

MRC

Medical
Research
Council

THE MEDICAL RESEARCH COUNCIL

Economic Impact Report

2010/11



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Section 1.0:

Introduction

The MRC Economic Impact Report has been published each year since 2005, and is part of the performance management framework implemented by the Department for Business, Innovation and Skills (BIS). All of the MRC Economic Impact Reports are available on the MRC website¹.

Reporting the economic and social dimensions of research council output has been significantly expanded since 2008/09. Additional metrics and information have been added in consultation with BIS and all research councils. The aim is to make reporting across the councils more consistent and to provide more informative and robust metrics. The structure and content of this report has therefore changed since previous years, but is expected to remain in this form throughout the current spending review period. The list of metrics agreed by BIS and all research councils can be found in Annex 1. Each research council can also provide a small number of additional metrics specific to it.

The Economic Impact Report now also contains case studies, which would previously have been included in the Economic Impact Baseline report². These two publications have been merged.

This report should be read in conjunction with the MRC Annual Report, the MRC Annual Review³ and the annual summary of MRC e-Val data⁴ which provide a comprehensive summary of achievements over the period.

The MRC Economic Impact Report shows data for 2007/08, 2008/09, 2009/10 and 2010/11 where possible.

1. The MRC Economic Impact Reports can be found at:

<http://www.mrc.ac.uk/Newspublications/Publications/EIRF/index.htm>

2. The Economic Impact Baseline report for 2009/10 was called Impact of MRC Research and can be found at:

<http://www.mrc.ac.uk/Utilities/Documentrecord/index.htm?d=MRC007392>

3. The MRC Annual Report and Annual Review can be found at: <http://www.mrc.ac.uk/Newspublications/Publications/index.htm>

4. The 2010 summary of MRC e-Val data is called "Outputs, outcomes and impacts of MRC Research" and can be found at

<http://www.mrc.ac.uk/Achievementsimpact/Outputsoutcomes/MRCe-Val2010/index.htm>

Section 2.0:

Summary and highlights

The heart of the MRC's mission is to improve human health through world-class medical research. To achieve this, we support research across the biomedical spectrum, from fundamental laboratory-based science to clinical trials, in all major disease areas. The organisation works closely with key stakeholders and other research funders in the UK and internationally to deliver our mission, prioritising research that is likely to make a real difference to clinical practice and the health of the population. MRC stakeholders include the UK's Health Departments and other government departments and agencies, the six other research councils, industry, the academic and charity sectors, and the public.

Established in 1913 and incorporated by Royal Charter in 1920, the MRC's mission is to:

- encourage and support research to improve human health;
- produce skilled researchers;
- advance and disseminate knowledge and technology to improve the quality of life and economic competitiveness of the UK; and
- promote dialogue with the public about medical research.

In 2009, the MRC published its five-year strategic plan, *Research Changes Lives*⁵, which defined our role in contributing to faster and more effective ways for medical research to flourish at all stages, from working to understand the fundamental science of how our bodies work, to tackling some of the most pressing health issues facing society.

To monitor progress with the MRC strategic plan and to better understand how MRC research leads to economic, societal and academic impact, all MRC-funded researchers are required to provide feedback on the impact of their work via an online system called MRC e-Val. This is the second year that MRC-funded researchers have used the system, and in 2010 more than 90 per cent of researchers that had held funding from the MRC since 2006 (more than 3,000 scientists) submitted information to us. Analysis of the MRC e-Val dataset is yielding a detailed picture of the progress, productivity and quality of the science we support. In particular, the analysis highlights how MRC research contributes to the development of new medicines and technologies, improvements to clinical policies and practices, and how MRC research encourages inward investment to the UK.

MRC research is generating world-leading knowledge

A primary indication of the quality of research is the extent to which others cite publications arising from the work. Analysis of 20,000 peer-reviewed papers produced by MRC-funded research groups between 2006 and 2009 demonstrated that these papers have more than twice the world average citation impact (2.17 times). UK papers in biological sciences or clinical and health-related disciplines typically have a citation impact of 1.5 times the world average⁶. This excellence is the result of effective and efficient selection procedures, combined with well judged strategic investments to develop newer areas, and the MRC will seek to maintain the impact of its work at this world-leading level.

An example of a highly cited paper arising from MRC-funded research was a 2009 paper in *Science*⁷ by the MRC/Imperial College Centre for Outbreak Analysis and Modelling, in collaboration with the World Health Organization (WHO), which estimated the transmissibility and severity of the influenza A (H1N1) strain. By the end of 2010 this paper had been cited 80 times more than the world average for a paper in this field.

5. The MRC Strategic Plan 2009–2014 *Research Changes Lives* can be found at:
<http://www.mrc.ac.uk/Utilities/Documentrecord/index.htm?id=MRC006090>

6. Analysis provided by Thomson Reuters

7. Fraser C. et al. "Pandemic Potential of a Strain of Influenza A (H1N1): Early Findings" *Science* 19 June 2009:
Vol. 324 no. 5934 pp. 1557-1561 DOI: 10.1126/science.1176062

MRC research is highly collaborative and catalyses significant inward investment to the UK

MRC-funded researchers had over 8000 research or impact collaborations with more than 2,000 partner organisations across 95 countries between 2006 and 2010. About half of the collaborations are international – an indication of the global profile of MRC research. 10% of partners were US-based, followed by multinational consortia and partnerships with Germany, Netherlands and France. India and China now appear in the top 20 countries.

The MRC has encouraged collaboration with industry via its new MRC Industry Collaboration Award (MICA) scheme, strategic initiatives such as the MRC / ABPI Immunology and Inflammation Initiative, and an increase in the number of CASE studentships, with more than 140 such training placements organised over the last four years (see metrics 19 and 20 in this report). MRC researchers have reported 668 collaborations with private sector partners since 2006, which have each been evidenced by tangible output such as exchange of staff/materials/expertise/access to facilities, co-funding of research or co-authorship of papers.

Analysis of MRC collaborations revealed that 62 per cent of MRC researchers embarked on new collaborations as a result of MRC funding since 2006 and 20 per cent of MRC-funded principal investigators had productive interactions with the private sector in this period. Productive interactions involve an exchange of material, expertise, funding or access to facilities and may result in co-publication.

One example of successful private sector collaborations is the interaction between the global pharmaceutical company Merck Sharpe & Dohme and the MRC/BHF/CRUK Clinical Trials Services Unit (CTSU), a relationship which has brought almost £100 million in additional funding for research into large-scale trials of cholesterol lowering treatments. CTSU is also liaising with the US Food and Drug Administration (FDA), a leading regulator of clinical trials, on the development of new approaches to monitoring Phase III studies which would increase their efficiency and reduce the costs to industry by 20-30%⁸. Another example is the Dundee Division of Signal Transduction Therapy (the largest biomedical collaboration between academia and industry in the UK) which has now brought more than £23m pharmaceutical R&D funding into the University⁹.

We estimate that MRC-funded groups were successful in obtaining around £900m additional funding from outside funding sources between 2006 and 2010. £300m of this was from the private sector or from outside the UK, growing the science base here.

MRC translational research is bringing new treatments to the clinic and providing a rich pipeline of opportunities for commercialisation.

MRC research since 2006 has resulted in the publication of 300 patents, around 30 per cent of which have subsequently been licensed worldwide.

MRC-funded research has led to over 40 new products and interventions reaching the market between 2006 and 2010, including new equipment for research, new genetic tests, and monoclonal antibody drugs licensed for nine separate conditions.

MRC-funded pipeline of approximately 360 potentially investable propositions since 2006 has been identified by MRC's annual "e-Val" survey.

- By "sweating" limited translational budgets and by working with MRCT, VC, Pharma and SMEs, 82 projects are progressing well, often with US investment
- 22 products or interventions in wide-scale adoption
- 16 drugs have reach at least the late stage clinical with 6 of these going through market authorisations and 4 drugs in either small scale or wide scale adoption.

8. Eisenstein of DSTT, et al. Am Heart J. 2005;149:482-8

9. Details of the DSTT can be found in last year's EIRF at

<http://www.mrc.ac.uk/Utilities/Documentrecord/index.htm?d=MRC007932>

These successes demonstrate the real potential of innovations from academic research, but, 281 MRC prospects are on the wrong side of the innovation investment gap or “Valley of Death”. If one takes account of the significant funding of medical research from the charity sectors this figure could easily be 2 or 3 times as high – indicating a huge untapped resource for economic growth and potential for improvements in healthcare.

Humanised antibody technology is an MRC discovery which has revolutionised medicine. The pipeline of therapeutic antibody drugs is now the fastest growing in the pharmaceutical industry with a market projected to reach \$60 billion by 2014.

- It is estimated that, to date, more than 1.5 million people worldwide have been treated with anti-TNF monoclonal antibody drugs for rheumatoid arthritis (RA) alone¹⁰. By August 2009 Humira™ (the most successful anti-TNF) was being used in 80 countries in the treatment of 370,000 patients, and estimated to be the world’s top-earning pharmaceutical product with projected sales of \$10 billion by 2016.
- Monoclonal antibody drugs with a link to MRC research are improving the lives of patients suffering from rheumatoid arthritis, psoriasis, ankylosing spondylitis, Crohn’s disease, paroxysmal nocturnal haemoglobinuria, multiple sclerosis, and age-related macular degeneration.

Other interventions that have recently been put into clinical practice, or are to reach a larger population due to policy changes, include:

- hypothermic neural rescue therapy (which reduces death and disability in infants starved of oxygen during difficult births, and is being adopted across the NHS and internationally - and should have 100 lives each year in the UK, and reduce disability in many more children);
- a new combination therapy for children with HIV/AIDS in resource-poor settings (Triomune™, which has received WHO backing);
- a pneumococcal vaccine originally trialled by the MRC Gambia Unit, which has been adopted by the Global Alliance for Vaccines and Immunisations programme (with the aim of averting seven million deaths by 2030);
- the MEND community-based intervention for childhood obesity which has been delivered to 30,000 children through 1,000 centres in six countries;
- a new ‘flexiscope’ test that will significantly cut bowel cancer death rates (estimated to save around 3,000 lives a year) which has been adopted by the UK National Screening Programme and begun a four-year roll out; and
- a national screening programme for abdominal aortic aneurysms, based on MRC trial results which showed that such screening could save around 6,000 lives each year, which has begun.

10. RA is an inflammatory disease which can result in the destruction of joints and lead to disability. Approximately 15,000 people are eligible for anti-TNF therapy in UK, with a further 950 cases arising each year.

Section 3.0:

Inputs: Investment in the research base

**This report will be re-published with this section included
when the data is publicly available.**

3.1 Income and expenditure

This report will be re-published with this section included when the data is publicly available.

3.1 Income and expenditure *contd*

This report will be re-published with this section included when the data is publicly available.

3.2 Human capital (input)

The MRC has a leading national role in training future research leaders across a range of biomedical, clinical and health disciplines. At any one time, the MRC supports around 1,650 PhD students and 200 postdoctoral fellows. Our aim is to:

- train and develop the next generation of research leaders;
- support excellent individuals at critical points of their careers; and
- help address national strategic research skills needs identified with partners.

MRC studentship and fellowship awards are targeted to outstanding individuals undertaking challenging projects in excellent research and training environments. As an MRC student or fellow, you can expect your university, MRC unit or institute to support your development in imaginative and effective ways.

The MRC funds a range of fellowship award schemes for both clinical and non-clinical researchers, as well as specific fellowships in strategically important research areas. There is further information on MRC schemes on our website as well as case studies on individuals that the MRC has supported during significant parts of their careers, including one on Dr Matt Jones who is an MRC Senior Non-Clinical Fellow at the University of Bristol¹².

¹² Full case study on Dr Matt Jones can be found at <http://www.mrc.ac.uk/Achievementsimpact/Profiles/MattJones/index.htm>

5 Principal Investigators

Principal Investigators on grants

2010/11: 1041

2009/10: 1081

2008/09: 1006

2007/08: 943

Data are expressed in terms of posts at 31 December.

To note; where a person holds more than one grant, they have been counted only once.

Programme Leaders and Programme Track Leaders in MRC units/institutes

2010/11: 289

2009/10: 346

2008/09: 349

2007/08: 351

There has been a significant reduction in the numbers of MRC Programme Leaders and Programme Track Leaders over the past calendar year, some of these are due to two MRC Units becoming University Units on 1 April 2010 (the MRC Human Immunology Unit and the MRC Molecular Haematology Unit) at which point the staff were transferred to Oxford University. Also the MRC Centre for Protein Engineering in Cambridge closed at the end of September 2010 following the retirement of its director.

6 Research Fellows

MRC-funded fellows

2010/11: 387

2009/10: 362

2008/09: 368

2007/08: 327

Data are expressed in terms of posts at 31 December.

Note: this represents the number of unique fellows as an individual cannot hold more than one fellowship at a time.

Section 4.0:

Outputs: Research performance

4.1 Knowledge generation

Translational research

A major focus for the MRC in recent years has been on research which translates the results of basic science into improved healthcare, products and services.

The primary aim of the MRC's translational strategy has been to increase the scale and speed of progress from discovery into new clinical studies. To meet this aim, a number of activities have been undertaken, including:

- strengthening R&D in areas which underpin and enable translation, where there are currently bottlenecks;
- enhancing the quality and scale of infrastructure for translational research;
- developing a strong programme in research methodology;
- smoothing the progression of innovative interventions into late phase II and phase III clinical trials;
- improving collaborative partnership working; and
- enhancing skills and capacity underpinning all of these areas.

The MRC increased its support for translational research by £132m in total over the previous Spending Review period. As stated in the MRC's strategic plan, Research Changes Lives (a commitment reiterated in the CSR 2010 Delivery Plan), overall spending in this area is likely to reach £250m over the current spending period, including an increase on spending on the managed programme (see below) to £50m per annum by 2014/15.

A key component of the MRC's translational research strategy was the creation of funding streams to support the development of novel therapies, interventions and diagnostics, and the research tools needed for their development. These streams take fundamental discoveries as their starting point, and cover preclinical and clinical development through to early evaluation. This "managed programme" therefore can, and does, support academically led research all the way into early evaluation in man. Over 100 projects have already been supported.

It should be emphasised that, prior to mid-2008, there was little MRC spending specifically targeted at supporting the development of novel therapies, interventions and diagnostics. Furthermore, there are no other substantive public-sector funding schemes that cover this area of research. The MRC's managed programme funding is, therefore, a substantial paradigm shift in the funding landscape, and has become an integral and major part of our research strategy.

Research emerging from the managed programme can be directed through agreed mechanisms towards the Efficacy and Mechanism Evaluation (EME) scheme, which is funded by MRC and managed by the National Institute for Health Research (NIHR), for further, large-scale evaluation as appropriate.

Predicted outcomes and outputs of the MRC approach include:

- quicker realisation of health and economic impact from basic research investment;
- UK remains an attractive environment for R&D investment for the pharmaceutical and biotechnology sectors;
- an increase in the number and diversity of new therapies, devices and diagnostics in development at all stages, from validation of new targets to early and later stage clinical trials;
- meeting academic and industry expectations for a pipeline of innovative, commercialisable research assets with high health impact; and
- better tools and resources to facilitate more rapid development of novel therapeutics.

The MRC also works with the NIHR to jointly deliver a coordinated programme of methodology research. This stream of activity aims to strengthen the tools, theories and disciplines that underpin health research, and is another important component of the MRC's translational strategy. The Methodology Research Panel supports both investigator-led and needs-led research.

The MRC's Translational Stem Cell Research Committee (TSCRC) was established in 2008 to fund research that will drive stem cells towards application, both clinically and in disease modelling and drug discovery. During 2010/11, the committee funded two projects jointly with the British Heart Foundation (BHF) to build capacity in cardiovascular stem cell research, and preclinical projects covering a range of therapeutic areas including: larynx replacement, liver repair, use of stem cells to treat graft versus host disease, hair follicle stem cells to regenerate skin and a bio-orthopedic implant for bone repair. In addition, one project was funded that uses stem cells to model Alzheimer's disease for use in drug discovery and testing.

7 Translational activities

Data for projects awarded (note some of these may not have started yet):

	2008/09		2009/10		2010/11	
Scheme	Awards	Value £	Awards	Value £	Awards	Value £
Developmental Pathway Funding Scheme (directly managed)	15*	£6.4m	17	£8.7m	19	£12.0m
Developmental Clinical Studies	-	-	3	£5.3m	10	£13.7m
Methodology Research Panel						
- Investigator led	14	£4.9m	12	£4.5m	8	£3.5m
- Needs led	4	£1.2m	11	£3.0m	-	-**
Translational Stem Cell Research Committee	12	£6.4m	13	£7.3m	10	£7.6m

*Nine of these DPFS awards were small awards to encourage and enable embedding of translational activities within universities. As such, these do not have milestones.

**Applications in this area during 2010/11 have not been competitive and therefore no 'Needs led' projects have been awarded in this period. MRC are in the process of putting together an advisory panel to help develop applications in this area.

To date, of the 51 DPFS projects directly overseen by the MRC (the rest being supported and managed through the Devolved DPFS portfolio funding, see below), eight projects have yet to start, 38 projects are live, three have concluded successfully and two have been terminated early, due to failure to reach milestone success criteria.

Devolved Developmental Pathway Funding Scheme Awards: These 'devolved' DPFS awards are block awards for universities to use to support goal-orientated translational research projects.

	2008/09		2009/10		2010/11	
Portfolio	Awards	Value £	Awards	Value £	Awards	Value £
University of Dundee	-	-	10	£2.6m	-	-
University of Edinburgh	-	-	7	£2.0m	-	-
King's College London	-	-	8	£1.8m	3	£0.1m
University of Nottingham	2	£0.3m	6	£1.8m	-	-
Sevenside Alliance for Translational Research (SARTRE)	-	-	14	£2.0m	-	-

Publications and non-paper outputs

As previously mentioned, the MRC collects data on outputs, outcomes and impact from MRC-funded research using an online system called MRC e-Val. This information is then linked inputs such as funding as far as possible. There are a number of challenges involved in tracking research over the long term because there are time lags of varying lengths between the input and outcomes/impacts being realised.

The MRC collects information relevant to a number of indicators of progress, several of which are in throughout this report. Over time we will be able to determine whether some indicators are better markers of progress than others, and the extent to which we can establish the MRC contribution to this. The MRC collects quantitative and qualitative data around each indicator type; the qualitative data enable a more in-depth understanding of the output, outcomes and/or impact realised. The tables in sections 9 and 10 below present some quantitative data on several indicator types. A large number of qualitative examples of impact can be read on the MRC website¹³.

8 Number of grants assessed (to which the outputs reported elsewhere refer)

The data presented here and below on outputs and outcomes were collected through MRC e-Val, the MRC online system to collect outputs, outcomes and impacts information from MRC-funded researchers. Data are collected annually during an eight-week data gathering period during which researchers can add to and/or amend the data held against their awards. This means that the numbers reported here for this year will be different to those reported last year as researchers can continue to add outputs retrospectively. During the data gathering period at the end of 2010 we sought 3,655 responses and received 3,339 — a 91.4 per cent response. This significantly improves upon the 83 per cent response in 2009.

9 Refereed publications

The following are numbers of unique publications submitted by MRC-funded researchers (both intramural and extramural) to MRC e-Val during the data gathering period in Oct/Dec 2010. Therefore the number of publications noted here for 2010 is only a partial picture for that year.

Year of publication	Articles	Reviews	Total
2010 (partial)	6673	612	7285
2009	6476	818	7294
2008	5531	648	6179
2007	4633	516	5149

MRC e-Val was completed for approximately 91 per cent of MRC-funded awards that were live between 2006 and 2010. Therefore it is likely that the figures for 2006 and 2007 are an underestimate as they do not include publications from grants finished before 2006.

Only five per cent of 2006–2009 MRC papers remain “uncited” in 2010 in contrast to the overall figures of 10 per cent of UK biological sciences papers (minus MRC papers), and 14 per cent of UK medically related papers (minus MRC papers).

Most MRC papers are more highly cited than the world average and the average normalised citation impact for the MRC is 2.17 times the world average.

Four per cent of MRC papers have a citation impact of more than or equal to eight times the world average, in contrast to 1.8 per cent of UK biological sciences papers (minus MRC papers), and 1.7 per cent of UK medically related papers (minus MRC papers).

13. <http://www.mrc.ac.uk/Achievementsimpact/Outputsoutcomes/MRCe-Val2010/index.htm>

10 Non-paper outputs

The following data were all reported through MRC e-Val.

10a Collaborations

A total of 1,499 MRC researchers across 1,896 MRC-funded awards reported that they had been part of a collaboration between 2006 and 2010. The survey collected the approximate start date of each collaboration and whether it collaboration was still active.

Researchers reported 6,191 collaborations in total, 4,770 (77 per cent) were still active in 2010 and 1421 (23 per cent) were no longer active in 2010. The average number of separate collaborations reported by a single researcher was 3.3 (median of 2).

10b Products or interventions

A total of 366 reports were recorded in this section, a 20 per cent increase on the information submitted in 2009. These reports were submitted by 262 unique researchers.

2010: 140 (partial)
2009: 122
2008: 46
2007: 22
2006: 36

'Products or interventions' includes the development of diagnostic tools such as screening tests; therapeutic interventions such as drugs, vaccines, medical devices or surgery; preventive interventions; health and/or social care services and several others.

MRC e-Val also records the current stage of development that the product/intervention has reached.

10c Research materials

3,069 reports detailing research materials were entered into MRC e-Val in 2010 by 1,330 individual researchers.

2010: 442 (partial)
2009: 512
2008: 362
2007: 260
2006: 427
1,064 were reported without a year

'Research materials' covers reports of databases, data analysis techniques, cell lines, models of mechanisms or symptoms, new equipment, and so on.

Split by type of research material

Type	
Antibody	122
Cell line	172
Data analysis technique	424
Database/collection of data/biological samples	623
Improvement to research infrastructure	209
Model of mechanism or symptoms — human	83
Model of mechanism/symptoms — in vitro	63
Model of mechanism/symptoms — non-mammalian in vivo	88
Model of mechanism or symptoms — mammalian in vivo	563
Other	2
Physiological assessment or outcome measure	102
Technology assay or reagent	618
Total	3,069

10d Awards and recognition

<p>5,730 reports made in this section, from 1,236 individual researchers.</p> <p>2010: 1,738 (partial)</p> <p>2009: 1,501</p> <p>2008: 1,129</p> <p>2007: 734</p> <p>2006: 624</p> <p>Four were reported without a year</p>	<p>'Awards and recognition' has five main categories — involvement in the publication of research (such as the editor of a journal), membership of learned societies (for example the Royal Society), prize lectures, poster prizes and other honours (e.g. Order of the British Empire).</p>
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Split by type of award/personal recognition

Type	
Appointed to the editorial board of, or advisor to, a journal or book series	747
Attracted visiting staff or interns to laboratory	86
Awarded membership, or a fellowship, of a learned society	580
Medal	186
NIHR Senior Investigator/Clinical Excellence Award	63
Order of Chivalry (e.g. OBE)	34
Other award	3
Personally invited as speaker at a conference	2267
Poster/abstract prize	301
Prestigious/honorary/advisory position to an external body	663
Research prize	800
Total	5730

4.2 Human capital (stock)

The MRC funds postgraduate research training in two ways: via Doctoral Training Grants and through competitions open to research organisations.

MRC Doctoral Training Grants (DTGs) are cash sums awarded annually to research organisations to provide flexible support for PhD studentship provision. However, allocation of DTGs without an application process has resulted in a reduction in the MRC's understanding of how universities deploy MRC studentships to advance their own strategies and to align with the MRC's. To address this, in 2010/11 the MRC launched the MRC Research Organisation (RO) Integrated Studentship Portfolio Agreements. This initiative is unique to the MRC, however, several of the other research councils have recently developed similar approaches.

The aim of the portfolio agreement approach is to:

- (i) achieve a greater coherence in the way that ROs manage and communicate information about their whole MRC studentship portfolio (i.e. incorporating all forms of MRC studentship support be that DTG, Industrial CASE, clinical PhDs etc);
- (ii) improve understanding and recognition of how ROs align their studentships with institutional strategy and strengths, and with MRC strategy;
- (iii) improve understanding of how ROs contribute to national strategic skill needs; and
- (iv) promote and share best practice in studentship management.

In addition to DTGs, MRC competitions are designed to build research capability in fields that are of strategic importance to UK medical science. One of the current MRC schemes is the Industrial CASE studentship scheme, the aim of which is to create partnerships between research organisations and industry, providing students with excellent training and experience. The MRC funded 34 individual Industry CASE PhD studentships in 2011/12, and aims to increase this in 2012. The aim is to award at least five per year to small and medium sized enterprises (SMEs), which we successfully exceeded last year following the introduction of more flexible requirements for SME partners.

11 Number of students supported

Total by academic year
 2010/11: 410
 2009/10: 460
 2008/09: 488
 2007/08: 452
 (From a snapshot of Je-S data taken on 21/07/2011)

Number of MRC-funded students registered on the Je-S System by academic year. We estimate the return to be approximately 70 per cent of the MRC-funded studentships, and the MRC are working towards increasing this.

The MRC studentship budget allocation has been at the same level for several years, however, the actual number of studentships has decreased slightly as shown by these data due to the increasing cost per student.

12 Finishing Rates

The following data show the percentage of students submitting their thesis within five years of commencing their studies, split by academic year. Data are only shown for records which completed the Je-S submission survey in May 2011

Registration year	2004	%	2005	%	2006	%
Within five Years	326	91.6%	394	90.8%	286	89.4%
Greater than five years	9	2.5%	4	0.9%	0	0.0%
Delayed submission	6	1.7%	9	2.1%	25	7.8%
Student will not submit	15	4.2%	27	6.2%	9	2.8%
Total number of submitted records	356		434		320	

13 Student funding/training schemes

Industry CASE Studentships — funding by academic year
 2010/11: £3.1m
 2009/10: £2.5m
 2008/09: £3.2m
 2007/08: £1.97m

Numbers of students are presented in metric 19, and the partnership organisations in metric 20.

Collaborative Industrial CASE PhD studentships provide students with not only a challenging research project, but also first-rate training involving intellectual and technical collaboration between scientists in industry and academia. The value of working across academic and commercial cultures is highlighted repeatedly by our CASE students

14 Diversity

Student data (From snapshot of Je-S data taken on 21/7/2011)

	% Female	% Male	% Not Disclosed
2010	59.5%	40.0%	0.5%
2009	57.6%	42.4%	0.0%
2008	57.2%	42.8%	0.0%
2007	61.9%	37.4%	0.7%

Grant and fellowships data

(From EAA data, applications and awards in 2010/11. Note this does not include holders of unit programmes.)

	Application		Awarded	
	Number	%	Number	%
All	1,895		343	
Female	649	34.2%	98	28.6%
Male	1,246	65.8%	245	71.4%
Of which grants	1,381		244	
Female	421	30.5%	54	22.1%
Male	960	69.5%	190	77.9%
Of which fellows	514		99	
Female	288	44.4%	44	44.4%
Male	286	55.6%	55	55.6%

4.3 Knowledge transfer and exchange

15 Knowledge exchange spend

Knowledge transfer spend includes spend on the commercialisation of discoveries, and does not include the funding of the science behind the discovery.

Development Gap Funding

2010/11: £1.10m

2009/10: £2.00m

2008/09: £3.28m

2007/08: £2.56m

2006/07: £2.56m

RCUK Business Plan Competition — the MRC contribution to the present round was £36,380 in 2009/10. It is not run annually, instead each round takes about 18 months over two financial years.

Biotechnology Young Entrepreneurs Scheme (YES) — the MRC contribution is approximately £50,000 per year

The MRC Development Gap Fund helps ideas from MRC scientists with commercial potential to cross the gap between traditional academic funding and commercial development. This is funded by the MRC but managed by MRCT.

The RCUK Business Plan Competition provides researchers who have ideas with commercial potential with the skills, knowledge and support needed to develop a first-rate business plan.

The MRC, along with other organisations (BBSRC, NERC, Cancer Research UK and industry partners), sponsors the Biotechnology Young Entrepreneurs Scheme (YES). This is a competition for teams of postgraduate and postdoctoral students that is designed to raise awareness of commercialisation of scientific research and ideas, and to encourage entrepreneurship for the benefit of the UK economy.

MRC Technology knowledge exchange spend

MRC Technology (MRCT) works with scientists from MRC-funded units and collaborating organisations to discover and protect healthcare innovations. The contributions from MRC to MRCT are outlined below.

	2007/08	2008/09	2009/10	2010/11
Technology transfer services	£2.18m	£4.29m	£4.34m	£4.34m
MRC grant	£1.99m	£1.07m		
MRC Drug Discovery Group (DDG) grant (includes the MRCT Centre for Therapeutics Discovery)		£5.96m**	£2.75m	£1.26m
	£4.2m	£11.3m	£7.1m	£5.6m

*** High due to deferral from previous years.

16 Knowledge exchange schemes The Development Gap Fund

The Development Gap Fund (DGF) is an innovative and successful MRC pre-seed fund managed by MRCT. It is designed to increase the commercial potential of MRC discoveries and intellectual property by providing funding at the earliest stage of the drug discovery/technology pipeline to demonstrate proof of concept and commercial potential. It is currently open to the intramural units and institutes of the MRC.

To January 2011, the DGF received 140 submissions from 26 different MRC units across the full breadth of the MRC's research portfolio. Of the 90 approved projects, 60 are complete. The DGF has committed £10 million of its £11.5 million budget and will be fully committed by the end of the 2010/11 financial year.

A number of economic and non-economic outcomes are already emerging from this scheme. Income has been generated from 22 DGF project-related licences with deal values totalling approximately £53 million with a further £2 million generated from other project-related income. Five spin out companies have been created and are operational.

Call for targets

The 'call for targets' initiative was designed to encourage academics to submit project proposals to MRCT's Centre for Therapeutics Discovery (CTD) via a web portal with a view to increasing project access for CTD so it could expand and strengthen its project portfolio. The website went live in February 2010 and has since had well over 1,000 unique visitors, with the maximum from any one institution being just more than 30. The initiative has so far generated 189 project proposals, with 72 per cent from the UK and the rest from the US, Germany, China and New Zealand amongst others. To date, these proposals have led to the initiation of 34 collaborations between the CTD and the originating academic, of which three have already delivered 'partnerable' assets. Awareness of the CTD and its translational capability has been enhanced amongst academics and the call for targets campaign was nominated for an industry award.

16a External representation in council

<p>2010/11 (total 14) Government: 21 per cent (3) Academia: 29 per cent (4) Business: 29 per cent (4)</p>	<p>For these purposes, government includes other government departments and non-departmental public bodies; academia includes higher education institutions and 'other' non-MRC academics.</p> <p>The total number of members on the MRC Council each year is also given.</p> <p>The remaining members not incorporated into these percentages are from overseas organisations or the MRC.</p>
<p>2009/10 (total 14) Government: 21 per cent (3) Academia: 29 per cent (4) Business: 29 per cent (4)</p>	
<p>2008/09 (total 14) Government: 21 per cent (3) Academia 29: per cent (4) Business 29: per cent (4)</p>	
<p>2007/08 (total 20) Government: 20 per cent (4) Academia: 45 per cent (9) Business: 20 per cent (4)</p>	

16b External representation in other bodies

<p>2010/11 (total 214) Government: 2 per cent (4) Academia: 72 per cent (155) Business: 9 per cent (19)</p>	<p>For these purposes, government includes other government departments and non-departmental public bodies; academia includes higher education institutions and 'other' non-MRC academics.</p> <p>The total is the number of members of MRC boards, overview groups and panels (where individuals sit on more than one they have only been counted once to avoid double counting).</p> <p>The remaining members not incorporated into these percentages are from overseas organisations or the MRC.</p>
<p>2009/10 (total 289) Government: 1 per cent (3) Academia: 74 per cent (215) Business: 11 per cent (32)</p>	
<p>2008/09 (total 230) Government: 2 per cent (5) Academia: 71 per cent (163) Business: 6 per cent (13)</p>	
<p>2007/08 (total 160) Government: 2.5 per cent (4) Academia: 81 per cent (129) Business: 4 per cent (7)</p>	

4.4 Intellectual property activity

The MRC has a strong track record in commercialising the outputs from its research; the licensing income to the MRC reached £61.69m in 2010/11. This brings the total cash generated from MRC intellectual property since 1998 to more than £550m.

Commercial activity in MRC units and institutes is managed through MRCT. The MRC also collects information in this area, both on intellectual property and spin-out companies, during the annual data gathering exercise through MRC e-Val¹⁴.

MRC e-Val collected information on 495 discoveries that have been or are in the process of being transferred to or shared with others. These included 42 reports of copyrighted works, 135 reports of discoveries for which protection was not possible/required, and 319 reports relating to published and granted patents. Approximately 30 per cent of patents arising from MRC-funded research since 2006 were reported as licensed by 2010. Bringing these discoveries

to market is a highly collaborative endeavour and data from the Intellectual Property Office (IPO) show that applicants on these patents include more 70 separate organisations.

Spin-out companies founded on MRC research have a significant impact on the UK economy through employment, provision of new products and technologies, and direct investment into the UK. They also play a key role in improving people's health and wellbeing by developing innovative drugs and therapies and by securing financial backing and working with pharmaceutical companies to drive their discoveries into the clinic.

MRC e-Val figures¹⁵ show that MRC-supported research has led to the creation or growth of 66 companies, 35 of which have been formed since 2006. It is estimated that these companies have created more than 400 highly skilled jobs.

17a Patents licensed

The data presented here and below are MRCT data and therefore represent the intramural part of the MRC portfolio only.

Patent applications

2010/11: 12
2009/10: 25
2008/09: 20
2007/08: 21

Patents granted

2010/11: 32
2009/10: 29
2008/09: 24
2007/08: 15

The decision whether to file a patent or not is based on a range of technical, legal and commercial factors. As research is a highly competitive activity, there can be conflict between the rapid dissemination of information and the requirement to protect an invention via a patent. This does not therefore fully reflect the number of patentable inventions from MRC unit funding.

Patent information is also collected through MRC e-Val: there were 315 unique reports of patents granted/published and 99 patents reported as licensed by 2010 (31 per cent). This is a similar proportion to that found in the analysis of MRC e-Val 2009 data (37 per cent of reports in 2009 noted that the patent was licensed).

17b Spin-outs created

New spin-outs each year from the MRC's intramural programme only (MRCT-managed).

2010/11: 0
2009/10: 2
2008/09: 0
2007/08: 1

These data are collected through MRCT and represent the MRC's intramural portfolio only.

The MRC also collects data on spin-out companies through MRC e-Val. MRC funding has contributed to the set up or growth of 66 companies, 35 of which have been formed since 2006. It is estimated that these companies represent over 400 new highly skilled jobs.

17c Income from IP activity

2010/11: £61.69m
2009/10: £66.17m
2008/09: £64.19m
2007/08: £85.44m

Income from IP includes licence income and receipts from sales of shares in MRC companies.

14. More information can be found in the MRC e-Val 2010 report on intellectual property at: <http://www.mrc.ac.uk/consumption/groups/public/documents/content/mrc008122.pdf>

15. More information can be found in the MRC e-Val 2010 report on spin out companies at: <http://www.mrc.ac.uk/consumption/groups/public/documents/content/mrc008124.pdf>

Section 5.0:

Outcomes

5.1 Human capital (flow)

18 Destination of leavers

The following data show the first destination of PhD students qualifying or completing their courses between 1 August 2008 and 31 July 2009¹⁶. Please note that this is an incomplete return and does not cover the total number of students funded by the MRC.

Category of first destination of MRC-funded students	2007/08	2008/09
Engaged in study	12	19
Government and public sector (not research related)	9	19
Government and public sector (research related)	6	5
Higher education (academic)	3	9
Higher education (mainly research)	70	100
Higher education (other)	1	4
Industry and commerce (research related)	3	3
Industry and commerce (not research related)	11	23
Not employed	8	23
Not known or not reported	1	12
Other employment	0	1
R&D sector unknown	25	27
School (education other)	1	0
School teaching or teacher training	1	1
Self-employed, voluntary and unpaid work	2	1
Total	153	247

16. Taken from DLHE (Destination of Leavers from Higher Education) data 2008/09. Students completing their studies in the 2008/09 academic year. 2009/10 data published in September 2011. Source: Annabel Clifton Research Councils UK (EPSRC).

19/20 Placements in user organisations

Numbers students by academic year
 2010/11: 34
 2009/10: 34
 2008/09: 46
 2007/08: 28

MRC Industrial CASE Award scheme — in partnership with industry, students must spend at least three months in an industry-based placement.

Each year the MRC aims to award at least five Industrial CASE awards to SMEs, which we now exceed following the introduction of more flexible requirements for SME partners.

Number of studentships awarded to large pharmaceutical companies over last four years:

Year	Astra-Zeneca	Glaxo-SmithKline	Pfizer	Total
2010/11	3	5	1	9
2009/10	4	2	6	12
2008/09	8	11	2	21
2007/08	5	6	3	14

Full list of companies from 2010/11 competition awards

Non-SME

GlaxoSmithKline	5
AstraZeneca	3
Novartis	2
Pfizer	1
GE Healthcare Ltd	1
Procter & Gamble	1
Eli Lilly	1
MedPharm Ltd	1
Oticon	1
H.Lundbeck A/S	1
Total	17

SME

ImmunoSolv Limited	1
4D Optics Ltd	1
Charmwood Molecular	1
PolyTherics Limited	1
MRCT	1
ImmunoBiology Ltd	1
MKS Instruments UK Ltd	1
Ovasort Ltd	1
NeuroSearch A/S	1
Associated Dental Products Ltd.	1
XstalBio Ltd	1
Domainex Ltd	1
Aimes Grid Services Ltd.	1
Asymptote	1
RenaSci Consultancy Ltd	1
Farfield Group Ltd	1
Neuroscience Technologies Ltd.	1
Total	17

5.2 Public policy

Research in areas such as the relationships between health and diet, and the environment and health, or other areas that result in public health interventions and policy changes are unlikely to find commercial market opportunities. In these areas it is vital that public funding is available to generate a sound evidence base.

21 Influence on policy and practice

<p>1,688 reports of policy influences between 2006 and 2010, reported by 531 unique researchers</p> <p>2010: 327 (partial) 2009: 447 2008: 396 2007: 229 2006: 289</p>	<p>Influence on policy and practice includes outputs such as researcher participation in a National Advisory Committee, membership of a guideline committee, citation in policy document and citation in clinical guidelines.</p>
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22a Instances of influence

Influences on policy-setting processes (1,299 reports)	This data includes reports of membership of a guideline committee, participation in a national consultation, participation in an advisory committee and giving evidence to a government review.
2010: 266 (partial)	
2009: 361	
2008: 267	
2007: 176	
2006: 229	

22b Value/changes induced

Citations in key policy documents (total 389 reports)	This data includes reports of citation in clinical guidelines, citation in clinical reviews, citation in other policy documents and citation in systematic reviews.
2010: 61 (partial)	
2009: 86	
2008: 129	
2007: 53	
2006: 60	

5.3 Public engagement

“The MRC is funded by the UK taxpayer. We recognise our responsibility to inform and involve the public, policy-makers and our partners about our work. Through our initiatives, many of which involve MRC-funded scientists, we develop effective relationships with a range of audiences.” MRC Strategic Plan 2009 – 2014¹⁷.

Over the past five years, the MRC has taken a number of innovative steps to embed public engagement in its funding and assessment processes and the dividends of this approach are now evident: MRC scientists readily engage with non-specialist audiences in many different arenas.

23 Public engagement events by type

MRC e-Val collects information about interactions between MRC scientists and non-specialist audiences.

Between 2006 and 2010 there were a total of 9,044 reports of dissemination activities, reported by 1,474 unique researchers. (As with all MRC e-Val data used in this report, due to the timing of the data-gathering period the data for 2010 is incomplete.)

To reduce the reporting burden on researchers, they are asked to report just one of any type of activity within any given year and, as such, these figures are an underestimation of actual activity.

Dissemination activities in MRC e-Val 2010, by method of dissemination and year (one was reported without a year):

2010: 1,846 (partial)
 2009: 2,424
 2008: 2,146
 2007: 1,566
 2006: 1,061

Split by type of activity

17. The MRC Strategic Plan 2009–2014 ‘Research Changes Lives’ can be found at: <http://www.mrc.ac.uk/Utilities/Documentrecord/index.htm?id=MRC006090>

Type	
In a magazine, newsletter or online publication	1,428
Through participation in an activity, workshop or similar event	1,625
Through participation in an open day or visit at my research institute	511
Via a formal working group, expert panel or similar	1,278
Via a press release, press conference or response to a media enquiry	995
Via a talk or presentation	3,207
Total	9,044

24 Public engagement budget

MRC-funded researchers in all establishments, whether an MRC-run institute or a university department, are supported in their public engagement work by a network of four MRC regional communication managers who facilitate public engagement by identifying opportunities, offering help and advice, organising training and providing seed funding for fledgling projects. The corporate budget for public engagement in 2010/11 was £361,315.

25 Examples of public engagement activity

Research to people

In 2010/11, the MRC ran activities, workshops and talks at all eight of the major UK science festivals including, for the first time, The Big Bang Fair, the UK's biggest single celebration of science and engineering for young people. These public science festivals provide the public with a unique opportunity to question and discuss research directly with the scientists who carry out the research.

More than 250 MRC scientists — from PhD students to programme leaders — took part in these events, representing the three MRC institutes, 11 units and eight centres. The events reached an estimated 13,100 unique visitors, including school-age children, their teachers and/or parents, staff from other research councils and research funders, the science communication community, MRC research scientists and unit directors.

This willingness by MRC scientists to take time out of the workplace to engage with members the public about their research demonstrates the understanding among senior MRC scientists of the importance of participating in these events, and the positive benefits to researchers and their institutions.

In addition, the MRC Corporate Affairs Group managed and delivered a number of events which allowed interaction and engagement with key stakeholders, including the MRC Open Council meeting and the Max Perutz Science Writing Award. It also identified and secured opportunities and provided support (mentoring, training and financial) for MRC-funded scientists to take part in a range of public events including science cafés, public talks, school visits and open days, Debating Matters (a schools debating competition) and various one-off events such as health days at community centres. The work of the MRC Press Office complemented this face-to-face engagement by generating extensive media coverage of MRC research in national, international and regional news outlets, both in print and online.

Supporting our scientists

There has been a huge effort within the MRC this year to support scientists in their public engagement work. One example is a short, practical training workshop which was developed and delivered in-house with the aim of equipping scientists with the skills to communicate with the public about their research and to give them confidence to do this well. In the workshop, run seven times throughout the UK, participants worked through a series of exercises to translate a scientific description of their work into simple, engaging language. Feedback was overwhelmingly positive, with all but one respondent said they were more likely to try writing about their research since doing the course, and 85 per cent said they would now be more confident writing a lay summary.

Value for money

Through its five-yearly assessment mechanisms, the MRC ensures that all its investments in research include an element of public engagement which is delivered directly by scientists as part of their funding agreement. To ensure value and best practice, all MRC units, institutes and centres produce annual plans detailing how they will engage with non-scientific audiences, and report on these each year.

Collaborative working

The MRC is active in the strategic coordination of cross-council public engagement initiatives through its membership of the RCUK Communication Strategic Advisory Group and the RCUK Public Engagement with Research network. The MRC's involvement in these networks ensures that there is no duplication within the MRC of work being coordinated or funded through RCUK, and enables knowledge and best practice to be shared amongst all research councils on strategies for effective public engagement by researchers.

Section 6.0:

Methodology

The online MRC e-Val system will continue to be the MRC's primary mechanism for prospectively tracking outputs, outcomes and impacts from MRC-supported research. Data in the MRC e-Val dataset will be updated by more than 3,500 researchers in late 2011, bringing the total research investment analysed to around £2.5billion over five years. Comprehensive analysis of the 2010 dataset has been published on the MRC website¹⁸.

MRC e-Val delivers a detailed view of the results of MRC-funded work, but most of this research also benefits from investments from other public and charitable funders of medical research. In 2010 the MRC has discussed in detail, and piloted with ten other funding agencies, a new e-Val approach. This new approach allows researchers to record details of their research outputs once, and flexibly submit this data (or subsets of it) to many funders. We will pursue this "federated e-Val" approach as it aims to minimise the reporting burden placed on researchers, and has the potential to generate a UK-wide view of public and charitable health research productivity, progress and quality. The approach will reduce the problem of double counting of outputs that occurs if agencies separately gather this information, and improve consistency of the data. In addition, if many agencies use the same approach then this will help reduce the cost to individual agencies of gathering this data.

MRC e-Val data is proving to be useful in tactical evaluation of individual schemes, scientific areas or research institutions. For example, in 2009/10 bibliometric data was used to supplement the quinquennial reviews of all three of the MRC's research institutes.

Government and the public expect that funding agencies will continue to gather evidence which develops the case for investment in research, and actively apply learning to optimise the support for this research. The research councils are expected not only to assess their own effectiveness, and gather evidence that will shape future policies, but also to ensure there are focused, timely studies on the performance of their sectors overall.

In order to strengthen the understanding of the link between research and economic and societal impact, the MRC plans to launch a consultation in 2011 for researchers, policy-makers and the public to provide their views on this important topic¹⁹. The aim of this consultation will be to ensure that the MRC can draw on the best available research in the field, and identify where more work is urgently needed, so that we can support studies which improve the way health research is funded.

The results of this consultation will be discussed at a workshop, and considered by the MRC Strategy Board. It is expected that, if required, a call for new research in this area will be announced early in 2012.

18. <http://www.mrc.ac.uk/Achievementsimpact/Outputsoutcomes/MRCe-Val2010/index.htm>

19. **MRC Economic Impact Consultation**
<http://www.mrc.ac.uk/About/Consultations/index.htm>

Annex 1 – Metrics framework for the 2010/11 Economic Impact Report.

The following table shows the proposed 25 metrics that are common to all (or most) research councils. Each research council is asked to provide up to five additional metrics. Separating one metric/indicator by discipline or by facility does NOT count as more than one metric where several indicators belong to one metric. Additional metrics can be quantitative or qualitative at the discretion of the research council. The list of metrics is to be revised annually.

INPUTS	OUTPUTS	OUTCOMES
Structure of income and expenditure Broad trends in resources received and spent. Suffices to reproduce last year's annual accounts.		
	Knowledge generation Bibliometrics Other publication outputs Co-authorship with industry and abroad	
Human capital (input) PIs, fellows, researchers supported as per JeS or outputs databases.	Human capital (stock) Students supported Finishing Rates	Human capital (flow) Destinations of leavers Placements/people exchanges in/with user organisations
Collaboration Moved to part of structure of income for simplicity. Consider for subsequent years.	Knowledge transfer and exchange KTE level (count and scheme description) IP activity, patents and spinouts. User Engagement	Public Policy Account for influence in policy, count instances of short description
		Public Engagement Trend counts and levels Public Attitudes Survey - biannual



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