

TECHNOPOLIS



**First Annual Survey of Knowledge Transfer
Activities in Public Sector Research Establishments**

Report to the Office of Science and Technology

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Technopolis Limited

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First Annual Survey of Knowledge Transfer Activities in Public Sector Research Establishments

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1 Introduction

This report presents the results of the first annual survey of knowledge transfer activities in Public Sector Research Establishments (PSREs). It is based on the results of a questionnaire survey directed to all PSREs and provides both numerical data and more qualitative indicators of knowledge transfer activities for the 2003-04 financial year.

The survey was designed and managed by the UK Office of Science and Technology (OST). Technopolis Ltd, a private consultancy specialised in research policy was contracted to actually administer the survey, prepare and analyse the data and report on the results.

This short report is structured in three further sections as follows

- **Section 2** sets out background information on the questionnaire design and administration, the target population and the response rates obtained
- **Section 3** presents findings on a number of key performance indicators for knowledge transfer, developed to permit comparison with data gathered through the annual Higher Education – Business Interaction (HE-BI) survey
- **Section 4** presents findings for all the other main sections of the questionnaire

The questionnaire itself is reproduced in **Appendix A** and a list of the responding organisations is given in **Appendix B**.

2 Background information

2.1 PSREs and Knowledge Transfer

2.1.1 PSREs

PSREs are a diverse collection of public bodies carrying out research in pursuit of various Government objectives, including improving quality of life and economic development through advances in basic science and informing Government policy making and statutory and regulatory functions.

The PSREs covered by this exercise fall broadly into two groups: those that are part of, or directly sponsored by, **Government departments**; and those that are sponsored by the UK **Research Councils**. Within this general split, the PSREs have, for the purposes of analysis, been further sub-divided into the following (5) groupings:

Government Department PSREs - we have introduced a three-way split within this category as follows:

- 1 **Cultural Institutions** are those funded by the Department of Culture, Media and Sport (DCMS), although they may also receive funding from other sources (such as the National Lottery). They comprise art galleries, museums, and arts and heritage organisations, and have been put into their own category due to their relatively low levels of research and innovation activity.
- 2 **NHS Regions** are not institutions as such but relate to the research activities of all NHS Trusts within a given region of the UK. In the last few years the Department of Health has established 'innovation hubs' to provide an innovation management service for most if not all of the NHS Trusts within a given region. It is these Innovation Hubs that have responded to the survey on behalf of the trusts within their region, and
- 3 **Departmental Research Bodies** represent all other Government Department PSREs not covered by the first two categories

Research Councils - we have introduced a two-way split between the headquarter operations and the research council institutes themselves as follows:

- 4 **Research Council Headquarters** are responsible for administration and as a general rule do not themselves carry out research. However, they are likely to be engaged in some kinds of knowledge transfer activities.
- 5 **Research Council Institutes** are the main research bodies performing intramural research on behalf of the parent Councils. They may either be 'owned' by the parent Research Council, receiving the great majority of their income, or they may have a more distant relationship, being treated as 'centres of excellence' and receiving a block grant representing only a minority of their income.

2.1.2 Knowledge Transfer

PSREs' "knowledge transfer" activities often take a variety of forms. Free dissemination of research outputs is often the primary means of knowledge transfer,

with benefits accruing to industry in general, rather than to specific businesses. Other routes include research collaborations and contract research on behalf of industry, the licensing of technology to business users, the sale of services, data and software, and the formation of joint ventures and spin-out companies.

As part of the *Science and Innovation Investment Framework 2004-2014*, the Government has established a basket of indicators to measure the responsiveness of the research base to the needs of the economy and public sector. These will be used to track performance over time and will allow cross-comparison with data emerging from the HEI sector as a result of the annual Higher Education – Business Interaction (HE-BI) survey. The eight core indicators that are relevant to PSREs are:

- (1) Business representatives on governing bodies
- (2) Full time equivalent staff employed in commercialisation /industrial liaison offices
- (3) Number of patent applications
- (4) Number of patents granted
- (5) Number of licensing agreements
- (6) Income from IP licensing
- (7) Number of spin-outs
- (8) Income from business

In addition to these indicators, this survey has included a number of other questions which taken together are intended to provide a more comprehensive picture of PSRE KT activities.

2.2 Survey design and administration

2.2.1 Design

In Winter 2003 OST ran a pilot survey of knowledge transfer activities in PSREs. This exercise was used as the basis for an ongoing dialogue between OST and various PSREs concerning their knowledge transfer activities and how best to begin to systematically collect data and information on these activities.

In Autumn 2004 a workshop was organised by OST at which PSREs were invited to comment on the survey design and following this a draft version of the questionnaire to be used in the first annual survey was distributed to those PSREs for comment. Following this process a number of detailed changes to the questionnaire were made. The final form of the questionnaire used in the 2004 survey is reproduced in **Appendix A**.

2.2.2 Administration

In Autumn 2004, OST issued an Invitation to Tender for a contract to assist with the process of survey administration and analysis. Following a competitive bidding process, Technopolis Ltd was awarded a contract to provide OST with the following services:

- Issuing the survey to PSREs, dealing with enquiries and encouraging returns
- Verification of the data received in order to ensure its integrity

- Analysis of the submitted responses
- Provision of a report setting out the survey results, including performance against the eight Science and Innovation Framework indicators

2.3 Response Rates

The number of organisations included in the initial mailout was 141. Four organisations were subsequently removed from the circulation list, and one further PSRE was added. In addition, the Medical Research Council (MRC) notified its intention to submit an amalgamated response covering 40 of its member organisations on the original list. An amalgamated response was also received from the Health Protection Agency covering several of their units.

As a result of these changes, the potential maximum number of PSREs covered by the study became 138. A total of 64 questionnaires were returned, covering 107 PSREs. This equates to an overall response rate of 78% if the constituent organisations covered in the amalgamated responses are counted individually.

As indicated above, the PSREs have been divided into five groups for the purpose of analysis. Exhibit 1 shows the numbers of PSREs within each category, the number of questionnaires returned, and the coverage rates obtained.

Exhibit 1 Response Rates

	Number of PSREs written to	Number of completed questionnaires	Number of PSREs covered	PSRE coverage rate
Cultural Institutions	14	6	6	43%
NHS Regions	10	7	7	70%
Departmental Research Bodies	25	17	17	68%
Research Council HQs	6	3	3	50%
Research Council Institutes	83	31	74	89%
TOTAL	138	64	107	78%

We consider an overall response rate of 78% to be very respectable, especially given that this is the first time the survey has been run. It is a non-trivial task for PSREs to provide the data requested, and in most cases will have necessitated a substantial amount of effort on their part. The intention is that, over time, collecting and reporting such data will become a routine task for PSREs, and that OST will see year on year improvements in both response rates and the quality and completeness of the data provided.

The response rate was highest among *Research Council Institutes*, who might be expected to relate most closely with the issues covered in the survey. The relatively low response rate from *Cultural Institutions* reflects a general perception that they are only peripherally involved in the more ‘commercially-oriented’ knowledge transfer activities covered by the survey.

3 Science and Innovation Framework Indicators

As part of the *Science and Innovation Investment Framework 2004-2014*, the Government has established a basket of indicators to measure the responsiveness of the research base to the needs of the economy and public sector. Exhibit 2 below lists the indicators and presents two figures from the current survey for each: first, a ‘raw’ figure showing the sum of values supplied to us by the responding PSREs, and secondly a ‘grossed up’ figure for the indicator to take account of missing values. This figure is calculated on the assumption that, on average, organisations that have provided a particular data item are representative of all organisations in their particular group¹. The raw figures may be taken as a lower bound for the indicator in question, while the grossed-up figure represents an improved estimate, providing a better basis for cross-sectional and longitudinal comparisons. Given the reasonable response rates obtained we would expect the grossed-up figures to be a fairly good approximation of the actual true figures that would have been obtained had all of the PSREs responded to the survey and answered all of the questions.

Also included in Exhibit 2 are data taken from the March 2003 HEFCE report ‘Higher Education Business Interaction Survey 2000-01’, allowing some PSRE/HEI comparisons.

Exhibit 2 Performance Indicators

Indicator	PSREs 2003-04: ‘Raw’ Data	PSREs 2003-04: ‘Grossed-up’ data	HE-BI Survey 2002-03
Business representatives on governing bodies	175	339	1,403
Staff employed in commercialisation/ industrial liaison offices (FTEs)	385	550 (average 5-6 per PSRE)	2233, (average 11- 13 per HEI)
Number of patent applications	316	441	1209
Number of patents granted	228	320	371
Number of licensing agreements	621	831	758
Income from IP licensing	£33m	£50m	£37.1m
Number of spin-outs	69	92	197
Income from business	£73m	£111m	£333m

In Section 4, the full results from the survey are covered in a more systematic manner under various headings, reflecting the grouping of questions in the questionnaire.

¹ An item of data may be missing either because a PSRE has not returned the questionnaire, or because that particular data item has not been supplied on a returned questionnaire. In view of the latter, ‘grossing up’ factors vary between particular data items.

4 Survey Results

4.1 Organisational Size, R&D and Staff Knowledge-Transfer Skills

First, we consider the involvement of PSRE staff in knowledge-transfer (KT) activity – specifically:

- Numbers of KT specialists (defined here as staff engaged in technology transfer, industrial liaison, contract officers and their equivalents), and
- Other staff engaged in KT to business and the community

Exhibit 3 shows the results of the survey on these measures from responding organisations, together with total numbers of employees, income and R&D expenditure.

Exhibit 3 Staff Involvement in Knowledge Transfer

(a) Raw Survey Data

	Number of employees	R&D spend (£m)	Total income (£m)	Specialist KT staff	Other staff involved in KT
Cultural Institutions	5,280	11.2	796	8	126
NHS Regions	377,220	260	7,962	100	21
Departmental Research Bodies	13,967	288	926	82	570
Research Council HQs	928	0	1,055	5	94
Research Council Institutes	11,709	456	539	191	1,380
TOTAL	409,103	1,015	11,279	385	2,191

(b) ‘Grossed up’ data

	Number of employees	R&D spend (£m)	Total income (£m)	Specialist KT staff	Other staff involved in KT
Cultural Institutions	18,480	39	2,786	21	353
NHS Regions	754,440	521	19,906	142	42
Departmental Research Bodies	20,539	450	1,544	128	838
Research Council HQs	1,856	0	2,110	10	188
Research Council Institutes	14,730	613	701	248	1,922
TOTAL	810,045	1,623	27,046	550	3,343

It is necessary to point out that variations in the nature of the responding organisations have raised some issues here. For example, with cultural institutions, the information returned to us in some cases related to the institution as a whole, while in other cases it related to a small scientific or research unit within the overall establishment.

Similar problems were encountered with the NHS Innovation Hubs, with some providing data for their NHS region as a whole while others provided data on their own (i.e. the hub’s activities). In line with our understanding of OST’s requirements, we have taken a broad perspective, treating the entire organisation as the ‘PSRE’

rather than one or more sub-elements or units. In the case of Cultural Institutions a given museum or gallery is taken to be the PSRE, and so data relating to staffing, income etc. will cover all of the organisation's staffing and income, not just that of a research unit. The same applies to the NHS regions – data on staff levels and income relate to *all NHS activity within that region*. This has, in some cases, meant that respondents have had difficulty in supplying the required information.

Overall, respondents have identified 385 FTE KT-specialist staff, with a further 2,191 engaged in knowledge transfer in some way and to some extent. These figures correspond to 0.06% and 0.36% of total organisational staff, respectively. These low proportions, however, come about largely because of the very large number of NHS employees. If we exclude the NHS Regions, proportions of KT staff increase to 0.9% and 6.8% respectively, under the two measures.

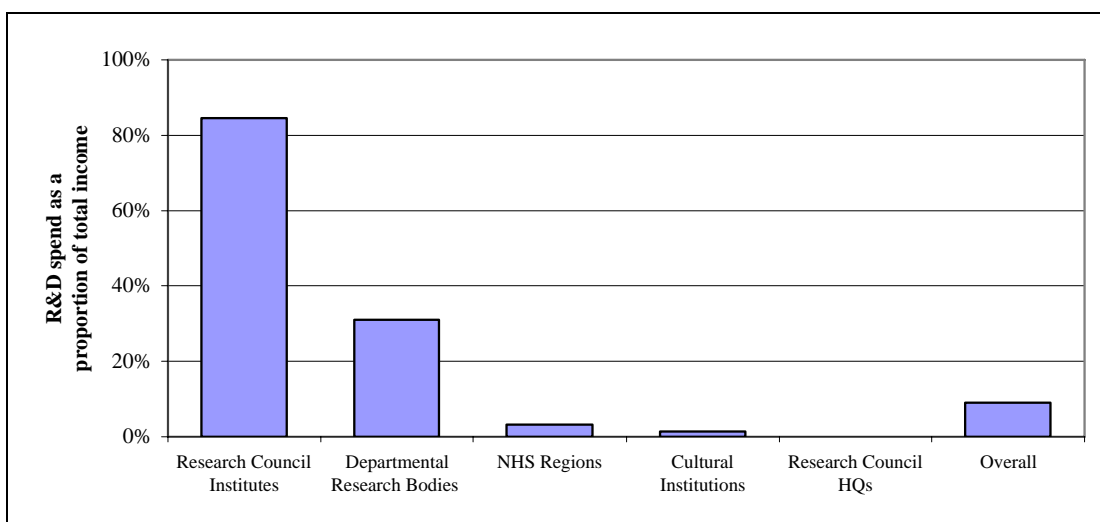
One organisation makes by far the biggest contribution to the figures for Departmental Research Bodies, accounting for 72% of the identified R&D expenditure. No single organisation dominates the R&D or income figures for the other categories of PSRE. Regarding KT staff, one organisation contributes almost half the total of the Departmental Research Bodies' 'other KT Staff', while another with a total of 45, is the biggest single contributor of specialist KT staff.

The picture provided by the above figures is not greatly changed if the numbers are 'grossed up' to account for missing data (Exhibit 3(b)), on the assumption that, on average, organisations that have provided a particular data item are representative of all organisations in their particular group. The figures here may be taken as the best estimates of numbers of KT staff in PSREs.

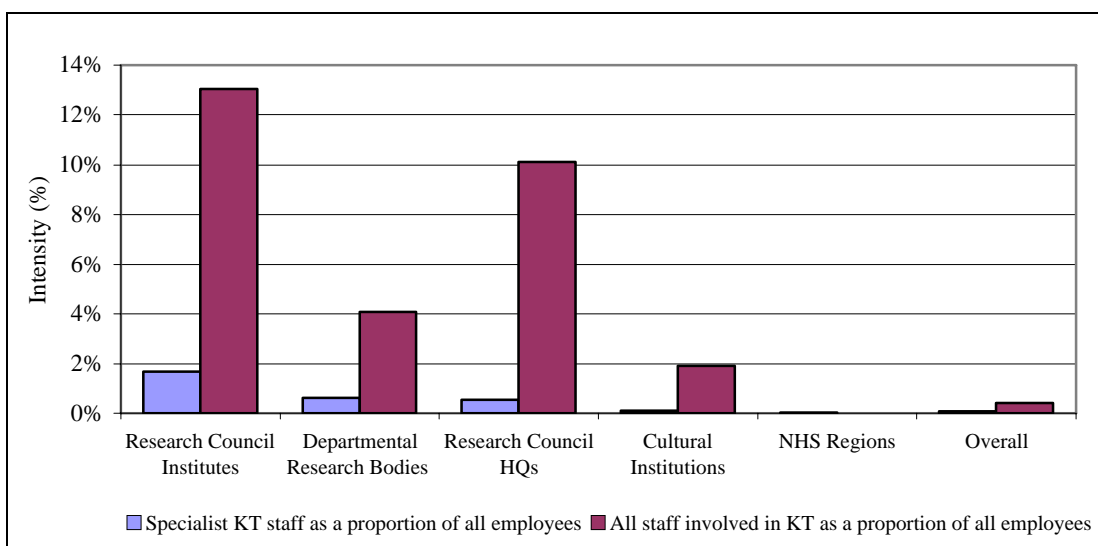
The PSREs are very heterogeneous, with multiple functions and objectives and varying greatly, for example, in their R&D intensity. However, there is a positive correlation between total R&D expenditure within each group of organisations and their number of specialist KT staff. This suggests that, despite their diversity, there is a tendency towards consistency in the staff resources they allocate to knowledge transfer. This is illustrated graphically in Exhibit 4, which shows, for example, that Research Council Institutes are both the most research-intensive and have the highest proportion of KT specialists among their staff. Departmental Research Bodies are runners-up on both measures. As non-research bodies engaged in some knowledge transfer, the Research Councils themselves are an exception to the pattern.

Exhibit 4 PSREs: Intensity of R&D and of knowledge transfer

(a) Research intensity – R&D expenditure as a percentage of income



(b) Knowledge-transfer intensity – KT Staff as a percentage of all employees



4.2 Other People-Based Knowledge-Transfer Measures

4.2.1 Governing Bodies

The size of governing bodies varies little between the different categories of organisation. The average size of these bodies is typically 12-16 individuals. There are, however, more marked differences in the *structure* of the governing bodies, in terms of the types of organisations from which they are drawn. In addition to total numbers, survey participants were asked to give the number of Governing Body members drawn from:

- (a) Commercial organisations
- (b) Social, community and cultural groups

(c) Public sector organisations

Results are presented in Exhibit 5, which shows representation from the various sources as a percentage of total representation of that class of organisation.

Exhibit 5 Representation on governing Bodies

Averages	Commercial	Social groups	Public sector
Cultural Institutions	40%	29%	27%
Departmental Research Bodies	28%	4%	55%
NHS Regions	23%	0%	77%
Research Council HQs	26%	2%	70%
Research Council Institutes	26%	3%	56%

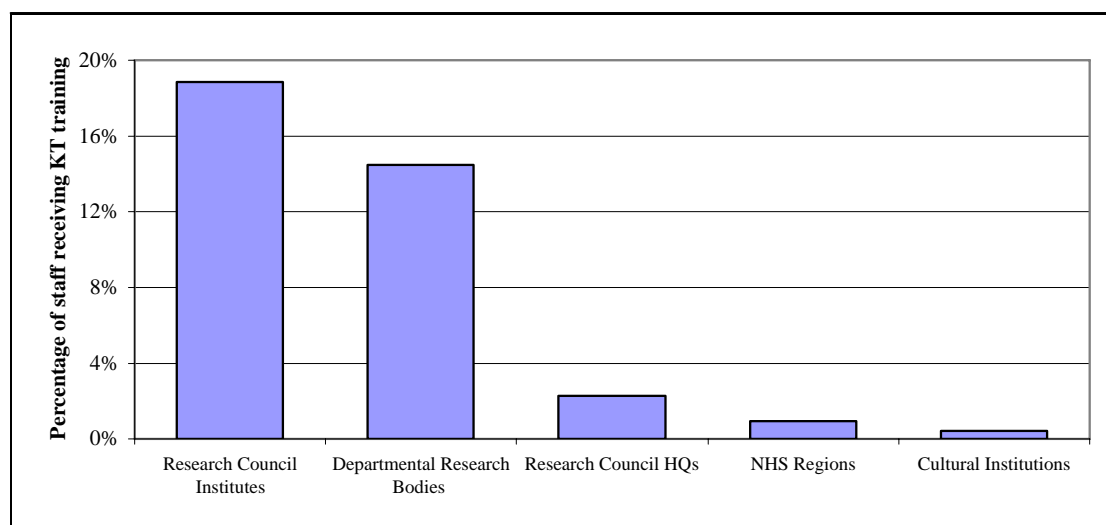
Cultural organisations have the highest representation from commercial organisations (40%), other types of PSRE averaging 20-30% of commercial representation.

Cultural Institutions also have significantly lower public sector representation compared with other groups, but a much higher than average contribution from social, community and cultural groups, which provide less than 5% of the governing body members of the other classes of PSRE. Overall, public sector organisations contribute the majority of governing body members, the proportion being particularly high for the NHS Regions.

4.2.2 Knowledge-Transfer Training

Respondents were asked to quote the percentage of their internal client base receiving knowledge transfer training. Exhibit 6 shows the results. Not surprisingly, the more research-intensive public bodies are more active in internal KT training. For NHS Regions, it should be stressed that the data applies across all NHS staff. Research Council Institutes and Departmental Research Bodies have 15-20% of their staff in KT training.

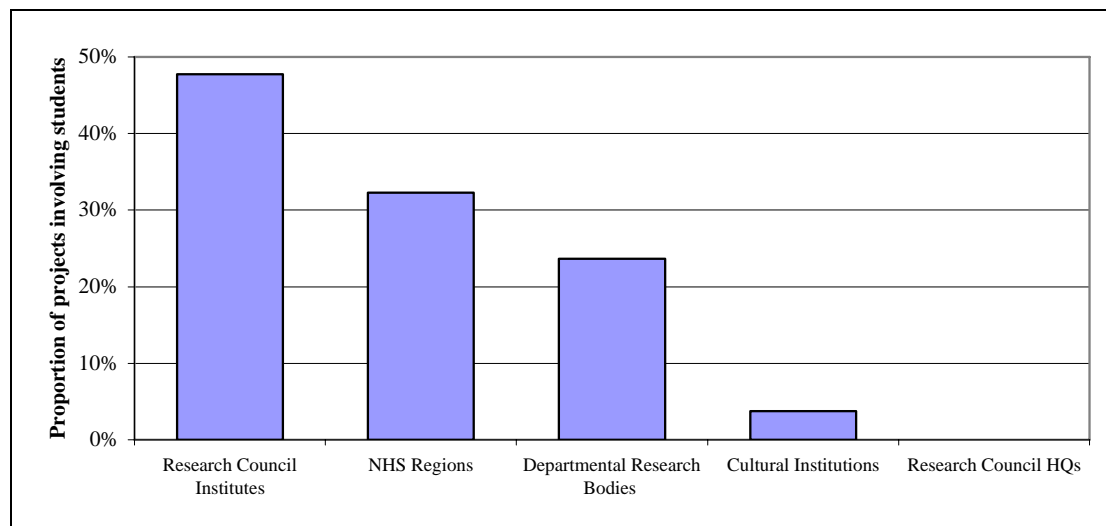
Exhibit 6 Percentage of staff receiving KT training



4.2.3 Development of Graduates

Respondents were asked to give the percentage of their current projects involving students (PhD and Research Assistants). As shown in Exhibit 7, Research Council institutes were the group most active in graduate development, with nearly 50% of projects involving students.

Exhibit 7 Proportions of projects involving students



4.3 Patents and Licences

PSREs' patenting and licensing activity is shown in Exhibit 8 below. The total number of patent applications filed in 2003-04 by organisations responding to the survey was 316, of which 123 were applied for in the UK and 193 overseas. 228 patents were granted in the year –34 in the UK and 194 overseas. Departmental research bodies had the greatest propensity to patent, particularly overseas, although three organisations accounted for 94% of all recorded patent applications from this group of organisations in the year.

Research Council Institutes also contribute significantly to patenting activity. The average per institute is, however, significantly lower than that of the Departmental Research Bodies. On the other hand, Research Council Institutes are considerably more active in the area of licensing; three organisations account for the overwhelming majority of the cumulative portfolio of licenses held by research institutes.

Again, the 'grossed up' data presented in part (b) of Exhibit 8 is produced on the assumption that organisations within a particular group for which we have data are representative of that group as a whole. The data represent the best estimate we have of overall PSRE patenting and licensing activity.

Exhibit 8 Patents and Licenses

(a) Raw Survey Data

	New Patent Applications in-year		Patents granted in-year		Cumulative 'live' patent application portfolio		Cumulative 'live' patent granted portfolio		Licences	
	UK	Overseas	UK	Overseas	UK	Overseas	UK	Overseas	2003-04	Cumulative
Cultural Institutions	0	0	0	0	1	0	1	0	0	2
Departmental Research Bodies	46	119	22	132	390	1,385	149	1,800	154	890
NHS Regions	27	20	2	0	43	44	5	1	19	25
Research Council HQs	0	0	0	0	0	0	0	0	0	0
Research Council Institutes	50	54	10	62	530	993	131	421	448	1,263
TOTAL	123	193	34	194	964	2,422	286	2,222	621	2,180

(b) 'Grossed up' Data

	New Patent Applications in-year		Patents granted in-year		Cumulative 'live' patent application portfolio		Cumulative 'live' patent granted portfolio		Licences	
	UK	Overseas	UK	Overseas	UK	Overseas	UK	Overseas	2003-04	Cumulative
Cultural Institutions	0	0	0	0	2	0	2	0	0	5
Departmental Research Bodies	68	175	32	194	574	2,037	219	2,647	241	1,309
NHS Regions	39	29	3	0	61	63	7	1	27	36
Research Council HQs	0	0	0	0	0	0	0	0	0	0
Research Council Institutes	63	68	13	78	667	1,249	165	530	564	1,589
TOTAL	169	272	48	272	1,304	3,349	393	3,178	831	2,938

4.4 Spin-outs

A number of different types of spin-outs were differentiated in the survey, as follows:

- Those with some PSRE ownership, using intellectual property from the PSRE
- Those with no PSRE ownership, where the PSRE has assigned or licensed IP
- Staff start-ups, where current or former PSRE staff are company founders, and where the PSRE has neither ownership nor an IP agreement with the company

Exhibit 9 shows data for the number in each category established in the year, numbers still active after three years, and estimated employment and turnover of remaining active spin-outs.

Research Council Institutes are clearly dominant in generating and retaining spin-outs. No single organisation stands out as being particularly successful in producing spin-outs - almost half of the responding Research Council Institutes have generated at least one. Spin-outs where there is some PSRE ownership are the most numerous, and this type of spin-out also shows a tendency to greater longevity.

There is a very large variation in the size of spin-outs. The total employment from all active spin-outs, in particular, is dominated by one company. At several thousand, employment generated by spin-outs makes a significant contribution, although employment and turnover within surviving spinouts is very small in comparison with corresponding totals for parent organisations – some 0.6 % in both cases.

4.5 Income from PSRE knowledge-transfer activities

Exhibit 10 summarises data on income from PSREs' commercialisation activities, broken down into categories of licensing, consultancy, facilities and training. Departmental Research Bodies and Research Council Institutes dominate the income statistics. Research Council Institutes make the greatest total contribution to 'Licensing and other IP' income, and also generate more income from this source on a per-institution basis. Over 60% of responding Research Council Institutes received licensing or other IP income from commercial organisations, as did almost half of the Departmental Research Bodies.

The grand total of income from commercialisation activities is estimated to be around £175m, which (excluding NHS regions) corresponds to around 2.5% of PSRE income. The highest proportion is generated by Research Council Institutes, which as a whole produce almost 15% of their income from commercialisation activities, followed by Departmental Research Bodies (2-3%). Less than 1% of the income of the other three types of PSRE is derived from commercialisation activities.

Of overall commercialisation income, about 65% is received from commercial organisations; of this, licensing contributes 41% and consultancy 50%, the remaining 9% being obtained from the provision of facilities and equipment, and training.

Exhibit 9 Spin-outs

(a) Raw Survey Data

	Spin-outs with some PSRE ownership		Spin-outs not owned by PSRE		Staff start-ups		Current employment of all active spin-outs	Current turnover of active spin-outs (£k)
	No. established	No. active after 3 years	No. established	No. active after 3 years	No. established	No. active after 3 years		
Cultural Institutions	0	0	0	0	0	0	0	0
Departmental Research Bodies	0	3	0	4	0	0	12	0
NHS Regions	1	1	1	0	1	1	4	150
Research Council HQs	0	0	0	0	0	0	0	0
Research Council Institutes	43	35	11	6	12	8	2,994	7,873
TOTAL	44	39	12	10	13	9	3,010	8,023

(b) 'Grossed up' Data

	Spin-outs with some PSRE ownership		Spin-outs not owned by PSRE		Staff start-ups		Current employment of all active spin-outs	Current turnover of active spin-outs (£k)
	No. established	No. active after 3 years	No. established	No. active after 3 years	No. established	No. active after 3 years		
Cultural Institutions	0	0	0	0	0	0	0	0
Departmental Research Bodies	0	6.3	0	8.3	0	0	30	0
NHS Regions	2	3	2	0	2	3	8	300
Research Council HQs	0	0	0	0	0	0	0	0
Research Council Institutes	56	47	14	9	16	12	4,490	16,160
TOTAL	58	56	16	17	18	15	4,528	16,460

Exhibit 10 Income from Commercialisation

(a) 'Raw' Survey Data

	Licensing and other IP		Consultancy		Facilities and Equipment		Training	
	From commercial organisations (£k)	From non-commercial organisations (£k)	From commercial organisations (£k)	From non-commercial organisations (£k)	From commercial organisations (£k)	From non-commercial organisations (£k)	From commercial organisations (£k)	From non-commercial organisations (£k)
Cultural Institutions	19	0	0	1	137	72	2	4
Departmental Research Bodies	6,949	1,656	3,007	1,183	107	38	1,045	3,221
NHS Regions	106	1	1,005	8,480	0	0	1	3
Research Council HQs	0	0	0	0	0	0	0	0
Research Council Institutes	24,127	157	32,089	15,438	4,581	2,672	116	168
Total	31,201	1,814	36,101	25,102	4,825	2,782	1,164	3,396

(b) 'Grossed up data

	Licensing and other IP		Consultancy		Facilities and Equipment		Training	
	From commercial organisations (£k)	From non-commercial organisations (£k)	From commercial organisations (£k)	From non-commercial organisations (£k)	From commercial organisations (£k)	From non-commercial organisations (£k)	From commercial organisations (£k)	From non-commercial organisations (£k)
Cultural Institutions	133	0	0	5	639	336	9	19
Departmental Research Bodies	13,364	3,185	6,264	2,275	222	73	2,374	6,710
NHS Regions	151	2	2,513	21,200	0	0	3	10
Research Council HQs	0	0	0	0	0	0	0	0
Research Council Institutes	32,446	245	46,350	25,086	6,617	3,860	181	262
Total	46,094	3,431	55,127	48,566	7,478	4,269	2,567	7,001

4.6 Non-Financial Impacts

In addition to the indicators covered in paragraphs 4.1 to 4.5 above, PSREs were asked for information covering a wider range of KT activities, including those which do not generate revenue. These questions were included to provide a more comprehensive picture of PSRE KT activities.

PSREs were asked about KT opportunities and invention disclosures notified to technology transfer, Industrial liaison or contract offices in the 2003-04 year. The totals obtained for each category of PSRE are presented in **Error! Reference source not found.** below. Also shown are the numbers of collaborative projects and numbers of agreements with commercial and non-commercial organisations, and numbers of publications.

A notable feature of these data is the significant contributions made by the NHS Regions and, to a lesser extent, Cultural Institutions, in contrast to their relatively small contributions to financial impacts. NHS Regions account for over half of the recorded total of disclosures, one-third of ongoing collaborative projects and one-tenth of publications of all kinds. NHS Regions and Cultural Institutions thus contribute primarily in these non-financial, more 'qualitative' areas of knowledge transfer.

As with financial impacts, Departmental Research Bodies and Research Council Institutes dominate in terms of numbers of agreements with commercial and non-commercial organisations.

There are many forms of non-financial knowledge transfer that are less amenable to quantification. In the final question, organisations were asked to comment in free format on any knowledge transfer activities undertaken but not covered in the questionnaire. Contributions were received from 37 organisations. Many of the contributions described specific institutional activities, and some of the comments elaborated on responses to the questionnaire. There were also several examples of 'other' KT work undertaken. Particular types of activity mentioned were as follows:

- Websites providing access to data on institutional activity and related information
- Provision of work experience for students
- Events for participants in industry, including training for suppliers and clients
- Staff secondments
- Attendance at conferences/seminars
- Networking initiatives
- Advice to Government or Parliamentary Select Committees (one respondent suggested that future surveys should include activities undertaken directly in support of policy formation, appraisal and evaluation - an area of increasing importance)
- Educational presentations to school groups, including 'fun days'
- Educational/discussion events with adult learners, academics and other groups
- Communications through members' associations
- Press releases, fact sheets

Exhibit 11 Quantified non-financial impacts

(a) 'Raw' Data

	Number of Disclosures	Number of collaborative projects		Number of agreements with commercial organisations		Number of agreements with non-commercial organisations		Number of Publications
		New in year	Ongoing total	New in year	Cumulative total	New in year	Cumulative total	
Cultural Institutions	110	100	216	19	28	24	0	201
Departmental Research Bodies	255	65	177	289	592	341	799	2,543
NHS Regions	1,052	172	672	21	168	18	591	1,478
Research Council HQs	0	0	0	0	0	0	0	0
Research Council Institutes	273	484	1,101	895	1,173	465	1,191	9,048
Total	1,690	821	2,166	1,224	1,961	848	2,581	13,270

(b) 'Grossed-up' Data

	Number of Disclosures	Number of collaborative projects		Number of agreements with commercial organisations		Number of agreements with non-commercial organisations		Number of Publications
		New in year	Ongoing total	New in year	Cumulative total	New in year	Cumulative total	
Cultural Institutions	513	350	613	89	98	84	0	563
Departmental Research Bodies	638	181	492	602	1,233	710	1,816	3,973
NHS Regions	1,503	430	2,240	35	280	30	985	2,952
Research Council HQs	0	0	0	0	0	0	0	0
Research Council Institutes	507	899	2,260	1,352	1,906	756	1,935	11,383
Total	3,161	1,859	5,605	2,077	3,517	1,580	4,736	18,871

Appendix A Survey Questionnaire

General guidance:

- For any questions where exact figures are not available, please provide estimates.
- Please provide figures for the last complete financial year (e.g. to April 2003 to April 2004)
- For any questions where you are unable to provide information, please answer as "not known" or "not applicable".
- For Research Councils please do not include activities undertaken by individual Institutes (separate questionnaires are being sent to them) or staff covered by the HE-BI survey. For RCs where all research is carried out by institutes or in HEIs, we would still be grateful if the RC central office could still complete questions 1-9.
- Throughout the survey the term "non commercial" is used to cover Government Departments, other public bodies, universities and EU funding and "commercial" to cover businesses.

General information

- | | |
|--|----------------------|
| 1. Name of PSRE | <input type="text"/> |
| 2. Number of employees in PSRE ² | <input type="text"/> |
| 3 PSRE's R & D and technological development expenditure (£000's) ³ | <input type="text"/> |
| 4. PSRE's total income (£000's) ⁴ | <input type="text"/> |

Infrastructure/internal capacity

- | | |
|---|----------------------|
| 5. How many of your PSRE's staff are engaged in Technology Transfer, Industrial Liaison and Contract Offices and their equivalents ⁵ | <input type="text"/> |
| 6. Other staff engaged in knowledge transfer to business and the community ⁶ | <input type="text"/> |
| 7. Business and community representation on your PSRE governing body | |
| Total number of members of Governing body | <input type="text"/> |
| Number that are from commercial organisations | <input type="text"/> |
| Number of these that are Directors of subsidiary companies which manage commercialisation activities on behalf of the PSRE. | <input type="text"/> |

² Provide answer as full time equivalents (FTEs) numbers of staff. Please include any staff employed by subsidiary companies which manage commercialisation activities on behalf of the PSRE, but not staff employed by start up or spin off companies covered by question 12. For NHS Innovation Hubs please include all the Trusts and other organisations covered by the Hub.

³ Include all R&D expenditure including any work funded from external sources, such as in come from collaboration and contract work. For NHS Innovation Hubs please include all the Trusts and other organisations covered by the Hub.

⁴ For NHS Innovation Hubs please include all the trusts and other organisations covered by the Hub.

⁵ Provide answer as full time equivalents (FTEs) numbers of staff. Include all staff in Technology Transfer, Industrial Liaison and Contract Offices and their equivalents plus any communications staff or consultants spending a significant proportion of their time on commercialisation of research. Please include any staff employed by subsidiary companies which manage commercialisation activities on behalf of the PSRE, but not staff employed by start up or spin off companies covered by question 12.

⁶ Provide answer as full time equivalents (FTEs) numbers of staff. Include all staff engaged in collaboration research and/or with regular contact with an external audience (including businesses, research communities and stakeholders), including staff engaged in producing publications which were developed in collaboration with external organisations and/or aimed at an audience outside the PSRE, but do not include staff included in the answer to question 5.

Number that are from social, community and cultural Groups	<input type="text"/>
Number that are from Public Sector organisations	<input type="text"/>
8. % of internal client base receiving knowledge transfer training ⁷	<input type="text"/>
9. Development of graduates - % of current projects involving students (both PhD and Research Assistant) ⁸	<input type="text"/>

Income generating activities

10. Patents and licensing ⁹	
Number of new patent applications filed in year	
UK	<input type="text"/>
Overseas	<input type="text"/>
Number of patents granted in year	
UK	<input type="text"/>
Overseas	<input type="text"/>
Cumulative portfolio of patents applications (e.g. all "live" patent applications held by PSRE)	
UK	<input type="text"/>
Overseas	<input type="text"/>
Cumulative portfolio of granted patents (e.g. all "live" granted patents held by PSRE)	
UK	<input type="text"/>
Overseas	<input type="text"/>
11. Licences	
Number of licence options and licences granted in this year.	
<input type="text"/>	
Cumulative portfolio of licence options and licences ¹⁰	
<input type="text"/>	
12. Spin outs ¹¹	
Spin -offs with some ownership by your PSRE	
Number established	<input type="text"/>

⁷ For client base include all staff employed by your organisation who are engaged in research, plus any external researchers with whom you have formal contracts of employment. Include any training including continuing personnel development and training courses, and also informal activities such as awareness raising seminars for staff.

⁸ Only include projects where your organisation has provided at least part of the funding.

⁹ Where data is requested for number of patents separate returns for UK and overseas patents should be included. Overseas is defined as non-UK and therefore EU numbers should be included in the overseas sub-total. For example, the same patent filed in UK, US and Japan would count as 1 UK and 2 overseas.

¹⁰ Include licence options and licences granted in previous years which are still in operation during the current financial year plus any new licence options and licences which are granted during the year.

¹¹ The different types of spin off and start up are defined as: Spin-off (with PSRE ownership) Spin-off companies established using the HEI's intellectual property (IP) and in which there is some element of PSRE ownership. Spin-off (with no PSRE ownership) Spin-off companies to which the PSRE has assigned or licensed IP, but in which there is no PSRE ownership. Staff start-ups Start-up companies involving current or former PSRE staff as founders where the PSRE has neither ownership nor an IP agreement. (In this case the PSRE staff must be connected to the PSRE immediately prior to formation of the company).

Number still active after at least 3 years	<input type="text"/>
Formal spin-offs, not owned by your PSRE	
Number established	<input type="text"/>
Number still active after at least 3 years	<input type="text"/>
Staff start ups	
Number established	<input type="text"/>
Number still active after at least 3 years	<input type="text"/>
Estimated current employment of all active firms ¹²	<input type="text"/>
Estimated current turnover of all active firms (£000's)?	<input type="text"/>
13. Income from commercialisation	
Income from licensing and other IP	
From commercial organisations (£000's)	<input type="text"/>
From non commercial organisations (£000's)	<input type="text"/>
Income from consultancy	
From commercial organisations (£000's)	<input type="text"/>
From non commercial organisations (£000's)	<input type="text"/>
Income from use of facilities and equipment ¹³	
From commercial organisations (£000's)	<input type="text"/>
From non commercial organisations (£000's)	<input type="text"/>
Income from training	
From commercial organisations (£000's)	<input type="text"/>
From non commercial organisations (£000's)	<input type="text"/>

Non financial impact

14. Number of knowledge transfer opportunities and invention disclosures communicated to Technology Transfer, Industrial Liaison and Contract Offices and their equivalent ¹⁴	<input type="text"/>
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15. Number of collaborative research projects¹⁵

¹² Provide answer as full time equivalents (FTEs) numbers of staff. Jobs are created through PSREs hosting manufacturing facilities and laboratories within their sites should not be included here, but you may wish to include any jobs created in this way as part of your answer to question 18.

¹³ Include any income generated from hiring out of the PSREs' facilities and equipment to external bodies, but not work the PSRE carries out on behalf of external bodies and therefore exclude e.g. contract analytical services.

¹⁴ Include both disclosures which are legally protected such as ideas that go on to be protected as patents as well as trademarks and copyright as well as research which is placed in the public domain without any legal protection.

¹⁵ Include all projects where there is a formal agreement between your organisation and an external organisation. This should include MoUs, strategic alliances and research contracts. It should exclude Material Transfer Agreements and contracts of employment with individual researchers or contracts for work which forms part of the core activity/management of the organisation but has been contracted out.

No collaborative research

Widespread collaborative research, but no formal agreements¹⁶

Number of collaborative projects (only complete if the answer to both of the previous questions is "No")

New in year

Running from previous years (with average number of years for which the projects have been running to date, *if information available*)

16. Business/community engagement - number of revenue generating agreements with commercial and non commercial organisations¹⁷

Number of agreements with commercial organisations, new in year

Cumulative portfolio of agreements with commercial organisations¹⁸

Number of agreements with non-commercial organisations, new in year?

Cumulative portfolio of agreements with non commercial organisations

17. Total number of publications¹⁹

18. Other activity

Given the complicated and diverse range of knowledge transfer activities undertaken by PSREs is it not possible to cover all their activities in the information requested above. Therefore you may wish to use the text box to the right to outline any other knowledge transfer activities not covered above (max 200 words)

¹⁶ Chose this option if the PSRE has contacts, collaboration and/or collaborates with external researchers on an informal basis, but does not have any formal agreements with them.

¹⁷ Include all agreements with business/non commercial organisations that generate revenue, including MoUs, strategic alliances, research contracts, Material Transfer Agreements and Clinical Document Architecture. Please do not include agreements where another PSRE is the leading partner or contracts for work which forms part of the core activity/management of your PSRE but has been contracted out.

¹⁸ Include agreements which started in previous years which are still in operation during the current financial year plus any agreements which started during the current year.

¹⁹ Include all publications produced by the PSRE for an external audience (including researchers, business, consumers, patients and stakeholders) including annual reports and marketing materials.

Appendix B Responding Organisations

Cultural Institutions

Arts Council England
British Library
English Heritage
National Gallery (Scientific Dept.)
National Maritime Museum
National Museums Liverpool

Departmental Research Bodies

British Potato Council (Sutton Bridge)
Central Science Laboratory
Defence Science and Technology Laboratory
Fire Statistics and Research Division
Forensic Science Service
Forest Research
General Lighthouse authorities R&D Dept.
Health and Safety Laboratory
Health Protection Agency
National Horizon Scanning Centre
National Radiological Protection Board
National Weights and Measures Laboratory
Plant Bioscience Ltd
Royal Botanical Gardens, Edinburgh
Royal Botanical Gardens, Kew
UK Atomic Energy Authority
Veterinary Laboratories Agency

NHS Regions

East London (East London Innovation Hub)
East Midlands (East Midlands Innovation Hub)
South London (MediCHIP)
Yorkshire and Humber (Medipex Ltd)
North East England and North Cumbria (NHS Innovations North)
Scotland (Scottish Health Innovations Ltd)
West London (Venture for Health)

Research Council HQs

BBSRC
EPSRC
MRC
NERC

Research Council Institutes

Babraham Institute
Biomathematics and Statistics Scotland
British Antarctic Survey
British Geological Survey
British Oceanographic Data Centre
CASIX (Air-Sea Interactions)
CCLRC
Centre for Ecology and Hydrology
Centre for Population Biology
Centre for Terrestrial Carbon Dynamics
Centres for Atmospheric Science
CERN
Climate and Land Surface Systems Interaction Centre
Data Assimilation Research Centre
Environmental Systems Science Centre
Hannah Research Institute
Institute for Animal Health
Institute of Food Research
Institute of Grassland and Environmental Research
John Innes Centre
Macauley Land Use Research Institute
MRC Technology
Plymouth Marine Laboratory
Proudman Oceanographic Laboratory
Roslin Institute
Rothamsted Research
Scottish Association for Marine Science
Sea Mammal Research Unit
Silsoe Research Institute
Southampton Oceanography Centre
Tyndall Centre for Climate Change Research