

Summary report

Wellcome Trust Basic Science Career Tracker

Results of wave 5 (2013)



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Introduction

1. Investment in individuals is integral to the Wellcome Trust's funding strategy, to support current research leaders and create future ones. A priority for the Evaluation Team at the Trust is therefore to monitor and track the career progression and choices of key cohorts of those the Trust has invested in – to ensure that we support the careers of researchers in the best and most helpful ways and thereby help to establish future research leaders.
2. Career tracking is a core component of post-award evaluation. In 2009 the Basic Science Career Tracker (BSCT) was established, a longitudinal cohort study that allows us to follow the careers of key cohorts of Trust-funded researchers.
3. Now in its fifth year, the BSCT is providing insights and trend data that are valuable evidence to support strategy setting and understanding of the impact of Trust funding schemes. For example, Tracker data on the sex differential in the exit from academic science underpin our renewed impetus to support and retain women in academic science. The demand for more rigorous and systematic data on career path progression among researchers has also increased the interest and reach of the Tracker work, and particularly from our peer organisations.
4. The BSCT currently includes a range of Trust-funded researchers in the UK and internationally, and was recently expanded to include recipients of different types of grant as the Tracker initiative grows. In 2013, we track current and former recipients of grants from the following funding schemes:
 - **Wellcome Trust Four-year PhD Programmes**, supporting PhD studentships in basic science.
 - **Wellcome Trust and National Institutes of Health Four-year PhD Studentships** (included from 2013), in which postgraduate students undertake international, collaborative four-year PhD training based both at the US National Institutes of Health campus and in either the UK or the Republic of Ireland.
 - **Sir Henry Wellcome Postdoctoral Fellowships**, early-career fellowships to allow newly qualified postdoctoral researchers to build a research portfolio and reputation.
 - **Research Career Development Fellowships**, intermediate-career fellowships aiming to help postdoctoral researchers to become independent.

- **International Senior Research Fellowships**, senior fellowships for outstanding researchers working in central Europe, India, South Africa, Australia or New Zealand.
- **Research Career Re-entry Fellowships** (included from 2013, previously Career Re-entry Fellowships), for postdoctoral scientists who have recently decided to recommence a scientific research career after a break of at least two years.

Methodology

5. Each year, current and former recipients of funding from the above grant schemes receive a short online survey asking about their career intentions and choices. New cohorts are added to the Tracker each year as grantholders enter their final year, while former grantholders continue to receive the survey annually – for up to ten years.
6. Respondent data are analysed by award (the type of grant received), cohort (the financial year in which the researcher received their award) and wave (the year of the survey).
7. A key challenge in any kind of cohort tracking is to ensure that the response at each investigation point remains high. In wave 5, we offered a £10 Amazon voucher to those who had been included in the study since the start. An increase in the number of responses in the majority of cohorts who were offered an incentive was observed between wave 4 and wave 5. We will further explore methods to increase the response in future waves.
8. To minimise the attrition over time in the information we have on each cohort – due mainly to declining response rates – in waves 4 and 5, data gathered from the online surveys were supplemented by web research, essentially to find people who did not respond to the surveys. As a result, the data reported in wave 5 might differ slightly from that of earlier waves, although emerging trends remain the same. Where the mixed methodology (survey combined with web research) of locating individuals has not been used, this is clearly noted.
9. In wave 5 of the BSCT (summer 2013), overall survey participation was high, with a total response of 81 per cent across all the cohorts; adding in the web research, we were able to reliably find 88 per cent of individuals across all of our cohorts. However, there is some variation across scheme types, and response rates among the most recent cohorts tend to be higher than for earlier cohorts (see table 1).

Table 1
Response across all cohorts

| Award and cohort | Number approached | Responses from survey | Results from web research | Total response |
|---|-------------------|-----------------------|---------------------------|------------------|
| PhD Programme studentships | | | | |
| 2003/04 | 59 | 44 | 4 | 48 (81%) |
| 2004/05 | 72 | 51 | 6 | 57 (79%) |
| 2005/06 | 69 | 51 | 7 | 58 (84%) |
| 2006/07 | 68 | 47 | 4 | 51 (75%) |
| 2007/08 | 115 | 92 | 6 | 98 (85%) |
| 2008/09 | 105 | 93 | 12 | 105 (100%) |
| Sir Henry Wellcome Postdoctoral Fellowships | | | | |
| 2006/07 | 19 | 14 | 2 | 16 (84%) |
| 2007/08 | 16 | 14 | 1 | 15 (94%) |
| 2008/09 | 16 | 14 | 0 | 14 (88%) |
| Research Career Development Fellowships | | | | |
| 2002/03 | 19 | 16 | 2 | 18 (95%) |
| 2003/04 | 14 | 12 | 1 | 13 (93%) |
| 2004/05 | 17 | 15 | 2 | 17 (100%) |
| 2005/06 | 22 | 20 | 1 | 21 (95%) |
| 2006/07 | 20 | 19 | 0 | 19 (95%) |
| 2007/08 | 23 | 22 | 0 | 22 (96%) |
| 2008/09 | 28 | 27 | 1 | 28 (100%) |
| International Senior Research Fellowships | | | | |
| 2001/02 | 21 | 17 | 2 | 19 (90%) |
| 2002/03 | 15 | 12 | 2 | 14 (93%) |
| 2003/04 | 11 | 9 | 0 | 9 (82%) |
| 2004/05 | 7 | 4 | 0 | 4 (57%) |
| 2005/06 | 4 | 4 | 0 | 4 (100%) |
| 2006/07 | 5 | 5 | 0 | 5 (100%) |
| Research Career Re-entry Fellowships | 9 | 8 | 0 | 8 (89%) |
| Wellcome Trust and NIH PhD Studentships | 8 | 6 | 1 | 7 (88%) |
| Total | 762 | 616 (81%) | 54 | 670 (88%) |

Source: Wellcome Trust BSCT, Wave 5 (2013)

10. Owing to the relatively small cohort sizes, all charts and tables reporting survey data show raw numbers unless otherwise stated.
11. When appropriate, and for illustrative purposes, participants' comments have been included in this report to support the data and illustrate emerging themes and issues.

Key findings

12. In the fifth year of the BSCT, we are starting to identify trends in the data, which we will continue to track.

- As in previous years, academia is the main sector of employment for former Trust-funded PhD students at the immediate post-PhD and early-career stage. Across all PhD cohorts included in the BSCT from waves 1 to 5, 75% of those who reported that they had finished their funding took a first position in academic research. However, the proportion of former PhD students from each cohort working in academia decreases over time.
- Former PhD students who had left academia were contributing to a wide range of sectors: biotechnology/ pharmaceutical companies, medicine, science communication/writing, consultancy, science administration/policy, and teaching. The vast majority of former PhD students who had left academia reported that they use their science training/background in their current role to at least some extent.
- In 2013, we started tracking Wellcome Trust and National Institutes of Health Four-year PhD students. Of the four who had completed the period of funding, three continued to work in academic research in the UK and the one who had left academia was employed in the pharmaceutical industry in the USA.
- Academia is the main sector of employment for former Sir Henry Wellcome Postdoctoral Fellows, with all but one of those completing their grant continuing to work in academia (26 of 27); of these, nearly two-thirds (16) were receiving funding as a lead applicant, co-applicant or fellow.
- Of the 26 former Sir Henry Wellcome Postdoctoral Fellows in academia, nearly one-third (eight) were working outside the UK (in the USA, Germany and the Netherlands). This is a slightly lower proportion than that of former PhD students in academia working outside the UK (37%; 77 of 210), though a slightly higher proportion than that of former Research Career Development Fellows in academia working outside the UK (23%; 20 of 88), suggesting that researchers in the early stages of a career in academia are more mobile than those at later stages.
- As in previous waves, the large majority of former Research Career Development Fellows were continuing their career in academic research (88 of 92). We are beginning to see indications of their career progression, with the numbers from the earlier cohorts employed in senior positions increasing over time through each wave.
- One current issue for debate is whether moving institutions or locations early in a research career is beneficial. There has been some discussion about whether this perceived or real imperative to move may actually deter the pursuit of an academic career for some. In wave 5 of the BSCT, one-fifth of former Research Career Development Fellows working in academia (17 of 88) reported that they moved location after finishing their award, citing better job opportunities and available funding as the major drivers – though some also noted that moving was disruptive and could have an impact upon research productivity.
- Wave 5 revealed the career stability experienced by former International Senior Research Fellows, with almost all continuing to be employed in academic positions (48 of 49) and leading independent research careers; 34 reported that they were receiving funding as a lead investigator.
- Research Career Re-entry Fellows were asked about the benefits and challenges of re-establishing a research career after a substantial break (the former Fellows surveyed had all had breaks of around seven years or more before starting their Fellowships). Benefits include the ability to bring new transferable skills gained outside academia, the ability to see the bigger picture and bring new context to their research, and the greater freedoms associated with academia, while the main challenges were perceptions that age may create barriers to establishing a research career, the need to (re)build a reputation, and the pressure to ‘perform’ (and publish).

Wellcome Trust Four-year PhD Programme studentship recipients

13. The Wellcome Trust Four-year PhD Programmes funding model was established in 1994 with the aim of improving the quality of PhD training for basic scientists in the UK. A key innovation was the inclusion of a first year of laboratory rotations and taught courses to enable students to make a more informed choice of PhD research project.
14. The first Programme was set up in the Department of Physiology at the University of Liverpool in 1994, followed by four more in 1995 in the Universities of Edinburgh, Glasgow and Oxford and University College London. Further expansion of the scheme, and renewals through open competition, brought the Trust's current portfolio of Programmes to 30 in 2012, hosted by 17 different higher education institutions for basic and clinical scientists throughout the UK and the Republic of Ireland.
15. Since 2000, across all of its PhD training provision (including Four-year PhD Programmes and NIH PhD Studentships), the Wellcome Trust has supported PhD training for nearly 2000 students and currently supports around 3.5% of all PhDs across biology and medicine in the UK. The training of the future generation of scientists is paramount to ensure capacity and a pipeline of researchers able to deliver discoveries and breakthroughs. Recipients of PhD funding are therefore a priority group to track the careers of.

Career tracks of former award holders

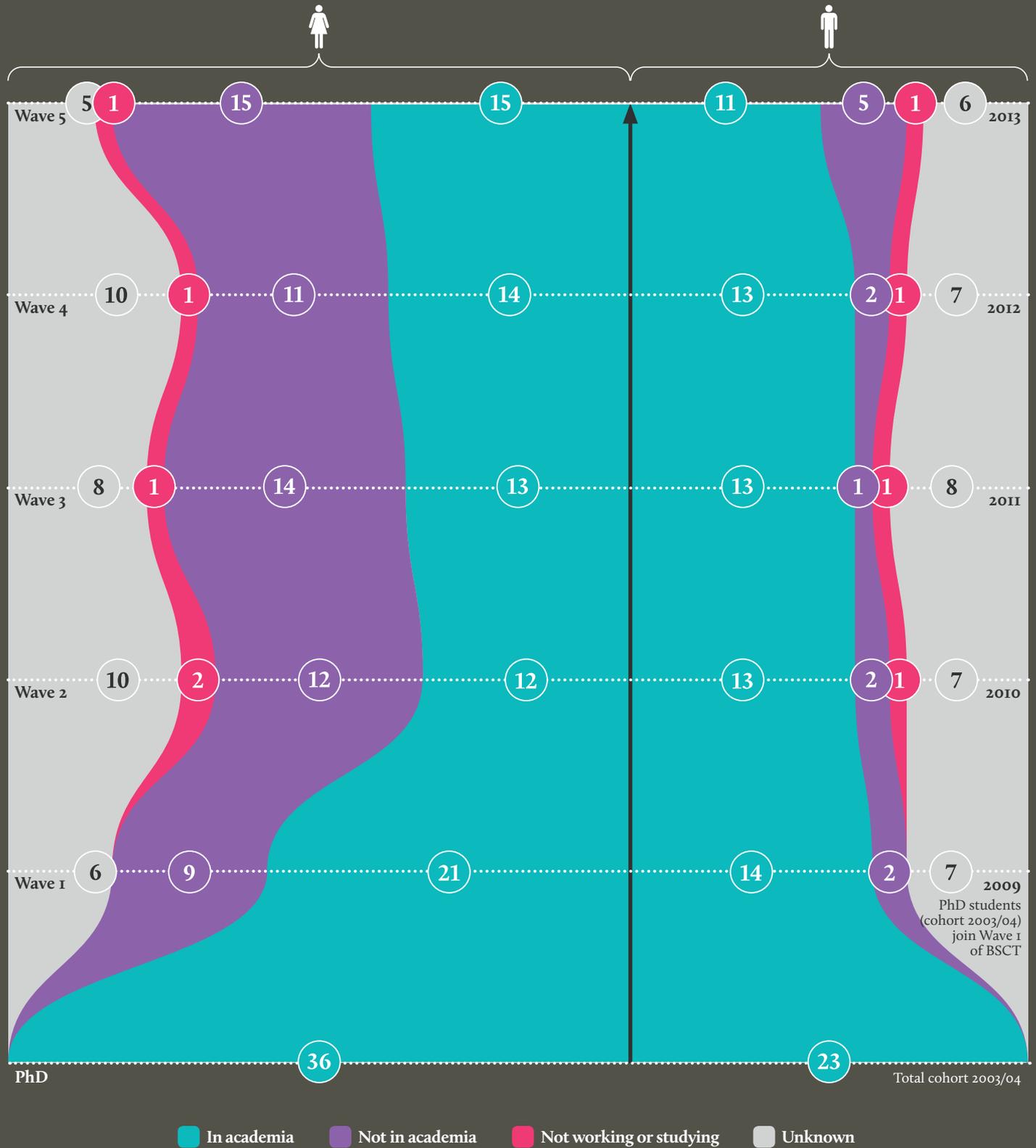
16. Academia employs the majority of former Trust-funded PhD students in the immediate post-PhD and early-career stage. For the latest PhD cohort where the majority of students had completed their training in wave 5 (2007/08, see table 2), 70% (65 of 93) had taken up a first position in academia. Across all PhD cohorts included in the BSCT between waves 1 and 5, 75% of those who reported that they had finished their funding took a first position in academic research.
17. However, the proportion of each cohort remaining in academia does decrease over time. While overall, 68% of former PhD students included in the BSCT were employed in academia at the time of wave 5, of the cohort completing their PhD training five years ago (2003/04), overall just over 50% remained in academia (see table 2).

Table 2
Employment and sector among PhD studentship recipients

| Cohort | Number in cohort | Number finished award (as reported in BSCT wave 5, 2012) | Working in academia | Working outside academia | Not working | Unknown | Still on award |
|---------|------------------|--|---------------------|--------------------------|-------------|---------|----------------|
| 2003/04 | 59 | 48 | 26 | 20 | 2 | 11 | 0 |
| 2004/05 | 72 | 57 | 39 | 16 | 2 | 15 | 0 |
| 2005/06 | 69 | 58 | 40 | 16 | 2 | 11 | 0 |
| 2006/07 | 68 | 51 | 40 | 11 | 0 | 17 | 0 |
| 2007/08 | 115 | 93 | 65 | 18 | 10 | 17 | 5 |
| 2008/09 | 105 | 1 | 0 | 1 | 0 | 0 | 104 |
| Total | 488 | 308 | 210 | 82 | 16 | 71 | 109 |

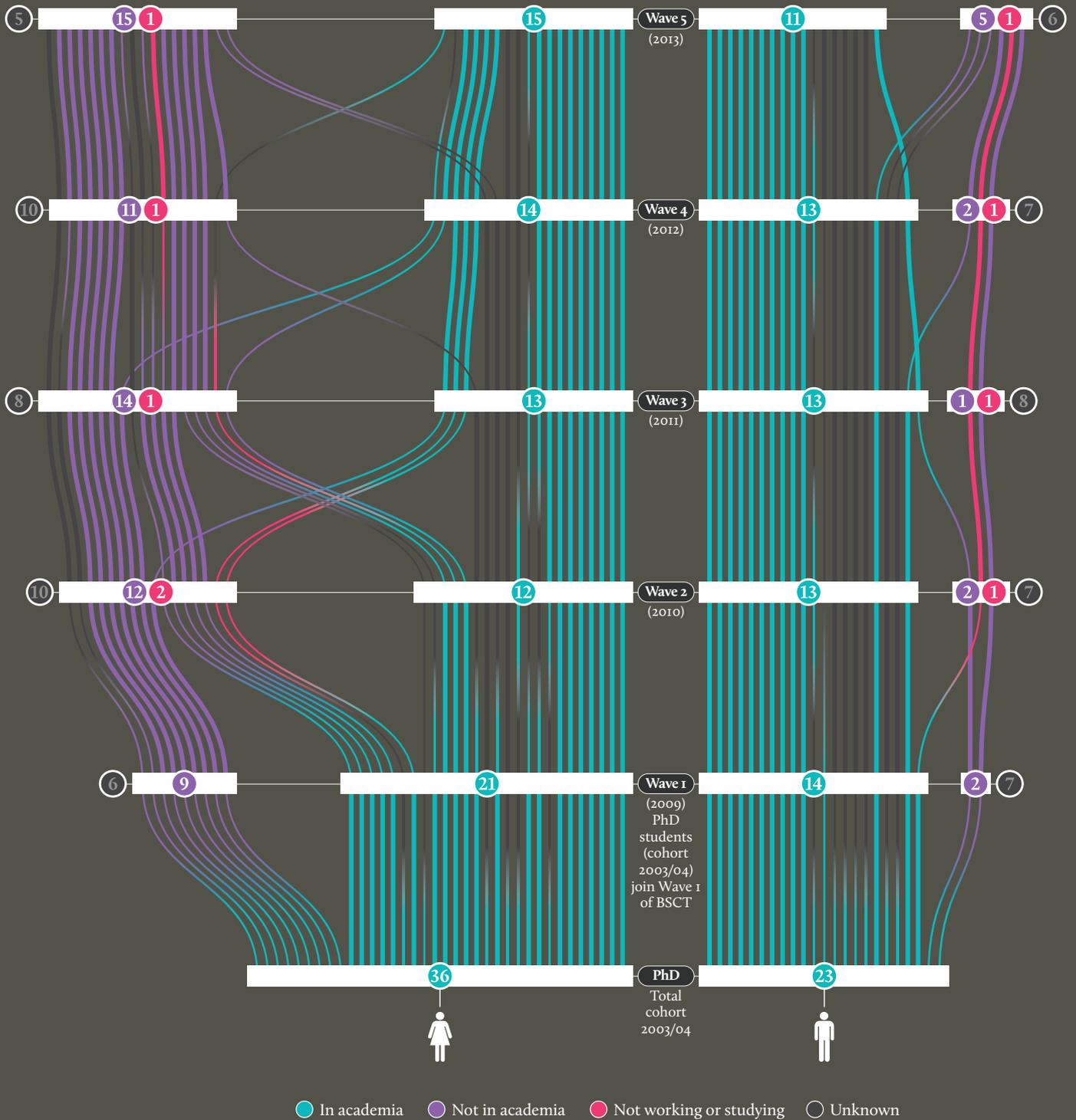
Source: Wellcome Trust BSCT, Wave 5 (2013)

Figure 1.
Former Wellcome Trust-funded PhD students (cohort 2003/04*) leaving/staying in academia post-funding



*PhD students received their award in financial year 2003/04.

Figure 2.
Former Wellcome Trust-funded PhD students (cohort 2003/04*) leaving/staying in academia post-funding



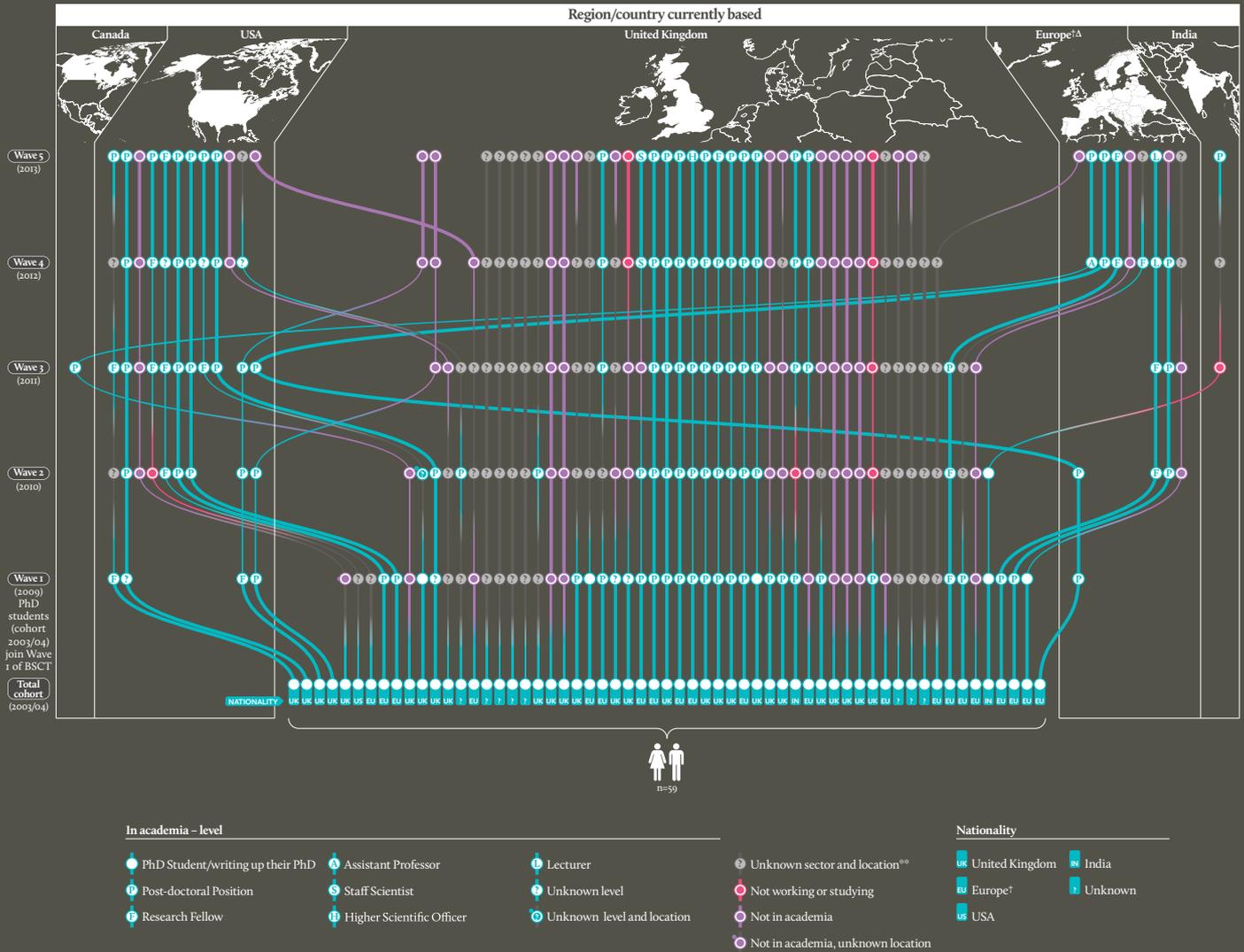
*PhD students received their award in financial year 2003/04.
Each line represents one person.

18. As figures 1 and 2 illustrate, there appears to be a clear initial period of exit from academia as an employment sector, with significant numbers leaving in the first two years post-PhD. We also witness a sex differential in the exit from academia, with women more likely to leave academia early in their career than men. This is something we will continue to track, as it may have important policy implications, particularly around the issue of how to attract, retain and develop women in science.
19. We are also starting to build trend data on patterns of geographical mobility (figure 3). Among former PhD students funded in 2003/04, of those remaining in academia six years post their PhD (26 of 59), approximately one third (eight) were working in the USA – and most of them have been there for at least three years. We will continue to track long-term movement to explore the extent to which there is a return to the UK to pursue an academic research career.
20. Recent qualitative research commissioned by the Wellcome Trust¹ suggests that among junior researchers, there is a perception that to be successful in an academic research career, it is preferable to move locations early in one's career – to broaden experiences and forge collaborations. However, the research also suggests that such early movement is not always attractive to those with local ties.
21. In any case, there are increasing data suggesting that patterns of researcher mobility are changing; the internet and globalisation of science and research make it easier for researchers to collaborate and share their research endeavours without the need for lengthy stays away from home.²

¹ Ipsos MORI. Risks and Rewards. How PhD students choose their careers. Ipsos MORI; 2013. wellcome.ac.uk/stellent/groups/corporatesite/@sf_central_grants_admin/documents/web_document/wtp053947.pdf

² Van Noorden R. Global mobility: science on the move. *Nature* 2012;490:326–9.

Figure 3.
Geographical mobility of former Wellcome Trust-funded PhD students (cohort 2003/04)



† PhD students received their award in financial year 2003/04. Each line represents one person. † not including UK. Δ PhDs were based in the following European countries: Denmark, Germany, Netherlands, Switzerland, France, Austria, Belgium.
 ** Did not respond to survey and could not be located via web research. N.B. Mixed methods used to locate individuals (online survey and web research).

22. Like most public and charitable funders, the Wellcome Trust is keen to support the progression and retention of the brightest minds in academic science to build capacity, make discoveries and train future generations. However, we also recognise the importance of our former award holders taking their scientific training and skills into professions outside academia. The BSCT reveals that the vast majority (92%) of former PhD students who left academia use their science training/background in their current role to at least some extent.
23. Overall, across all cohorts of former Trust-funded PhD students included in wave 5, 82 (27%; 47 women and 35 men) are now pursuing a career outside academia. Of these 82, the majority (52) now work in the private/commercial sector (29 women and 23 men), and 17 in the public sector (13 women and four men).
24. As in previous years, former PhD students who have left academia contribute to a wide range of sectors: the biotechnology/pharmaceutical industry (25), medicine (13), science communication/writing (eight), consultancy (seven), science administration/policy (five), teaching (two) and others (22). This echoes the Economic and Social Research Council review³ which reported that PhD graduates who leave academia are highly employable over time in a wide range of sectors, and contribute diverse skills and knowledge.
25. As illustrated in figures 1 and 2, the BSCT is showing a clear post-PhD exit period from academia, with women being more likely than men to leave, either immediately or shortly after completing a PhD.
26. Our qualitative research⁴ indicates that both men and women find a career in academia to be very rewarding, but that there are risks associated with this, particularly during the early postdoctoral years when trying to establish a career. Both men and women highlighted the difficulties of securing funding and the pressure to publish as major challenges in the early years of a postdoctoral research career. Other aspects of academic culture, such as long working hours and the pressure to move institutions, were also often perceived to be a deterrent to pursuit of an academic career by both men and women, but were seen by both as more likely to disadvantage women.
27. Women noted that the absence of female role models for aspiring researchers makes it difficult to visualise what a successful career could look like. They also cited a competitive environment and the need for self-promotion – which conflicts with a philosophy that success should be based on merit – as significant factors in their decisions to leave. Given the Trust’s overall aim to support the research leaders of the future, it is important that we work to remove any real or perceived barriers to career advancement in academia for both women and men.

³ Raddon A, Sung J. The Graduate Choices and Impact of PhD Graduates in the UK: A synthesis review. Economic and Social Research Council; 2009. [esrc.ac.uk/_images/career-choices-and-impact-on-graduates-report_tcm8-6388.pdf](https://www.esrc.ac.uk/_images/career-choices-and-impact-on-graduates-report_tcm8-6388.pdf)

⁴ Ipsos MORI. Risks and Rewards. How PhD students choose their careers. Ipsos MORI; 2013. wellcome.ac.uk/stellent/groups/corporatesite/@sf_central_grants_admin/documents/web_document/wtp053947.pdf

PhD student career intentions

28. Among those PhD students who were still working on their PhD, the main motivations for undertaking their PhD studies were to pursue a career in academia and their interest in research. From the qualitative study we know that many participants actually described having a lack of awareness, at the start of their PhD, of the range of potential career options open to them once they completed their training. There is increasing evidence of the need for good careers advice throughout the education system in the UK.
29. The Wellcome Trust Monitor⁵, a survey of the UK public, showed that young men and young women tend to feel equally knowledgeable about careers in general and about careers in science specifically. However, there is a marked difference when it comes to perceived knowledge of broader STEM careers, with young women more likely than young men to say they know little or nothing about these careers (64% compared with 47%). This reflects the fact that the gender gap is particularly acute when it comes to careers centred on technology, engineering and maths.
30. We also know that the PhD experience is a critical influence in the desire to pursue an academic research career; not surprisingly, a good PhD experience has been shown to create a greater propensity to pursue a career in academic research⁶. We have recently revisited Trust provision of PhD training to help ensure that all students trained via our PhD Programmes receive good mentorship and support in addition to their scientific training.
31. Most of the current PhD students reported an intention to take a first position in academia once they finish their award. We will continue to map intentions to actual career choices over time.

Wellcome Trust and National Institutes of Health Four-year PhD Studentship recipients

32. Wave 5 of the BSCT included recipients of Wellcome Trust and National Institutes of Health (NIH) PhD Studentships for the first time. Introduced in 2007/08, this funding scheme provides opportunities for postgraduate students to undertake international, collaborative four-year PhD training based both at the intramural campus of the National Institutes of Health at Bethesda (Maryland, USA) and in a UK/Republic of Ireland academic institution. Due to the collaborative, multi-location nature of this scheme, and the fact that it is aimed at early-career researchers, tracking recipients of its funding is thought to be of strategic importance and may also provide useful career path benchmarks for other early-career researchers. It is important for us to compare recipients of these awards with recipients of studentships under our Four-year PhD Programmes in future, particularly in terms of location and scientific mobility.
33. In wave 5, we located seven of the eight Wellcome Trust and NIH PhD Studentship recipients in either their final year of training or their post-funding period (see table 1); three were still studying and four had completed their PhD training (two men and two women). Of those four, three were continuing their career in academia in the UK and one had left to work in the pharmaceutical industry in the USA. We intend to track the career paths of this cohort in future waves of the BSCT as the numbers increase.

⁵ Clemence M et al. Wellcome Trust Monitor, Wave 2. Wellcome Trust; 2013. wellcome.ac.uk/stellent/groups/corporatesite/@msh_grants/documents/web_document/wtp053113.pdf

⁶ Lober Newsome J. The chemistry PhD: the impact on women's retention. Royal Society of Chemistry; 2012. rsc.org/images/womensretention_tcm18-139215.pdf

Sir Henry Wellcome Postdoctoral Fellowship recipients

34. The Sir Henry Wellcome Postdoctoral Fellowship scheme was launched in 2006 and aims to help the best newly qualified scientists start their independent research careers. The four-year Fellowships are for candidates with no more than one year of postdoctoral research experience.
35. When it was introduced, the scheme was relatively unique in its offering of salary and research expenses to new postdoctoral researchers. Consequently, recipients of these grants (the 'Henrys') are included in the BSCT to provide information on the effectiveness of this type of support in launching independent research careers. Again, this cohort of early-career researchers will, over time, provide useful benchmark data.
36. In wave 5, 27 (of the 51) Henrys in the first three cohorts included in the BSCT (see table 1) had finished their funding period, 18 were still on the grant and the status of six was unknown.
37. In earlier waves (waves 3–4), before completing their funding period, the majority of Henrys stated an intention to continue their career in academia. While the number of former Henrys is small, wave 5 data show the majority of them (26 of 27) employed in academia.
38. Both current and former Henrys who either intend to pursue, or are already employed in, academia said that key influences in their career choices included freedom, flexibility, enjoyment of science and contributing to the treatment of major diseases.
- "Freedom to conduct cutting edge research of my choosing, making novel discoveries."*
Former Sir Henry Wellcome Postdoctoral Fellow
- "Via the SHW I feel confident I know how to obtain further academic appointments and career advice."*
Current Sir Henry Wellcome Postdoctoral Fellow
39. In terms of scientific mobility, in wave 5, of former Henrys in academia, nearly one-third (eight of 26) were based outside the UK (in the USA, Germany and the Netherlands). This is a slightly lower proportion than that of former PhD students in academia working outside the UK (37%; 77 of 210), though a slightly higher proportion than that of former Research Career Development Fellows in academia working outside the UK (23%; 20 of 88), suggesting that researchers in the early stages of a career in academia are more mobile than those at later stages.
40. Seven out of the eight former Henrys based outside the UK were male; one was female. Encouraging Henrys to experience research in different labs and to build UK and international collaborations was a key aim of the scheme. In a previous review of the scheme, Henrys mentioned that the logistics and administration of moving country were challenging.
41. Of former Henrys, ten were female and 17 were male. All were working in academia except one woman who was working as a consultant. Thus, no significant differences were observed between the number of men and women working in academia. In terms of their posts within academia:
- 17 were research fellows or in other postdoctoral researcher posts (seven women, ten men)
 - three were lecturers (one woman, two men)
 - two were associate professors or readers (one woman, one man)
 - two were senior researchers (both men)
 - two were professors/heads of department or lab heads (both men)
42. The majority of former Henrys in academia (16 of 26) were receiving funding as a lead applicant or a fellow, three of whom were also receiving funding as a co-applicant. This provides an indication that the former Henrys are able to establish an independent research career – at least at this stage.

Research Career Development Fellowship recipients

43. The Research Career Development Fellowship scheme was launched in 1994 for outstanding postdoctoral scientists who wanted to build their own UK-based independent research career addressing an important biomedical and/or public health question. The Fellowships were for candidates with between three and six years' research experience from the date of their doctoral degree.
44. Research Career Development Fellowships have been included in the BSCT since wave 1, in order to track the effectiveness of this type of support in building independent research careers. The final cohort of awards under this scheme was made in 2012, when the scheme was merged with the 'biomedical' Royal Society University Research Fellowships to form the Sir Henry Dale Fellowships, in partnership with the Royal Society. The new scheme is also for outstanding postdoctoral scientists

who want to build their own UK-based independent research career addressing an important biomedical and/or public health question, and it will be added to the BSCT when the first cohort is in its penultimate year. We will continue to track Research Career Development Fellows.

45. As in previous waves, wave 5 of the BSCT found former Research Career Development Fellows in relatively established research careers in academia; almost all of those included were in academic research (88 of 92). Two former Fellows reported that they were employed in the biotechnology or pharma industry, and one was employed in medicine or healthcare. One was a freelance artist.
46. As table 3 shows, we are beginning to see indications of career progression among former RCDFs in academia, with the numbers from the earlier cohorts employed in senior positions increasing over time through each wave (though numbers are small).

Table 3
Academic level of former Research Career Development Fellows

| | 2002/03 cohort | 2003/04 cohort | 2004/05 cohort | 2005/06 cohort | 2006/07 cohort | 2007/08 cohort | 2008/09 cohort | Total |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|
| Research fellow | 2 | 1 | | 1 | 1 | 2 | | 6 |
| Lecturer | 3 | 1 | | 5 | 3 | 2 | | 12 |
| Senior researcher | | 1 | 2 | 3 | 3 | | | 9 |
| Senior lecturer | 2 | 3 | 6 | 2 | 4 | | | 16 |
| Associate professor or reader | 5 | 4 | 3 | 4 | 3 | | 1 | 20 |
| Professor or head of department | 5 | 3 | 1 | 4 | 1 | 1 | | 14 |
| Other | | | 3 | 1 | 1 | 1 | | 6 |
| Total | 17 | 13 | 15 | 20 | 16 | 6 | 1 | 88 |

Source: Wellcome Trust BSCT, Wave 5 (2013)

47. In terms of gender, Research Career Development Fellowships were awarded to 49 women and 94 men between financial years 2002/03 and 2008/09. Looking at the earliest cohort included in the BSCT, 2002/03, the academic level by gender was as follows:

- two men (15%) and no women were research fellows
- two men (15%) and one woman (25%) were lecturers
- one man (8%) and one woman (25%) were senior lecturers
- three men (23%) and two women (50%) were associate professors/readers
- five men (38%) and no women were professors/heads of department.

While these data might suggest that more men are employed in the most senior positions than women, the number of women in the cohort is particularly small, and no firm conclusions can be drawn at this stage.

48. Sixty-five former Research Career Development Fellows (17 women, 61%; 48 men, 75%) were receiving funding as a lead applicant or on a fellowship, 44 (11 women, 39%; 33 men, 52%) were receiving funding as a co-applicant, and 24 (six women, 21%; 18 men, 28%) were funded through a grant held by someone else (funding information for a further five is unknown). These data show that men included in the study have been slightly more successful than women in securing funding post-Fellowship.

49. One current issue for debate is whether moving institutions or locations early in a research career is beneficial. There has been some discussion about whether this perceived or real imperative to move may actually deter the pursuit of an academic career for some. One-fifth of former Research Career Development Fellows working in academia (17 of 88) reported that they moved location after finishing their award – six women (24%) and 11 men (17%). Reasons for moving included better job opportunities and available funding, but some noted that moving was disruptive and could have an impact upon research productivity.

50. Research Career Development Fellows gave a range of reasons for not moving institutions when taking up their Fellowships (75 of the 131 included in the BSCT did not move to take up their Fellowships; data for 12 are unknown) (see box 1). The main reasons were that they had created research momentum and collaborations on which to build, and that they were happy in their current place or felt that they were in the best environment already.

51. In terms of the reasons for moving institution, the main motivations given included (see box 1) the perceived wisdom (and requirement) that it is good to move, and a desire to develop new skills and establish themselves as independent researchers.

Box 1

Reasons to move and not to move when applying for a Research Career Development Fellowship

Reasons to move

Perceived wisdom/felt had to

“Research environment was world-class and thus provided improved career opportunities. The other major consideration for career advancement is that ‘external’ scientists are often viewed preferentially.”

Former Research Career Development Fellow

“As well as being a mandatory requirement, there is a lot of benefit from moving institution. When setting up lab, escaping from the shadow of a previous supervisor is important. More important is experiencing new working approaches and colleagues. In my case, the chance to work with experts in animal healing models was crucial, as it has allowed me to introduce such approaches into my research.”

Current Research Career Development Fellow

“Partly to do with my sponsor and his world leading research and partly because my husband had an academic position at the same institution. I also felt it important to move institution.”

Former Research Career Development Fellow

To develop new skills and become independent

“It would have allow me to establish myself, work independently, and to gain new skills.”

Current Research Career Development Fellow

“To become fully independent, I felt I had to move to a place where I would not be in the shadow of my previous supervisor.”

Former Research Career Development Fellow

Reasons not to move

Already built research momentum and sought continuity

“During my time in Oxford leading up to my application I put in a huge amount of work into establishing the necessary foundation for my application (i.e. knowledge, collaborators, samples etc.). It made Oxford is the most suitable place for me to develop a career.”

Former Research Career Development Fellow

“I felt that I could make the biggest impact and be most successful by staying where I was and taking advantage of continuity and long term stability (an underrated commodity).”

Former Research Career Development Fellow

In the best place already

“I was happy to move to the best environment for conducting the research on my RCDF. That environment happened to be the one I was already working in, so I did not need to move.”

Current Research Career Development Fellow

“For the work that I wanted to do, I considered UCL to be the best place due to the close integration of technical and clinical research.”

Former Research Career Development Fellow

“I was already based in the best place in the country to do the work. THERE IS NO POINT IN MOVING IF YOU ARE ALREADY BEST PLACED WHERE YOU ARE.”

Former Research Career Development Fellow

International Senior Research Fellowship recipients

52. The International Senior Research Fellowship scheme supported outstanding postdoctoral scientists establishing their scientific careers in Australia, New Zealand, South Africa, India and central Europe (Czech Republic, Estonia, Hungary and Poland).
53. At the time of wave 5, former International Senior Research Fellows remained established in their academic careers. There has been very little movement between sectors over the five years, with most remaining in academia: 48 out of 49 are employed in academia; one is self-employed working in biomedical text processing (six are still on their award and employment information on eight is unknown). There has also been little movement between countries, with 45 out of the 48 in academia remaining in the country in which they were based during their Fellowship.
54. Most former International Senior Research Fellows were in senior academic positions. Of the 48 in academia:
- more than half (35) were professors/heads of department or equivalent
 - nine were associate professors/readers
 - three were senior researchers
 - one's position was unknown.
55. Former International Senior Research Fellows in academia were asked what key factors had influenced their career choices. Most commonly mentioned reasons included: an interest in science, academic research or teaching; and the freedom and independence of a scientific research career.
56. Among current International Senior Research Fellows, the main motivation for taking up the grant is the opportunity it affords them to establish an independent research career or laboratory. The BSCT data provide evidence that the Fellowships have indeed helped former recipients to achieve this career goal.

“This is a very prestigious and generous funding scheme. It was instrumental in establishing my own laboratory... I particularly appreciate the flexibility in spending the funds, which allows me to adjust quickly and allows me to efficiently pursue the most interesting lines of research. The fact that the ISRF includes my salary is also very helpful.”
Current International Senior Research Fellow (based in Poland)

Research Career Re-entry Fellowship recipients

57. The Research Career Re-entry Fellowships are included in the BSCT for the first time in wave 5. The scheme, introduced in 1994, is intended to fill a niche and support postdoctoral scientists who decided to recommence a scientific research career after a continuous break of at least two years. Applicants can request up to four years' support.
58. In wave 5, two current Fellows and six who had finished their funding period took part. All former Fellows (four women and two men) were based in the UK; five of them were continuing careers in academia and one was not working at the time of the survey. Three were working full-time and two part-time, and all were employed on fixed-term contracts.
59. The six former Research Career Re-entry Fellows had each had around a seven-year break or more prior to starting their Fellowship. The BSCT explored the benefits and challenges for researchers trying to re-establish a research career after a substantial break. Among the key benefits were (see box 2):
- ability to bring new transferable skills gained outside academia (e.g. commercial experience and management)
 - ability to see the bigger picture and context
 - greater freedoms associated with academia
 - benefits of new technologies that make research easier.
60. The main challenges associated with a return to academia were (see box 2):
- perceptions that age may create barriers for someone attempting to establish a research career
 - the need to (re)build a reputation and the pressure to 'perform' (and publish).
61. We intend to track Research Career Re-entry Fellows in the future waves of the BSCT. As this group could give us a somewhat unique insight into the working of the science community, we may conduct further qualitative studies to explore returning to academia. We also plan to compare the career profiles of Research Career Re-entry Fellows with some matched recipients of other Trust fellowships to explore whether they differ and, if so, how.

Box 2

Benefits and challenges of returning to academia after a substantial break

Benefits

Bringing new skills to academia

"I bring much better management and teaching skills back with me."

Former Research Career Re-entry Fellow

Seeing the bigger picture

"Very supportive colleagues, particularly my mentor. Lots of opportunities for staff development... and to learn new skills e.g. postgraduate teaching. Exciting and rewarding to be back in... research. I found that having spent my time away from research... really helped me with the 'bigger picture' of developments in genetics and the context of my project."

Former Research Career Re-entry Fellow

Greater freedoms of academia

"The fellowship gave me space to study and get up to speed with research area, develop my research interest, attend conferences, get support of mentor, get respect of my peers, publish research papers."

Former Research Career Re-entry Fellow

"Freedom to pursue the task without distractions and corporate difficulties of industry."

Former Research Career Re-entry Fellow

Benefits of technology

"The science itself, the technology that made everything easier."

Former Research Career Re-entry Fellow

Challenges

Perceptions around age

"Re-starting as essentially a postdoc in a new field was hard. It took me a while to get up to speed, and by the time I found my feet I was too old for most fellowship opportunities. Restarting an academic career in one's 40s/a number of years post-PhD means that future opportunities are extremely limited."

Former Research Career Re-entry Fellow

"Not fitting in socially due to large age difference."

Current Research Career Re-entry Fellow

Need to (re)build a reputation

"My earlier research achievements are often not known by my new colleagues, so I feel I have had to re-establish a reputation/new publication output from scratch."

Former Research Career Re-entry Fellow

"The increased and constant pressure to 'perform', publish, with all that talk of 'world-class' all the time etc."

Former Research Career Re-entry Fellow

"The greatest challenge has been getting enough first author papers out in time to be 'REF returnable' by the end of the Fellowship. I think that 3 years is a very short time in which to re-establish a research career."

Former Research Career Re-entry Fellow

"Unless you are a PI, then University research involves 2-3 year contracts. Despite the policies in place, Universities do not encourage (i) people having multiple serial contracts or (ii) older researchers."

Former Research Career Re-entry Fellow

Next steps

62. We intend to build the trend data further over time to create a robust evidence base, not only to support our own assessments of the value and impact of Wellcome Trust funding support to research careers and capacity, but also to inform wider debates around the value of careers in science.

63. As a priority, we intend to produce more analyses of the differences and similarities in career paths according to the funding type received and stage of career for our researchers. We will also continue to build the evidence and our understanding of patterns of gender differences and scientific mobility across cohorts and time.

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