THE MEDICAL RESEARCH COUNCIL (MRC)
Economic Impact Reporting Framework

2008/09
DATA

INTRODUCTION

This is the fourth annual Economic Impact Reporting Framework (EIRF) report published by the MRC. These reports were implemented across all the Research Councils in 2005 and form part of the performance framework managed by the Department for Business, Innovation and Skills. More information about the Economic Impact Framework can be found at: www.dius.gov.uk/~/media/publications/F/file42023.

The MRC's EIRF should be read in conjunction with its Annual Report and Annual Review www.mrc.ac.uk/Newspublications/Publications/index.htm which provide a comprehensive summary of achievements over the period.

The EIRF contains data on selected aspects of the MRC's performance relevant to the Government's objectives for the UK science base, and is presented with reference to the Government's 10 year Framework for Science.

The EIRF shows, where possible, data for 2005/06, 2006/07 and 2007/08 alongside those for 2008/09 and includes a commentary on emerging trends.

HIGHLIGHTS

- A consortium of researchers from Brunel University, the Office of Health Economics, and RAND Europe, commissioned by the MRC, Wellcome Trust and Academy of Medical Sciences published a study on the rate of return from medical research .The study provides quantitative evidence of a significant and positive return on investment from medical research and development.

- In 2008/09 the MRC delivered efficiency savings worth £35.54m against a target of £28.50m. This achieved by reducing the proportion that we spend on administration, reprioritising programme spend, through more co-funding of research with industrial and other partners and by increasing efficiency within MRC research units and institutes.

- The MRC exceeded its target of new spend of £25m in support of translational research by the end of 2008/09, from a range of new strategic initiatives planned and implemented in 2008.

- As part of its translation research strategy, the MRC launched the Developmental Pathway Funding Scheme - a novel milestone based managed programme of support for early translational studies.

- AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline (GSK), Merck-Serono, Merck KGaA, and Pfizer committed to a further four years of funding from 2008, totalling £10.8m to support the Division of Signal Transduction Therapy (DSTT). The DSTT is a partnership between these pharmaceutical companies and thirteen research teams based at the University of Dundee, eight of which are within the MRC Protein Phosphorylation Unit.

- The MRC continued its strong track record in commercialising the output from its research with licensing income receipts from all sources reaching £55m during 2008/09. This brings the total cash generated from MRC intellectual property since 1998 to £439.4m.

1 Health Economics Research Group, Office of Health Economics, RAND Europe. Medical Research: What's it worth? Estimating the economic benefits from medical research in the UK. London: UK Evaluation Forum; 2008. (*www.wellcome.ac.uk/About-us/Publications/Reports/Biomedical-science/WTX052113.htm*)

OVERALL ECONOMIC IMPACTS

Economic returns from investment in medical research and development comprise two elements:

- Health gains net of the health care costs of delivering them
- GDP gains, that is to say the UK national income that results directly and indirectly from the medical research and the further activity stimulated by it.

There are numerous examples of MRC research leading to new and improved ways to prevent, diagnose and treat disease, and promote wellbeing for people worldwide (examples are given in the MRC delivery plan report and annual review). The MRC also makes a pervasive contribution to the competitiveness, productivity of and inward investment from the private sector through its support of a high quality UK medical science base (a summary of some of the direct investment resulting from MRC intellectual property is given below under knowledge exchange efficiency).

METRIC	DATA	COMMENTS
1. Impact studies	The MRC commissioned, with the Wellcome Trust and the Academy of Medical Sciences, a study to compare the macroeconomic benefits accruing from UK medical research with the cost of that research.	The report, titled 'Medical Research: What's it worth? Estimating the economic benefits from medical research in the UK' was published in November 20081. The study looked at cardiovascular disease and mental health. For cardiovascular disease the study estimated that the total health and GDP gains to public/charitable research in the UK between 1975 and 1992 gives a total internal rate of return (IRR) of around 39 per cent. For mental health this was 37 per cent. The research also critically appraised both the selected approach and the previous attempts to estimate economic returns from research.

2 http://www.dius.gov.uk/~/media/publications/I/IntComparativePerformanceUKResearch

KNOWLEDGE GENERATION: STOCK OF PUBLICLY AVAILABLE KNOWLEDGE

The International Comparative Performance of the UK Research Base report (July 2008) commissioned by BIS was the fifth report of its kind and focussed on the UK's relative international research performance of science, engineering, the social sciences and the humanities and arts. Metrics two to five are taken from this study.

METRIC	DATA	COMMENTS
2. International standing – UK per cent share of publications among G8 comparator group of Nations	As published in the recent BIS report on the comparative performance of the UK research base, the UK's relative research output in terms of its share of indexed papers is very strong in medical sciences. In clinical sciences the UK share of publications has fallen from 9.5 per cent to 8.7 per cent but it still remains ranked second in the world behind the USA. In health sciences publications increased to 10.6 per cent (from 10.3 per cent last year) and again the UK is ranked second to USA. In biology the number of papers grew by 2000 in 2008, and the UK remains third in this subject area (behind USA and Japan).	The UK contributes approximately 7.9 per cent of the world's indexed publication output, by number of papers. This is down from 9.3 per cent last year, which the report associates with changes in the database.
3. International standing – UK per cent share of citations among G8 comparator group of Nations	As published in the recent BIS report on the comparative performance of the UK research base, the UK's share of citations is second only to USA in clinical sciences (12.7 per cent), health sciences (13.8 per cent) and biological sciences (12.4 per cent).	Despite the drop to 7.9 per cent share of the world publications, the UK's share of world citations has risen to 11.8 per cent in 2008.
4. International standing – impact (citations/paper) of UK papers among G8 comparator Nations	The UK has 14.4 per cent of the worlds top one per cent of most highly cited papers. Citation impact has improved and is now ranked second in the G8 (fourth last year), ahead of USA but behind Germany. The UK has a higher citation impact than it did in 2007, the average citation impact has improved by 14 per cent, compared to an improvement of eight per cent in last years report.	The 14.4 per cent of papers in the top one per cent of most highly cited papers have an average impact of 153.2 citations per papers. It lies second in the G8 by volume but third by impact. The UK increased its share of citation to 14.4 per cent compared to the UK average citation of 7.9 per cent of world sources which reflects its competitive advantage.

5. International standing - For the medical sciences, citations relative to spend on research and development within the BIS group of comparator nations.	As published in the recent BIS report on the comparative performance of the UK research base, the UK is ranked first in the G8 on publication productivity with almost 32 papers recorded per $billion GDP. On citations per unit GDP, the UK has fallen by five per cent against the comparator group average. It remains first in the G8 but dropped to eighth in the comparator group as a whole.	The UK once again ranks first among the G8 nations in measures of productivity, in terms of numbers of papers and citations, per unit of investment in R&D or per unit of GDP.
6. MRC Publications per £	**2008** 4.6 publications per £m (£219,000 per publication) **2007** 4.8 publications per £m (£208,000 per publication) **2006** 5.1. publications per £m (£197,000 per publication) **2005** 5.3. publications per £m (£188,000 per publication)	Data for intramural research only. Publications reported in calendar years (extracted from PubMed using the address of the first author); spend in financial year. Costs are historical. Important to note that publication in any one year should not be expected to be related to spend in the same year. It is important to note that the data submitted here (and in metrics seven and eight) are not comparable to previous EIRF. The data reported here have been calculated differently to last year as it has been based on publications in PubMed where the first author has an MRC address. Previous figures used data from an annual exercise to gather publication information directly from researchers. We consider the PubMed data to be an under representation of publications from MRC units/institutes. The MRC is currently developing a system to collect information on Outputs and Outcomes directly from researchers, it is envisaged that this will give us a more accurate and complete record of publications resulting from MRC-funded research, and will cover both intramural and extramural research.

7. MRC Publications per lead researcher	**2008** 3.2 **2007** 3.0 **2006** 2.9 **2005** 2.8	Data for intramural research only. Publications used were extracted from PubMed by calendar year where the first author has an MRC unit/institute address. Data for previous years has been revised to present publications per unique Programme Leaders in units/institutes for the nearest financial year.
8. Rate of publication in verified quality journals	In the calendar year 2008, there were a total of 1,388 publications reported in PubMed where the first author was based at an MRC establishment, this comprised 1,144 primary peer reviewed publications and 244 reviews. This is an increase of around four per cent of the total number of MRC papers reported in PubMed last year.	It is important to note that no data on publications from extramural researchers is included.

Year	Total	Reviews	primary papers
2008	1,388	244	1,144
2007	1,334	240	1,096
2006	1,286	230	1,056
2005	1,199	247	952

KNOWLEDGE GENERATION: HUMAN CAPITAL

It is crucial that the UK has sufficient highly-skilled researchers to maintain its international competitiveness in medical research. One of the MRC's key objectives is to ensure that biomedical scientists are supported at key stages of their careers, through enhanced, targeted training and development programmes.

During 2008/09 the MRC established the new Training and Careers Group. The aim of this group is to take a broad, long-term perspective on strategic research skills shortages and on the development of the next generation of research leaders. Its role is to (a) develop the MRC's research training strategy in alignment with the MRC's delivery plan; (b) help strengthen the effectiveness of the MRC's investment in training, and (c) contribute to evaluation of the impact of that investment.

Competitions for training awards during 2008/09 focused on strategic research skills for early career stage researchers in areas including in vivo science, stem cell science, biomedical imaging, mathematics and statistics, biostatistics and population health sciences. Many of these awards were made in partnership with the other research councils and with professional bodies. Other initiatives, such as the new Methodology Research Fellowship, were targeted at early post-doctoral scientists who are ready to become more independent as researchers, and who have the ambition to lead the development of new health research methods. The MRC increased its commitment in 2008/09 to research capacity building in clinical and translational research by £6m over and above its pre-CSR baseline.

8. Number of PhD studentships funded by the MRC	From expenditure on Doctoral Training Accounts (£30.8m) an estimated 446 new students started in October 2008 (this does not include intramural studentships, only those funded by Doctoral Training Accounts). 2008/09 £30.8m (446 students) 2007/08 £27.3m (427 students) 2006/07 £23.1m (428 students) 2005/06 £24.2m (424 students)	Data for intramural research only. Publications used were extracted from PubMed by calendar year where the first author has an MRC unit/institute address. Data for previous years has been revised to present publications per unique Programme Leaders in units/institutes for the nearest financial year.
9. Number of people awarded MRC-funded PhDs per annum	See MRC metric eight; most of those awarded PhD studentships will complete, although not all within four years. Based on studentship final reports received for 2007/08 (the 2003 cohort) it is estimated that 360 students were awarded PhDs this year. We do not yet have sufficient data to provide an update for 2008/09.	Our aim is to record whether a PhD is awarded within four years (the tenure of DTAs), or not. It is unlikely that we will capture PhDs awarded after this point. Currently the MRC relies on a paper based process for the collection of final reports from Higher Education Institutions. It is expected that this will be replaced by an electronic process in the near future which will improve the completeness of the data we collect, and enable us to report more fully.
10. Completion rates for MRC-funded PhD students	Based on studentship final reports received for 2007/08 (the 2003 cohort) 92 per cent submitted their theses within four years of starting, this is compared with 80.6 per cent in 2006/07, and 83.3 per cent for the previous year. We do not yet have sufficient data to provide an update for 2008/09.	It is difficult to determine whether the changes seen in previous years are significant as there is an incomplete return of final reports.
11. Percentage of MRC- funded PhDs in units and universities unemployed on finishing their awards	Using data submitted so far for 2008/09 (2004 starters) 5.2 per cent of students are currently unemployed following completion of their MRC studentship. (For 2003 starters 6.8 per cent were unemployed, for 2002 starters 2.8 per cent were unemployed, for 2001 starters the figure was eight per cent).	It is difficult to determine whether these changes are significant as there is an incomplete return of final reports. It should also be noted that the data that we do have is a snapshot in time, we do not know for instance whether those unemployed graduates remain unemployed for long.

12. Diversity of new MRC-funded PhD students relative to society norms	In 2008, sex ratio: 57.9 per cent female; 42.1 per cent male. Ethnicity was only known, or disclosed, for about 22 per cent of PhD students. Where ethnicity was known, in 2008, 88.5 per cent were white and 11.5 per cent were non-white. In 2007, sex ratio: 61.6 per cent female; 38.4 per cent male. Ethnicity was only known, or disclosed, for about 21 per cent of PhD students. Where ethnicity was known, in 2007, 95 per cent were white and five per cent were non-white.	The proportion of new female students has decreased slightly from 2007. The society norm will be the population of graduate students from which PhD students are drawn. Data 2007/08 from HESA shows that the proportion of PhD students that are female is about 60 per cent, no significant difference to the population of students receiving MRC support.
13. Rate of change in priority areas for PhD awards	In 2008/08 there were 8 priority areas, these were the same eight reported in 2007/08, therefore the rate of change is zero. The rate of turnover in 2007/8 was two out of eight i.e. two were discontinued and replaced by two new ones, compared with three out of seven for 2006/07 and zero for 2005/06.	Where priority areas have been identified, it is important that we keep these as strategically important areas for a period of time. There is of course at least a three-year lag time, and the time taken to build up an area is probably significantly longer. The fact that we have maintained the same strategic areas for the last two years is therefore a sensible reflection of developing these areas over the long term.
14. Newly trained people per researcher	1,010 PhD Students and career development fellows were in training on 31 December 2008 in MRC units and institutes, supervised by 306 scientists. This is equivalent to 3.3 trainees per MRC scientist. 1,025 PhD Students and career development fellows were in training on 31 December 2007 in MRC units and institutes, supervised by 308 scientists. This is equivalent to 3.3 trainees per MRC scientist. 849 PhD students, pre-doctoral fellows and career development fellows were in training on 31 Dec 2006 in MRC institutes and units, supervised by 286 scientists: equivalent to three trainees per MRC scientist. 860 PhD students, pre-doctoral fellows and career development fellows were in training on 31 Dec 2005 in MRC institutes and units, supervised by 362 scientists: equivalent to 2.38 trainees per MRC scientist.	The data include all those eligible to supervise students and fellows not necessarily only those that actually supervises students and fellows. We have not included visiting scientists, or visiting students in these figures.

15. Staff joining and leaving the MRC	861 staff joined the MRC during 2008 and 858 left (25 per cent of total staff). Females comprised 58 per cent of starters and 56 per cent of leavers. People of non-white ethnicity comprised 20 per cent of starters and 21 per cent of leavers where ethnicity was known. 882 staff joined the MRC during 2007/08 and 835 left (24 per cent of total staff). Females comprised 58 per cent of starters and 58 per cent of leavers. People of non-white ethnicity comprised 16 per cent of starters and 21 per cent of leavers where ethnicity was known (in around 48 per cent and 83 per cent of cases respectively). 881 staff joined the MRC during 2006/07 and 779 left (23 per cent of total staff). Females comprised 57 per cent of starters and 56 per cent of leavers. People of non-white ethnicity comprised 16 per cent of starters and 19 per cent of leavers where ethnicity was known (in around 72 per cent and 89 per cent of cases respectively).	The figures do not vary significantly between 2007/08 and 2008/09. The figures do not vary significantly between 2005/06 and 2007/08.
16. Number of active researchers - MRC employees - others funded by MRC grants	2008/09 data: 5925 in total. 1279 scientists in units, 3952 posts supported on grants 694 fellows and research staff supported on fellowships. 2007/08 data: 5755 in total. 1333 scientists in units, 3822 posts supported on grants 600 fellows and research staff supported on fellowships 2006/07 data: 5313 posts: 1288 scientists in units; 3433 posts supported on grants; 592 fellows and research staff supported on fellowships.	All data expressed in terms of posts, at 31 December. Research active staff in units includes programme leader, programme leader track, career development fellows and PhD students. There is potentially some double counting on grants and fellowships where support for an individual is spread across more than one award.

INVESTMENT IN THE RESEARCH BASE AND INNOVATION

The MRC has maintained its level of funding for high-quality basic research, and there has been a bigger drive to translate it – boosting capacity, developing research leadership and forming partnerships. We have also introduced changes to governance and funding structures to support strategy development and the delivery of research priorities.

The MRC planned to spend an additional £25m in 2008/09 on these translational priorities, a challenging target given the time needed to design suitable initiatives, launch new calls for proposals and award funds to high quality applications. Actual spend in 2008/09 from these new awards totalled £26m, a significant success and an excellent base from which to achieve the target of new spend totalling £44m in 2009/10 in this area.

As part of its translation research strategy, the MRC launched the Developmental Pathway Funding Scheme - a novel milestone based managed programme of support for early translational studies.

METRIC	DATA	COMMENTS
17. MRC 'DEL' (Departmental Expenditure Limit) expenditure	2008/09 £680.8m 2007/08 £550.1m 2006/07 £543.8m 2005/06 £459.5m	The UK contributes approximately 7.9 per cent of the world's indexed publication output, by number of papers. This is down from 9.3 per cent last year, which the report associates with changes in the database.
18. Other MRC Expenditure	2008/09 £146.5m 2007/08 £101.8m 2006/07 £74.3m 2005/06 £67.5m	Includes Commercial Fund expenditure
19. Expenditure on Studentships and Fellowships	Annual cost of studentships live at 10/08 = £30.8m Annual cost of Fellowships live at 4/08 = £37.9m Total expenditure on studentships and fellowships: 2008/09 £68.7m 2007/08 £57.6m 2006/07 £52.2m 2005/06 £51.8m	Includes Commercial Fund expenditure
20. Total expenditure on MRC facilities (land, buildings and equipment)	2008/09 £65.3m 2007/08 £74.8m 2006/07 £51.5m 2005/06 £61.8m	These figures fluctuate from year to year largely due to the impact of big projects such as the new MRC Laboratory of Molecular Biology (LMB) in Cambridge.

21. Level of inter-disciplinary activity within and beyond research council domain

MRC SPEND ON CROSS COUNCIL PROGRAMMES

New Programmes

2008/09	£m
Life Long Health and Wellbeing	1.3

Existing Programmes

2008/09	£m
Brain Sciences	0.0
Stem Cells	1.7
e-Science	1.7

2007/08	£m
Brain Sciences	0.8
Stem Cells	2.9
e-Science	4.0

2006/07	£m
Brain Sciences	3.3
Stem Cells	3.9
e-Science	4.5

2005/06	£m
Brain Sciences	4.1
Stem Cells	3.9
e-Science	3.1

Spend in grant schemes specifically aimed at interdisciplinary working (centres and Discipline Hopping Grants):

2008/09 £16.3m
2007/08 £9.3m
2006/07 £6.9m

Spend in MRC Research institutes and units, a form of support intended to foster interdisciplinary research.

2008/09 £263.1m
2007/08 £240.1m
2006/07 £226.6m

Estimate of spend on multidisciplinary grants as per cent of total annual spend

2008/09 39 per cent
2007/08 36 per cent
2006/07 36 per cent
2005/06 39 per cent

To note that gross spend in these areas is specifically against projects awarded through these particular calls and initiatives, there may be significant spend in these subject areas allocated via response mode funding.

We are interested in encouraging interdisciplinary and collaborative work, both of these leverage input from other funding agencies and maximise the impact of the research.

The data on cross-council spend is presented to illustrate the scale of cross-council coordination for previous and current CSR initiatives.

FRAMEWORK CONDITIONS: FINANCIAL SUSTAINABILITY

Improvements in business effectiveness and operational performance are essential to ensure that the funding decisions made by the MRC are delivered efficiently. The MRC works in partnership with Research Councils UK (RCUK) to optimise efficiency gains and to release resources to support research and to contribute to Treasury targets for value for money savings.

In 2008/09 the MRC delivered efficiency savings worth £35.54m against a target of £28.50m. This achieved by reducing the proportion that we spend on administration, reprioritising programme spend, through more co-funding of research with industrial and other partners and by increasing efficiency within MRC research units and institutes.

Priorities for 2008/09 included infections and immunity, virology, stem cell research, underpinning translational neuroscience, and initiatives aiming to increase impact through clinical and public health research. Research investments were also increased in areas of high disease burden such as respiratory, musculoskeletal and cardiovascular disease.

METRIC	DATA	COMMENTS
22. Reduction in proportion of MRC administrative costs	2008/09 £1.81m (0.22 per cent) 2007/08 £1.63m (0.25 per cent) 2006/07 £1.34m (0.22 per cent) 2006/07 £1.34m (0.25 per cent)	Percentages calculated against total expenditure.
23. Demonstrating effective reprioritisation of programme spend: rate of change in MRC spend profile in relation to identified priorities	By the end of 2008/09, the launch of new programmes had enabled £10.8m of spend to be directed towards priority areas. In 2007/8 this figure was £23.3m and 2006/07 was £11.53m.	The decrease in the figure for 2008/09 is due to the experimental medicine initiative coming to an end 2007/08. This re-prioritisation exceeded the agreed targets of £8.07m in 2006/07 and £15.88m for 2007/08.
24. Increased efficiency of MRC institutes and units	2008/09 £16.69m 2007/08 £12.68m 2006/07 £20.78m 2005/06 £9.29m, against a base year of 2004/05.	2006/07 savings include the effects of some large unit closures.
25. Growing the level of co-funding: value of academic-user networks/ consortia	2008/09 £6.2m 2007/08 £18.86m 2006/07 £12.01m 2005/06 £5.18m, against a base year of 2004/05.	This is calculated as savings on new co-funding agreements, as reported via Admin Efficiency Project Board and only represents MRC intramural programme. The value of co-funding significantly decreased in 2008/09 due to the charity sector not having the income to co-fund grants/fellowships at the rate they did in previous years, this was especially true for the British Heart Foundation and Cancer Research UK who have previously co-funded initiatives with the MRC such as the Clinical Research Initiative.

26. Research council management efficiency: reduction in wasteful tail of unsupported grant applications	The per cent of applications received by the MRC that were internationally competitive: 2008/09 23.3 per cent 2007/08 27.3 per cent 2006/07 25.4 per cent 2005/06 21.0 per cent	The MRC has worked with higher education institutions to improve the quality of applications. Continuing to publish success rates by institution may also have contributed.
27. Research council capital investment in facilities as per cent of capital value	2008/09 17 per cent 2007/08 21 per cent 2006/07 18 per cent 2005/06 24 per cent	Capital expenditure/tangible fixed assets.
28. Total capital expenditure on MRC facilities	2008/09 £65.3m 2007/08 £74.8m 2006/07 £51.5m 2005/06 £61.8m	These figures fluctuate from year to year largely due to the impact of big projects such as the new MRC Laboratory of Molecular Biology (LMB) in Cambridge.
29. Capital expenditure on new facilities entering service as a result of research council funding	2008/09 £110.9m 2007/08 £105.2m 2006/07 £32.5m 2005/06 £17.3m	
Efficiency of institutes and units	2008/09 £110.9m 2007/08 £105.2m 2006/07 £32.5m 2005/06 £17.3m	See metric 24

FRAMEWORK CONDITIONS: PUBLIC ENGAGEMENT

The MRC continued to develop the role of its public panel in 2008/09. The panel was originally launched in 2007/08 and is a network of individuals who provide a broad range of public views, experiences and expertise on different aspects of the MRC's work. Panel members provided input to the cross-council Life Long Health and Wellbeing initiative, taking part in a workshop to encourage networking between prospective applicants for the collaborative network grants, and contributing to the peer review and assessment of collaborative and network grant applications.

The MRC organised five events at the inaugural Oxfordshire Science Festival; in Oxford, MRC science cafés were launched, a forum to discuss topics such as pandemic flu and mouse models of human disease; and in Cambridge we organised dialogue events on stem cells. MRC-funded scientists took part in all the major public science festivals in the UK, which take place throughout the year. These included science festivals in Brighton, Cambridge, Edinburgh, Cheltenham and Liverpool, and a new high-profile event in London, the Big Bang Fair.

The MRC's profile in the national media remained high throughout the year. We secured widespread national coverage for many key MRC discoveries and achievements in 2008/09 including: the first mouse model of rhinovirus; changes in H5N1 structure uncovered which make it Tamiflu-resistant; health outcomes for extremely pre-term babies; stem cell self-sufficiency; HIV prevalence in gay men; a new method for delivering a malaria vaccine using the cold and pox viruses; the discovery of a key process that governs embryo implantation; and the virus-free creation of induced pluripotent stem (iPS) cells.

Support for science communication and media training for MRC scientists has been increased and we aim to provide communication training as an integral part of the skills development programme. During the year, 61 scientists received media training and a further 89 took part in science communication training.

METRIC	DATA	COMMENTS
30. Funding of discussion events, Researchers in Residence, CREST, publications and network events	2008/09 £0.85m 2007/08 £0.94m 2006/07 £0.90m 2005/06 £0.80m	The MRC budget for public engagement includes MRC-only and joint ventures, and does not include staff costs.
31. Survey trends in public attitudes towards science issues and towards the MRC	The Research Councils worked collectively through the RCUK Science in Society Unit to carry out the third UK Public Attitudes to Science Survey (funded by BIS) in 2007[3]. Research into "new drugs to cure human disease" was rated most highly by the public, with only two per cent stating that it was not beneficial. The MRC commissioned Ipsos MORI to look at public attitudes to and awareness of the use of personal health information in medical research. A separate study by the University of Surrey for the Wellcome Trust looked more broadly at the public's attitudes towards the governance of medical research. Their findings published in June 2007 have shown that public support for research is strong, but more needs to be done to understand people's concerns in areas such as consent and confidentiality.	The MRC budget for public engagement includes MRC-only and joint ventures, and does not include staff costs.

KNOWLEDGE EXCHANGE EFFICIENCY

In 2008/09, the MRC has continued to work with partners across UK industry, building on links with individual companies and trade associations. The new MRC Pharma Forum, launched during 2008/09, consolidates these links, providing a platform for continuing and effective engagement between the MRC and industry and to oversee all aspects of strategic interaction with the pharmaceutical/biopharmaceutical sectors. The Forum, whose membership includes the TSB, the Association of the British Pharmaceutical Industry (ABPI) and the BioIndustry Association, is beginning to deliver real benefits to the MRC, securing powerful strategic and intellectual contributions to the development of our Strategic Plan, Research Changes Lives, through the identification of training needs across academia and industry.

3 *http://www.rcuk.ac.uk/cmsweb/downloads/rcuk/scisoc/pas08.pdf*

So far the forum has advised on the development of a new approach to funding academic-industry research partnerships: the MRC-Industry Collaboration Award (MICA) scheme. A key attribute of the new scheme, launched in January 2009, is its flexibility, especially in the level and nature of the industry contribution.

The MICA scheme allows UK companies of any size to participate and so may prove particularly attractive to small and medium-sized enterprises. We hope this scheme will prove catalytic in initiating many more new partnerships, particularly when compared with the MRC Open LINK scheme, which MICAs replace.

We have been working closely with the Technology Strategy Board (TSB) to ensure alignment between our research investments and the new TSB health sector strategy, due to be published later in 2009, and to identify value-adding collaborations.

MRC Technology (MRCT) works to translate cutting edge scientific discoveries into commercial products. MRCT identifies and protects intellectual property (IP) resulting from research within the MRC's own units and institutes. Many new treatments arise from the MRC's patented technology. Perhaps the most well known of these is Herceptin®, a monoclonal antibody to the Her2 receptor found on a subgroup of breast cancers. Since the product's launch in 1998, many thousands of women have benefited from treatment by this drug.

MRCT has continued to actively engage with the industry and academic communities in areas associated with healthcare. In response to the changing environment within healthcare industries MRCT has reviewed its strategy and realigned it to incorporate a greater emphasis on a translational role in bridging the gap between the output of basic academic research and the start point of industrial healthcare research and development activities. This includes the formation of the MRCT Centre for Therapeutics Discovery which replaces and extends the work of the Drug Discovery Group (DDG).

The most significant licensing deal executed during 2008/09 was the sale of rights to a humanised antibody to Centocor Biopharma, a subsidiary of Johnson & Johnson. The original mouse antibody came from the MRC Laboratory of Molecular Biology (LMB) in Cambridge and had shown efficacy in a mouse model of respiratory disease. The mouse antibody was humanised by MRCT's Therapeutic Antibody Group (TAG) who also generated additional IP. The final deal was one of the largest MRCT has ever carried out.

METRIC	DATA	COMMENTS
33. Number of MRC-funded publications co-authored with business	We do not have any data for 2008 on the numbers of publications co-authored with industry. In 2007, 121 out of 2120 (6 per cent) collected through the annual intramural publications exercise were reported as co-authored with partners from the private sector. This compares with 65 out of 1,996 (three per cent) in 2006.	Other publications will involve industrial collaboration without joint authorship. It should be noted that the data reported here for 2007 and 2006 was collected in a different way to other publication data in this report and should not be compared. We are in the process of implementing a tool to systematically collect output information from all MRC-funded researchers, this will enable us to report more fully on publications in general and co-authorship of publications.

34. Licence income	We do not have any data for 2008 on the numbers of publications co-authored with industry. In 2007, 121 out of 2120 (6 per cent) collected through the annual intramural publications exercise were reported as co-authored with partners from the private sector. This compares with 65 out of 1,996 (three per cent) in 2006.	Other publications will involve industrial collaboration without joint authorship. It should be noted that the data reported here for 2007 and 2006 was collected in a different way to other publication data in this report and should not be compared. We are in the process of implementing a tool to systematically collect output information from all MRC-funded researchers, this will enable us to report more fully on publications in general and co-authorship of publications.
35. Recruitment and retention trend in higher education institutions by domain: pattern of first destinations of new PhDs	Known first destinations (per cent) of MRC-funded PhD students starting in 2004, 2003 and 2002.	It should be noted that these data are drawn from final reports submitted by HIGHER EDUCATION INSTITUTIONS which for 2008/09 (ie 2004 starters) is currently only a 15 per cent return rate.
36. Percentage of MRC-funded PhDs whose first destination is the science and engineering base	See indicator 35. 53 per cent for 2008/9, down from 60 per cent in 2007/8.	A further nine per cent went to positions overseas, and 11 per cent started further training, many of these may return to the UK and the science and engineering base in due course with increased skills.
37. Percentage of MRC-funded PhDs whose first destination is in business or public services	Figure for 2004 cohort this was nine per cent compared to 14 per cent for 2003 cohort.	The decrease was due to a fall in those finding employment in industry.

	2004 (per cent)	2003	2002
Permanent academic appointment	11	0	5
Fixed-term academic appointment	41	68	50
Further training	11	2	6
Industry	7	14	15
Government or other public sector	2	0	5
Other employment UK non-research	7	5	7
Unemployed	5	7	8
Not known	16	4	5
Of the above, those reporting a next destination outside the UK.	9	15	16

38. Interactions with partners and users e.g. relevant Government Departments, Research Councils and other organisations	The MRC works closely with the Health Departments, the Department for International Development, and other government departments; with other research councils directly and through RCUK; with research charities, including through the UK Clinical Research Collaboration and Funders Fora; and with industry.	A more comprehensive picture of the MRC's partnerships can be obtained from the Annual Report. One of the most significant developments to note is the renewal of the MRC concordat with the Department for International Development (DFID) at an increased level of £45m over five years, compared with £20m over five years in the previous settlement. In responding to the challenges of the Cooksey Review, the MRC has continued to work closely with the Office for Strategic Coordination of Health Research (OSCHR), NIHR and the UK health departments to align our programmes and strategy to facilitate more efficient translation of health research into health and economic benefits within this new environment for UK health research.
39. Numbers from higher education institutions on Council and research committees	In 2008/09 167/244 members of Council, the Research Boards, Overview Groups and panels were based in higher education institutions (69 per cent). In 2007/08 205/242 members of Council, the Research Boards and panels were based in Higher education institutions (85 per cent). In 2006/07 133/175 members of Council, the Research Boards and Research Panels were based in Higher education institutions (76 per cent). The proportion is similar to 2005/06.	It is worth noting the full composition of Council, the Research Boards, Overview Groups and panels (per cent) HEI 69 Other academics 19 Business seven Government three Overseas orgs two
40. Interactions with Higher education institutions	No additional strategic partnerships have been signed since 07/08. 11 strategic partnerships with universities were signed in 2007/08. These agreements cover scientific strategy, knowledge transfer and training. In the first year of this initiative (2006/7) seven agreements were signed.	The MRC has reviewed the way these partnerships are managed and has agreed a revised approach. Arrangements are being made to pro-actively visit the top 10 Universities (based on MRC funding levels) during 09/10. Better coordination with other existing relationships and interactions with higher education institutions is also to be put in place.

41. Per cent business/services people on Council and Research Committees	In 2008/09 17/244 members of Council, the Research Boards, Overview Groups and panels were from the private sector (seven per cent). In 2007/08 10/242 members of Council, the Research Boards and panels were from the private sector (four per cent). In 2006/07 11/175 members of Council, the Research Boards and Research Panels are from business or the public services (six per cent). The proportion is slightly less than in 2005/06 (eight per cent).	In 2007/08 a significant number of new panels were convened to make recommendations for funding of awards through new initiatives and calls. The MRC has explored mechanisms, other than the significant commitment that serving on a research board represents, to include input from the private sector. The MRC Showcase events are an important networking opportunity for business and MRC researchers. The MRC has also appointed a special industry advisor (Professor Kimber) to work with research management group, and has been holding industry forum meetings from 2008/09. Formation of cross-cutting overview groups and new recruitments to the research boards in 2008/09 represented an opportunity to recruit further industry input, and can be seen in the net increase in industry representation in 2008/09.
43. Membership of networks	The MRC collaborates in several major networks with industry: the Dundee Consortium (attracting industry investment of more than £15m over five years), and the Integrative Mammalian Biology Consortium, involving three Pharmaceutical companies. The MRC is also involved in bilateral and multilateral networks with research charities e.g. the UK Clinical Research Collaboration, the Cardiovascular Research Funders Forum, UK Stem Cell Forum and the National Prevention Research Initiative. In January 2008, the MRC and GlaxoSmithKline (GSK) jointly funded a programme seeking to identify and validate genes associated with common human diseases. The MRC and GSK will each invest £1m in the programme over the next three years.	

	The MRC Strategy Board has allocated £6m to support a programme of work to tackle chronic non-communicable diseases in developing countries and to help establish a new alliance of research funders committed to supporting the grand challenge objectives in this area. The new £3.7m MRC Centre for Drug Safety Science at the University of Liverpool work was established, this facilitates collaboration of researchers with leading pharmaceutical companies including AstraZeneca, Novartis, Pfizer, Merck and with the Association of the British Pharmaceutical Industry to improve understanding of adverse drug reactions and investigate how to improve the design, tailoring and selection of drugs.	
32. Survey assessment of user confidence in research councils	In 2007 the research councils worked collectively through the RCUK Economic Impact Group to publish a user satisfaction survey. The survey work was carried out by Price Waterhouse Coopers: It was reported that 97 per cent of respondents understood the role of the MRC, that "overall, MRC is meeting the expectations of its users to a considerable extent across all activity areas", that the MRC's "performance (across aspects of service delivery and communication) is quite strong", over 71 per cent, agreed that the MRC's strategy addresses key priorities in its field, 81 per cent of users were satisfied with their relationship with the MRC, and 77 per cent said they would speak highly of the MRC. Areas for performance improvement included the ability of the MRC to understand and respond to user needs, the efficiency of MRC processes and signposting who to contact in the MRC.	The MRC is planning to carry out a reputation audit towards the end of 2009 which will inform into the new communications strategy.

44. Interactions with partners and users	In 2006 the MRC and MRCT launched a programme of Showcase events to highlight the science being funded by the MRC and to enhance the ability to develop partnerships with Industry. To date, GSK, Pfizer, AstraZeneca, UCBCelltech, Organon, Roche and Novartis have participated in these events, four of which took place in 2007. Further showcase events took place in 2008. The MRC and MRCT committed a budget of £3m for 2007/08 to set up the Pilot Industry Collaboration Award (PICA) Scheme to encourage collaborative research between MRC-funded researchers and Industry Showcase attendees, open to those who attend Showcase events. In January 2009 the MRC Industry Collaboration Award (MICA) Scheme was launched, this scheme aims to encourage and support collaborative research project and allows UK companies of any size to participate. The MRC has committed £30m in collaborative areas over the 2008/09 – 2010/11) CSR period.	In 2008/09 the new MRC Pharma Forum was launched to provide a platform for continuing effective engagement between MRC and industry. The forum contributed to a review of the industry showcase programme, and a new programme will be launched during 2009/10. The Forum advised on the set up of the MICA scheme and continue to work closely with the Technology Strategy Board on future collaborative research initiatives.
45. External income to MRC institutes/units from collaborative research with users	2008/09 £35.2m 2007/08 £31.5m 2006/07 £24.5m 2005/06 £20.9m	
46. Spend on 'LINK' type projects including work with the Department of Business Innovation and Skills on collaborative research and development	LINK project spend 2008/09 £0.04m 2007/08 £0.12m 2006/07 £0.39m 2005/06 £0.73m	Fall in LINK funding is largely due to Applied Genomics projects terminating, since the programme stopped accepting applications in 2004. This scheme is being replaced by the MRC Industry Collaboration Award (MICA) Scheme.
47. Expenditure on intellectual property exploitation, patenting and licensing	2008/09 £9.8m 2007/08 £9.1m 2006/07 £8.7m 2005/06 £7.2m	This includes the direct costs of administering MRC intellectual property, the staffing and other running cost for MRCT and its collaborative centres, plus legal costs of administering the MRC patent estate.

48. Numbers of new patent applications	2008/09 20 2007/08 21 2006/07 25 2005/06 25	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 rapid dissemination of information and the requirement to patent protect an invention, as such this does not fully reflect the number of patentable inventions from MRC unit funding.
49. Numbers of patents granted	2008/09 24 2007/08 15 2006/07 15 2005/06 23	
50. Numbers of new licensing agreements	2008/09 38 2007/08 31 2006/07 39 2005/06 40	
51. Numbers of signed collaborative agreements	2008/09 27 2007/08 16 2006/07 10 2005/06 40	
52. Employment in MRC start-up/spin-out companies	Having secured around £20m in funding, MRC start-up company Heptares Therapeutics has now vacated the MRCT Mill Hill site to move to new premises at the science park in Welwyn. At 31 March 2006 there were 1,247 employees in MRC start-up companies (not including Celltech Group, part of UCB Pharma).	Given recent acquisitions (above) and the long time since the establishment of many of these companies, this metric is no longer appropriate. However, businesses based on MRC IPR that contributed to the employment figure for 2006 continue to operate whether as separate companies or within larger ones.
53. Expenditure on Development Gap Funding	By March 2009, 66 projects had been funded (commitment now £7.68m) since launch of the scheme.	Notable outcomes from DGF projects include formation of the start-up company Heptares and development of a medical device for detection of oesophageal cancer.
54. Implementation of Drug Discovery Group (DDG) business plan	MRCT spend on DDG in 2008/09 = £4.71m. Group is being expanded to form a national resource for drug discovery – the Centre for Therapeutics Discovery. MRC spend on the Group in 2007/08 was £1.5m, and £3.8m in 2006/07.	2006/07 costs included significant start-up costs.

55. Expenditure on collaborative and vocational skills training for PhD students and post-docs	2008/09 £3.7m 2007/08 £2.0m	
56. Number of user organisations involved in collaborative training	2008/09 34 2007/08 24 2006/07 19 2005/06 16	For 2008/09 this includes eight for fellowships, 23 for studentships and three on capacity building projects.

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