style-type: none"> <li>○ Rare Disease Workshop</li> <li>○ Showcasing British Neuroscience</li> <li>○ Evington Initiative – Dementia meeting</li> <li>○ Antibiotic Action meeting</li> <li>○ Neurodegenerative Diseases Initiative Workshop</li> </ul> </li> </ul>	P80

## 1. DISCOVERIES

- Significant advances in the generation of new knowledge and understanding
- Contributions to discoveries with tangible impacts on health

### SIGNIFICANT ADVANCES IN THE GENERATION OF NEW KNOWLEDGE AND UNDERSTANDING

#### Figure 1.1 Wellcome Trust-associated publications output 2012

##### **Volume & distribution of scientific research papers**

In 2012<sup>7</sup>, **4711** new scientific research papers associated with the Wellcome Trust were published, indexed on PubMed and appeared on Thomson Reuters Web of Knowledge<sup>8</sup>. Overall, there has been a gradual increase in the annual volume of Trust-associated publications since 2006 (Fig. 1.2), although the 19% increase in annual papers between 2006 and 2011 is slightly less than the overall increase of 20% in all papers covered by the Web of Knowledge over the same period<sup>9</sup>.

Thomson Reuters allocates papers to one or more of 254 research fields according to the journal in which they are published<sup>10</sup>; the 2012 cohort of Trust-associated papers is published across 145 fields, from the field with the largest number, 'Biochemistry & Molecular Biology' (838 papers), to 'Religion' and 'Robotics' (both 1 paper). In terms of volume of output, the 'top' ten research fields are presented in Fig. 1.3, along with corresponding data from 2010 and 2011.

The University of Oxford was the institution most frequently linked to the 2012 cohort of Trust-associated papers with 868 papers published (see Fig. 1.4), followed by University College London (744 papers) and the University of Cambridge (602 papers).

##### **Indication of scientific research paper impact<sup>11</sup>**

**To account for variations in citation patterns across research fields, Thomson Reuters data provide the ability to assess the citation performance of a specific research paper in relation to the performance of the average paper published in the same research field at the same time. This 'Normalised Citation Impact' (NCI) has been calculated for all Trust-associated papers.**

For 2012 papers, the NCI for all Trust-associated papers at the end of 2012 was **1.98**; almost double the world average NCI of 1<sup>12</sup> (see trend in Fig. 1.2). In terms of citation impact, the full cohort of Trust-associated papers 2006-2012 compares well to UK benchmarks in related fields (see Fig. 1.6).

The NCIs of Trust-associated papers published in 2010-2012 compare favourably to the world average across all research fields in which more than 75 Trust-associated papers were published (see Figs. 1.7 and 1.8). The 2012 cohorts of papers in 'Tropical Medicine' and 'Oncology' have particularly high average NCIs of 3.67 and 5.86 respectively.

The Wellcome Trust Sanger Institute was linked to 64 'highly-cited'<sup>13</sup> papers in 2012 - representing 27.8% of its Trust-associated output - with only Oxford, Cambridge, UCL and Imperial College being linked to more 'highly-cited' papers in the 2012 cohort (see Fig 1.9).

<sup>7</sup> To enable the Wellcome Trust to draw on international benchmarks, unless otherwise stated, all bibliometric analysis refers to scientific research papers – defined as articles and reviews, and excluding editorials, letters and other publication types - published within a specific calendar year (January - December).

<sup>8</sup> Although this represents a decrease of almost 5% (n=248) on the 2011 volume, it is known that PubMed processes mean that some papers are indexed as being Trust-associated a significant time after publication, so the 2012 data is expected to rise over time.

<sup>9</sup> Figures as of 18 October 2013. Increase measured on 2006 to 2011 data, and not 2012 data, due to the time-lag on PubMed processing mentioned above.

<sup>10</sup> Papers published in major interdisciplinary journals (e.g. Nature, Science, PLoS ONE) are allocated to subject categories on an individual basis.

<sup>11</sup> All citations — and averages for rebasing — taken as at end December 2012.

<sup>12</sup> Citation impact can change significantly over time — the 2011 cohort had an average NCI of 2.02 at the end of 2011, below the 2010 level it now exceeds — so the 2012 level of NCI is also likely to change

*PLoS ONE* continues to publish more Trust-associated papers than any other journal, with 364 papers published in 2012 (see Fig 1.10). This mirrors a general trend, as the journal has 23,452 papers indexed in the Web of Knowledge for 2012 – more than three times as many as the next biggest journal by volume (*FASEB Journal*) – and has seen its number of published papers increase more than threefold over the 2010-2012 period.

Nearly 60% (n=2762) of the 2012 cohort of Trust-associated papers list a non-UK address amongst their authors, with the US the most frequently linked country with 23% (n=1080) of the papers, and 115 other countries being linked to at least one of the papers (see Fig. 1.11).

Some of the ‘top’ Trust-associated papers for 2012 across selected research fields are listed in Fig. 1.12. Included in the list are:

- those papers with the highest NCIs for their fields;
- those which have received noteworthy assessments on the *F1000 Prime* post-publication “recommendation service”; and
- those which have scored highly on *Altmetric*, an online service which complements traditional citation tools by collating a variety of article-level metrics based on social media mentions, bookmarking sites and other sources of online attention.

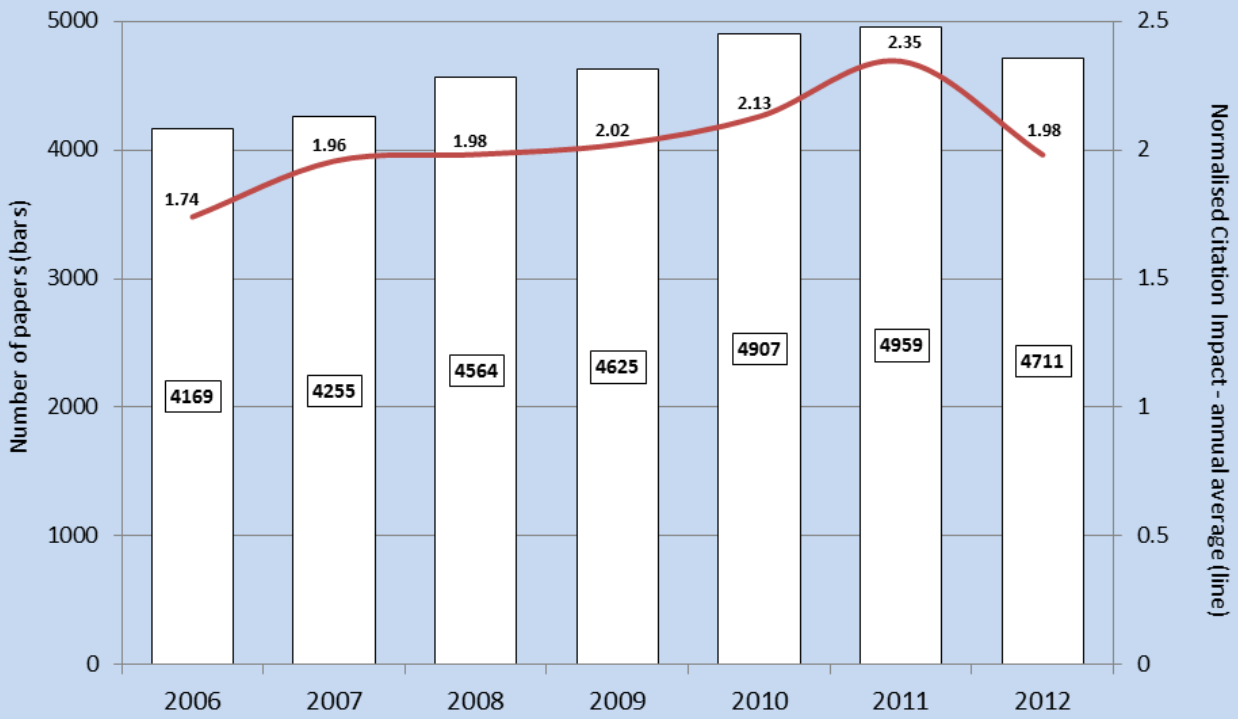
It is interesting to note that, for these papers, high numbers of citations do not necessarily correspond to high levels of online attention as recorded on *Altmetric*. While it is accepted that ‘altmetrics’ do not provide reliable information on the quality of the papers themselves, they do provide indications of attention, re-use and potential routes for impact, and they are included here for the first time for reference purposes. The Wellcome Trust’s Evaluation Team will continue to monitor the development of ‘altmetrics’ and incorporate them into our activities where they can add value.

Source: Strategic Planning and Policy Unit; 2013

---

<sup>13</sup> ‘Highly-cited’ refers to papers which have been cited at least four times the world average for that research field (i.e. NCI ≥ 4), typically thought to represent the top 5% of papers

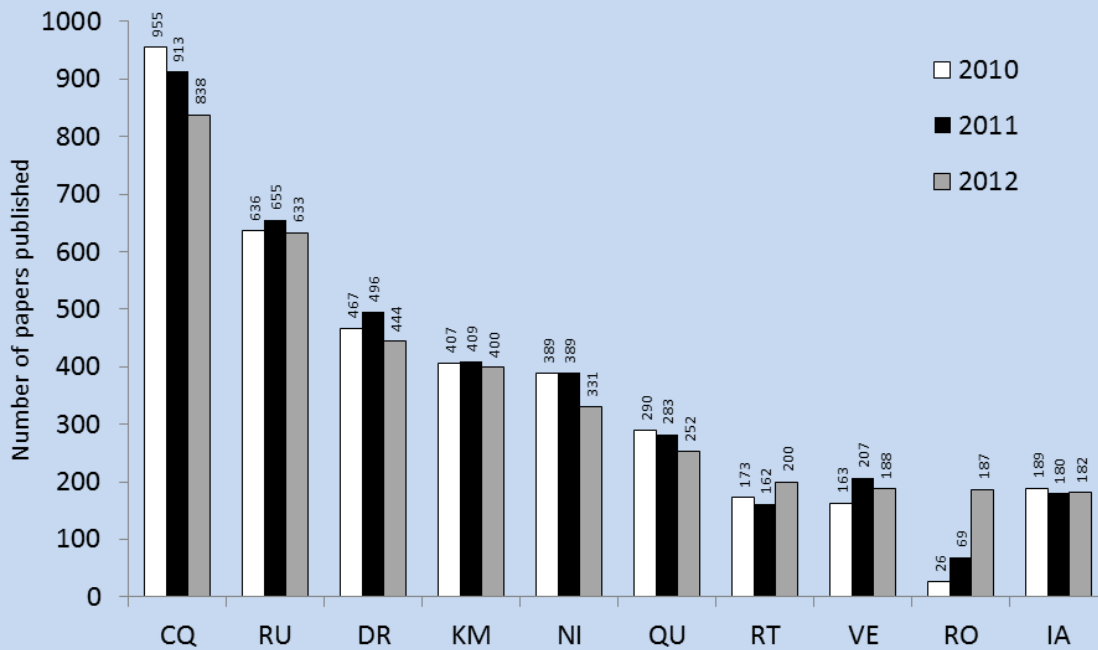
Fig 1.2: Volume and impact of Wellcome Trust-associated papers 2006-2012



Source: Data drawn from Thomson Reuters Web of Knowledge<sup>SM</sup>, Analysis by Thomson Reuters

Assessment Framework 2012/13

Fig 1.3: Research fields in which Wellcome Trust-associated publications most frequently appear 2010-2012



Source: Data drawn from Thomson Reuters Web of Knowledge<sup>SM</sup>; Analysis by Thomson Reuters

Assessment Framework 2012/13

Key to Research Field codes			
<b>CQ</b>	Biochemistry & Molecular Biology	<b>QU</b>	Microbiology
<b>RU</b>	Neurosciences	<b>RT</b>	Clinical Neurology
<b>DR</b>	Cell Biology	<b>VE</b>	Psychiatry
<b>KM</b>	Genetics & Heredity	<b>RO</b>	Multidisciplinary Sciences
<b>NI</b>	Immunology	<b>IA</b>	Endocrinology & Metabolism

**Figure 1.4: Institutions linked to the most Wellcome Trust-associated papers, 2010-2012**

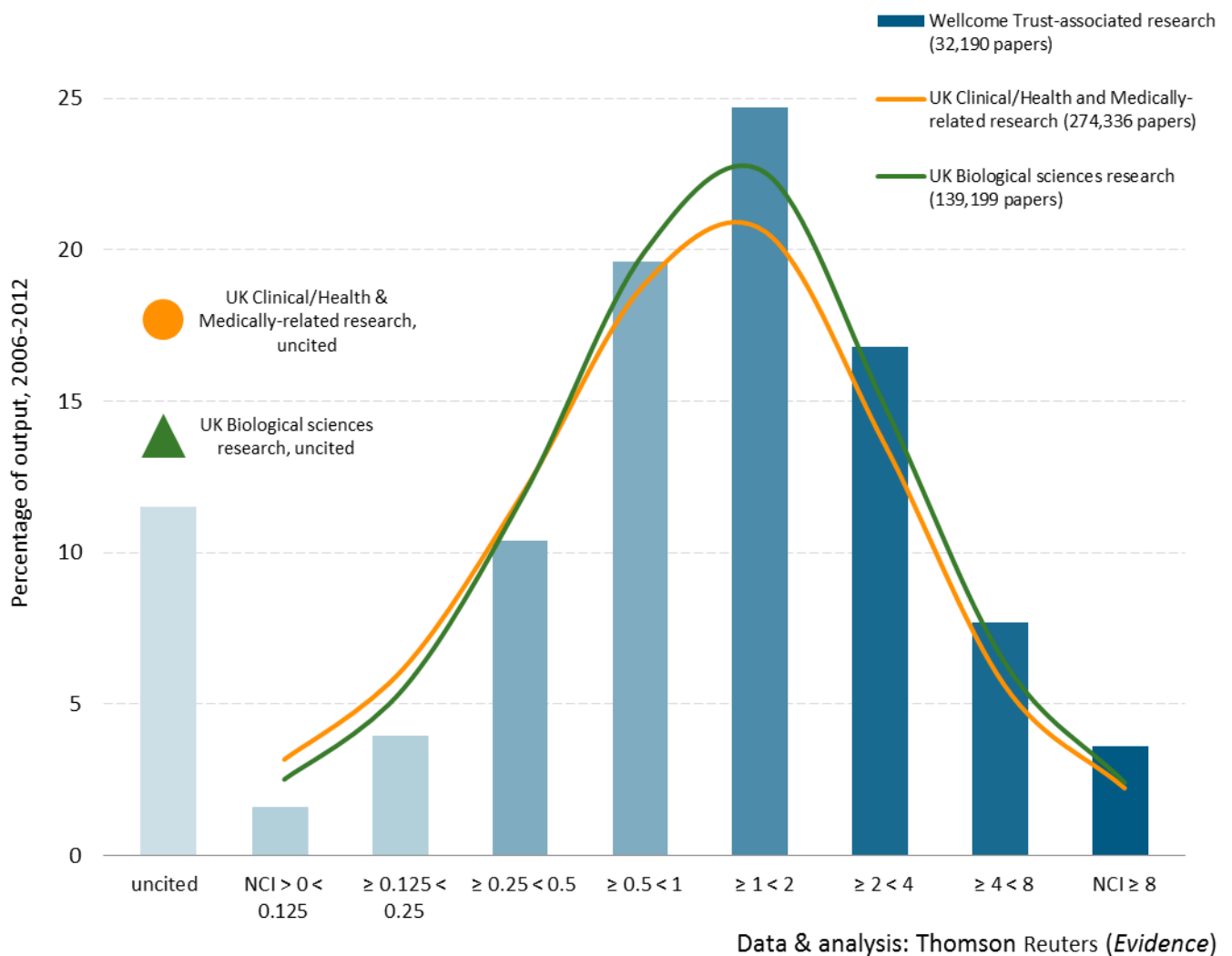
<b>Institution</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
University of Oxford	741	852	868
University College London	664	734	744
University of Cambridge	598	667	602
Imperial College London	460	482	409
King's College London	304	336	328
University of Edinburgh	297	321	321
University of Bristol	223	215	237
London School of Hygiene & Tropical Medicine	239	270	235
Wellcome Trust Sanger Institute	253	247	230
Harvard University	131	143	165
University of Manchester	205	211	162

Source: Data drawn from Thomson Reuters Web of Knowledge<sup>SM</sup>; Analysis by Thomson Reuters

Base: 11 institutions linked to the most WT-associated papers in 2012. Note that the institutions are not necessarily funded by the Trust, but may be the locations of collaborating authors funded by other agencies. Sorted on 2012 order.

**Figure 1.6 Wellcome Trust-associated publications, compared to UK baselines 2006-2012**

To provide context for the citation impact of Trust-associated papers, the ‘impact profile’ (below) provides a graphical representation of the impact of these papers compared to UK baselines in biological and health-related fields<sup>14</sup> over time. Impact profiles indicate the proportion of publications in a range of normalised citation impact (NCI) values. For the cohort of Trust-associated papers a higher proportion fall into the higher categories of NCI than the average UK paper in related fields. A smaller proportion of Trust-associated papers remained uncited as of the end of 2012<sup>15</sup>, compared to the UK average.

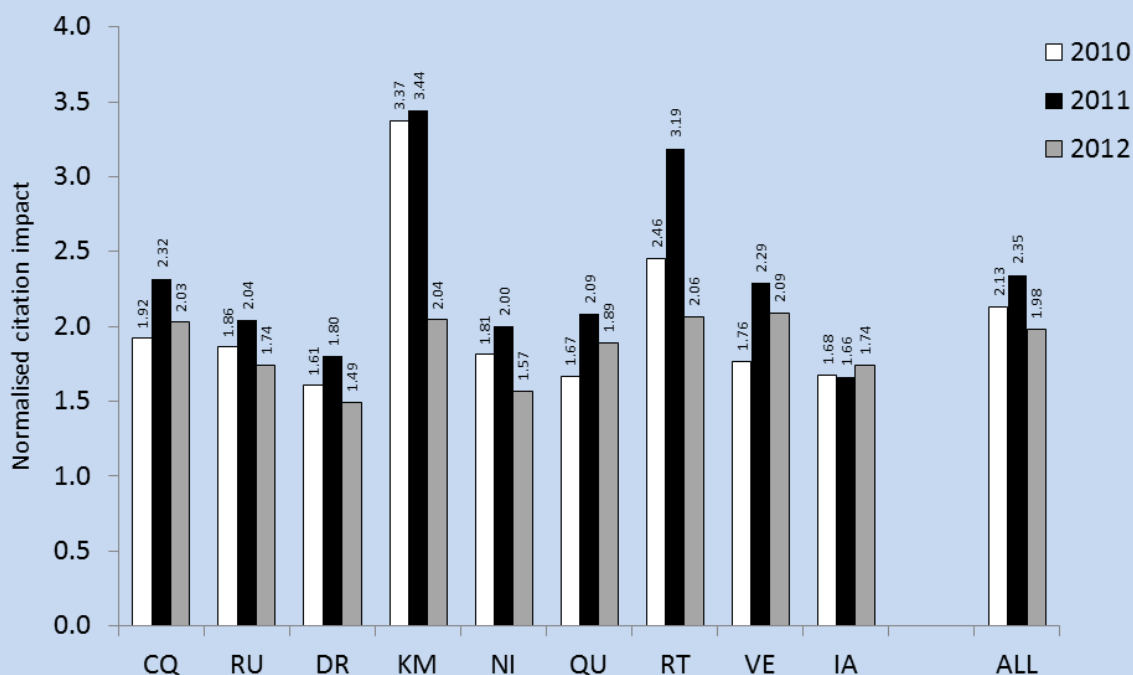


Source: Strategic Planning and Policy Unit; 2013

<sup>14</sup> Papers with at least one author based in a UK institution in Clinical/Health & Medically-related fields, or Biological Sciences, as defined by Thomson Reuters.

<sup>15</sup> The Trust and UK benchmark cohorts of papers include those published towards the end of 2012 which had little time to be cited by the end of the data gathering period. The proportion of these papers which is uncited is likely to fall over time.

Fig 1.7: Impact of Wellcome Trust-associated publications within specific research fields 2010-2012



Source: Data drawn from Thomson Reuters Web of Knowledge<sup>SM</sup>; Analysis by Thomson Reuters

Assessment Framework 2012/13

#### Key to Research Field codes

<b>CQ</b>	Biochemistry & Molecular Biology	<b>QU</b>	Microbiology
<b>RU</b>	Neurosciences	<b>RT</b>	Clinical Neurology
<b>DR</b>	Cell Biology	<b>VE</b>	Psychiatry
<b>KM</b>	Genetics & Heredity	<b>IA</b>	Endocrinology & Metabolism
<b>NI</b>	Immunology		

Average NCIs for Trust-associated papers compare favourably to the world average (NCI=1) across all of the Trust's 'top' (by volume) research fields for 2010-2012 (see Fig. 1.7). Although 2012 levels are generally lower than 2011, this is a common trend reflecting the citation patterns of the Trust-associated papers, and the 2012 average NCIs are expected to rise next year.

Indeed, average NCIs for Trust-associated papers compare well to international averages for all subject areas in which more than 75 Trust-associated papers were published in 2012 (see Fig. 1.8), with only the average NCI for 'Haematology' falling below the NCI=1 level, and this could increase in future years. In terms of the 2012 papers, the high average NCIs for 'Tropical Medicine' (NCI=3.67) and 'Oncology' (NCI=5.86) stand out as particularly impressive. 'Genetics & Heredity' and 'General & Internal Medicine' are areas of consistently high citation impact over the three-year period.



**Figure 1.8: Impact of Wellcome Trust-associated publications within specific research fields, 2010-2012**

Institution	2010		2011		2012	
	No. of papers	Ave. NCI	No. of papers	Ave. NCI	No. of papers	Ave. NCI
Biochemistry & Molecular Biology	955	1.92	913	2.32	838	2.03
Neurosciences	636	1.86	655	2.04	633	1.74
Cell Biology	467	1.61	496	1.80	444	1.49
Genetics & Heredity	407	3.37	409	3.44	400	2.04
Immunology	389	1.81	389	2.00	331	1.57
Microbiology	290	1.67	283	2.09	252	1.89
Clinical Neurology	173	2.46	162	3.19	200	2.06
Psychiatry	163	1.76	207	2.29	188	2.09
Multidisciplinary Sciences	26	2.05	69	1.55	187	1.31
Endocrinology & Metabolism	189	1.68	180	1.66	182	1.74
Public, Environmental & Occ. Health	236	1.78	204	2.45	176	1.76
Infectious Diseases	180	1.94	180	1.77	173	1.98
Parasitology	213	1.53	230	1.84	168	1.75
Pharmacology & Pharmacy	135	1.70	158	2.11	144	2.10
Biotechnology & Applied Microbiology	145	2.91	157	3.59	135	2.25
Virology	160	1.77	164	1.87	127	1.51
Biochemical Research Methods	166	3.17	139	3.55	127	1.23
Tropical Medicine	138	2.20	123	2.37	115	3.67
Biophysics	114	3.09	115	4.35	103	1.61
General & Internal Medicine	61	4.83	78	4.72	96	3.38
Developmental Biology	119	1.35	115	2.22	90	1.39
Radiology, Nuclear Med. & Medical Imaging	74	2.21	76	2.13	88	1.55
Biology	62	2.19	63	2.33	88	2.25
Oncology <sup>16</sup>	87	2.27	80	2.02	87	5.86
Research & Experimental Medicine	72	2.05	83	2.29	84	1.95
Physiology	111	1.58	86	1.75	79	1.56
Haematology	84	1.91	78	2.41	75	0.87

Source: Data drawn from Thomson Reuters Web of Knowledge<sup>SM</sup>; Analysis by Thomson Reuters

Base: All Thomson Reuters journal subject areas in which at least 75 WT-associated papers were indexed for 2012. Sorted on 2012 order.

<sup>16</sup> The 2012 'Oncology' cohort includes the most highly-cited Trust-associated paper for the year: Gerlinger et al. Intratumor heterogeneity and branched evolution revealed by multiregion sequencing. **New England J Med** (2012) 366:493-501. The paper had 133 citations as of the end of 2012, with a NCI = 173.27.

**Figure 1.9: Institutions linked to the most highly-cited Wellcome Trust-associated papers (NCI ≥ 4), 2010-2012. Number of papers, and as a proportion of total output of Trust-associated papers.**

Institution	2010		2011		2012	
	No. of papers NCI ≥ 4	% of institution's WT-papers	No. of papers NCI ≥ 4	% of institution's WT-papers	No. of papers NCI ≥ 4	% of institution's WT-papers
University of Oxford	130	17.5%	152	17.8%	143	16.5%
University of Cambridge	103	17.2%	112	16.8%	119	19.8%
University College London	80	12.0%	123	16.8%	103	13.8%
Imperial College London	75	16.3%	74	15.4%	66	16.1%
Wellcome Trust Sanger Institute	88	34.8%	93	37.7%	64	27.8%
King's College London	46	15.1%	70	20.8%	63	19.2%
University of Edinburgh	37	12.5%	50	15.6%	51	15.9%
Harvard University	49	37.4%	49	34.3%	47	28.5%
LSHTM	44	18.4%	47	17.4%	35	14.9%
University of Bristol	30	13.5%	27	12.6%	35	14.8%

Source: Data drawn from Thomson Reuters Web of Knowledge<sup>SM</sup>; Analysis by Thomson Reuters  
 Base: 10 organisations linked to the most highly-cited WT-associated papers in 2012. Sorted on 2012 order.

**Figure 1.10: Journals in which Wellcome Trust-associated papers most frequently appear, 2012**

Journal	Journal Impact Factor	Number of papers		
		2010	2011	2012
<i>PLoS ONE</i>	3.73	196	304	364
<i>Proceedings of the National Academy of Sciences</i>	9.737	97	75	96
<i>Journal of Neuroscience</i>	6.908	92	92	83
<i>Journal of Biological Chemistry</i>	4.651	109	119	76
<i>NeuroImage</i>	6.252	32	40	60
<i>Nucleic Acids Research</i>	8.278	55	55	57
<i>Nature Genetics</i>	35.209	43	35	49
<i>PLoS Neglected Tropical Diseases</i>	4.569	42	45	45
<i>Journal of Immunology</i>	5.52	52	42	43
<i>PLoS Genetics</i>	8.517	33	38	40
<i>Biochemical Society Transactions</i>	2.587	30	34	40

Source: Data drawn from Thomson Reuters Web of Knowledge<sup>SM</sup>; Analysis by Thomson Reuters  
 Base: 11 journals indexed on Thomson Reuters databases which featured the most WT-associated papers in 2012.  
 Note: Top 10 journals for 2010 and 2011 are different, but *PLoS ONE*, *Journal of Biological Chemistry*, *PNAS* and *Journal of Neuroscience* make up the top four for all three annual cohorts. *Nucleic Acids Research*, *PLoS NTD* and *Journal of Immunology* also appear in all three annual top tens.

**Figure 1.11: Countries producing Wellcome Trust-associated research papers, 2012**

Of the 2012 cohort of Trust-associated papers, 41% (n=1949) have solely UK-based authors, with the remaining papers demonstrating the international nature of research by describing a total of 116 different countries amongst their institutional addresses. The map below illustrates the extent of this scientific collaboration by highlighting all these countries.



The table, right, lists the most frequently featuring countries on the 2012 papers, along with average NCI for those papers.

Of the 2012 papers, 91% (n=4303) have at least one UK institutional address linked to them. Unsurprisingly, the US is the next most frequently occurring collaborating country, appearing on 23% (n=1080) of the papers.

Collaborations with the growing economies of China and Brazil have generally been increasing since 2006, but still represent a relatively small amount of Trust-funded research: less than 2% each for the 2012 cohort of papers.

Although the measure of average NCI across a country's output does not represent the full picture, and may be susceptible to a few extreme outliers, there are indications that the 2012 papers arising from collaborations with institutions from Denmark, Sweden or Canada had particularly high citation impact.

Rank	Country	2010	2011	2012	Ave. NCI for 2012
1	<b>UK</b>	4418	4532	4303	2.07
2	<b>US</b>	1041	1095	1080	2.99
3	<b>Germany</b>	369	418	426	2.36
4	<b>Netherlands</b>	255	272	284	3.37
5	<b>France</b>	240	286	276	2.91
6	<b>Australia</b>	248	308	274	2.81
7	<b>Canada</b>	185	186	220	3.67
8	<b>Italy</b>	179	214	207	2.79
9	<b>Spain</b>	154	176	171	2.18
10	<b>Sweden</b>	144	141	166	3.85
11	<b>Switzerland</b>	171	164	142	3.05
12	<b>South Africa</b>	162	141	140	2.27
13	<b>Thailand</b>	94	100	121	2.48
14	<b>Denmark</b>	106	120	107	4.06
15	<b>Ireland</b>	110	117	100	2.40
16	<b>Kenya</b>	120	119	97	1.85
...					
21	<b>China</b>	84	106	91	3.02
22	<b>Brazil</b>	81	95	80	1.70
<b>Total</b>		4907	4959	4711	1.98

Source: Data drawn from Thomson Reuters Web of Knowledge<sup>SM</sup>; Analysis by Thomson Reuters; Map generated through use of IBM Many Eyes<sup>R</sup>

**Figure 1.12: Wellcome Trust-associated papers with high NCI and/or Altmetric score by research field, 2012**

Publication details (all papers published 2012)	No of citations <sup>17</sup>	NCI	F1000 Prime <sup>18</sup>	Altmetric details <sup>19</sup>	Key WT Funding/ affiliation
<b>CQ - Biochemistry &amp; Molecular Biology</b>					
Punta M et al. The Pfam protein families database. <b>NUCLEIC ACIDS RES</b> 40:D290-D301	128	159.303		<i>Mentioned by:</i> 7 tweets; 1 blog; 1 Google+ post <i>Readers:</i> 13 CiteULike	Wellcome Trust Sanger Institute
Gaulton A et al. ChEMBL: a large-scale bioactivity database for drug discovery. <b>NUCLEIC ACIDS RES</b> 40:D1100-D1107	66	82.141		<i>Mentioned by:</i> 1 Facebook page; 1 blog <i>Readers:</i> 9 CiteULike	European Bioinformatics Institute
Rawlings ND et al. MEROPS: the database of proteolytic enzymes, their substrates and inhibitors. <b>NUCLEIC ACIDS RES</b> 40:D343-D350	49	34.848			Wellcome Trust Sanger Institute
Alsford S et al. High-throughput decoding of antitrypanosomal drug efficacy and resistance. <b>NATURE</b> 482:232-236	7	8.712	12*	<i>Mentioned by:</i> 8 tweets; 2 Facebook pages <i>Readers:</i> 35 Mendeley; 4 CiteULike	<b>Project Grant</b> to D Horn; <b>Programme Grant</b> to MC Field; Wellcome Trust Sanger Institute
Finn RD et al. Making your database available through Wikipedia: the pros and cons. <b>NUCLEIC ACIDS RES</b> 40:D9-D12	2	2.489		<i>Mentioned by:</i> 38 tweets; 4 Google+ posts; 2 blogs <i>Readers:</i> 30 Mendeley; 18 CiteULike	Wellcome Trust Sanger Institute

<sup>17</sup> Citations as at end of December 2012 on Thomson Reuters databases.

<sup>18</sup> F1000 Prime is a post-publication "recommendation service" which seeks to identify and evaluate 'the most important' research publications. All ratings as of July 2013.

<sup>19</sup> Altmetric is a web-based service which collates a variety of article-level metrics based on social media mentions, bookmarking sites and other sources of online attention. Details recorded as of October 2013.

<b>RU – Neurosciences</b>					
Shi Y et al. Human cerebral cortex development from pluripotent stem cells to functional excitatory synapses. <b>NAT NEUROSCI</b> 15:477–U180	17	25.893	1*		<b>Senior Investigator Award</b> to FJ Livesey
Smith SM et al. Temporally-independent functional modes of spontaneous brain activity. <b>P NATL ACAD SCI USA</b> 109:3131-31360	11	14.882			<b>Research Career Development Fellowship</b> to KL Miller
Brickley SG et al. Extrasynaptic GABA(A) receptors: Their function in the CNS and implications for disease. <b>NEURON</b> 73:23-34	10	13.529		<i>Mentioned by:</i> 1 tweet <i>Readers:</i> 80 Mendeley; 1 CiteULike	<b>Project Grant</b> to SG Brickley
Terbeck S et al. Propranolol reduces implicit negative racial bias. <b>PSYCHOPHARMACOLOGY</b> 222:419-424	2	2.706	1*	<i>Mentioned by:</i> 64 tweets; 2 Facebook pages; 3 blogs; 3 Google+ posts; 1 Redditor <i>Readers:</i> 8 Mendeley	<b>Strategic Award</b> in Biomedical Ethics to J Savulescu; <b>Society and Ethics University Award</b> to G Kahane
<b>DR – Cell Biology</b>					
Hardie DG et al. AMPK: a nutrient and energy sensor that maintains energy homeostasis. <b>NAT REV MOL CELL BIO</b> 13:251-262	21	20.109			<b>Senior Investigator Award</b> to DG Hardie
Nicholson JK et al. Host-gut microbiota metabolic interactions. <b>SCIENCE</b> 336:1262-67	17	16.279			<b>Strategic Award</b> to JK Nicholson (co-applicant)
Barnes E et al. Novel adenovirus-based vaccines induce broad and sustained T cell responses to HCV in man. <b>SCI TRANSL MED</b> 4:115ra1	9	8.618		<i>Mentioned by:</i> 21 tweets; 1 Google+ post; 1 blog <i>Readers:</i> 10 Mendeley	<b>Senior Clinical Research Fellowship</b> to P Klenerman

<b>KM - Genetics &amp; Heredity</b>					
MacArthur DG et al. A systematic survey of loss-of-function variants in human protein-coding genes. <b>SCIENCE</b> 335:823-28	42	50.296	5*		Wellcome Trust Sanger Institute; <b>Strategic Award</b> to PJ Donnelly
Schmidt D et al. Waves of retrotransposon expansion remodel genome organization and CTCF binding in multiple mammalian lineages. <b>CELL</b> 148:335-348	14	16.765		<i>Mentioned by:</i> 15 tweets; 1 Facebook page; 1 blog <i>Readers:</i> 189 Mendeley; 12 CiteULike	European Bioinformatics Institute
Iqbal Z et al. De novo assembly and genotyping of variants using colored de Bruijn graphs. <b>NAT GENET</b> 44:226-233	11	13.173	4*	<i>Mentioned by:</i> 42 tweets; 2 Facebook pages; 5 blogs; 1 Google+ post <i>Readers:</i> 350 Mendeley; 40 CiteULike	Wellcome Trust Centre for Human Genetics; <b>Project Grant</b> to G McVean
<b>NI – Immunology</b>					
Schulz C et al. A lineage of myeloid cells independent of Myb and hematopoietic stem cells. <b>SCIENCE</b> 336:86-90	16	20.889	9*		<b>Project Grant</b> to KJ Liu
King IL et al. Invariant natural killer T cells direct B cell responses to cognate lipid antigen in an IL-21-dependent manner. <b>NAT IMMUNOL</b> 13:44-U64	15	19.583			<b>Programme Grant</b> to GS Besra
Tobin DM et al. Host genotype-specific therapies can optimize the inflammatory response to mycobacterial infections. <b>CELL</b> 148:434-446	11	14.361	4*		Vietnam Research Programme and Oxford Clinical Research Unit
Warren-Gash C et al. Influenza infection and risk of acute myocardial infarction in England and Wales: A CALIBER self-controlled case series study. <b>J INFECT DIS</b> 206:1652-1659	0	0		<i>Mentioned by:</i> 8 tweets; 1 Facebook page; 1 blog <i>Readers:</i> 3 Mendeley	<b>Senior Clinical Research Fellowship</b> to L Smeeth; <b>Project Grant</b> to H Hemingway

<b>QU – Microbiology</b>					
Köser CU et al. Rapid whole-genome sequencing for investigation of a neonatal MRSA outbreak. <b>NEW ENGL J MED</b> 366:2267-2275	13	19.944			<b>Health Innovation Challenge Fund</b> to SJ Peacock
Gow NA et al. Candida albicans morphogenesis and host defence: discriminating invasion from colonization. <b>NAT REV MICROBIOL</b> 10:112-122	10	15.341			<b>Programme Grant</b> to NA Gow
Lillie PJ et al. Preliminary assessment of the efficacy of a T-cell-based influenza vaccine, MVA-NP+M1, in humans. <b>CLIN INFECT DIS</b> 55:19-25	3	4.602		<i>Mentioned by:</i> 8 tweets; 1 blog; 1 Facebook page <i>Readers:</i> 3 Mendeley	<b>Project Grant</b> to SC Gilbert; <b>Clinician PhD</b> to CJA Duncan
<b>RT – Clinical Neurology</b>					
Majounie E et al. Frequency of the C9orf72 hexanucleotide repeat expansion in patients with amyotrophic lateral sclerosis and frontotemporal dementia. <b>LANCET NEUROL</b> 11:323-330	18	33.331	1*		<b>Strategic Award</b> to NW Wood
Snowden JS et al. Distinct clinical and pathological characteristics of frontotemporal dementia associated with C9ORF72 mutations. <b>BRAIN</b> 135:693-708	18	33.331	2*	<i>Mentioned by:</i> 1 tweet <i>Readers:</i> 12 Mendeley; 1 CiteULike	<b>Strategic Award</b> to SM Pickering-Brown and DM Mann (co-applicants)
Djoughri L et al. Partial nerve injury induces electrophysiological changes in conducting (uninjured) nociceptive and nonnociceptive DRG neurons. <b>PAIN</b> 153:1824-1826	2	3.703		<i>Mentioned by:</i> 6 tweets; 1 blog; 1 Facebook page <i>Readers:</i> 8 Mendeley	<b>Project Grant</b> to SN Lawson

<b>VE – Psychiatry</b>					
Wray NR et al. Genome-wide association study of major depressive disorder: new results, meta-analysis, and lessons learned. <b>MOL PSYCHIATR</b> 17:36-48	24	42.453		<i>Mentioned by:</i> 3 tweets; 1 blog <i>Readers:</i> 2 CiteULike	<b>Programme Grant</b> to DHR Blackwood; Wellcome Trust Clinical Research Facility Edinburgh
Ersche KD et al. Abnormal brain structure implicated in stimulant drug addiction. <b>SCIENCE</b> 335:601-604	12	21.227	2*		Behavioural and Clinical Neuroscience Institute, University of Cambridge
de Moor MH et al. Meta-analysis of genome-wide association studies for personality. <b>MOL PSYCHIATR</b> 17:337-349	11	19.458		<i>Mentioned by:</i> 27 tweets; 1 Google+ posts; 4 blogs <i>Readers:</i> 66 Mendeley; 6 CiteULike	Wellcome Trust Sanger Institute
Eccles JA et al. Brain structure and joint hypermobility: relevance to the expression of psychiatric symptoms. <b>BR J PSYCHIATR</b> 200:508-9	0	0		<i>Mentioned by:</i> 54 tweets; 10 Facebook pages; 1 Google+ post; 1 Redditor; 2 Pinterest boards; 1 video <i>Readers:</i> 3 Mendeley	<b>Project Grant</b> to HD Critchley
<b>IA – Endocrinology &amp; Metabolism</b>					
Lazarus JH et al. Antenatal thyroid screening and childhood cognitive function. <b>NEW ENGL J MED</b> 366:493-501	14	19.547	9*		<b>Project Grant</b> to JH Lazarus; <b>Project Grant</b> to NJ Wald
Tolhurst G et al. Short-chain fatty acids stimulate glucagon-like peptide-1 secretion via the G-protein-coupled receptor FFAR2 <b>DIABETES</b> 61:364-371	10	13.962		<i>Mentioned by:</i> 1 tweet <i>Readers:</i> 30 Mendeley	<b>Senior Clinical Research Fellowship</b> to FM Gribble; <b>Senior Research Fellowship</b> to F Reimann
Schoenaker DA et al. Dietary saturated fat and fibre and risk of cardiovascular disease and all-cause mortality among type 1 diabetic patients: the EURODIAB Prospective Complications Study	1	1.396		<i>Mentioned by:</i> 16 tweets; 2 Facebook pages <i>Readers:</i> 6 Mendeley; 1 CiteULike	EURODIAB Prospective Complications Study



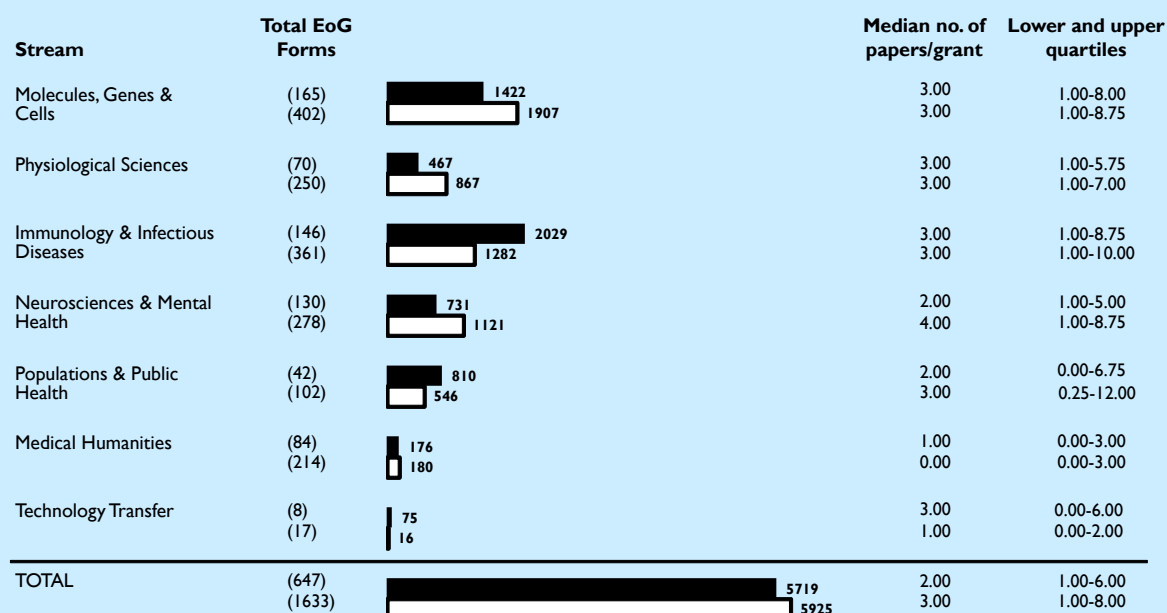
<b>DM – Oncology</b>					
Gerlinger M et al. Intratumor heterogeneity and branched evolution revealed by multiregion sequencing. <b>NEW ENGL J MED</b> 366:883-892	133	173.266	13*		<b>Health Innovation Challenge Fund Award</b> to P Campbell; Wellcome Trust Sanger Institute
Garnett MJ et al. Systematic identification of genomic markers of drug sensitivity in cancer cells. <b>NATURE</b> 483:570-U87	29	37.780	2*		Wellcome Trust Sanger Institute
Gray L et al. Association of body mass index in early adulthood and middle age with future site-specific cancer mortality: the Harvard Alumni Health Study. <b>ANN ONCOL</b> 23:754-759	0	0		<i>Mentioned by:</i> 6 tweets; 2 Facebook pages; 1 blog <i>Readers:</i> 4 Mendeley; 1 CiteULike	<b>Research Career Development Fellowship</b> to GD Batty
<b>YU – Tropical Medicine</b>					
Phyo AP et al. Emergence of artemisinin-resistant malaria on the western border of Thailand: a longitudinal study. <b>LANCET</b> 379:1960-1966	21	54.773	4*		Wellcome Trust-Mahidol University-Oxford Tropical Medical Research Programme
Cheeseman IH et al. A major genome region underlying artemisinin resistance in malaria. <b>SCIENCE</b> 336:79-82	17	44.340	2*		Wellcome Trust-Mahidol University-Oxford Tropical Medical Research Programme
Prichard RK et al. A research agenda for helminth diseases of humans: intervention for control and elimination. <b>PLOS NEGLECT TROP D</b> 6	14	29.358		<i>Mentioned by:</i> 1 tweet <i>Readers:</i> 1 Mendeley	<b>Project Grant</b> to MG Basáñez; <b>International Senior Research Fellowship</b> in Public Health and Tropical Medicine to HH García
Ndiaye M et al. Assessment of the molecular marker of Plasmodium falciparum chloroquine resistance (Pfcr1) in Senegal after several years of chloroquine withdrawal. <b>AM J TROP MED HYG</b> 87:640-645	0	0		<i>Mentioned by:</i> 3 tweets; 1 Facebook page; 1 blog <i>Readers:</i> 7 Mendeley	<b>Strategic Award</b> to BM Greenwood

<b>NE – Public, Environmental &amp; Occupational Health</b>					
Borghol N et al. Associations with early-life socio-economic position in adult DNA methylation. <b>INT J EPIDEMIOL</b> 41:62-74	11	28.574	1*		<b>Technology Development Grant</b> to M Pembrey
Relton CL et al. Two-step epigenetic Mendelian randomization: a strategy for establishing the causal role of epigenetic processes in pathways to disease. <b>INT J EPIDEMIOL</b> 40: 47-62	9	23.379			<b>Strategic Award</b> to G Davey Smith
Smithers LG et al. Dietary patterns at 6, 15 and 24 months of age are associated with IQ at 8 years of age. <b>EUR J EPIDEMIOL</b> 27: 525-535	0	0		<i>Mentioned by:</i> 42 tweets; 15 Facebook pages; 3 blogs <i>Readers:</i> 5 Mendeley	ALSPAC study
<b>SA – Nutrition &amp; Dietetics</b>					
Barros FC et al. Cesarean section and risk of obesity in childhood, adolescence, and early adulthood: evidence from 3 Brazilian birth cohorts. <b>AM J CLIN NUTR</b> 95:465-470	3	6.088		<i>Mentioned by:</i> 10 tweets; 2 Facebook pages	<b>Programme Grant</b> to CG Victora
Romieu I et al. Dietary glycemic index and glycemic load and breast cancer risk in the European Prospective Investigation into Cancer and Nutrition (EPIC). <b>AM J CLIN NUTR</b> 96: 345-355	0	0		<i>Mentioned by:</i> 122 tweets; 13 Facebook pages; 1 Google+ posts <i>Readers:</i> 1 Mendeley	EPIC Project

CU – Biology					
Kanai R et al. Online social network size is reflected in human brain structure. <b>PROC R SOC B</b> 279: 1327-1334	10	18.508		<i>Mentioned by:</i> 264 tweets; 12 Facebook pages; 14 blogs; 21 Google+ posts; 2 Redditors <i>Readers:</i> 86 Mendeley; 9 CiteULike	<b>Senior Clinical Research Fellowship</b> to G Rees
Kishida KT et al. Implicit signals in small group settings and their impact on the expression of cognitive capacity and associated brain responses. <b>PHILOS TRANS R SOC LOND B</b> 367: 704-16	3	5.552		<i>Mentioned by:</i> 32 tweets; 10 blogs; 4 Google+ posts, 1 Redditor <i>Readers:</i> 50 Mendeley; 2 CiteULike	<b>Principal Research Fellowship</b> to P Read Montague
Wright ND et al. Testosterone disrupts human collaboration by increasing egocentric choices. <b>PROC R SOC B</b> 279:2275-2280	1	1.851		<i>Mentioned by:</i> 46 tweets; 2 Facebook pages; 1 blog; 3 Google+ posts <i>Readers:</i> 85 Mendeley; 1 CiteULike	Wellcome Trust Centre for Neuroimaging; <b>Programme Grant</b> to R Dolan

Source: Strategic Planning and Policy Unit; 2013

Fig. I.13: Number of peer-reviewed papers reported at 'end of grant' per funding stream



Base: 647 EoG report forms returned 1st October 2012-30th September 2013; Total includes 2 non-stream grants; Please note that three grants reported more than 150 publications – see Fig. I.10b for details.

Base: 1633 EoG report forms returned 1st October 2009-30th September 2012 – data averaged for the three years; Total includes 9 non-stream grants.

■ 2012/13  
□ Average of 2009/10 to 2011/12 data

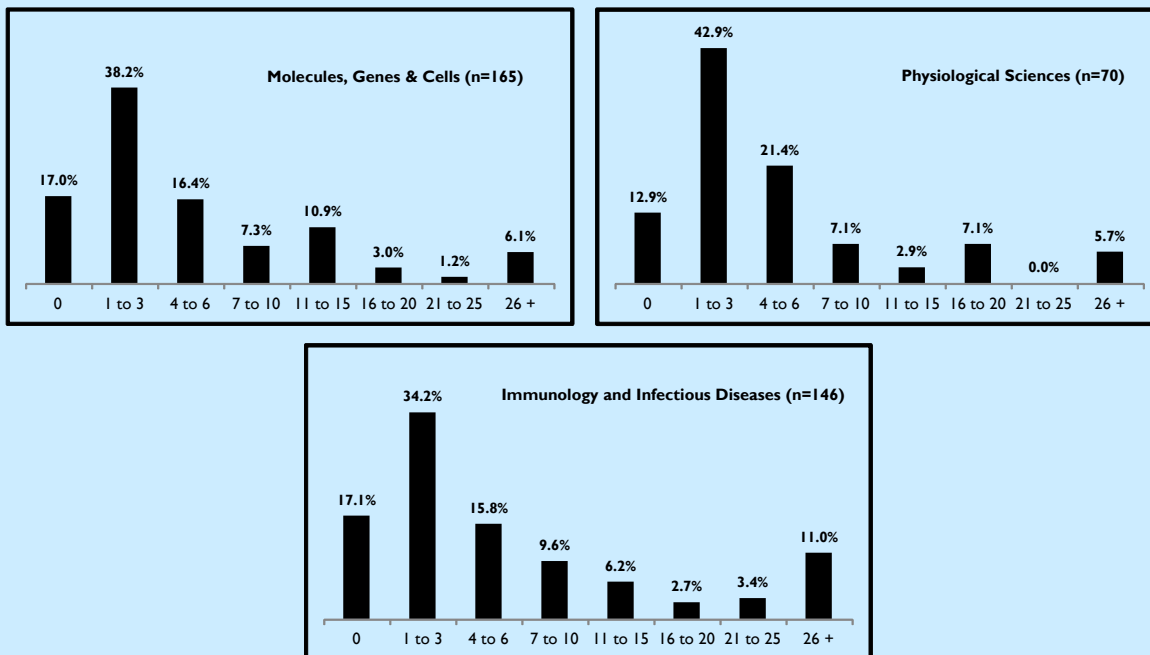
Assessment Framework 2012/13

Fig. I.14: Grants reporting over 150 papers at 'end of grant'

Grant holder	Grant title	Stream	Grant type	No of papers reported
Dr Brian Angus	Wellcome Trust Centre for research in Clinical Tropical Medicine at Oxford 2009 – 2013	Immunology & Infectious Diseases	Other – Wellcome Trust Centre	678
Dr David Batty	Life course and trans-generational influences on cardiovascular disease and cancer	Populations and Public Health	Research Career Development Fellowship	265
Professor Tim Spector	TwinsUK resource: Data and Sample Harmonisation towards Open Access and Cohort Maintenance	Populations and Public Health	Equipment	193

Assessment Framework 2012/13

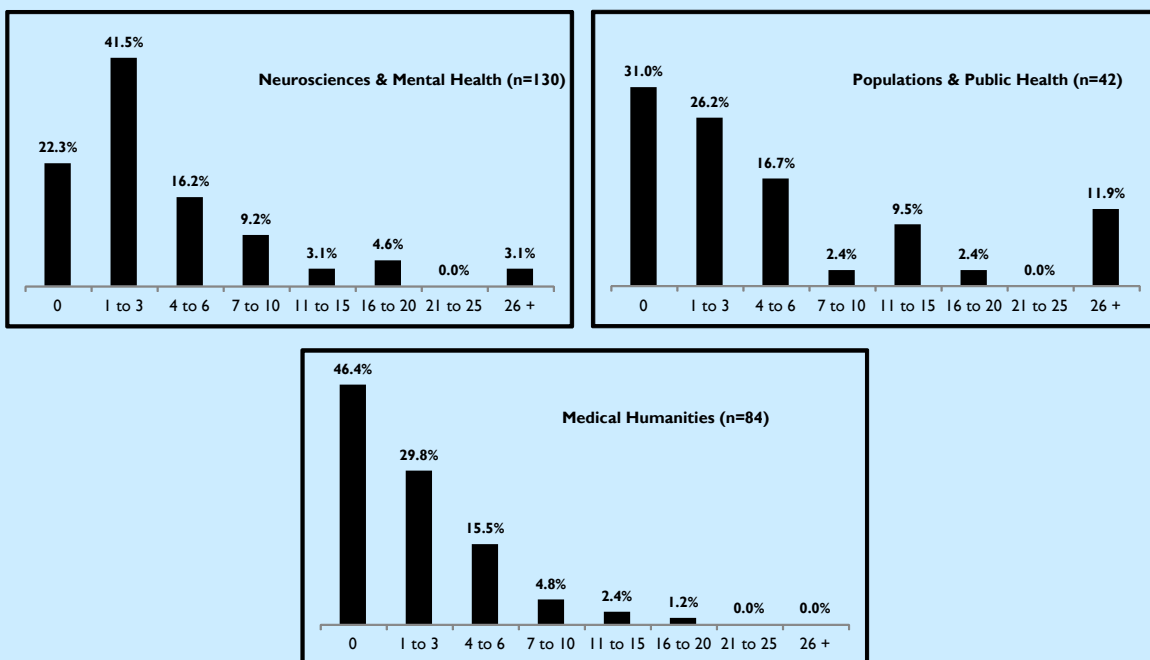
Fig. I.15: Number of peer-reviewed papers reported at 'end of grant' per funding stream - frequency distribution 2012-13



Base: 647 EoG report forms returned 1st October 2012-30th September 2013  
(There were only eight End of Grant report forms from Technology Transfer grants)

Assessment Framework 2012/13

Fig. I.16: Number of peer-reviewed papers reported at 'end of grant' per funding stream - frequency distribution 2012-13



Base: 647 EoG report forms returned 1st October 2012-30th September 2013  
(There were only eight End of Grant report forms from Technology Transfer grants)

Assessment Framework 2012/13

Fig. I.17: Number of peer-reviewed papers reported at 'end of grant' per grant type

Grant type	Total EoG Forms		Median no. of papers/grant	Lower and upper quartiles
Programme Grant	(42) (136)		16.00 20.00	13.00-22.75 10.75-36.00
Project Grant	(205) (682)		2.00 2.00	1.00-4.00 1.00-5.00
Principal/Senior Fellowship	(25) (73)		19.00 18.00	13.00-41.00 9.00-37.00
Intermediate Fellowship	(38) (136)		5.50 5.00	3.25-13.25 2.00-12.00
Equipment Grant	(28) (57)		5.50 9.90	3.75-15.25 2.00-25.00
Studentship	(182) (261)		1.00 1.00	0.00-2.00 0.00-2.00
Early Career Fellowship	(61) (123)		1.00 2.00	0.00-4.00 1.00-5.50
Other	(66) (165)		2.00 1.00	0.00-6.00 0.00-6.00
<b>TOTAL</b>	<b>(647) (1633)</b>		<b>2.00 3.00</b>	<b>1.00-6.00 1.00-8.00</b>

Base: 647 EoG report forms returned 1st October 2012-30th September 2013

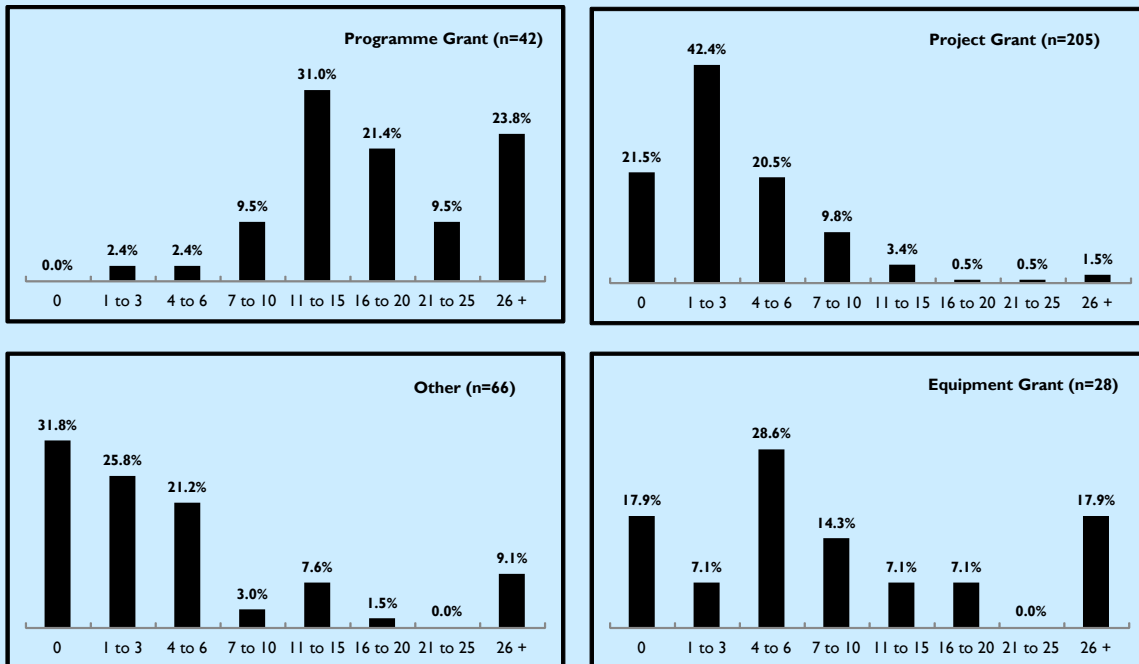
Base: 1633 EoG report forms returned 1st October 2009-30th September 2012 – data averaged for the three years

■ 2012/13

□ Average of 2009/10 to 2011/12 data

Assessment Framework 2012/13

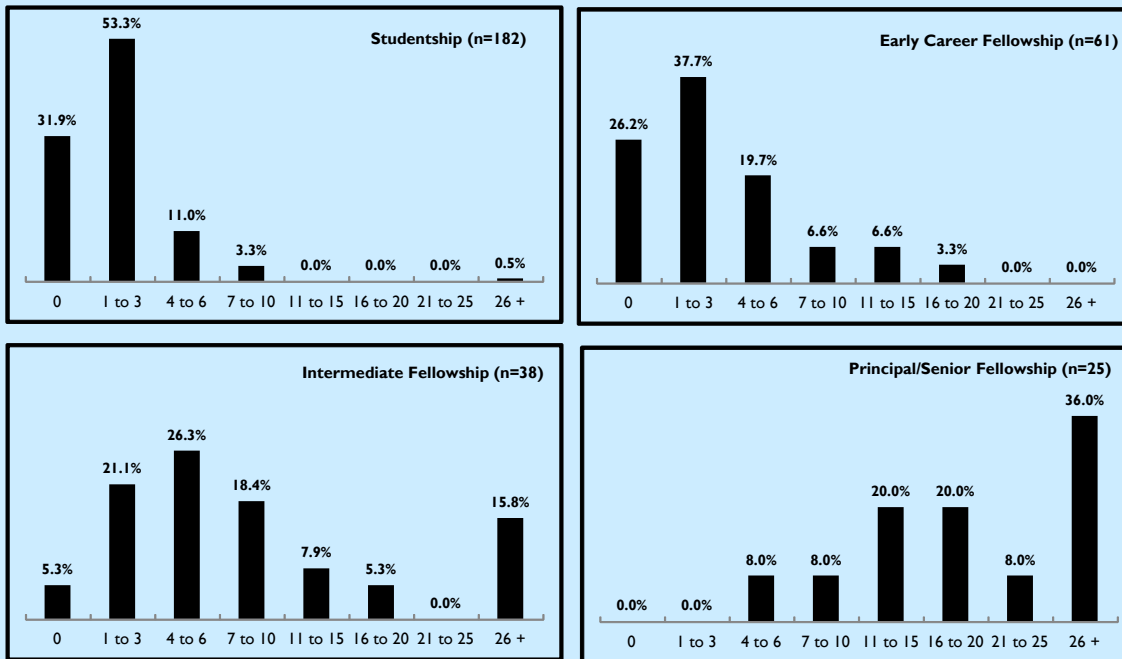
Fig. I.18: Number of peer-reviewed papers reported at 'end of grant' per grant type - frequency distribution 2012-13



Base: 647 EoG report forms returned 1st October 2012-30th September 2013

Assessment Framework 2012/13

Fig. I.19: Number of peer-reviewed papers reported at 'end of grant' per grant type - frequency distribution 2012-13



Base: 647 EoG report forms returned 1st October 2012-30th September 2013

Assessment Framework 2012/13

Fig. I.20: Number of books/monographs reported at 'end of grant' per funding stream

Stream	Total EoG Forms	2012/13	Average of 2009/10 to 2011/12 data	Range
Molecules, Genes & Cells	(165) (402)	88	100	0-20 0-69
Physiological Sciences	(70) (250)	98	50	0-21 0-13
Immunology & Infectious Diseases	(146) (361)	110	103	0-20 0-25
Neurosciences & Mental Health	(130) (278)	37	79	0-5 0-29
Populations & Public Health	(42) (102)	32	50	0-9 0-49
Medical Humanities	(84) (214)	70	42	0-10 0-18
Technology Transfer	(8) (17)	1	1	0-1 0-3
<b>TOTAL</b>	<b>(647) (1633)</b>	<b>436</b>	<b>426</b>	<b>0-21 0-69</b>

Base: 647 EoG report forms returned 1st October 2012-30th September 2013; Total includes 2 non-stream grants  
 Base: 1633 EoG report forms returned 1st October 2009-30th September 2012 – data averaged for the three years; Total includes 9 non-stream grants.

■ 2012/13  
 □ Average of 2009/10 to 2011/12 data

Assessment Framework 2012/13

**Figure 1.24 Key examples of generation of new knowledge**

Key WT Associated Researcher	Key WT Funding	Subject Area	Impact
<b>Molecules, Genes and Cells</b>			
Dr Rachel Freathy	Sir Henry Wellcome Postdoctoral Fellowship	Genetics, Child health	A study of almost 70,000 individuals has confirmed 3 genetic regions that influence birth weight. The study funded by the Wellcome Trust, the Netherlands Organisation for Scientific Research, the European Union, the Medical Research Council (UK), the Academy of Finland and the National Institute of Health (USA) has also identified 4 new genetic regions that are associated with birth weight, such as blood pressure in adulthood. The findings were published in <i>Nature Genetics</i> . <a href="http://www.nature.com/ng/journal/v45/n1/full/ng.2477.html">http://www.nature.com/ng/journal/v45/n1/full/ng.2477.html</a>
Professor Catherine Williamson	Programme Grant	Obesity, Diabetes	A study funded by the Wellcome Trust, Genesis Research Trust, Imperial College London and the National Institute for Health Research has found that children born to mothers with intrahepatic cholestasis of pregnancy (ICP) have a higher body mass index at age 16 than children born from non-cholestatic pregnancies. Offspring from a mouse model of the condition were also more prone to obesity and Diabetes than controls. The results, published in the <i>Journal of Clinical Investigation</i> , suggest that ICP can cause epigenetic alterations to infant metabolism which persist into adult life. <a href="http://www.jci.org/articles/view/68927">http://www.jci.org/articles/view/68927</a>
Dr Venki Ramakrishnan	Senior Investigator Award, Programme Grant	Genetics, Molecular Biology	Normally, the translation of proteins requires stop codons that start with a Uridine base but a group of investigators, led by Wellcome Trust funded researchers at the University of Cambridge, has shown that a pseudouridine can be incorporated instead and the ribosome is still able to correctly read the stop codon. This requires the formation of normally forbidden base pairing and suggests that under certain circumstances base pairing considered to be disallowed is possible, thereby allowing an expansion of the genetic code. The crystal structure of the 30S ribosome subunit in complex with tRNA bound to a pseudouridine containing stop codon was solved using the Diamond Light Source and published in the journal <i>Nature</i> . <a href="http://www.nature.com/nature/journal/v500/n7460/full/nature12302.html#contrib-auth">http://www.nature.com/nature/journal/v500/n7460/full/nature12302.html#contrib-auth</a>
Professor Sir Mike Stratton	Sanger Institute	Genetics, Cancer	Researchers from the Wellcome Trust Sanger Institute have identified traces of diverse mutational processes within cancer genomes that lead to the development of cancers. These compilations of mutational signatures found in numerous cancer genomes have profound implications for understanding how cancer develops, with potential applications in cancer prevention and treatment. The findings were published in <i>Nature</i> . <a href="http://www.nature.com/nature/journal/vaop/ncurrent/full/nature12477.html?WT.ec_id=NATURE-20130815">http://www.nature.com/nature/journal/vaop/ncurrent/full/nature12477.html?WT.ec_id=NATURE-20130815</a>
Dr Chris Bakal	Research Career Development Fellowship	Cancer	Researchers at the Institute of Cancer Research, Harvard Medical School and The Methodist Hospital Research Institute, Texas, have identified a set of genes, including the tumour suppressor <i>PTEN</i> , that regulate the ability of melanoma cells to change rapidly between two discrete shapes to escape from the skin and spread around the body. The findings were published in <i>Nature Cell Biology</i> and could pave the way for scientists to develop treatments for malignant melanoma. <a href="http://www.nature.com/ncb/journal/v15/n7/full/ncb2764.html?WT.ec_id=NCB-201307">http://www.nature.com/ncb/journal/v15/n7/full/ncb2764.html?WT.ec_id=NCB-201307</a>



Dr Chas Bountra	Strategic Award	Structural genomics	<p>Researchers in the Structural Genomics Consortium have solved the 3D structure of TREK-2, a human ion channel responsible for maintaining the normal hyperpolarised membrane potential of cells. The TREK-2 channel has been implicated in depression, nociception and cognition and is opened by neuroprotective compounds and inhibited by antidepressants such as Prozac, antipsychotics and some anaesthetics. Knowledge of its structure provides insight into the functional properties of the protein, its interactions and informs drug design. The 3D structure has been deposited in the ProteinDataBank. <a href="http://www.rcsb.org/pdb/explore/explore.do?structureId=4BW5">http://www.rcsb.org/pdb/explore/explore.do?structureId=4BW5</a></p>
Dr Derek Stemple	Sanger Institute	Genetics, Animal Models	<p>Researchers led by the Sanger Institute have sequenced the entire genetic make-up of the zebrafish to reveal that 70 per cent of protein-coding human genes are related to genes found in the zebrafish and that 84 per cent of genes known to be associated with human disease have a zebrafish counterpart. The study, published in <i>Nature</i>, highlights the importance of zebrafish as a model organism for human disease research. <a href="http://www.wellcome.ac.uk/News/2013/News/WTP052343.htm">http://www.wellcome.ac.uk/News/2013/News/WTP052343.htm</a></p>
Professor Daan van Aalten	Senior Research Fellowship in Basic Biomedical Science	Biochemistry	<p>Researchers at the University of Dundee have uncovered the mechanism of action of the enzyme O-GlcNAc transferase (OGT). OGT is the master regulator of O-linked N-acetylglucosamine (O-GlcNAc) which is at inappropriate levels in some forms of cancer, diabetes and dementia. This research, published in <i>Nature Chemical Biology</i>, sets the groundwork for designing inhibitors that can probe the role of O-GlcNAc in these different diseases and determine any therapeutic effect from inhibiting this enzyme. <a href="http://www.lifesci.dundee.ac.uk/news/2012/10/29/breakthrough-understanding-role-enzyme-disease">http://www.lifesci.dundee.ac.uk/news/2012/10/29/breakthrough-understanding-role-enzyme-disease</a></p>
Professor Nazneen Rahman	Genome Wide Association Study, Wellcome Trust Centre for Human Genetics, Oxford	Genetics	<p>A team of researchers led by the Institute of Cancer Research, London, have found that rare mutations in a gene called PPM1D are linked to an increased risk of breast and ovarian cancer. The mutations are not inherited and suggest that around one in five women with PPM1D mutations will develop breast or ovarian cancer in their lifetime (almost double the breast cancer risk and more than ten times the ovarian cancer risk of women in the general population). The discovery could have implications for genetic testing and targeted prevention, in particular for ovarian cancer, which is often diagnosed at an advanced stage. The findings were published in <i>Nature</i>. <a href="http://www.wellcome.ac.uk/News/2012/News/WTP041104.htm">http://www.wellcome.ac.uk/News/2012/News/WTP041104.htm</a></p>
Mr Felix Schumacher	PhD Studentship	Cancer, Diagnostics	<p>Researchers at University College London have developed a method to generate homogeneous antibody conjugates for therapeutic and diagnostic use. In <i>Nature Scientific Reports</i>, with Schumacher as a first author, they describe the generation of homogeneous antibody conjugates in one quick site-specific chemical step using maleimides to functionalise the disulphide bond and add a label that can be detected using electron spin resonance (ESR). The researchers have demonstrated the use of the new type of antibody conjugate in determining the presence of certain cancer biomarkers. The methodology has been termed "spinostics". <a href="http://www.nature.com/srep/2013/130322/srep01525/full/srep01525.html">http://www.nature.com/srep/2013/130322/srep01525/full/srep01525.html</a></p>

Cellular, Developmental and Physiological Sciences			
Professor Andrew Hattersley	Senior Investigator Award	Genetics, Metabolic disorders	An international research team led by Professor Andrew Hattersley at the University of Exeter have pinpointed the single genetic mutation responsible for MDP syndrome – a condition thought to affect as few as eight people in the world, including National Paracycling Champion Tom Staniford. The discovery was made possible by new genome sequencing technology, which will increasingly assist scientists in the development of therapies for extremely rare genetic disorders. The findings were published in <i>Nature Genetics</i> . <a href="http://www.nature.com/ng/journal/v45/n8/full/ng.2670.html">http://www.nature.com/ng/journal/v45/n8/full/ng.2670.html</a>
Professor David Gems	Programme Grant	Ageing	Researchers funded by the Wellcome Trust and the Biotechnology and Biological Sciences Research Council have identified a chemical pathway of cell-death in worms, revealing the means by which necrosis spreads throughout the worm at the end of its life. The mechanisms involved are similar to those active in mammals, and may provide a useful model to understand cell death in humans. The findings were published in <i>PLOS Biology</i> . <a href="http://www.plosbiology.org/article/info:doi/10.1371/journal.pbio.1001613">http://www.plosbiology.org/article/info:doi/10.1371/journal.pbio.1001613</a>
Immunology and Infectious Diseases/Populations and Public Health			
Professor Charles Newton	Senior Research Fellowship in Clinical Science	Epidemiology, Epilepsy	A study conducted at the International Network for the Demographic Evaluation of Populations and Their Health (INDEPTH) demographic surveillance sites in Kenya, South Africa, Uganda, Tanzania and Ghana has screened 586,607 residents and identified 1711 that were diagnosed as having active convulsive epilepsy. The aim of the study is to understand the prevalence of epilepsy in Africa and the impact of putatively associated risk factors. <a href="http://www.wellcome.ac.uk/News/Media-office/Press-releases/2013/WTP051537.htm">http://www.wellcome.ac.uk/News/Media-office/Press-releases/2013/WTP051537.htm</a>
Dr Markus Meissner	Senior Research Fellowship in Basic Biomedical Science	Parasitology	A study published in <i>Nature Methods</i> , by researchers at the Wellcome Trust Centre of Molecular Parasitology at the University of Glasgow, has transformed thinking on how the <i>Toxoplasma gondii</i> parasite invades its host. The findings have implications for the development of drugs that are currently being produced based on previous knowledge, and which may therefore be ineffective. <a href="http://www.nature.com/nmeth/journal/v10/n2/full/nmeth.2301.html?WT.ec_id=NMETH-201302">http://www.nature.com/nmeth/journal/v10/n2/full/nmeth.2301.html?WT.ec_id=NMETH-201302</a>
Dr Cameron Simmons	Senior Research Fellowship in Basic Biomedical Science	Dengue Fever	Scientists at the Oxford University Clinical Research Unit at the Hospital for Tropical Disease in Vietnam have identified the dose of dengue virus in human blood that is required to infect mosquitoes when they bite. Understanding the level of virus needed for transmission will assist the development of experimental drugs and vaccines. The study was published in the <i>Proceedings of the National Academy of Sciences</i> . <a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3670336/">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3670336/</a>
Dr Seena Fazel	Senior Research Fellowship in Clinical Science	Epidemiology, Epilepsy, Mental Health	The correlation between premature death and mental illness among people with epilepsy is considerably higher than previously thought, according to the findings of a 41-year study published in <i>The Lancet</i> . The study, funded by the Wellcome Trust, the Swedish Prison and Probation Service and the Swedish Research Council, compared the mortality and cause of death of 69,995 people with epilepsy born between 1954 and 2009 with 660,869 age and sex matched controls. Significantly more epileptics died during the study, and of those 16% were due to accident or suicide.

<http://press.thelancet.com/epilepsy.pdf>

**Neuroscience and Mental Health**

Professor Nilli Lavie	Project Grant	Cognition, Memory	A study has found that individuals can suffer from 'inattentive blindness' when they are focusing on remembering something specific. The study was led by Professor Nilli Lavie from UCL Institute of Cognitive Neuroscience and the findings were published in the <i>Journal of Cognitive Neuroscience</i> . <a href="http://www.ncbi.nlm.nih.gov/pubmed/22905823">http://www.ncbi.nlm.nih.gov/pubmed/22905823</a>
Professor Ian Goodyer	Project Grant	Child Psychiatry	A study funded by the Wellcome Trust and the Medical Research Council has found that teenage girls with severe antisocial behaviour show abnormal changes in the structure of their brains. The study was published in the <i>Journal of Child Psychology and Psychiatry</i> . <a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3562487/">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3562487/</a>
Professor Simon Lovestone	Programme Grant	Alzheimer's Disease	A study led by researchers at King's College London's Institute of Psychiatry has found new targets for drug discovery that could be exploited to combat Alzheimer's disease. The study gives the most detailed understanding yet of the complex processes leading to the disease. The study was largely funded by the Wellcome Trust, the Alzheimer's Society, BUPA foundation and Alzheimer's Research UK, and was published in the journal <i>Molecular Psychiatry</i> <a href="https://www.ncbi.nlm.nih.gov/m/pubmed/23164821/?i=4&amp;from=/23333523/related">https://www.ncbi.nlm.nih.gov/m/pubmed/23164821/?i=4&amp;from=/23333523/related</a>
Dr Dharshan Kumaran	Intermediate Clinical Fellowship	Cognitive Neuroscience	Researchers at UCL's Institute of Cognitive Neuroscience have discovered that we use a different part of our brain to learn about social hierarchies than we do to learn about ordinary information. Twenty six volunteers were asked to play a simple science fiction computer game while they were monitored by functional magnetic resonance imaging to monitor their brain activity. The findings will be published in <i>Neuron</i> . <a href="http://www.ncbi.nlm.nih.gov/pubmed/23141075">http://www.ncbi.nlm.nih.gov/pubmed/23141075</a>
Professor Ray Dolan	Senior Investigator Award	Cognitive Neuroscience	A study at the Wellcome Trust Centre for Neuroimaging at UCL has identified the specific areas of the brain that compute the value of options presented to us and our confidence in the decisions we make. The new research, carried out with the use of the functional magnetic resonance imaging (fMRI), has shown that the interaction between the ventromedial prefrontal cortex and an adjacent area of the brain. The findings are published online in <i>Nature Neuroscience</i> . <a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3786394/">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3786394/</a>
Professor Andrew King	Principal Research Fellowship	Auditory function	A ferret model of otitis media (inflammation of the middle ear) has revealed insights into how the brain switches between different strategies to localise sounds during periods of partial hearing loss. The results, published in <i>Current Biology</i> , suggest that the brain becomes more reliant on spectral cues arising from sounds filtered by the outer ear during periods of hearing loss in one ear. The study has implications for the treatment of 'Glue Ear', which is experienced at least once by age 10 in eight out of ten children. <a href="http://www.ncbi.nlm.nih.gov/pubmed/23810532">http://www.ncbi.nlm.nih.gov/pubmed/23810532</a>
Dr Maria Chait	Project Grant	Auditory function	A study, co-funded by the Wellcome Trust and Deafness Research UK and published in <i>eLife</i> , has revealed the importance of time to the brain's ability to differentiate salient sounds from background noise. The findings improve on previous models of the 'cocktail party

			problem' which emphasise the roles of frequency and pitch, and could lead to new diagnostic tests for neurological hearing disorders. <a href="http://elife.elifesciences.org/content/2/e00699">http://elife.elifesciences.org/content/2/e00699</a>
Professor Dimitri Kullmann	Project Grant	Optogenetics, Epilepsy	Researchers at UCL have shown that gene therapy in a rodent model of epilepsy can be used to suppress seizures and treat established focal epilepsy. The authors used optogenetic inhibition of a subset of neurons in the mouse brain to attenuate seizures. This work was published in <i>Science Translational Medicine</i> . <a href="http://stm.sciencemag.org/content/early/2012/11/12/scitranslmed.3004190">http://stm.sciencemag.org/content/early/2012/11/12/scitranslmed.3004190</a>
Professor Scott Waddell	Senior Fellow in Basic Biomedical Research	Decision making and cell biology	Research published in <i>Science</i> and <i>Neuron</i> has provided evidence for differential expression of transposons in subsets of mushroom body neurons that drive genetic heterogeneity. This research opens up exciting opportunities to address how transposition leads to genetic heterogeneity for cell-type specialisation, which may impact behaviour. <a href="http://www.sciencemag.org/content/340/6128/91.short">http://www.sciencemag.org/content/340/6128/91.short</a>
<b>Medical Humanities</b>			
Professor Simon Swain	Project Grant	History of Medicine	The translation of several 'lost' resources of ancient Greco-Roman medicine into English has ensured the continued accessibility of important texts on the development of clinical medicine to researchers and clinicians across the world. Three books (one collected volume of critical essays and two editions of Galen's commentaries) have resulted from this funding and represent a fundamental addition to the Galenic corpus. It is uniquely valuable, because of the continued intellectual legacy that Galen left to the field medicine. <a href="http://wellcomehistory.wordpress.com/2013/02/24/rediscovering-medical-history-through-ancient-texts/">http://wellcomehistory.wordpress.com/2013/02/24/rediscovering-medical-history-through-ancient-texts/</a>
Professor Mark Jackson	Programme Grant	History of Medicine	A study has revealed the social, cultural, political and economic factors that have shaped physiological studies of stress during the twentieth century. The research explores the history of scientific studies of stress in the modern world and how the science that legitimates and fuels current anxieties about stress has been shaped by a wide range of socio-political and cultural, as well as biological, factors. The research resulted in the acclaimed book <i>The Age of Stress</i> published by OUP in 2013. <i>The Age of Stress: Science and the Search for Stability</i> , Oxford University Press, 2013

Source: [www.wellcome.ac.uk](http://www.wellcome.ac.uk); Science Funding, Medical Humanities & Engagement; 2013

## CONTRIBUTIONS TO DISCOVERIES WITH (POTENTIAL) TANGIBLE IMPACTS ON HEALTH

Figure 1.25 Key examples of research with (potential) tangible impacts on health			
Key WT Associated Researcher	Key WT Funding	Subject Area	Impact
<b>Molecules, Genes and Cells</b>			
Professor Sharon Peacock	Sanger Institute	Genetics, MRSA, Diagnostics	<p>Researchers from the Wellcome Trust Sanger Institute, the University of Cambridge and Cambridge University Hospitals have used advanced DNA sequencing technologies to confirm the presence of an ongoing outbreak of methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) in a Special Care Baby Unit in real time. This helped the outbreak to be stopped earlier, preventing possible harm to patients. Using this technology, the team revealed that the outbreak had extended into the wider community. They also used sequencing to link the outbreak to an unsuspecting carrier, who was treated to eradicate MRSA. The findings and methodology were published in <i>The Lancet Infectious Diseases</i>.</p> <p><a href="http://www.ncbi.nlm.nih.gov/pubmed/23158674">http://www.ncbi.nlm.nih.gov/pubmed/23158674</a></p>
Professor John Todd	Strategic Award	Type 1 Diabetes	<p>Researchers at the Juvenile Diabetes Research Foundation/Wellcome Trust Diabetes and Inflammation Laboratory, at the University of Cambridge, have begun a clinical trial for a potential new treatment for type 1 Diabetes that could eventually mean patients are able to reduce insulin treatment from several times a day to once or twice a week. The new treatment is a direct result of previous research which identified variants of one particular gene - known as interleukin-2, or IL2 - that seem to have a prominent role in the disease. IL-2 is important in helping regulate the immune system.</p> <p><a href="http://www.wellcome.ac.uk/News/Media-office/Press-releases/2013/WTP052844.htm">http://www.wellcome.ac.uk/News/Media-office/Press-releases/2013/WTP052844.htm</a></p>
Professor Andrew Wilkie	Project Grant	Genetics	<p>Researchers at Oxford University have discovered two new genetic causes of craniosynostosis - a rare bone condition that can inhibit brain growth in children. Instances of craniosynostosis with a genetic cause carry a risk of being inherited and, in most cases, are more severe forms of the disorder. The research provides the opportunity for families and clinicians to be more prepared and plan treatments for future patients. The research was published in two articles in <i>Nature Genetics</i>.</p> <p><a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3683605/">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3683605/</a>  <a href="http://www.ncbi.nlm.nih.gov/pubmed/23354436">http://www.ncbi.nlm.nih.gov/pubmed/23354436</a></p>
<b>Immunology and Infectious Diseases/Populations and Public Health</b>			
Professor Jonathan Weber	Strategic Awards	HIV	<p>A new study has added to the evidence that early initiation of HIV treatment benefits individuals by preventing severe disease and reducing the danger of transmitting the infection. The SPARTAC study was funded by the Wellcome Trust, and coordinated by researchers from Imperial College London and the Medical Research Council Clinical Trials Unit. <a href="http://www.wellcome.ac.uk/News/Media-office/Press-releases/2013/WTP041441.htm">http://www.wellcome.ac.uk/News/Media-office/Press-releases/2013/WTP041441.htm</a></p>

Neuroscience and Mental Health			
Professor Peter Howell	Programme Grant	Speech	Researchers have developed a new model to predict the persistence of stuttering which could be used to screen all children as they enter primary school, enabling early intervention to take place where needed. The research has been published in the <i>Journal of Fluency Disorders</i> . <a href="http://www.ncbi.nlm.nih.gov/pubmed/23773664">http://www.ncbi.nlm.nih.gov/pubmed/23773664</a>
Dr Rumana Chowdhury	Research Training Fellowship	Ageing	Increasing levels of dopamine in the brain by administering the drug Levodopa improves the decision making abilities of adults in their seventies, according to the findings of a study by Dr Rumana Chowdhury at the Wellcome Trust Centre of Neuroimaging. The study has been published in the journal <i>Nature Neuroscience</i> . <a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3672991/">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3672991/</a>
Professor Paul Fletcher	Senior Fellowship in Clinical Science	Obesity, Eating Disorders	A clinical trial conducted by Paul Fletcher and colleagues has shown that a novel, potent mu-opioid receptor antagonist is associated with a significant reduction in brain responses to high-calorie food. The results provide a link between the brain's opioid system and food-related behaviour, which could pave the way for future clinical interventions to reduce over eating in obese individuals. This work was published in <i>Biological Psychiatry</i> . <a href="http://www.biologicalpsychiatryjournal.com/article/S0006-3223(12)00944-4/abstract">http://www.biologicalpsychiatryjournal.com/article/S0006-3223(12)00944-4/abstract</a>
Medical Humanities			
Professor Mary Dixon-Woods	Senior Investigator Award	Bioethics, Healthcare delivery	Research examining the ethical issues involved in delivering and researching patient safety and quality in healthcare is generating attention in media and policy circles. An aspect of the research, including analysis of the potential for the use of surgical check lists in clinical practice, was recently featured on the BBC World Service's <i>Health Check</i> programme (August 2012). In a paper published in <i>BMJ Open</i> the researchers conclude that surgical checklists should be used 'only' as part of multifaceted cultural and organisational programmes to strengthen patient safety. Despite being only recently published, the paper has already attracted considerable attention – particularly via social media - featuring in the top 5% of all articles ever tracked by Altmetric. <a href="http://bmjopen.bmj.com/content/3/8/e003039.full">http://bmjopen.bmj.com/content/3/8/e003039.full</a>

Source: [www.wellcome.ac.uk](http://www.wellcome.ac.uk); Science Funding & Medical Humanities, 2013

## 2. APPLICATIONS OF RESEARCH

- Contributions to the development of enabling technologies, products and devices
- Uptake of research into policy and practice

### CONTRIBUTIONS TO THE DEVELOPMENT OF ENABLING TECHNOLOGIES, PRODUCTS AND DEVICES

**Figure 2.1 Number of grants involved in IP-related activity (reported at end of grant)**

Activity	2009/2012	2012/13
Number of grants resulting in patent filing	N=82/1633 (5.0%)	N=36/647 (5.6%)
Number of grants acquiring product licences	N=23/1633 (1.4%)	N=10/647 (1.5%)
Number of grants collaborating with commercial partners	N=231/1633 (14.1%)	N=112/647 (17.3%)

Base: 1633 EoG report forms returned 1 October 2009 - 30 September 2012

Base: 647 EoG report forms returned 1 October 2012 - 30 September 2013

**Figure 2.2 Overview of Technology Transfer activity: developing technologies, products and devices**

Activity	2008/09	2009/10	2010/11	2011/12	2012/13
Cases where consent to commercial exploitation granted by Wellcome Trust	12	15	10	10	13
Projects partnered through licensing	8	12	9	10	13
Inventions arising from Wellcome Trust Translation Awards	7	17	20	11	40
Number of Wellcome Trust Translation Awards that received follow-on funding	5	10	19	18	25
Venture capital finance secured in follow-up to Wellcome Trust funding (in £million)	192	107	122	185	218

Source: Technology Transfer; 2013

**Figure 2.3 Cases where Wellcome Trust's consent right to commercial exploitation exercised during 2012/13 (including Wellcome Trust-funded projects licensed during 2012/13) – Redacted Figure**

Product	Subject Area	Key WT Associated Researcher	Key WT Funding	Details
<b>Alzheimer's Disease Therapeutics</b>	Alzheimers	Professor Jonathan Corcoran  King's College London	Seeding Drug Discovery Award	Licensed to Coco Therapeutics Limited.  <b>(Licence)</b>
<b>Typhoid and paratyphoid fever vaccines</b>	Infectious diseases, Vaccines	Dr Laura Martin  Novartis Vaccines Institute for Global Health	Strategic Award	Licensed to Biological E Limited.  <b>(Licence)</b>
<b>Dengue Fever antiviral drugs</b>	Infection, Drugs	Professor Johan Neyts  Rega Institute, KU Leuven	Seeding Drug Discovery Award	Licence Option to Janssen Pharmaceuticals Inc.  <b>(Licence)</b>

Source: Technology Transfer; 2013


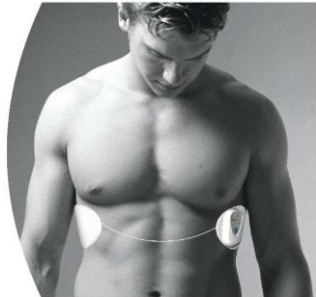
**Figure 2.5 Overview of venture capital & industry finance secured in follow-up funding, 2012/13 – Redacted Figure**

Source	Amount	Key WT Funding
PTC Therapeutics Ltd	\$125m (£82.4m)	Seeding Drug Discovery Award
Achaogen Inc.	\$85m (£56m)	Seeding Drug Discovery Award
Biocartis SA	€34.5m (£28m)	Strategic Translation Award
Biota Pharmaceuticals Inc.	\$27m (£16.8m)	Seeding Drug Discovery
Polytherics Ltd	£13.5m	Translation Award
Sapiens Steering Brain Stimulation B.V	€7.5m (£6.4m)	Strategic Translation Award
Canbex Therapeutics Ltd	\$3.2m (£2.1m)	Translation Award
PsiOxus Therapeutics Ltd	£1.7m	Translation Award
Haemostatix Ltd	£0.8m	Translation Award

Source: Technology Transfer; 2013



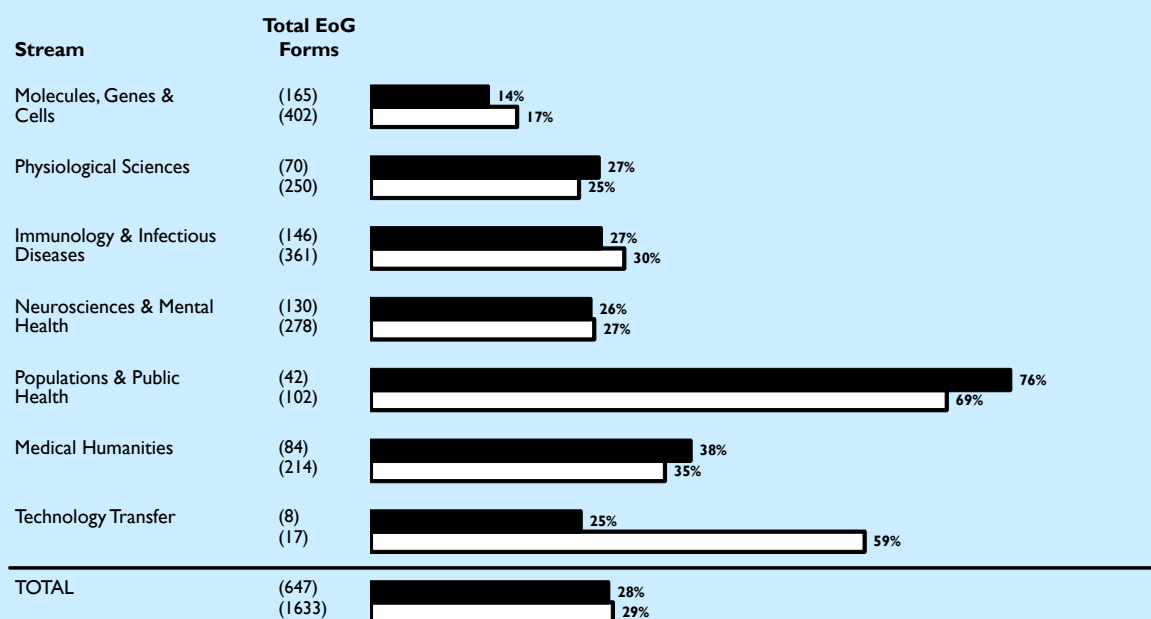
**Figure 2.7 Key new and existing products and devices in use during 2012/13, developed through previous Trust funding – Redacted Figure**

Product	Key WT Associated Researcher/Company	Key WT Funding	Details
<p>Newton Nm1 - Portable Field Microscope for tropical disease diagnosis</p>	<p>Keith Dunning and Richard Dickinson  Newton Microscopes Ltd</p>	<p>Translation Award</p>	<p>The Newton Nm1 is a robust, portable, affordable microscope for tropical disease diagnosis at the health periphery.</p> <p>It is also well suited to a range of other applications from healthcare to field science, general microscopy, micro-photography and veterinary pathology. The Newton Nm1 is marketed by Newton Microscopes Ltd.</p> 
<p>'Aingeal' wireless respiration detection and ECG analysis device for in-hospital patient monitoring</p>	<p>Professor Jim McLaughlin  Intelesens Ltd</p>	<p>Translation Award</p>	<p>The Aingeal is designed to provide in-hospital wireless respiration detection, ECG analysis and cardiac event detection.</p> <p>It is designed to be rapidly added to or integrated into medical devices or systems. The Aingeal is marketed by Intelesens Ltd.</p> 

Source: Technology Transfer; 2013

## UPTAKE OF RESEARCH INTO POLICY AND PRACTICE

Fig. 2.8: Proportion of grants reporting engagement with policy makers and healthcare professionals at 'end of grant'



Base: 647 EoG report forms returned 1st October 2012-30th September 2013; Total includes 2 non-stream grants  
 Base: 1633 EoG report forms returned 1st October 2009-30th September 2012 – data averaged for the three years; Total includes 9 non-stream grants.

■ 2012/13  
 □ Average of 2009/10 to 2011/12 data

Assessment Framework 2012/13

**Figure 2.9 Key examples of uptake of research into policy and practice in 2012/13**

Key WT Associated Researcher	Stream	Key WT Funding	Area of Research	Impact
Dr Maciej Boni	Populations and Public Health	Sir Henry Dale Fellowship	Pandemics	The Wellcome Trust Oxford University Clinical Research Unit has completed the first population-level study of immunity to the H7N9 virus. The findings, published in the <i>Journal of Infectious diseases</i> , suggest that people living in Southern Vietnam have had very little or no previous exposure to H7, and therefore possess very low immunity to the virus. These findings have important implications for pandemic preparedness plans in this area. <a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3719906/">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3719906/</a>
Professor Ulf Schmidt	Medical Humanities (Society & Ethics)	Project Grant	Bioethics	The project provides, for the first time, an analysis of the ethical, political and legal dimensions of Britain's chemical and biological warfare programme during the Cold War. The research has helped inform the discussion between the Ministry of Defence and the Porton Down Veterans Support Group, resulting in a comprehensive compensation scheme for the Porton Down veterans by the Government, and an apology in the House of Commons. <a href="http://www.kent.ac.uk/porton-down-project/">http://www.kent.ac.uk/porton-down-project/</a>
Dr Gareth Owen	Medical Humanities (Society & Ethics)	Research Fellowship for Health Professionals  Parliamentary Office of Science & Technology (POST) Fellowship	Mental Health	Dr Owen's research provides new understanding of abilities that can become threatened when a person is severely depressed.  Through his 'POSTnote' from his Trust POST Fellowship and the contacts he made whilst placed in Westminster, he has influenced the shaping of the agenda of the House of Lords Select Committee on the Mental Capacity Act. He has also just submitted written evidence to this committee with research-based recommendations.  <a href="http://www.parliament.uk/business/committees/committees-a-z/lords-select/mental-capacity-act-2005/">http://www.parliament.uk/business/committees/committees-a-z/lords-select/mental-capacity-act-2005/</a>
Professor Stephen Wilkinson	Medical Humanities (Society & Ethics)	Senior Investigator Award	Bioethics, Reproductive Health	Professor Wilkinson's work on reproductive ethics and the regulation of reproductive technologies has played a role, being cited, in the recent report of the UK Parliament Inquiry into Abortion

				<p>on the Grounds of Disability. The Inquiry's recommendations included allowances for retaining the time limit for abortion on the grounds of disability at birth (rather than the 24 weeks limit specified in the 1967 Act). The evidence of these researchers informed the moral and legal justification for this position.</p> <p>Professor Wilkinson's work has also received significant national and international media coverage.</p> <p><a href="http://www.abortionanddisability.org/">http://www.abortionanddisability.org/</a></p> <p><a href="http://www.keele.ac.uk/media/keeleuniversity/ri/risocsci/eugenics2013/Eugenics%20and%20the%20ethics%20of%20selective%20reproduction%20Low%20Res.pdf">http://www.keele.ac.uk/media/keeleuniversity/ri/risocsci/eugenics2013/Eugenics%20and%20the%20ethics%20of%20selective%20reproduction%20Low%20Res.pdf</a></p>
--	--	--	--	---

Source: [www.wellcome.ac.uk](http://www.wellcome.ac.uk); Science Funding, Medical Humanities & Engagement; 2013

## Figure 2.10 Wellcome Trust-associated work featuring on National Institute for Health and Care Excellence (NICE) clinical guidelines - 2013 Update

The National Institute for Health and Care Excellence (NICE)<sup>20</sup> develop and disseminate clinical guidelines for the NHS in England and Wales. Clinical guidelines are recommendations on the appropriate treatment and care of people with specific diseases and conditions and they are based on the best available evidence.

As a result of a collaboration between the Wellcome Trust, National Centre for Biotechnology Information (NCBI) a project to digitise and improve access to clinical guidelines is underway.

A total of 142 historic NICE guidelines are digitised and are now available on the US National Library of Medicine (NLM) Bookshelf service with a remaining 16 in the process of digitisation<sup>21</sup>. Inclusion of the NICE guidelines on the NLM Bookshelf has increased the international reach of the guidelines; between Sep 2012 and May 2013, the total page views increased from 45,000 to just over 70,000.

An analysis of the 142 guidelines has been conducted to investigate the extent to which Trust-associated scientific research papers are impacting on clinical activities through NICE guidance. Currently 155 Trust-associated papers are cited across 67 of the 142 guidelines (with 12 papers cited in more than one guideline)<sup>22</sup>. These papers are published across 77 different journals: the *British Medical Journal* is the most commonly featured journal with 18 papers, and the cohort includes 14 papers from the *Lancet* and 11 from the *British Journal of Psychiatry*.

NICE group the guidelines under broad topic area, the guideline topics where Trust-associated papers most commonly feature to date are listed in Fig 2.11., with the most number (69) being in the Mental health and behavioural topic. Of individual guidelines the Post-traumatic stress disorder (PTSD) guideline<sup>23</sup>, and the Eating disorders guideline<sup>24</sup> both cite the most Trust-associated papers (n=12), followed by the guideline for Obesity<sup>25</sup> (n=10), see Fig 2.12. Fig 2.13 shows the authors linked to the most Trust-associated papers cited by NICE clinical guidelines, Professor Christopher Fairburn is co-author on ten papers cited by the Eating disorders guideline.

For 43 Trust-associated papers published between 2005 and 2012 and cited by NICE guidelines, twelve are highly cited with an NCI  $\geq 8$ . One paper cited by four guidelines: Lipid modification; Type 2 diabetes; Stroke, and Stable angina has an NCI of 159.616 and has been cited over 2,000 times, as at the end of 2012<sup>26</sup>.

Source: Strategic Planning and Policy Unit; 2013

<sup>20</sup> In April 2013 NICE became a Non Departmental Public Body (NDPB) as set out in the Health and Social Care Act 2012, taking on responsibility for developing guidance in social care, hence the name change [http://www.nice.org.uk/aboutnice/howweare/who\\_we\\_are.jsp](http://www.nice.org.uk/aboutnice/howweare/who_we_are.jsp)

<sup>21</sup> As at June 2013

<sup>22</sup> Search conducted on PubMed using the search command: *Wellcome Trust [gr] "books pubmed nicecollect"* [Filter]

<sup>23</sup> NICE (2006) CG26 Post-traumatic stress disorder (PTSD). <http://publications.nice.org.uk/post-traumatic-stress-disorder-ptsd-cg26>

<sup>24</sup> NICE (2004) CG9 Eating disorders. <http://publications.nice.org.uk/eating-disorders-cg9>

<sup>25</sup> NICE (2006) CG43 Obesity. <http://publications.nice.org.uk/obesity-cg43>

<sup>26</sup> Baigent C et al. Efficacy and safety of cholesterol-lowering treatment: prospective meta-analysis of data from 90,056 participants in 14 randomised trials of statins (2005) *Lancet* 366(9493):1267-1278

**Figure 2.11 NICE Clinical Guideline topic where Trust-associated papers are most commonly featured**

NICE Clinical Guideline Topic	Number of WT-associated papers cited	Total number of guidelines citing WT-associated papers	Total number of digitised guidelines in topic area
Mental health and behavioural conditions	69	20	27
Gynaecology, pregnancy and birth	25	9	14
Endocrine, nutritional and metabolic	14	5	11
Cardiovascular	13	9	18

Source: Strategic Planning and Policy Unit; 2013

**Figure 2.12 NICE Clinical guidelines citing the most Trust-associated papers**

NICE Clinical Guideline	Number of WT-associated papers cited
Post-traumatic stress disorder	12
Eating disorders	12
Obesity	10
Antenatal care <sup>27</sup>	9
Schizophrenia <sup>28</sup>	7

Source: Strategic Planning and Policy Unit; 2013

<sup>27</sup> NICE (2008) CG62 Antenatal care <http://publications.nice.org.uk/antenatal-care-cg62>

<sup>28</sup> NICE (2009) CG82 Schizophrenia <http://publications.nice.org.uk/schizophrenia-cg82>

**Figure 2.13 Examples of Trust-funded researchers being cited on NICE Clinical Guideline**

Key WT-Associated Researcher	Key WT Funding	NICE Clinical Guideline	No. of WT-associated papers	Details
Professor Christopher Fairburn	Principal Research Fellowship; Programme grants	Eating disorders	10	Professor Fairburn was a member of the eating disorders guideline development group, which included ten papers which he co-authored (published during the 1990s). In 2004, his cognitive behavioural therapy for bulimia nervosa was the first psychological intervention to be recognised by NICE as the leading treatment for a clinical condition and recommended for routine use in the NHS.
Professor Anke Ehlers	Principal Research Fellowship	Post-traumatic stress disorder	9	Professor Ehlers co-Chaired the PTSD guideline, which included nine papers which she had co-authored. She has developed cognitive behavioural therapies for anxiety disorders including PTSD, and developed psychological treatments that have been shown to be more effective than other therapies and/or drugs.
Professor Jean Golding	Programme grant	Obesity; Feverish illness in children <sup>29</sup> ; Nocturnal enuresis <sup>30</sup> ; Antibiotics for early-onset neonatal infection <sup>31</sup> ; When to suspect child maltreatment <sup>32</sup>	7	The Avon Longitudinal Study of Parents and Children (ALSPAC) launched in 1991, is a long-term population study following 14,000 children born in the early 1990s. The study has received core funding from the Trust since its inception. Seven papers associated with ALSPAC are included across five guidelines.
Dr Caroline Fall and Dr Chittaranjan Yajnik	Collaborative Research Initiative grant; Programme grant	Obesity	4	Dr Fall and Dr Yajnik are co-authors on four papers included in the guideline.
Professor Theresa Marteau	Programme grant	Antenatal care	3	Professor Marteau has three papers included in the guideline. Professor Marteau has since been awarded a Biomedical Ethics Strategic Award for the Centre for the Study of Incentives in Health at King's College, London.

<sup>29</sup> NICE (2013) CG160 Feverish illness in children <http://publications.nice.org.uk/feverish-illness-in-children-cg160>

<sup>30</sup> NICE (2010) CG111 Nocturnal enuresis <http://publications.nice.org.uk/nocturnal-enuresis-cg111>

<sup>31</sup> NICE (2012) CG149 Antibiotics for early-onset neonatal infection <http://publications.nice.org.uk/antibiotics-for-early-onset-neonatal-infection-cg149>

<sup>32</sup> NICE (2013) CG89 When to suspect child maltreatment <http://publications.nice.org.uk/when-to-suspect-child-maltreatment-cg89>

Professor Nick White and Professor Jeremy Farrar	Principal Research Fellowship; Major Overseas Programme Vietnam	Bacterial meningitis and meningococcal septicaemia <sup>33</sup>	2	Professor White and Professor Farrar are co-authors on two papers included in the guideline.
--	---	--	---	--

Source: Strategic Planning and Policy Unit; 2013

---

<sup>33</sup> NICE (2010) CG102 Bacterial meningitis and meningococcal septicaemia  
<http://publications.nice.org.uk/bacterial-meningitis-and-meningococcal-septicaemia-cg102>

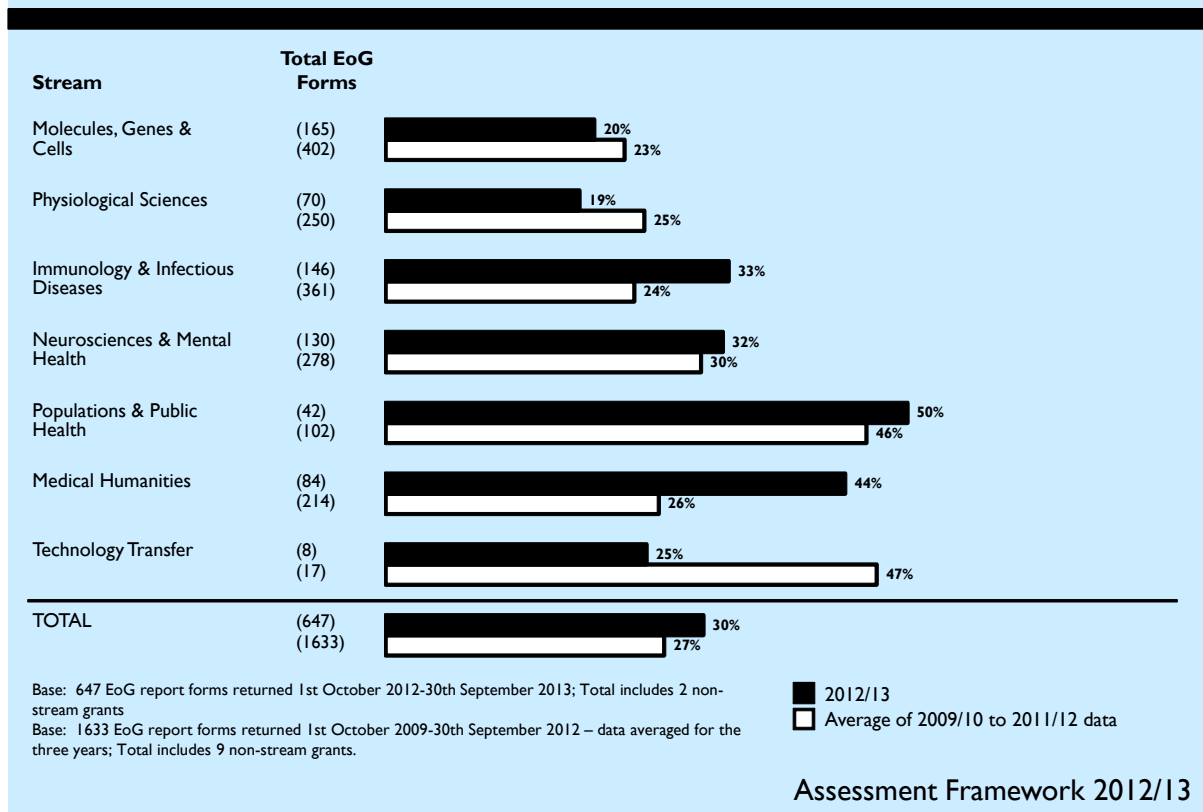


### 3. ENGAGEMENT

- Enhanced level of informed debate on biomedical science issues
- Significant engagement of key audiences in biomedical science, and increased audience reach

#### ENHANCED LEVEL OF INFORMED DEBATE ON BIOMEDICAL SCIENCE ISSUES

Fig. 3.1: Proportion of grants reporting their research receiving media coverage at 'end of grant'



#### Figure 3.2 Web and social media reach 2012/13

- Page views for [wellcome.ac.uk](http://wellcome.ac.uk) = 6 million (up from 5.5 million last year)
- Page views for [wellcomecollection.org](http://wellcomecollection.org) = 3.9 million (up from 3.3 million last year)
- Page views for [library.wellcome.ac.uk](http://library.wellcome.ac.uk) = 1 million (minimal change from last year)
- Number of Twitter followers = 43,000 (up from 25,000 last year)
- Facebook 'likes' 5,100 (up from 2,000 last year)
- Media clippings = 15,000 (up from 12,600 last year)

Source: Medical Humanities & Engagement; 2013

**Figure 3.3 Communications campaigns delivered 2012/13**

### **Avoiding the transfer of mitochondrial diseases**

- In March, the Human Fertility and Embryology Authority (HFEA) announced that its consultation on new techniques to prevent the transmission of serious mitochondrial diseases had found the public to be broadly in favour. The Wellcome Trust and partner organisations worked hard during 2013 to engage with various stakeholders on the importance of the research. The HFEA report was widely covered in the media; the Trust coordinated the production of a [letter](#) to *The Times* from several Nobel laureates and placed a [comment piece](#) in the *Daily Telegraph* from Professor Doug Turnbull, calling on the Government to act quickly.
- At the end of June, Chief Medical Officer Dame Sally Davies announced that the Department of Health would begin drafting regulations for discussion within Parliament as early as this autumn. Media commentary showed widespread support.

### **Government Spending Round**

- Throughout May and June, the Trust's Strategic Planning and Policy Unit and Media Office worked closely with partner organisations to make the case for continued investment in research and against the proposals to transfer medical research and training to the Department of Health. As part of this the Trust facilitated comment pieces by Shankar Balasubramanian in the [Financial Times](#) and Venki Ramakrishnan in [the Times](#), and briefed the *Times* for a [leader](#) column on the 'false economy' of moving part of the MRC's budget to the Department of Health.

### **Engaging new audiences through communication activities**

- The Trust is sponsoring the first ever Science Comment Award category at the annual Editorial Intelligence Comment Awards, attended by leading opinion writers from the national media.
- The Trust supported Editorial Intelligence's Names not Numbers conference, a series of curated salons and discussions "dedicated to the smart individual who is curious about the complexities of the mass age", with speakers including Professor Ray Dolan.
- The first cohort of Wellcome Trust-sponsored students joined the City University science journalism course.
- Seed funding was provided for a UK version of the website *The Conversation*, which features articles co-authored by academics and journalists. The site is already proving very popular and regularly features work funded by the Wellcome Trust.
- A Q&A session was held with Professors Doug Turnbull and Susan Golombok about the implications of the new techniques to prevent the transmission of mitochondrial diseases on the website *Mumsnet*. The Trust also consulted 'Mumsnetters' on the issues of granting researchers access to personal health data and the use of neuroscience-inspired activities in education.

### **Open access**

- In May, the Trust announced the extension of its open access policy to cover scholarly monographs. Head of Wellcome Library, Simon Chaplin, made the case for the new policy on the [Guardian website](#). In Autumn 2013 the first book will be published under this new policy.

### **Genomics**

- Working with Rohan Silva from the Prime Minister's Office, the Trust organised a 'genomics dinner' to bring senior journalists and editors together with genomics researchers and politicians. As well as engaging the media in the issues concerned, the dinner led to a [feature](#) in the *Guardian* about the 'Genomics Revolution'.
- In June, Professor Andrew Hattersley and colleagues in Exeter identified the genetic cause of an extremely rare condition that affected only eight individuals worldwide, including Paralympic hopeful Tom Staniford. As a direct result of coverage on [BBC online](#), three new cases were identified.

### **Mosaic**

- *Mosaic*, the Wellcome Trust's new digital publication, will launch in early 2014. Its audience will be people with an active interest, but not necessarily a formal qualification, in science. The first batch of articles and films that will feature on the site when it launches have now been commissioned, including a series of films about mental health research and articles on drug-resistant malaria and the health benefits of cycling. Ahead of the launch, we have launched our *Mosaic* blog to begin generating interest.

Source: Medical Humanities & Engagement; 2013

Figure 3.4 Communication images

The screenshot shows the Mumsnet website with a navigation bar and a main article titled "Q&A with the Wellcome Trust on using IVF techniques to prevent mitochondrial disease". The article discusses the ethical and scientific aspects of using IVF to prevent children from inheriting severe diseases by replacing faulty DNA with genetic material from a donor. It includes a quote from Professor Susan Golombok and a Q&A section with a user named Declinganje.

The screenshot shows the website "THE CONVERSATION" with a navigation bar and a main article titled "Jazz musicians can teach surgeons how to improvise". The article is by Roger Kneebone, Professor of Surgical Education at Imperial College London. It includes a photograph of a musician playing a saxophone and discusses the parallels between jazz improvisation and surgical decision-making.

The screenshot shows a news article from The Guardian titled "Genomics revolution: UK could miss the boat, scientists warn". The article, written by Sarah Bosley, discusses the need for better data collection and NHS backup for whole genome tests on patients. It includes a photograph of several babies and mentions that the UK has a huge opportunity to lead in disease discovery.



The screenshot shows a Financial Times article titled "Wellcome eyes £3.5bn charity spending". The article, by Anne-Dunne, reports that Wellcome Trust, the UK's largest charity, aims to spend more than £3.5bn on charitable projects in the next five years, supported by strong returns on its liquid assets.

Source: Medical Humanities & Engagement; 2013

**SIGNIFICANT ENGAGEMENT OF KEY AUDIENCES IN BIOMEDICAL SCIENCE, AND INCREASED AUDIENCE REACH**

**Figure 3.5 Public Engagement grants: audience reach 2012/13**

Type of grant (number of grants for which there are data)	Total number of participants	Examples of Public Engagement Grant projects
<b>National Science Learning Centre through Project ENTHUSE, 2008-13</b>	5,449 teachers and technicians from across the UK	Project ENTHUSE has provided bursaries for participants totalling 10,491 training days. A wide range of courses are available tailored to the subjects taught and experience of participants – including those with little background knowledge in the subjects they are teaching; there are also courses for senior managers, technicians and teaching assistants.
<b>People Awards (52)</b>	5,035,415	<p><b>George Pepper, Research.ms, Queen Mary &amp; Westfield College, University of London</b></p> <p>Shift.ms is a social network, run by its users, where people with multiple sclerosis (MSers) meet, share experiences and support each other. The network developed the <b>Research.ms</b> project, which aims to transform the way scientists communicate their work to the multiple sclerosis (MS) community and to shape MS research by encouraging dynamic communication between MSers and researchers. Trust funding supported collaboration with the MS research centre at Queen Mary, University of London. As a result of the impact on the researchers involved, Queen Mary also requested that Research.ms deliver researcher communication training to MSc and PhD students, and University College London and Cambridge University have approached Shift.ms to get their researchers involved in speaking to patients.</p> <p>Following training, the Queen Mary team’s blog output and hits have increased ten-fold (78 posts and 18,900 hits per month since June 2011). The team use the blog to inform their research; for example, a poll that proved their readers would be willing to undertake lumbar punctures for a drug trial resulted in securing funding for a project previously rejected on the assumption that no one would voluntarily undertake a lumbar puncture.</p> <p><b>Primary Audience Reach: 15,000 (including the general public, academics and health professionals)</b></p>
<b>Society Awards (7)</b>	67,658	<p><b>Cell! Cell! Cell!, Jenny Shipway, InTech Science Centre</b></p> <p><b>Cell! Cell! Cell!</b> is a 24 minute digital planetarium film exploring cell biology and genetics with supporting education materials for children aged eight to sixteen, and public audiences. It was developed by the National Space Centre (Leicester) and InTech Science Centre (Winchester) and was provided free to all UK planetaria. (Audience figures are correct as at November 2012 when final reports were submitted. We will be receiving follow-on reports to see wider uptake and impact.)</p> <p><b>Primary Audience Reach: 8,582 (including the general public, academics, teachers/educators and science communicators)</b></p>

<b>Arts Awards (38)</b>	823,171	<p><b>Deeds Not Words, Mark Neville</b></p> <p><i>Deeds Not Words</i> is a photo book by photographer Mark Neville. It chronicles the people of Corby, Northamptonshire, and the environmental issues made public by the court case known as the 'Corby 16'. The project was shot over 18 months and printed in 2011 as a book of photographs, scientific reports and testimonials. The book, which is not available commercially, was used as an advocacy tool and sent to the 433 local council authorities in the UK and to environmental agencies internationally, and examined issues related to the handling of toxic waste and the reuse of contaminated land. The project was extended to include a contemporary art exhibition at The Photographers' Gallery in London, which fully explored both the scientific and the artistic content, context, and themes of the photo book. The exhibition was extensively featured on Channel 4 News.</p> <p><b>Primary Audience Reach: 76,500 (including the general public, academics, health professionals, policy makers, teachers/educators, arts practitioners, science communicators and the media)</b></p>
<b>International Engagement Awards (14)</b>	58,723	<p><b>Doi Moi in Science, Mary Chambers, Oxford University Clinical Research Unit, Vietnam</b></p> <p><i>Doi Moi in Science</i> was a project that aimed to bring science to the forefront of people's minds in an engaging and entertaining way through theatre productions, lively debate and informed writing in Ho Chi Minh City and surrounding locations. The project had three distinct parts: a science theatre for primary school children; science Cafes for young people (18-25); and science communication training for health journalists and media/public relations personnel from local hospitals.</p> <p><b>Primary Audience Reach: 40,921 (including the general public, academics, health professionals, teachers/educators, arts practitioners, science communicators and the media)</b></p>
<b>Co-Production Awards (1)</b>	1,360,000	<p><b>Secret Universe, the hidden life of the cell, David McNab, Wide Eyed Entertainment Ltd</b></p> <p><i>Secret Universe, the hidden life of the cell</i> was a television special for BBC2 and a supporting website that revealed the universe inside a single human cell. Taking as its dramatic arc an invasion by the adenovirus during a common cold, the show revealed the structures and processes that drive the basic unit of life and the continuing strategic battle of cat and mouse between the cell's defences and the virus. Threading the visual world together was expert testimony from academics including Steve Jones, Bonnie Bassler, Susanna Bidgood and Nick Lane, and narration by David Tennant.</p> <p><b>Primary Audience Reach: 1,360,000 (the general public)</b></p>

Source: Medical Humanities & Engagement; 2013

Figure 3.6 Public Engagement grants: primary audience focus 2012/13					
	Type of grant (number of grants for which data are available)				
	People Awards (52)	Society Awards (7)	Arts Awards (38)	International Engagement Awards (14)	Co-Production Awards (1)
<b>The public</b>	49	6	37	13	1
<b>Academics</b>	25	6	26	14	-
<b>Health professionals</b>	19	3	20	10	-
<b>Policy makers</b>	10	2	11	6	-
<b>Teachers / educators</b>	28	6	22	7	-
<b>Arts practitioners</b>	16	2	34	5	-
<b>Science communicators</b>	16	3	21	4	-
<b>Media</b>	20	3	18	8	-

Source: Medical Humanities & Engagement; 2013

### Figure 3.7 MH&E Activities

#### The Hub at Wellcome Collection

In 2012/13 the Trust launched a new scheme, *The Hub at Wellcome Collection*: to provide resources and a stimulating space for researchers and other creative minds to collaborate on an interdisciplinary project linked to the Trust's vision of improving human and animal health, at the interface of health and the wider arts, humanities, sciences and social sciences.

As part of the [Wellcome Collection Development Project](#) a specially designed, flexible space within the Wellcome Building will be made available for a multidisciplinary research team to be resident for up to two academic years. In 2012/13 55 preliminary applications were received and 7 shortlisted to submit full applications. The selected group will take up residence in September/October of 2014.

#### 'Wonder': Art and Science on the Brain

'Wonder' was announced at the end of November 2012 as a collaboration between the Trust, the British Neuroscience Association and the Barbican Centre to produce a season bringing together neuroscience and the arts. A programme of public engagement and events took place in the run up to and during the British Neuroscience Association's conference – the 'Festival of Neuroscience' – held at the Barbican Centre in April 2013.

An estimated 15,000 people attended events as part of 'Wonder', which included *Consciousness*, *The Salon Project*, *I'm a Neuroscientist*, *Ruby Wax*, *Packed Lunches* and a three day 'Wonder' Street Fair. Over 200 neuroscientists were directly involved in delivering public events at the Barbican, as speakers, stall holders and event guides. The Barbican integrated neuroscience into its film, theatre, and creative learning programmes and is now using the project as a model for working across both creative programming and corporate hire teams. The British Neuroscience Association was very pleased with the way the public programme complemented their scientific conference and is keen to build on this for future events.

The reach, impact, and quality of 'Wonder' was excellent. Ninety three per cent of public attendees of events at the Barbican surveyed rated their experience as good or very good, and 81% said they had learnt something new about the brain. Our partnership with Barbican was also very effective, with the team programming more Trust-recommended events than we expected and across all art forms. The Barbican team also fed back that they were very happy with the quality of the events, saying that the science content added real depth to their Creative Learning Programme.

Several of the activities created for 'Wonder' at the Barbican Centre were funded by the Trust to tour to other events during the summer of 2013, including the Latitude Festival (a 35,000 capacity event in the Suffolk countryside) and the first ever Shuffle Festival (a film, music and arts festival curated by Danny Boyle, taking over a former psychiatric hospital in East London).

Source: Medical Humanities & Engagement; 2013

**Figure 3.8 Researching Education Audiences 2012/13**

Medium	Reach/impact indicators
Education e-newsletter	Over 7,000 subscribers with an above-average 26% open rate.
Twitter account	Nearly 1,500 followers.
'Big Picture'	10,067 print subscribers in the UK. 10,834 e-subscribers (online reach is increased via the Times Educational Supplement website).
'Perspectives in Education' on school accountability systems and how they impact upon science education	Launched in May 2012 at a joint event with the Royal Society.

Source: Medical Humanities & Engagement; 2013

**Figure 3.9 Education work 2012/13**

### Education Focus areas

1. *Primary Science*. The one year Primary Science Specialist course has been successfully delivered at Science Learning Centres and its short and longer term impacts are being evaluated through a two year randomised control trial. Depending on the results of the evaluation, government support for roll-out of the course will be sought. The Trust will also be publishing research on how schools use primary science expertise and is contributing to an expert group to support roll-out of the new curriculum.
2. *Informal Learning*. The review of informal science learning was launched in Nov 2012 with a commentary by John Holman and Clare Matterson. The findings were disseminated and discussed at a number of conferences and key stakeholders gave written responses to inform the next steps:
  - a one-off funding programme for research into the value and impact of informal science learning in partnership with the National Science Foundation in the US and others (likely to include the Economic and Social Research Council).
  - exploring how to increase opportunities for young people from disadvantaged backgrounds to engage with informal science learning.
  - establishing a Funders' Forum in collaboration with the Science in Society Programme at The Department for Business, Innovation & Skills (BIS).
3. *Education and Neuroscience*. Surveys have been conducted to understand how teachers', parents' and pupils' understanding of neuroscience influences their approaches to learning and by commissioning a series of expert reviews on the potential and readiness of neuroscience to influence education. The Trust has worked with the Education Endowment Foundation to disseminate early findings and are now planning a joint one-off initiative to fund research into the impact of interventions influenced by neuroscience on classroom outcomes.

### Wellcome Monitor

Ipsos-Mori completed interviews with 1,396 adults and 460 young people (age 14 to 18) about their views on biomedical research and science education for Wave 2 of the Wellcome Trust Monitor in October 2012. The report was launched in May 2013 at the British Science Association Science Communication conference and received media coverage (including in the *Times* and *Guardian*) and much social media attention. The reports, four topic-focused infographic summaries and data, are freely available to use and share ([www.wellcome.ac.uk/monitor](http://www.wellcome.ac.uk/monitor)).

It is anticipated that impact will increase over time as its research potential is realised (there are already two research studies based on the Wave 2 data) and its rich contextual information is recognised by the media, policy makers and practitioners. The Monitor also tested new methodologies and used a robust sampling method now adopted by the Department for Business, Innovation and Skills for its next Public Attitudes to Science survey. We are now planning full evaluation of Waves 1 and 2. (For further details on the Monitor see the Research Profile in Volume 2).

Source: Medical Humanities & Engagement; 2013

**Figure 3.10 Wellcome Collection overview 2012/13**

2012/13 was Wellcome Collection's busiest year so far, with total visits numbering over half a million for the first time. The start of the year overlapped with the last weeks of *Superhuman*, our exhibition on prosthetic enhancement which thematically complemented London hosting the Paralympic Games. That was followed by the exhibition *Death: A Self-Portrait*, a critically acclaimed and exceptionally well-visited show celebrating the eclectic and moving collection of death-related art gathered by Richard Harris. The next exhibition was Japanese outsider art: *Souzou*. *Souzou* was strongly praised for its curatorial sensitivity, and it also attracted a range of visitors who had not previously come to Wellcome Collection (with 33% of visitors being first time visitors).

Highlights of the events series included another very successful series of *Exchanges at the Frontier*, with high-profile scientific discussions conducted in collaboration with the BBC's World Service, and also an intriguing series of events on insects, entitled *Who's the Pest?*

Finally, the *Death* book was our most popular publication to date (with sales of more than 6,000 copies in the UK and internationally), and visits to [wellcomecollection.org](http://wellcomecollection.org) also grew encouragingly (with 3.9 million page views - up from 3.3 million last year).

Source: Medical Humanities & Engagement; 2013

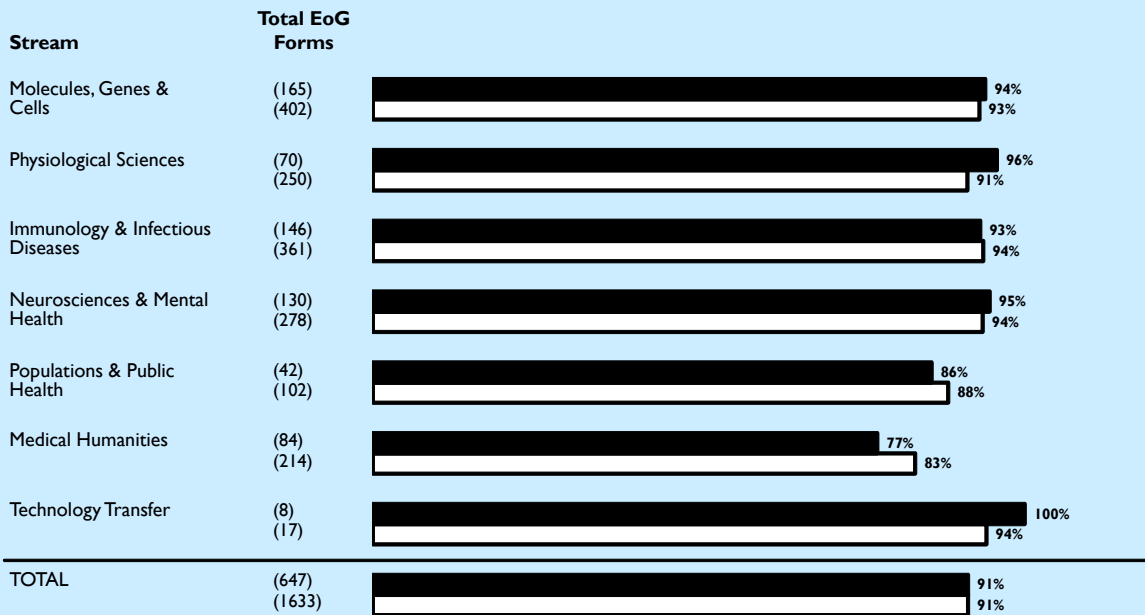
**Figure 3.11 Wellcome Collection visit figures 2012/2013**

	2007/2008	2008/09	2009/10	2010/11	2011/12	2012/13
<b>Building total</b>	325,206	336,265	410,098	466,043	492,053	535,487
Galleries	160,454	149,233	230,741	304,769	324,605	353,138
Library	33,336	38,246	43,945	40,760	41,875	40,870
Conference Centre	27,130	24,152	26,261	27,600	33,869	29,229
Public events and tours (total)	17,221	17,457	20,410	22,499	24,747	24,292
- Public events	9,384	9,308	10,381	10,577	12,694	10,663
- Other special events	546	360	456	1,119	800	2,808
- Library insight tours	281	196	732	399	391	356
- Behind the scenes tours	276	176	99	197	139	98
- Perspectives tours	339	205	402	393	366	76
- Visitor Services group tours and gallery tours	6,495	6,803	8,340	9,879	10,357	10,519

Source: Medical Humanities & Engagement; 2013



Fig. 3.12: Proportion of grants reporting presentation of their work at academic workshops/conferences at 'end of grant'

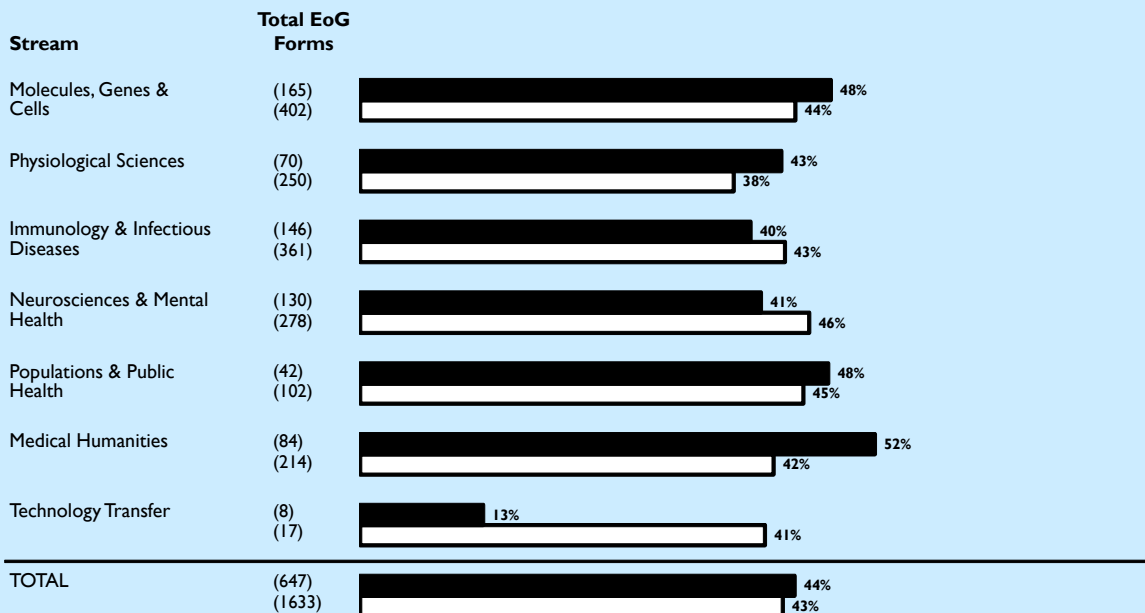


Base: 647 EoG report forms returned 1st October 2012-30th September 2013; Total includes 2 non-stream grants  
 Base: 1633 EoG report forms returned 1st October 2009-30th September 2012 – data averaged for the three years; Total includes 9 non-stream grants.

■ 2012/13  
 □ Average of 2009/10 to 2011/12 data

Assessment Framework 2012/13

Fig. 3.13: Proportion of grants reporting presentation of their work to non-academic audiences at 'end of grant'

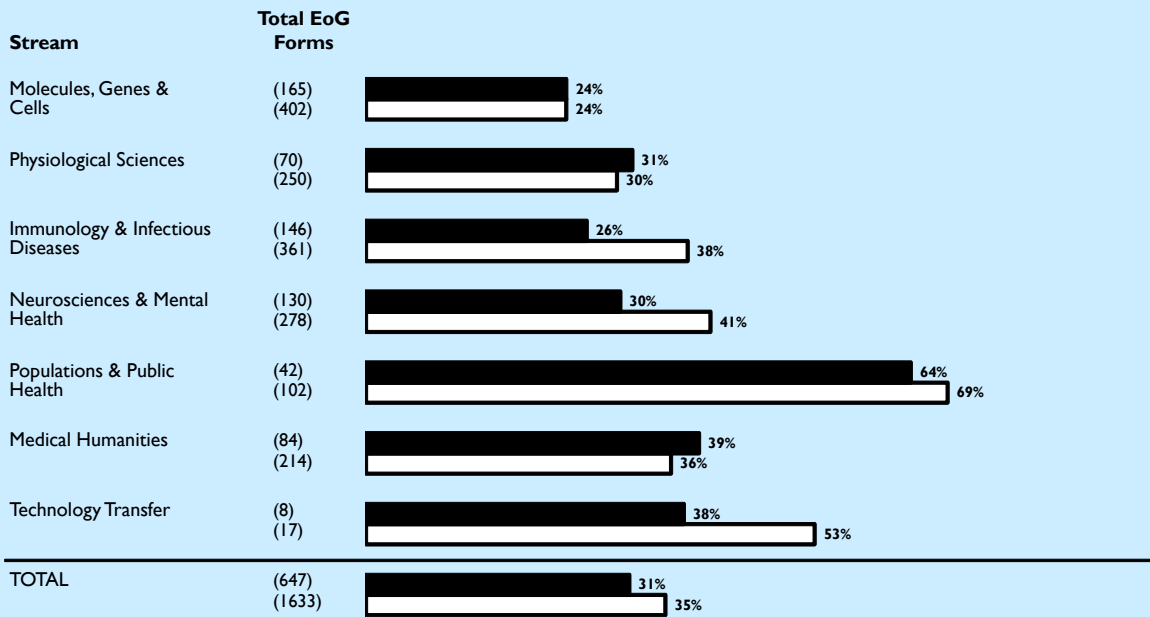


Base: 647 EoG report forms returned 1st October 2012-30th September 2013; Total includes 2 non-stream grants  
 Base: 1633 EoG report forms returned 1st October 2009-30th September 2012 – data averaged for the three years; Total includes 9 non-stream grants.

■ 2012/13  
 □ Average of 2009/10 to 2011/12 data

Assessment Framework 2012/13

Fig. 3.14: Proportion of grants reporting provision of feedback to research participants and related communities at 'end of grant'



Base: 647 EoG report forms returned 1st October 2012-30th September 2013; Total includes 2 non-stream grants  
 Base: 1633 EoG report forms returned 1st October 2009-30th September 2012 – data averaged for the three years; Total includes 9 non-stream grants.

■ 2012/13  
 □ Average of 2009/10 to 2011/12 data

Assessment Framework 2012/13

### Figure 3.15 Wellcome Trust Sanger Institute public engagement activities 2012/13

The Sanger Institute's Public Engagement (PE) Programme covers 6 action areas to stimulate interest in the cutting-edge science at the Institute and to engage the public with the social and ethical issues of modern genomic research. The Programme promotes dialogue and informed debate between a range of publics and the Institute's research community, both on the Genome Campus and at diverse events and locations. Highlights in 2012/13 include:

#### Genomics online

- Providing access to facts, stories and debates on genomics on the public engagement website [www.yourgenome.org](http://www.yourgenome.org). In 2012/13 the website received 27,000 visitors, on average, per month. Four new videos were posted on the *yourgenome* YouTube channel.

#### Experiencing Sanger Science

- Hosting 1,953 visitors at the Genome Campus: ranging from school students (682), those in early tertiary education (155), teachers and educators (280), academic researchers (38) to other adult groups (798).

#### Engaging with Schools

- Developing major teaching resources, including *Genome Generation*, a resource to encourage and facilitate discussion about contemporary socio-scientific issues in genomics, and *BRAF: from genes to cancer therapy*, to introduce GCSE students to the application of DNA sequencing technologies in cancer therapy.
- Providing access to teaching resources: there were 2,378 total unique downloads of Sanger Institute teaching resources from the National STEM Centre eLibrary between October 2012 and June 2013.
- Offering a 2-day *DNA Barcoding Workshop*, hosted in partnership with Cold Spring Harbor DNA Learning Laboratory, attended by 23 representatives from 14 Science Centres across the world.

#### Inspiring Artists and Scientists

- Hosting artists in residence: Katie Paterson undertook a 6-month residency as one of the 6 artists in the Wellcome Collection's *Art in Global Health*. Inspired by the work of Chris Tyler-Smith's group on human evolution, the residency culminated in a new piece *Fossil Necklace* consisting of 170 carved beads from fossils that chart the evolution of life on earth. The piece was on view at Kettle's Yard, University of Cambridge from April - June 2013 and attracted 6,367 visitors.
- Hosting *Parasite*, a video installation examining the science, economics and politics of malaria created by artist-in-residence Deborah Robinson in collaboration with the research groups of Julian Rayner and Oliver Billker from the Malaria Programme.

#### Creating Exhibits and Events

- Contributing to the annual Cambridge Science Festival: *Dynamic DNA* involved 39 scientists/explainers reaching 5,000 visitors over 2 days. *Genomes on a grand scale* involved talks from EBI's Paul Flicek and Sanger Institute Group Leader Matt Hurlles and attracted 84 visitors to the Genome Campus.
- Designing and running an exhibit for the week-long Royal Society Summer Exhibition (RSSE). The stand, *DNA Sequencing: exploration beyond the genome*, looked at the technical advances in DNA sequencing during the 20-year history of the Sanger Institute, culminating in current examples of the application of genomics in clinical and global health. The project involved over 60 scientists.
- Developing the game *Out at both ends* in the Royal Society-sponsored "game jam". Scientists Nick Thomson and Matt Holden won the opportunity to develop the game, one of 4 showcased at the RSSE.
- Contributing to the Wellcome Trust *Health Station* at the Natural History Museum's *Science Uncovered* event in September 2013, reaching 8,000 visitors.

#### Communicating Science

- Mentoring game developers for *Make Something Unreal Live*, a gaming competition run by Epic Games Inc. and supported by the Trust. The 4 scientists, Darren Logan, Carl Anderson, Joshua Randall, and James Floyd also acted as mentors and judges at the final round of the competition at the *Gadget Show live* in Birmingham which attracted over 98,000 visitors.
- Co-hosting the Trust-funded *Experimental Stories: creating original stories from science*. We hosted follow-up residencies for 2 of the BBC scriptwriters: Richard Monks met with 8 scientists over 2.5 days, Sarah Woods visited for 4 days to work with Group Leader Paul Kellam and pre-doc Sarah Smith on a script commissioned by BBC Radio 4.
- Providing Science Communication Training to 14 Sanger Institute and 2 EBI PhD students.

Source: Wellcome Trust Sanger Institute; 2013

#### 4. RESEARCH LEADERS

- Development of a cadre of research leaders
- Evidence of significant career progression among those we support

**Figure 4.1: Most highly cited researchers in the field of Neurosciences & Behaviour (January 2003 to June 2013)**

Rank	Scientist	Institution	Trust funding	Total citations	Number of papers	Cites per paper
1	TW Robbins	University of Cambridge, UK	✓	14,437	217	66.53
2	RJ Dolan	WT Centre for Neuroimaging, UK	✓	13,633	196	69.56
3	JQ Trojanowski	University of Pennsylvania, USA		13,455	228	59.01
4	EJ Nestler	Mount Sinai Medical Center, USA		12,290	167	73.59
5	KJ Friston	WT Centre for Neuroimaging, UK	✓	11,703	190	61.59
6	DR Weinberger	US National Institute of Mental Health, USA		11,604	162	71.63
7	AW Toga	UCLA School of Medicine, USA		11,562	263	43.96
8	PM Thompson	UCLA School of Medicine, USA		11,280	258	43.72
9	VMY Lee	University of Pennsylvania, USA		11,256	160	70.35
10	DW Dickson	Mayo Clinic College of Medicine, USA		10,608	214	49.57

Source: Thomson Reuters Essential Science Indicators; 2013

**Figure 4.2 Career focused funding developments and updates**

**Sir Henry Dale Fellowship:** This fellowship scheme, funded in partnership with the Royal Society, was launched in 2011. The fellowships are aimed at outstanding postdoctoral scientists wishing to build their own UK-based independent research career addressing an important biomedical question. To date 34 awards have been made.

**PhD Programmes:** Support was renewed for 12 Basic Science and 4 Clinical PhD Programmes in the recent PhD Programme competition. Additionally, 2 new Programmes were recommended for support (at Imperial College London and University College London).

Source: Science Funding; 2013

**Figure 4.3 Wellcome Trust Research Leadership Development Programme**

In the Wellcome Trust's 10-year Strategic Plan, *Extraordinary Opportunities*, the Trust committed to developing outstanding individuals as part of our support for scientists. The Research Leadership Development Programme, established in 2013 with implementation partners Monitor Deloitte, aims 'to provide a world-class, innovative and immersive programme to enhance the leadership style, impact and resilience of researchers'. The goal is to build capabilities within research teams and institutional leadership, and to broaden the talent pool from which to recruit future research leaders.

In its first year, the programme will focus on people who already hold senior positions, such as the Directors of Wellcome Trust's Centres and Major Overseas Programmes, as well as those who are considering a senior leadership position in academia, industry or a major research centre as their next career move.

Source: Strategic Planning and Policy Unit; 2013

#### Figure 4.4 Wellcome Trust Career Tracking: Basic Science Career Tracker (BSCT) 2012/13

Career tracking is a core component of post-award evaluation. In 2009 the Basic Science Career Tracker (BSCT) was established, a longitudinal cohort study that allows us to follow the careers of key cohorts of Wellcome Trust-funded researchers.

Now in its fifth year, the insights and trend data provided by the BSCT are providing valuable evidence to support strategy setting and understanding of the impact of Wellcome Trust funding schemes. For example, Tracker data on the sex differential in the exit from academic science recently underpinned the renewed Wellcome Trust impetus to supporting and retain women in academic science (see Figure 4.5). The demand for more rigorous and systematic data on career path progression among researchers has also increased the interest and reach of the Tracker work, and particularly from our peer organisations.

After Wave 5 (2013) high level findings from the BSCT to-date are:

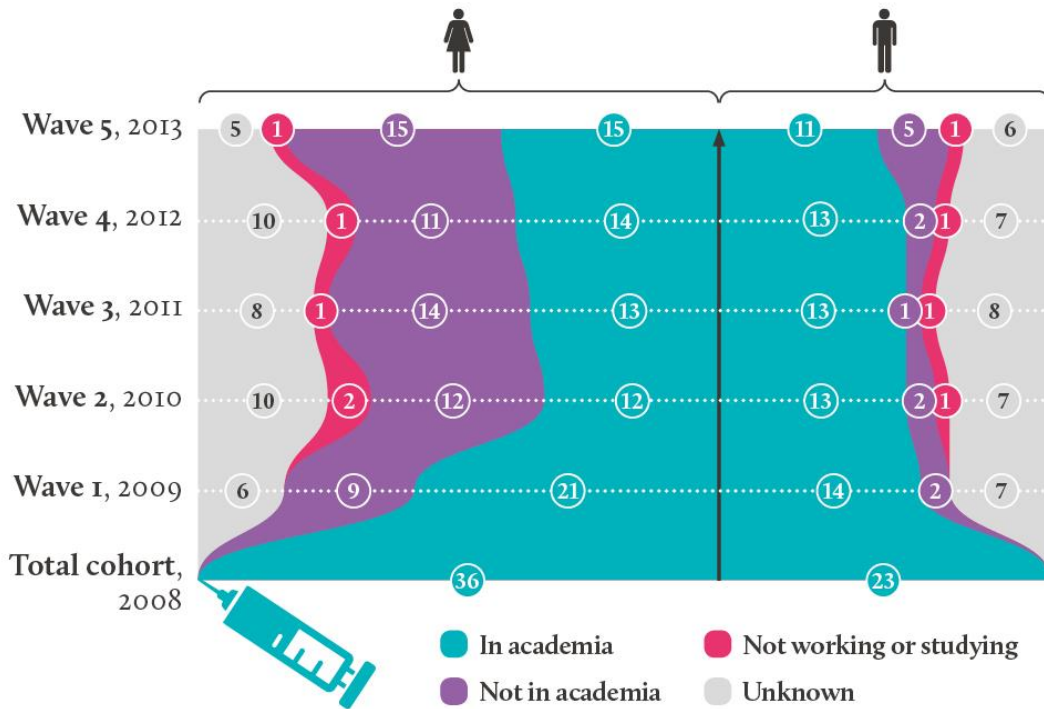
- Academia is the main employment destination for former **Wellcome Trust-funded PhD students** at the immediate post-PhD and early career stage. Across all PhD cohorts included in the BSCT between Waves 1 and 5, 75% of those who have reported that they have finished their funding period typically take a first position in academic research. However, the proportion of former PhD students working in academia decreases over time.
- Academia is the main employment destination for former **Sir Henry Wellcome Postdoctoral Fellows (SHWPF)** with all but one of those completing their grant funding period continuing to work in academia (n=26 of 27).
- The large majority of former **Research Career Development Fellows (RCDF)** are continuing their career in academic research. There are indications of career progression among former RCDFs, with the numbers from the earlier cohorts employed in senior positions increasing over time through each wave.
- Wave 5 of the BSCT revealed the career stability experienced by former **International Senior Research Fellows (ISRF)** with the majority continuing to be employed in academic positions and leading independent research careers.

Source: Evaluation Team Strategic Planning and Policy Unit; 2013

Figure 4.5

## Staying in/leaving academia

Former PhD students who received their award in financial year 2003/04 (n=59)



This data tree shows the earliest PhD cohort to be included in our Basic Science Career Tracker, giving the **numbers, by gender, of those inside and outside of academia.**

Data: Basic Science Career Tracker, Waves 1-5 (2009-13). Base: Former PhD students funded through the Wellcome Trust four-year PhD Programme who received their award in financial year 2003/04 (n=59).

**Figure 4.6 Key prizes and accolades associated with Trust-funded activity awarded 2012/13**

Recipient	Stream	Prize	Comments
<b>Science Funding</b>			
Professor Gero Miesenböck	Neuroscience and Mental Health	The Brain Prize  The Jacob Heskel Gabbay Award in Biotechnology and Medicine	The Brain Prize is awarded to one or more scientists who have distinguished themselves by an outstanding contribution to European neuroscience.  The Jacob Heskel Gabbay Award is to recognise, as early as possible in their careers, scientists in academia, medicine, or industry whose work had outstanding scientific content and significant practical consequences in the biomedical sciences.
Professor Mike Stratton	Molecules, Genes and Cells	Louis-Jeantet Prize	For experienced researchers who have distinguished themselves in the field of biomedical research in Europe.
Professor Mike Stratton	Molecules, Genes and Cells	Knighthood	For services to Medical Science.
Professor Stephen O'Rahilly	Physiology in Health and Disease		For services to Medical Science.
Professor Ronald Hay	Molecules, Genes and Cells	Novartis Medal and Prize	Awarded annually in recognition of contributions to the development of any branch of biochemistry to scientists (of any nationality) working in the UK.
Professor Robin Allshire	Molecules, Genes and Cells	The Genetics Society Medal	Award that recognises outstanding research contributions to genetics.
Professor Jane Clarke	Molecules, Genes and Cells	Royal Society of Chemistry Interdisciplinary Prize	Awarded for pioneering work in the application of atomic force microscopy (AMF) to study folding in families of proteins.
Professor Michael English	Immunology and Infectious Disease	Elected Fellow of the Academy of Medical Sciences	
Professor Jane Clarke	Molecules, Genes and Cells		

Professor I. Sadaf Farooqi	Physiology in Health and Disease		
Professor Russell Foster	Neuroscience and Mental Health		
Professor Paul Klenerman	Immunology and Infectious Disease		
Professor Anthony Scott	Immunology and Infectious Disease		
Professor Magdalena Zemicka-Goetz	Cell and Developmental Biology		
Professor William Earnshaw	Molecules, Genes and Cells		
Professor Ray Goldstein	Molecules, Genes and Cells		
Professor Sir Walter Bodmer	Molecules, Genes and Cells	Royal Medal	For seminal contributions to population genetics, gene mapping and understanding of familial genetic disease.
Dr Tracey Gloster	Molecules, Genes and Cells	L'Oreal-UNESCO for Women in Science Award	For her work on understanding unusual forms of protein glycosylation (biochemistry).
Dr Katie Hampson	Immunology and Infectious Disease		For her work on investigating strategies for canine rabies elimination (ecology).
Professor Gillian	Immunology and	Elected Fellow of the Royal Society	



Griffiths	Infectious Disease		
Professor William Earnshaw	Molecules, Genes and Cells		
Professor Ray Goldstein	Molecules, Genes and Cells		
Professor William Richardson	Cellular and Molecular Neuroscience		
Professor Brigitta Stockinger	Immunology and Infectious Disease		
<b>Medical Humanities and Engagement</b>			
Clare Matterson		Honorary Fellowship of the British Science Association (Hon.FBAASc.)	Clare Matterson, Director of Medical Humanities and Engagement, was awarded this fellowship for outstanding contribution to public engagement.
At-Bristol Science Centre - <i>In the Zone</i>		Creative Event of the Year award, Event Magazine	<i>In the Zone</i> Touring exhibition.
Professor Clare Williams	Medical Humanities (Society & Ethics)	Member of the Ethics Working Party of the International Stem Cell Forum	Professor Williams has become the first social scientist to sit on this body ( <a href="http://www.stem-cell-forum.net/">http://www.stem-cell-forum.net/</a> ).
Dr Martyn Pickersgill	Medical Humanities (Society & Ethics)	UK Representative to the ALLEA (European Federation of Academies of Sciences and Humanities) Permanent Working Group on Science and Ethics (2013-16)	( <a href="http://www.allea.org/Pages/ALL/19/228.bGFuZz1FTkc.html">http://www.allea.org/Pages/ALL/19/228.bGFuZz1FTkc.html</a> ).
Phil Winfield	Public Engagement	Cell! Cell! Cell! won the Best Immersive Cinema (FullDome) category at the Jackson Hole Science Media Awards in the US	Cell! Cell! Cell! is a show on cell biology for digital planetaria.

Sharna Jackson	Public Engagement	Wondermind won two 2012 Lovie Awards - Gold in Games and Silver in Best Use of Interactive Video	Wondermind is a series of online games about neuroscience based around the theme of Alice in Wonderland.
Melanie Wilson	Public Engagement	Autobiographer won best sound design at the Off West End Awards (the 'Offies')	Autobiographer is a sound installation and performance about memory and dementia.
<b>Technology Transfer</b>			
Professor Kevin Brindle	Strategic Translation Award	European Society of Molecular Imaging Award	Recognition for his work with hyperpolarized <sup>13</sup> C magnetic resonance imaging, which also relates to his work on the Trust-funded project ' <i>Real time clinical imaging of tumour metabolism using hyperpolarized <sup>13</sup>C magnetic resonance spectroscopy</i> '.
Professor Sergey Piletsky	Translation Award	Bronze award (£1000) for the Chemistry section from SET for BRITAIN	Competition for early-stage researchers, held in the UK Parliament. The team at Cranfield have been working on solid-phase synthesis of molecularly imprinted nanoparticles.
Professor John Fisher	Medical Engineering	President Prize, UK Biomaterials Society	The President's prize aims to recognise outstanding contributions during a lifetime career in the UK Biomaterials field.
Dr Mazen Al-Hajjar	Medical Engineering	Prize Winner: National Institute for Health Research (NIHR) new media competition.	
Dr Sarah Deacon	Medical Engineering	Annual Medical Engineering Centres Networking Event	Dragons' Den Award (£40K) to deliver a proof of concept project.
Professor Molly Stevens	Medical Engineering	Elected fellow of the Royal Academy of Engineering	
Professor Guang-Zhong Yang	Medical	Elected Fellow of City of Guilds College.	

	Engineering	Elected Fellow of Fellow of the International Academy of Medical and Biological Engineering.  Elected Fellow of MICCAI Society (Medical Image Computing and Computer Assisted Intervention).	
George Lim	Medical Engineering	Institute of Mechanical Engineering award for best final year project	For his work on modelling strains, fluid pressure and fluid velocity for different osteocyte morphology.
Ben Desai	Medical Engineering	TWI prize for Best Sports, Healthcare and Wellbeing Technology project	For his work developing a back brace for weight lifting.
Professor Alison Noble	Medical Engineering	OBE  Appointed President of the MICCAI Medical Image Computing and Computer Assisted Intervention Society).	For services to Science and Engineering in the Queen's Birthday Honours List.
Professor Lionel Tarassenko	Medical Engineering	Elected Fellow of the Academy of Medical Sciences	

Source: Science Funding, Medical Humanities & Engagement, Technology Transfer Division, Strategic Planning and Policy Unit; 2013

## 5. RESEARCH ENVIRONMENT

- Key contributions to the creation, development and maintenance of major research resources
- Contributions to the growth of centres of excellence

### KEY CONTRIBUTIONS TO THE CREATION, DEVELOPMENT AND MAINTENANCE OF MAJOR RESEARCH RESOURCES

Fig. 5.1: Proportion of grants reporting software/database development at 'end of grant'

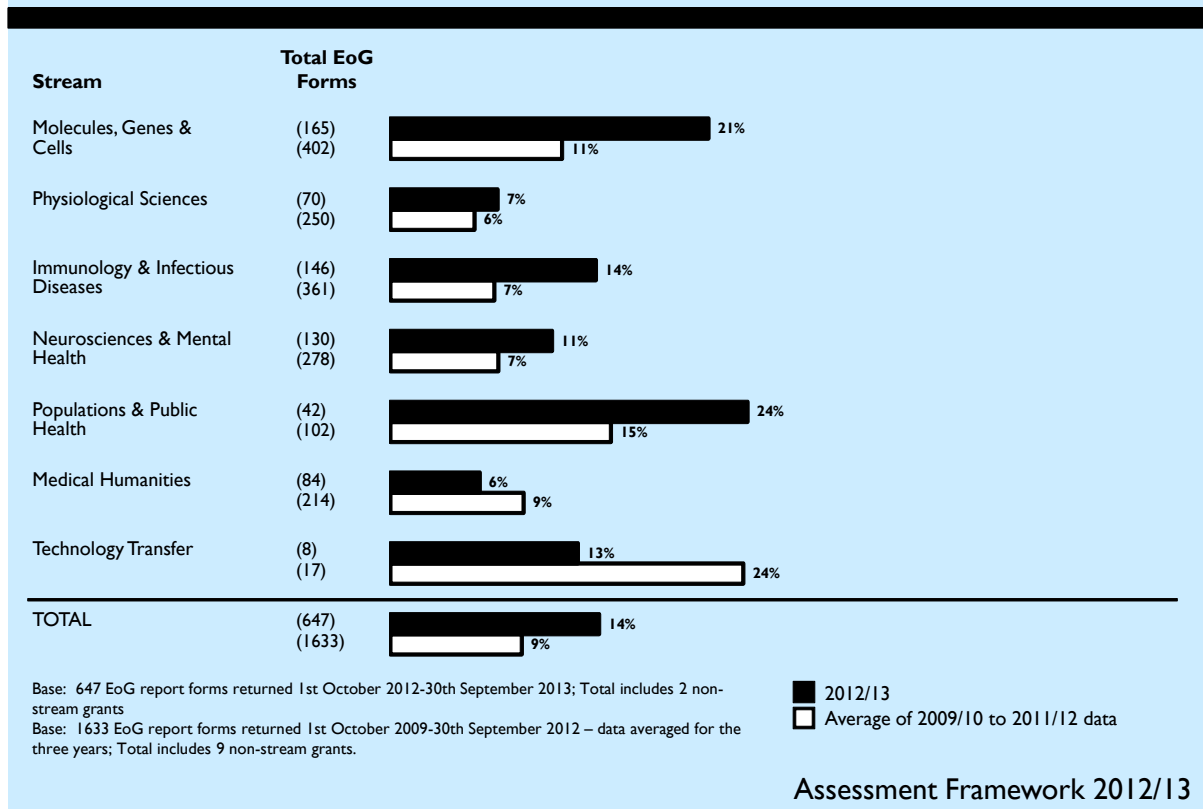


Figure 5.2 Development of major software/database and other research resources 2012/13

Key WT Associated Researcher	Key WT Funding	Stream	Details/Impact
Professor Jason Swedlow	Technology Development Award Strategic Award	Molecules, Genes and Cells	Further development and release of the open source Open Microscopy Environment (OME) used by 1000s of labs worldwide for imaging research.

Source: Science Funding; 2013

**Figure 5.3 Wellcome Trust Sanger Institute informatics statistics 2012/13**

The Sanger Institute hosts a large number of web-based genome and informatics resources. Over 50 domains are currently hosted, with the table below detailing the number of visits, pageviews, valid hits and bytes for ten significant resources.

Domain	Visits	Pageviews	Pages/Visit	New Visitors	Returning Visitors	Valid Hits	Bytes
Cosmic	467536	2852650	6.10	186,757	280,779	27,559,259	2.84E+11
Decipher	143449	770380	5.37	29040	114409	18263371	8.11E+10
Ensembl <sup>34</sup>	2505308	21417189	8.55	562938	1942370	132177897	1.56E+12
Asia Ensembl	690202	4877271	7.07	265518	424684	56483589	4.24E+11
US East Ensembl	564186	3393119	6.01	230596	333590	53014938	4.35E+11
US West Ensembl	228377	1343580	5.88	96632	131745	26909685	1.65E+11
GeneDB	91065	558411	6.13	38894	52171	17183505	2.76E+11
UK10K	8266	24293	2.94	4189	4077	235947	5.8E+09
Merops	79914	592088	7.41	34018	45896	2422062	2.55E+10
pFam	930162	5031232	5.41	412569	517593	73388536	1.25E+12
Sanger <sup>35</sup>	1237560	3337018	2.70	606649	630911	53502297	1.32E+12
WTCCC	13575	33097	2.44	9331	4244	265173	2.92E+09
YourGenome	263708	560437	2.13	221572	42136	19974619	7.11E+11

**Visits:** A series of page requests from the same uniquely identified client with a time of no more than 30 minutes between each page request, and no requests for pages from other domains intervening between page requests.

**Pageviews:** A request for a file whose type is defined as a page. A single page view may generate multiple hits as all the resources required to view the page (images, .js and .css files) are also requested from the web server.

**Pages/Visit:** The ratio of Pageviews per visit (e.g. If 10 pages were viewed on two separate visits this would give an average value of  $10/2 = 5$ )

**New Visitors:** A visitor that has not made any previous visits. A new visitor can also be defined as someone who enters the site, and does not have the "web cookie" set. If a user deletes their cookies, and re-enters the site, they will be seen as a new visitor again.

**Returning Visitors:** A visitor that has made at least one previous visit as defined by the presence of a web cookie in their browser.

**Valid Hits:** A request for a file on a web server. Valid Hits describe the number of successful connections to files on a web server, and can include images, javascript files, css files, html pages, and more.

**Bytes:** Measure of the number of bytes downloaded from the web servers.

Source: Wellcome Trust Sanger Institute; 2013

<sup>34</sup> There are in total four Ensembl websites worldwide [www.ensembl.org](http://www.ensembl.org) (main one hosted at the Wellcome Trust Genome Campus); [asia.ensembl.org](http://asia.ensembl.org); [uswest.ensembl.org](http://uswest.ensembl.org); [useast.ensembl.org](http://useast.ensembl.org).

<sup>35</sup> Wellcome Trust Sanger Institute now tends to generate subdomains and consortium sites rather than adding content to the main website ([www.sanger.ac.uk](http://www.sanger.ac.uk))

**Figure 5.4 The growth of the ORCID (Open Researcher and Contributor ID) registry 2012/13**

This year has seen a significant expansion in the interest and engagement with ORCID (Open Researcher and Contributor ID); in its first year, more than 300,000 researchers across the world have signed up for an ORCID id and are increasingly able to use this in aspects of the research ecosystem.

ORCID is a not-for-profit, open, multi-agency effort to establish a global registry of unique researcher identifiers and thereby provide the foundations to enable automatic and unambiguous connections between researchers and contributors and their profile and works. ORCID has the potential to bring massive efficiencies to the research ecosystem for all and several agencies, including the Wellcome Trust, are now integrating ORCIDs into their workflows (e.g. when submitting a paper to a journal, when registering to apply for a grant).

For research funders, if ORCID continues to grow and build critical mass, it will deliver efficiencies beyond the grant application, management and reporting processes and has the potential to address the challenges of peer review selection, career tracking and research outputs tracing.

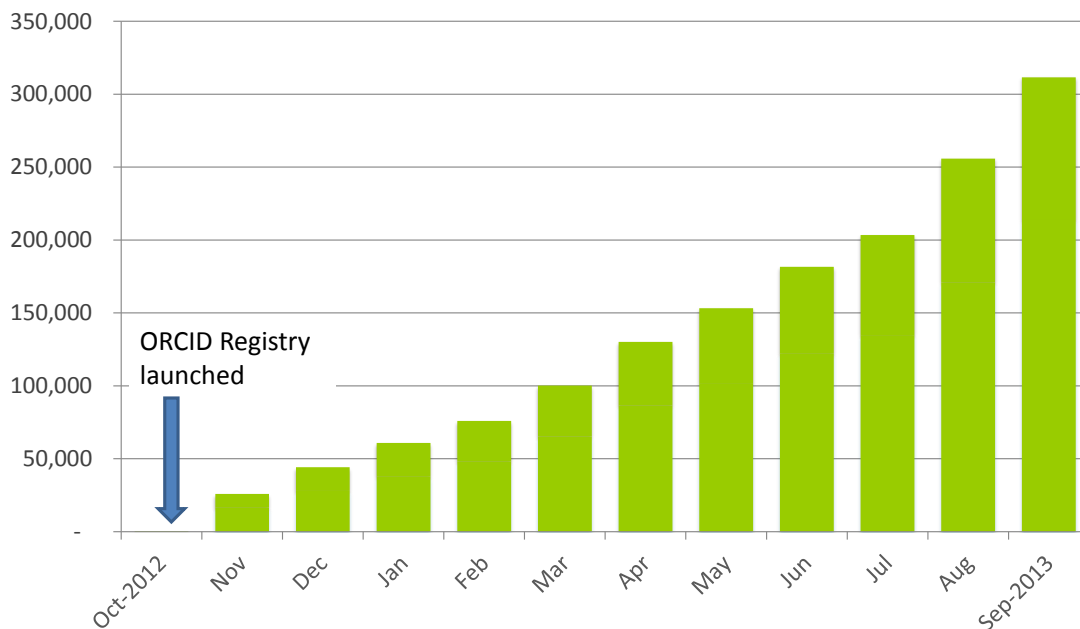
The first research funder to engage with ORCID, the Wellcome Trust has been a part of the ORCID endeavour since its inception in 2010; Liz Allen (and Robert Kiley as alternate) is an ORCID Board Director and has been involved in setting strategy and development of ORCID Inc.

Source: Strategic Planning and Policy Unit; 2013

Figure 5.5



### 311,000 individual identifiers issued in first year

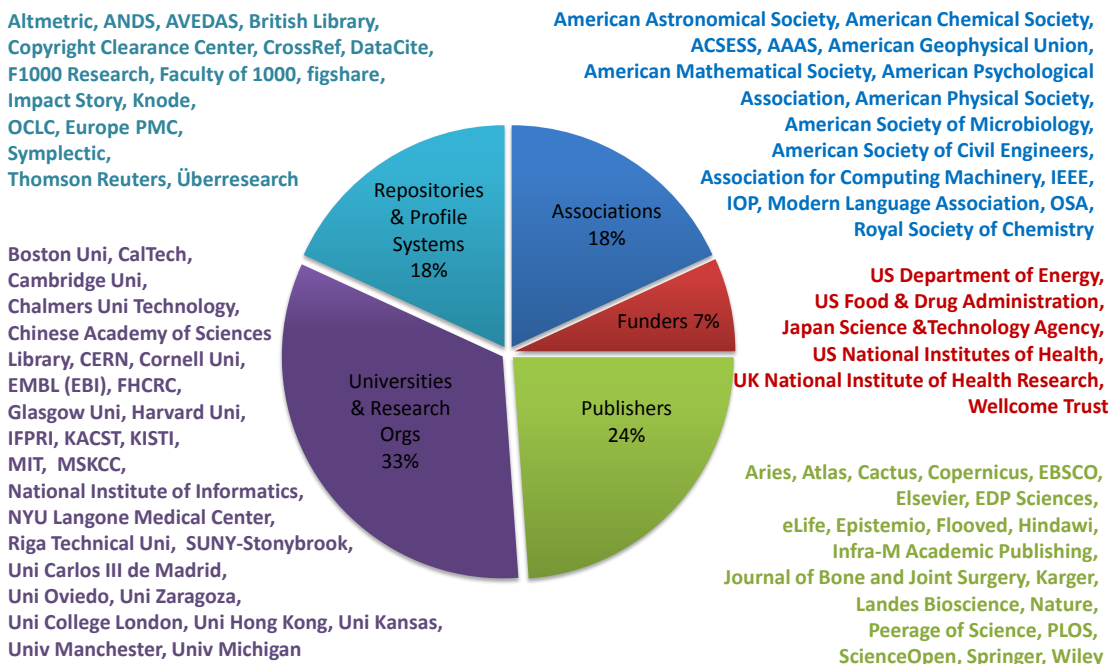


Source: [www.orcid.org](http://www.orcid.org) (2013)

Figure 5.6



### 80 cross-sector member organisations



Source: [www.orcid.org](http://www.orcid.org) (2013)

**Figure 5.7 Wellcome Library activity highlights 2012/13**

- The new Library website launched in November 2012, with the subsequent launch of 'Codebreakers: Makers of Modern Genetics' in March 2013. This online resource represents the first release of content from the Library's digitisation programme.
- The digital library infrastructure, including the development of the Library Player, has provided access to content which has been digitised under the Codebreakers project, which so far has seen over two million pages of books and archives digitised.
- 2012/13 saw an extension of the Trust Open Access policy to include monographs and book chapters. The Library has also worked with all of the major publishers used by Trust funded researchers, and successfully encouraged the overwhelming majority of them to offer a CC-BY licence when they publish Trust-funded content.
- Strategic acquisitions included a Japanese smallpox manuscript, showing various manifestations of the disease in pictures and tactile form; a seventeenth century German obstetrical manuscript complete with an illustration of an abortion instrument; and also archives and books from the British Association of Sexual Health and HIV.
- The success of the Human Genome Archives Project resulted in 53 relevant institutions/individuals being surveyed. The Library received deposits of key collections, including those of Nobel Prize winner John Sulston, as well as Michael Ashburner, Richard Durbin and Carol Churcher.

Source: Medical Humanities & Engagement; 2013

**Figure 5.8 Wellcome Library activities: audience reach/volume**

Activity	Audience reach/volume							
	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
User visits to the Library	19,713	20,511	32,144	38,246	43,945	40,760	41,875	40,870
Visitors on Library tours	658	633	1,192	1,330	1,375	1,339	2,249	2,075
Research enquiries answered (e-mail/letter/telephone etc)	4,036	3,937	3,945	5,871	6,200	6,013	2,276	4,392
Library Catalogue searches	589,042	806,469	1,175,123	750,265	680,518	761,824	1,356,047	1,699,570
New items purchased	3,111	2,905	2,917	2,737	2,225	2,339	1,792	1,764
Items catalogued	10,507	14,694	25,016	18,932	22,139	22,745	30,033	26,009
Items lent to other libraries	357	445	378	149	398	379	314	307
Items conserved	431	552	701	1,083	2,234	4,219	12,686	5,610
Items preserved	1,737	818	1,238					
Items exhibited	46	149	40	149	193	171	110	255
Wellcome Images reproduced and broadcast	2,307	3,241	3,486	4,186	3,464	4,287	3,796	4,267
Items retrieved from store for public usage	19,584	21,463	21,149	21,462	23,628	22,269	23,948	24,621

Source: Medical Humanities & Engagement; 2013



**Figure 5.9 Medical Humanities & Engagement – resources created and developed 2012/13**

**The National Archives, Kew**

'Death, Dirt and Disease: Cataloguing MH13, the 'General Board of Health' correspondence, 1848-1871'

MH13 is a series of historic public records in the National Archives comprising large bound volumes containing the letters, reports and memos from the numerous local boards of health set up following the 1848 Public Health Act, in addition to those from local individuals and other local institutions, concerning sanitation and contagious disease. In many cases the volumes also contain the responses of the General Board of Health, offering a rich and varied resource for scholarly research across a wide range of subjects relating to the spread of contagious diseases during the 19<sup>th</sup> century.

**London School of Hygiene and Tropical Medicine (LSHTM)**

'Cataloguing and Preservation of the HIV/AIDS Collections at the London School of Hygiene and Tropical Medicine'

A Research Resources scoping project identifying the need for further funding to catalogue and preserve LSHTM's collections relating to HIV/AIDS has led to a larger grant to enable research access. The archives include the papers of Professor Peter Piot, The AIDS social history programme, the work of Professor Virginia Berridge on the study of the social impact of HIV/AIDS in the UK and Professor Kaye Welling's papers from LSHTM's Department of Social and Environmental Health Research. Further records relating to project SIGMA and the Centre for Sexual and Reproductive Health Research Collection are also included.

**London Metropolitan Archives**

'Mapping and Imaging Smallpox in London 1870-1910'

A small grant of £24,000 has enabled the complex repair and digitisation of five large-scale maps of London, each created to map the spread of individual cases of Smallpox during separate epidemics in the 19<sup>th</sup> century. The badly damaged maps, each measuring approximately 5 metres by 4 metres, were completely inaccessible to both researchers and the general public prior to the Research Resources grant.

**Mitchell Library, Glasgow Life**

'The Scottish Women's Hospital Archives, 1911-1922: Delivering medical care on the Western Front'

A Research Resources grant to catalogue and preserve the Scottish Women's Hospital archives is opening up access to a unique resource which records the crucial contribution made to the delivery of medical care during the First World War, in particular relating to the strategic challenge 'combatting infectious diseases'. The archive also highlights the Scottish Women's Hospitals as a key factor in the changing role of women in medicine in the UK.

**Churchill College Archives, Cambridge**

'Cataloguing the papers of Professor Sir Aaron Klug OM FRS'

A Research Resources grant has enabled full physical and intellectual access to the personal papers of Professor Sir Aaron Klug, Nobel Prize winning chemist and biophysicist, and former Director of the Medical Research Council Laboratory of Molecular Biology and President of the Royal Society. It is expected that the project will also lead to the exhibition and digitisation of key items from the collection.

Source: Medical Humanities & Engagement; 2013

## CONTRIBUTIONS TO THE GROWTH OF CENTRES OF EXCELLENCE

**Figure 5.10 Top global institutions in the field of Microbiology – ranked by citations per paper (January 2003 to June 2013)<sup>36</sup>**

Rank	Institution	Total citations	Number of papers	Citations per paper
1	Institute for Genomic Research, USA	14,312	157	91.16
2	Joint Genome Institute, USA	4,356	64	68.06
3	Santa Fe Institute, USA	3,381	57	59.32
4	Aaron Diamond Aids Research Center, USA	2,940	52	56.54
5	Public Health Research Institute, USA	4,036	84	48.05
6	Rockefeller University, USA	19,765	416	47.51
7	Wageningen Centre for Food Sciences, Netherlands	3,104	67	46.33
8	Royal Netherlands Institute for Sea Research, Netherlands	4,919	110	44.72
9	J. Craig Venter Institute, USA	8,511	191	44.56
<b>10</b>	<b>Wellcome Trust Sanger Institute, UK</b>	<b>11,987</b>	<b>272</b>	<b>44.07</b>

Source: Thomson Reuters Essential Science Indicators; 2013

**Figure 5.11 Top global institutions in the field of Biology & Biochemistry – ranked by citations per paper (January 2003 to June 2013)**

Rank	Institution	Total citations	Number of papers	Citations per paper
1	Institute for Genomic Research, USA	7,910	75	105.47
2	Applied Biosystems Inc., USA	7,407	74	100.09
3	Tokyo Metropolitan University, Japan	23,590	261	90.38
4	European Bioinformatics Institute, UK	23,589	286	82.48
5	<b>Wellcome Trust Sanger Institute, UK</b>	<b>24,954</b>	<b>305</b>	<b>76.55</b>
6	Whitehead Institute for Biomedical Research, USA	14,252	195	73.09
7	Dan Farber Cancer Institute, USA	25,715	410	62.72
8	Stanford Research Institute International, USA	4,654	76	61.24
9	GlaxoSmithKline, UK	10,260	171	60.00
10	National Library of Medicine, USA	10,578	178	59.43

Source: Thomson Reuters Essential Science Indicators; 2013

**Figure 5.12 Top global institutions in the field of Neurosciences & Behaviour – ranked by citations per paper (January 2003 to June 2013)**

Rank	Institution	Total citations	Number of papers	Citations per paper
<b>1</b>	<b>WT Centre for Neuroimaging, UK</b>	<b>5,730</b>	<b>53</b>	<b>108.11</b>
2	Rush University Medical Center, USA	7,569	108	70.08
3	Douglas Institute, Canada	5,379	90	59.77
4	Cold Spring Harbor Laboratory, USA	17,964	308	58.32
5	National Human Genome Research Institute, USA	4,991	87	57.37
6	Amgen, USA	4,538	80	56.73
7	American Academy of Neurology, USA	4,652	83	56.05
8	Western Psychiatric Institute & Clinic, USA	4,377	85	51.49
9	Banner Sun Health Research Institute, USA	5,410	114	47.46
10	Donders Institute for Brain, Cognition and Behaviour, Netherlands	4,760	101	47.13

Source: Thomson Reuters Essential Science Indicators; 2013

<sup>36</sup> Only institutions which have published at least 50 papers are included in Figs. 5.10 – 5.12

**Figure 5.13 Significant capacity building initiatives, 2012/13**

**African Institutions initiative (All)**

The Trust's £30 million **African Institutions initiative (All)** consists of 51 African research institutes and universities and 20 non-African 'Northern' partners, working together through 7 African-led consortia. A third of sub-Saharan countries are involved in at least one consortium. Significant progress impact includes:

- **Institutional training and research career structures have been improved** in several key African universities; for example, All has led, for the first time, to the introduction of research posts (rather than posts focused only on teaching responsibilities) and in most institutions it is leading to improved research training models and higher-quality research training and supervision.
- Existing All **consortia have been offered an opportunity to submit an application for a year of additional funding**, subject to review, to bring the capacity strengthening portfolio into alignment for a major review in 2015 (subject to approval by the Board of Governors).

**Health Research Capacity Strengthening Initiative in Kenya and Malawi (HRCSI).**

The HRCSI is jointly funded by the Wellcome Trust and the UK Department for International Development (DFID) who agreed to contribute £10 million each over five years from 2008. Significant progress impact includes:

- Following a review, the Trust and DFID will transfer management of the RCS initiative to the host institution, the Government of Malawi National Commission of Science and Technology (NCST), over the next 12 months.
- Through the Programme, over 40 Masters students are working in areas of strategic need to Malawi and over 350 undergraduates have had the opportunity to undertake a research project as part of their degree.
- Through the programme NCST will continue to monitor and support HRCSI alumni as well as continuing a number of the funding schemes. Subject to approval, both the Malawi and Kenya HRCSI programmes will have the opportunity to apply for renewal in the 2015 call.

During this year the **Trust International Activities team** have developed a 'Good Practice' document describing recommendations and lessons learnt for engaging in research capacity strengthening in low- and middle-income countries, in collaboration with an international group of funders (the ESSENCE group). The document will be showcased on the World Health Organization website (pending endorsement by each member organization).

Source: International Activities, Science Funding; 2013

**Figure 5.14 Science Funding Quinquennial Reviews 2012/13**

Programme	Established	Location	Aim	Review result
Malawi-Liverpool-Wellcome Trust Clinical Research Programme Major Overseas Programme	2003	Malawi	To increase fundamental understanding of disease mechanisms and burden, test novel interventions and translate findings to improving health care. The 2013-18 core grant will underpin this research agenda by strengthening strategic, operational, laboratory and data management infrastructure, and further developing the community-based and social science within the Programme.	Quinquennial review in February 2013.  Core renewal awarded to Malawi by April 2013 SAC.

Source: Science Funding; 2013

## 6. INFLUENCE

- Significant impact on science funding and policy developments
- Significant impact on global research priorities

### SIGNIFICANT IMPACT ON SCIENCE FUNDING AND POLICY DEVELOPMENTS

#### Figure 6.1 Wellcome Trust response to consultations 2012/13

The Policy Team in the Strategic Planning and Policy Unit (SPPU), in collaboration with colleagues across the Trust, produced 44 consultation responses between 1st October 2012 and 30th September 2013. Consultation responses are openly available on the [Wellcome Trust website](#).

#### Parliamentary Monitoring

In 2012/13, the Trust submitted written evidence to 14 Parliamentary Committee inquiries and gave oral evidence at three Committee inquiries (clinical trials; regenerative medicine; and the Joint Committee scrutiny of the Care and Support bill). The Trust was mentioned 11 times in debates in the House of Lords and House of Commons, 6 times in House of Lords written answers, (on the topics of mitochondrial disease, embryology and the Science Learning Centre and 8 times in House of Commons written answers).

Source: Policy Team, Strategic Planning and Policy Unit; 2013

#### Figure 6.2 Influencing Government policy and legislation

Subject theme	Update
<b>Spending Round 2013</b>	The Chancellor of the Exchequer announced the Spending Round, for Government spending in 2015-16, in June 2013. In the lead-up to the review, the Trust submitted evidence to HM Treasury and the Department for Business, Innovation and Skills (BIS), and worked with a cross-sector group of stakeholders and the Biomedicine Forum to ensure consistent messages about the importance of investment in science. In a tough spending round, the resulting announcement was positive for science, with a flat-cash settlement and additional long-term investment for infrastructure. Importantly, proposals to transfer medical research and training to the Department of Health were abandoned. SPPU is already beginning to build an evidence base to inform the next Comprehensive Spending Review, expected after the election in 2015.
<b>Research involving animals</b>	<p>Following the adoption of the EU Directive on the protection of animals used for scientific purposes, the revised Animals (Scientific Procedures) Act 1986 came into effect in the UK on 1 January 2013. The Wellcome Trust has been working with the UK Bioscience Sector Coalition (UKBSC) to ensure that implementation continues to protect animal welfare whilst enabling high quality science and reducing any unnecessary bureaucratic burden.</p> <p>The Trust responded to consultations on the guidance, codes of practice and statistical collection of data through the UKBSC and held regular meetings with the Home Office and BIS and is also engaged across Government with the process to replace Section 24 which governs what information can be disclosed regarding licenses for the use of animals. The Trust has also contributed to the development of the Concordat on openness in the use of animals in research which is expected to be published in early 2014.</p>
<b>Regulation of clinical research</b>	The Trust continues to work with Government and other stakeholders on reforms to the regulation and governance of clinical research. The Care Bill was formally introduced into Parliament in May 2013, including clauses to establish Health Education England (HEE) and the Health Research Authority (HRA) as statutory non-departmental public bodies. The Trust worked with other research organisations to brief peers on key aspects of the Bill, including the research duties of HEE and the HRA's role in streamlining local research approvals in NHS trusts, and will provide further input as the Bill continues its progress through Parliament in autumn 2013. The Trust has also submitted evidence to the independent review by Justin McCracken of the Human Fertilisation and Embryology Authority and the Human Tissue Authority, which recommended – in line with the Trust's position – that the Government retain both bodies while ensuring that regulation in these areas remains under review.

<b>Education policy</b>	<p>The Education Team work closely with colleagues at BIS, DfE, Royal Society and other science education organisations. Key achievements for our education policy work include:</p> <ul style="list-style-type: none"> <li>• The Wellcome Trust Monitor uses a robust sampling methodology to ensure that its results are representative of the UK population. BIS has now adopted this same methodology for its next Public Attitudes to Science survey.</li> <li>• The Trust’s review of Informal Science Learning has been influential in BIS’s Science and Society review and their subsequent actions. We will be collaborating with them on establishing a funders’ forum.</li> <li>• The Trust’s Statement of Recommended Practice for Boards of Governors has been widely disseminated and referred to in the Education Select Committee’s report in this area.</li> <li>• A joint paper produced with the Gatsby Foundation on assessing practical science, discussed with the Council for Technology and Ofqual, has been influential in retaining direct assessment of science practical work in GCSE proposals (and is referenced in Ofqual documentation).</li> <li>• The Trust connected DfE with experts at NowGen who had developed proposals for a modern genetics and genomics curriculum (funded by Engaging Science), reflected in current proposals.</li> </ul>
-------------------------	---

Source: Policy Team, Strategic Planning and Policy Unit; Medical Humanities & Engagement 2013

<b>Figure 6.3 Influencing European policy and legislation</b>	
<b>Policy area</b>	<b>Update</b>
<b>Physical Agents (electromagnetic fields) Directive (EU PAD)</b>	<p>Concerns about the potentially damaging impact of the EU PAD on the use of MRI in the clinic and for research were first raised in 2005. Since that time, the Trust has been working with a pan-European alliance of medical stakeholders to reduce the threat. In June 2013, the European Commission adopted a revised Directive, which includes an exemption for MRI technology. The Health and Safety Executive is now drawing up guidance for implementation of the Directive in the UK, and the Trust is continuing to engage with this process.</p>
<b>Data Protection Regulation</b>	<p>The draft Regulation has continued through the legislative process and the Trust has been actively trying to ensure a positive outcome for research. The rapporteur of the Justice, Home Affairs and Civil Liberties (LIBE) committee – who is leading the passage of the legislation through the European Parliament – proposed potentially damaging amendments for research, and the Trust led the development of a joint statement with 29 signatories to oppose these amendments. The Trust also provided voting recommendations and a detailed briefing on the concerns, and hosted a meeting in the European Parliament with the Federation of European Academies of Medicine, Science Europe and the European Alliance on Personalised Medicine. The compromise amendments adopted by the LIBE committee in October 2013 were not a significant improvement on the rapporteur’s amendments and therefore the Trust is building on its work with European and UK stakeholders to ensure these amendments are not included in the final legislative text. In the UK the Trust continues to interact with key Government departments on the Regulation and is represented on the Ministry of Justice Data Protection Advisory Panel, which informs the UK’s negotiating position.</p>
<b>Clinical Trials Regulation</b>	<p>In July 2012, the European Commission proposed a new Regulation to replace the existing Clinical Trials Directive and associated Member State legislation. The Trust has worked with other stakeholders, including Cancer Research UK, to ensure that the academic perspective is taken into account. We have produced a number of briefings; attended meetings in the European Parliament and with the rapporteur; and are represented on the Medicines and Healthcare products Regulatory Agency’s Clinical Trials Stakeholder Reference Group, which informs the UK’s negotiating position. The current draft is much more proportionate than the previous Directive.</p>

Source: Policy Team, Strategic Planning and Policy Unit; 2013

#### Figure 6.4 Enhancing data sharing

SPPU is taking forward a range of work in partnership with others to address key cultural, professional and infrastructural barriers to research data sharing. Activities include:

- Providing the secretariat for the joint Medical Research Council, Economic and Social Research Council, Cancer Research UK and Wellcome Trust Expert Advisory Group on Data Access (EAGDA). The current workplan includes: establishing incentives to promote data sharing in the research community; a survey and analysis of Data Access Committees for studies in the UK; and establishing the risks of re-identifying research participants from anonymised genetic data.
- Coordinating the Public Health Research Data Forum. Research commissioned by the Trust on mechanisms for data citation was published in February. Projects in progress include: work to explore the views of research participants and stakeholders in lower middle income countries; an analysis of options for capacity building for data management in developing countries; and work to examine data discoverability.
- Ensuring best practice among grant-holders by updating guidelines on the publication of Trust-funded research and associated datasets.
- Commissioning focus groups to explore public attitudes to personal data, including health data, and data linkage. The findings were discussed at a Spotlight event, 'Private data, public good?' in July 2013.
- Providing evidence to a consultation on amending the NHS Constitution and supporting the Caldicott Information Governance Review, to help unlock the potential of patient records for research.
- Holding a cross-sector workshop on clinical trial data transparency in April 2013 to focus the discussions on practical solutions, and beginning to explore a role for the Trust in the area. The Trust has agreed to contribute towards a study by the US Institute of Medicine into responsible sharing of clinical trial data.

Source: Policy Team, Strategic Planning and Policy Unit; 2013

## SIGNIFICANT IMPACT ON GLOBAL RESEARCH PRIORITIES

<b>Figure 6.5 Wellcome Trust Frontiers meetings and workshops 2012/13</b>	
<b>Meeting theme</b>	<b>Wellcome Trust lead department</b>
Rare Disease Workshop	Science Funding (GMS)
Showcasing British Neuroscience	Science Funding (NMH)
Evington Initiative – Dementia meeting	Science Funding (NMH)
Antibiotic Action meeting	Science Funding (PIPH)
Neurodegenerative Diseases Initiative Workshop	Science Funding (NMH)

Source: Science Funding; 2013

<b>Figure 6.6 Wellcome Trust staff key positions on external Committees/Boards</b>	
<b>Staff member</b>	<b>External Committee and role</b>
<b>Directorate and Grants Management</b>	
David Lynn	<ul style="list-style-type: none"> <li>• Association of Medical Research Charities Executive Council – Member</li> <li>• Independent Advisory Panel; Expert Group; Funders Group – Member</li> <li>• Centre for Macaques Advisory Board – Member</li> <li>• Canadian Institutes of Health Research Working Group – Member</li> <li>• European Foundation Centre Research Forum Steering Group – Member</li> <li>• Public Health Foundation of India Governing Board; Executive Committee; Audit Committee – Member</li> <li>• Responsible Research &amp; Innovation TOOLS Advisory Board – Member</li> <li>• Biomedicine Forum – Member</li> <li>• BBC Appeals Advisory Committee sub-committee – Member</li> <li>• BBC Appeals Advisory Committee meeting – Member</li> </ul>
Liz Allen	<ul style="list-style-type: none"> <li>• Open Researcher and Contributor ID (ORCID) Board of Directors - Member</li> </ul>
Nancy Lee	<ul style="list-style-type: none"> <li>• Steering Group for the Concordat on Openness on Use of Animals in Research - Member</li> </ul>
Katherine Littler	<ul style="list-style-type: none"> <li>• Emerging Science and Bioethics Advisory Group (ESBAC) – Ex-Officio Member</li> </ul>
Simon Jeffreys	<ul style="list-style-type: none"> <li>• Diamond Light Source Limited - Non-Executive Director</li> </ul>
<b>Science Funding</b>	
Candy Hassall	<ul style="list-style-type: none"> <li>• Biotechnology and Biological Sciences Research Council Industrial CASE Scheme Review Panel 2012 – Chair</li> <li>• Interview and Management Panel for CW Maplethorpe Postdoctoral Fellowships for Pharmaceutical Education and Research – Chair</li> <li>• European Molecular Biology Laboratory Interdisciplinary Postdocs (EIPOD) selection committee 2012 - External expert</li> <li>• Research Concordat Strategy Group and its Executive Group - Member</li> <li>• Vitae's Research Staff Development Advisory Group (ReSDAG) - Member</li> </ul>
Jimmy Whitworth	<ul style="list-style-type: none"> <li>• Board of Trustees of India Alliance – Trustee</li> <li>• South East Asia Infectious Diseases Research Network – Member of Governing Committee</li> </ul>
John Williams	<ul style="list-style-type: none"> <li>• The National Student Association of Medical Research – Honorary Vice President</li> <li>• Academic Medicine Committee, Royal College of Physicians – Member</li> <li>• Department of Health Dementia Research Champion Group – Member</li> <li>• INSPIRE shortlisting Committee (Academy of Medical Sciences) – Member</li> <li>• State of Psychiatric Health Care Services Inquiry Panel (Mental Health Foundation) – Member</li> <li>• National Academy of Sciences (United States), Institute of Medicine, Forum on Neuroscience and Nervous System Disorders – Member</li> <li>• Canadian Institute for Health Research, International Advisory Panel for</li> </ul>

	<ul style="list-style-type: none"> <li>Pan-Canadian Dementia Research Platform – Member</li> <li>World Innovation Summit in Health, Mental Health Forum - Member</li> </ul>
Kevin Moses	<ul style="list-style-type: none"> <li>Genome Research Limited Board – Director</li> <li>BioRad Labs Inc. Science and Technology Advisory Board - Member</li> </ul>
Michael Dunn	<ul style="list-style-type: none"> <li>Serious Adverse Events Consortium Board – Director</li> <li>National Cancer Research Institute (NCRI) Board – Member</li> <li>Structural Genetics Consortium Board – Director</li> <li>Wellcome Trust and Cancer Research UK Gurdon Institute Management Committee – Member</li> <li>Stem Cell Funders Forum – Member</li> <li>International Cancer Genome Consortium – Executive Committee and Scientific Steering Committee Member</li> </ul>
Val Snewin	<ul style="list-style-type: none"> <li>Enhancing Support for Strengthening the Effectiveness of National Capacity Efforts (ESSENCE) group of Funders Steering Committee - Member</li> <li>3 African Institution Initiative Advisory Boards - Observer</li> </ul>
Jane Kengeya-Kayondo	<ul style="list-style-type: none"> <li>Consortium for National Health Research, Kenya, Board of Management - Member</li> </ul>
Marta Tufet	<ul style="list-style-type: none"> <li>4 African Institution Initiative Advisory Boards – Observer</li> <li>9 Global Health Trial steering committees - Observer</li> </ul>
<b>Technology Transfer</b>	
Ted Bianco	<ul style="list-style-type: none"> <li>Board of MSD Wellcome Trust Hilleman Laboratories - Observer</li> <li>Board of the Innovative Vector Control Consortium, Liverpool School of Tropical Medicine - Observer</li> </ul>
Richard Seabrook	<ul style="list-style-type: none"> <li>EPSRC Strategic Advisory Network - Member</li> <li>Multiple Sclerosis Society IP Advisory Group - Member</li> <li>Wellcome Trust Sanger Institute Translation Committee – Member</li> <li>NIHR reference group supporting a Call for Research on Anti-Microbial Resistance - Member</li> </ul>
Daniel Nelki	<ul style="list-style-type: none"> <li>Stevenage BioScience Catalyst Board - Observer</li> <li>Board of MSD Wellcome Trust Hilleman Laboratories - Observer</li> <li>HIV Medicines Alliance Steering Group - Member</li> </ul>
Tim Knott	<ul style="list-style-type: none"> <li>Royal Academy of Engineering's Biomedical Engineering Panel - Member</li> <li>Wellcome Trust Sanger Institute Translation Committee - Member</li> </ul>
Ann Mills-Duggan	<ul style="list-style-type: none"> <li>HealthTech Steering Board – Member</li> <li>Medicines Knowledge Transfer Network – Member</li> </ul>
<b>Medical Humanities &amp; Engagement</b>	
Clare Matterson	<ul style="list-style-type: none"> <li>Myscience Board - Member</li> <li>Science in Culture Advisory Board and Funding Committee, Arts and Humanities Research Council - Member</li> <li>Science Gallery International Board - Member</li> <li>Y Touring Steering Committee - Member</li> </ul>
Hilary Leever	<ul style="list-style-type: none"> <li>ENTHUSE Charitable Trust - Trustee</li> </ul>
Stephanie Sinclair	<ul style="list-style-type: none"> <li>British Interactive Group - Member</li> </ul>
Ken Arnold	<ul style="list-style-type: none"> <li>Arts and Humanities Research Council REF panel for History – Member</li> </ul>
Simon Chaplin	<ul style="list-style-type: none"> <li>Arts Council England Designation Committee - Member</li> <li>Strategic Content Alliance - Member</li> </ul>
Robert Kiley	<ul style="list-style-type: none"> <li>EMBO Publications Advisory Board- Member</li> <li>Europe PMC Funders Group - Member</li> </ul>
Chloe Sheppard	<ul style="list-style-type: none"> <li>Florence Nightingale Museum – Trustee</li> </ul>

Source: Directorate, Science Funding, Technology Transfer, Medical Humanities & Engagement; 2013



## Appendix A – Assessment Framework

Indicator	Evidence	Key source/s
<b>1. DISCOVERIES</b>		
<b>A. Significant advances in the generation of new knowledge and understanding</b>	<p>Analysis of publication output (including scientific, peer-reviewed publications, books, and monographs) associated with Trust support.</p> <p>Measures to include:</p> <ul style="list-style-type: none"> <li>– volume,</li> <li>– proportion considered high quality (normalised citation impact on subject area), and</li> <li>– indicators of online attention through the use of altmetrics</li> </ul> <p>% of grants rated as outstanding to poor</p> <p>Examples of significant advances in the generation of new knowledge and understanding</p> <p>Research Profiles: Highlights &amp; Histories</p>	<ul style="list-style-type: none"> <li>– PubMed</li> <li>– Thomson Reuters (Evidence)</li> <li>– F1000 Prime</li> <li>– Altmetric</li> <li>– Achievement reporting<sup>37</sup></li> </ul>
<b>B. Contribute to discoveries with (potential) tangible impacts on health</b>	<p>Examples of contributions to discoveries with (potential) impacts on health</p> <p>Research Profiles</p>	<ul style="list-style-type: none"> <li>– Achievement reporting</li> </ul>
<b>2. APPLICATIONS OF RESEARCH</b>		
<b>A. Contribute to the development of enabling technologies, products &amp; devices</b>	<p>% of awards with IP-related output, product licenses or collaborations with commercial partners</p> <p>Number of and key examples of:</p> <ul style="list-style-type: none"> <li>– cases where consent to commercial exploitation granted by Trust</li> <li>– projects successfully partnered through licensing or adoption by public-private partnerships</li> <li>– inventions arising from translational research awards</li> <li>– Translation Awards that receive follow-on investment</li> </ul> <p>Amount of venture capital finance secured through follow-on funding</p> <p>Research Profiles</p>	<ul style="list-style-type: none"> <li>– Achievement reporting</li> </ul>
<b>B. Uptake of research into policy and practice</b>	<p>% of grants reporting discussions with policy makers/health care professionals</p> <p>Key examples of update of research into policy and practice</p> <p>WT associated work featuring on National Institute for Health and Clinical Excellence</p> <p>Research Profiles</p>	<ul style="list-style-type: none"> <li>– Achievement reporting</li> <li>– Digitised NICE guidelines</li> </ul>
<b>3. ENGAGEMENT</b>		
<b>A. Enhanced level of informed debate on biomedical science issues</b>	<p>Portrayal of Wellcome Trust in press cuttings over time and examples of key campaigns and press coverage</p> <p>% of grants with associated media coverage</p> <p>Research Profiles</p>	<ul style="list-style-type: none"> <li>– Communications Team</li> <li>– Achievement reporting</li> </ul>
<b>B. Significant engagement of key audiences in biomedical science, and increased audience reach</b>	<p>Evidence of volume of people engaged in Trust's activities:</p> <ul style="list-style-type: none"> <li>– visitor numbers to Wellcome Collection</li> <li>– number of people engaged by/in public engagement grants and direct activities</li> <li>– % of main stream grants doing wider communication: <ul style="list-style-type: none"> <li>○ presentations to non-academic audiences</li> <li>○ feedback to research participants and related communities</li> </ul> </li> </ul> <p>Research Profiles</p>	<ul style="list-style-type: none"> <li>– Wellcome Collection visitor monitoring</li> <li>– Achievement reporting</li> <li>– Wellcome Trust Sanger Institute</li> </ul>

<sup>37</sup> ACHIEVEMENT REPORTING – is a term used to include *any* type of reporting on progress, development and achievement associated with a Trust-funded project or activity (e.g. annual reports, End of Grant reports, milestone reporting and e-Val).

4. RESEARCH LEADERS		
<b>A. Develop a cadre of researcher leaders</b>	Most highly cited researchers in Thomson Reuters fields	<ul style="list-style-type: none"> <li>- Thomson Reuters Essential Science Indicators</li> <li>- Achievement reporting</li> <li>- WT Career Trackers</li> </ul>
<b>B. Evidence of significant career progression among those we support</b>	Changes to Trust careers funding	
	Key findings from the Wellcome Trust Career Trackers	
	Examples of Prizes awarded	
	Research Profiles	
5. RESEARCH ENVIRONMENT		
<b>A. Key contributions to the creation, development &amp; maintenance of major research resources</b>	% and examples of grants yielding software/ database development	<ul style="list-style-type: none"> <li>- Achievement reporting</li> <li>- Sanger Institute</li> <li>- Wellcome Trust Library reporting</li> <li>- ORCID</li> </ul>
	Sanger resources usage	
	ORCID registry activities	
	Wellcome Trust Library activities, audience and research	
<b>B. Contributions to the growth of centres of excellence</b>	Research Profiles	
	Top institutions in Thomson Reuters fields	<ul style="list-style-type: none"> <li>- Essential Science Indicators</li> <li>- Achievement reporting</li> <li>- Initiative-based reviews</li> </ul>
	Updates on initiatives and reviews	
	Research Profiles	
6. INFLUENCE		
<b>A. Significant impact on science funding policy developments</b>	Trust impact in policy arena - contributions to consultations, govt/legislative environment. Mentions of Trust in Parliament.	<ul style="list-style-type: none"> <li>- SPPU policies &amp; briefings database</li> <li>- Parliamentary monitoring SPPU and Education</li> </ul>
	Examples of influence on Government policy and legislation and update on policy activities	
	Research Profiles	
<b>B. Significant impact on global research priorities</b>	Examples of Wellcome Trust Frontiers meetings and workshops	<ul style="list-style-type: none"> <li>- Funding Divisions</li> </ul>
	WT representation on external committees and boards	
	Research Profiles	

## 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.

Wellcome Trust  
Gibbs Building  
215 Euston Road  
London NW1 2BE, UK  
T +44 (0)20 7611 8888  
F +44 (0)20 7611 8545  
E [contact@wellcome.ac.uk](mailto:contact@wellcome.ac.uk)  
[www.wellcome.ac.uk](http://www.wellcome.ac.uk)

The Wellcome Trust is a charity registered in England and Wales, no. 210183. Its sole trustee is The Wellcome Trust Limited, a company registered in England and Wales, no. 2711000 (whose registered office is at 215 Euston Road, London NW1 2BE, UK). SP-5890/11-2013