

House of Commons Science and Technology Committee: Women in STEM careers

Response by the Wellcome Trust

September 2013

Key Points

- There have been many recommendations and solutions proposed to tackle gender inequality within STEM, medicine and academia. Better cross-sector coordination is required, while proposals based on the best available evidence must now be put into action.
- The Wellcome Trust's Basic Scientist Career Tracker demonstrates the disproportionate number of women who exit academia early in their career. A follow-up qualitative study of a small cohort of Wellcome Trust-funded PhD graduates identified common challenges between genders to a successful academic career, but that men and women respond differently to these perceived risks.
- Evidence from our career tracking work shows that many of those who leave academia post PhD continue to use their scientific training for the benefit of their career. Pejorative descriptions of those who exit from academia as a 'failure' or 'loss' from science are unhelpful.
- There is an increasing understanding of the career paths of women in STEM, however there remains a need for better longitudinal career tracking with coordination by Government on multi-sector, multi-agency data.
- Evaluation of existing initiatives should help inform evidence-based policy making to shape practical solutions to changing attitudes, perceptions and behaviours regarding women in science.

INTRODUCTION

1. There are challenges to be faced regarding gender equality in STEM and this important inquiry has the potential to encourage coordinated action to support the careers of women in academic STEM.
2. The Wellcome Trust is pleased to submit evidence for this inquiry. Supporting outstanding women and men in research is one of the focus areas of our Strategic Plan 2010-2020¹. Our response focuses predominantly on biomedicine and public health research in the UK.

¹ <http://www.wellcome.ac.uk/About-us/Strategy/>

3. The Wellcome Trust believes success demands diversity - of people, ideas and approaches. We strive to provide flexibility in the range of scientific career opportunities and support for those we fund. Some details of support we provide are given in Annex. A.
4. We would encourage the committee to recognise that although there is a shortage of good quality data, there are concerns about the level of diversity more generally in the scientific research workforce, in relation to ethnicity, disability and socio-economic status as well as gender. The National Institutes of Health has called for a sea change in the diversity of the US biomedical research workforce and has recently announced a new senior scientific position, the Chief Officer for Scientific Workforce Diversity.

RESPONSES TO QUESTIONS

Q.1 Why do numbers of women in STEM academic careers decline further up the career ladder?

5. The decline in the numbers of women in more senior positions is not unique to STEM professions but is seen in business, the law and politics. Recently the UK was ranked 39 out of 45 countries on the proportion of women in senior management positions, with only 19% filled by women, compared to 51% in China.² Currently only 22.5% of MPs and 14.2% of university vice-chancellors are women.³ The issues faced in STEM careers reflect challenges for our society more generally.
6. While there is a relatively equal balance of men and women studying biomedical subjects,⁴ there remains an imbalance within other STEM subjects and the numbers of women leaving academia is disproportionate – particularly in the early career stages - in comparison to men.

Wellcome Trust data

7. In line with our funding ethos to support the best researchers regardless of their gender, we strive to ensure a fair, balanced and flexible funding system through our funding policies and practices. Our fellowship award rates are very similar for women and men at all stages of the research career. Despite similar award rates the number of applications from female researchers declines at the mid-career and senior level resulting in less absolute numbers of female researchers being awarded in relation to men.
8. To understand the career paths of our researchers we introduced the Basic Science Career Tracker (BSCT) in 2009; an annual online survey to follow the career destination of key cohorts of Wellcome Trust-funded basic scientists.⁵ This was followed by the Clinical Career Tracker (CCT) in 2011, to track the career paths of key cohorts of our clinical fellows.

² http://www.gti.org/files/ibr2013_wib_report_final.pdf

³ <http://www.countingwomenin.org/wp-content/uploads/2013/02/Sex-and-Power-2013-FINALv2.-pdf.pdf>

⁴ <http://www.hesa.ac.uk/content/view/1897/239/>

⁵ <http://www.wellcome.ac.uk/Funding/Biomedical-science/Career-tracker/index.htm>

9. In common with other studies, the BSCT shows clear exit points where researchers are more likely to leave academia. The sex differential in the exit from academia is particularly stark. Amongst those who commenced their studies in 2003/4 (n=59), two years post-PhD (2009) 70% of women were employed in academia, compared with 88% of men. After four years, this gap had widened further and in 2012, only 54% of women were still in academia, compared with 81% of men - although both are higher than previously reported figures for PhD graduates.⁶
10. The reasons and motivations that lead to women pursuing careers away from academia are not well-understood. Therefore, we undertook a qualitative in-depth study on the career choices made by fifty-nine previously Wellcome Trust-funded biomedical PhD students.⁷
11. The qualitative nature of the work allowed several themes to be identified, however given the small numbers involved we would caution against over-extrapolation of these results. The findings suggest that success in an academic career is perceived by both genders to be far from certain, with the main challenges being:
 - i. Lack of stability and short term contracts;
 - ii. Securing and maintaining funding;
 - iii. Pressure to publish and focus on research outputs for promotion;
 - iv. Long working hours culture;
 - v. Pressure to move.
12. Each of these were perceived as a challenge to remaining in academia for both genders, but particularly for women. Men and women described themselves as equally motivated to work in science, however women were more likely to report that the challenges outweighed the risks. Although the numbers were small, the participants with children did not seem to have different aspirations or behaviours to those without children.
13. It is worth noting that the group as a whole were positive about their career decisions. Of those choosing to leave academia, the vast majority reported that they were doing fulfilling and enjoyable work and using their scientific training in their current role. However, some of these same participants, including women, reported that they would have liked to remain in academia.

Q.2 When women leave academia, what careers do they transition into? What are the consequences of scientifically trained women applying their skills in different employment sectors?

14. Since 2009 we have used the Basic Science Career Tracker to follow the careers of former Wellcome-Trust funded PhD students who commenced their studies after 2003/4.

⁶ http://www.vitae.ac.uk/CMS/files/upload/Vitae_What_do_researchers_do_Career_paths_2011.pdf

⁷ Ipsos MORI (2013). *Risk versus Reward: How PhD students choose their careers: Qualitative research report.*

(This report has been submitted for publication and we will be able to supply the committee with a copy shortly.)

In 2013, of the 47 women who had left academia, 29 reported they now worked in the private sector, 13 in the public sector, 2 were self-employed and 2 were employed in the voluntary sector.⁸ Sectors in which they were working in included: the biotechnology/pharmaceutical sector, medicine, science communication, science policy, teaching and consultancy.

15. As a charitable funder, we would like our PhD students to embark on an academic research career to help deliver discoveries and breakthroughs in line with our mission. However, we recognise the importance of PhD graduates taking their scientific training and skills into professions outside of academia. Pejorative descriptions of the exit from academia as a 'failure' or 'loss' from science are unhelpful; most of those who leave academia following completion of a PhD continue to use their scientific training in a way that benefits their career, their new employer and the economy.
16. A review by the ESRC in 2009 notes that PhD graduates who leave academia contribute to a wide range of sectors, are highly employable over time, and contribute diverse skills and knowledge to a team or business.⁹ We also recognise the importance of embedding science and research into the culture of the UK to enable growth and long term prosperity, which was a key theme of the UK Council for Science and Technology's 'Vision for UK Growth.'¹⁰

Q.3 What should universities and the higher education sector do to retain women graduates and PhD students in academic careers? Are there examples of good practice?

Creating a supportive environment for researchers

17. The Wellcome Trust expects institutions employing researchers and their teams to provide environments in which women and men can excel at all levels in their careers. We expect organisations that hold our funding to adopt the principles of the 'Concordat to Support the Career Development of Researchers', one of the key tenets of which is to promote diversity and equality in all aspects of career management for researchers.^{11,12} Institutions which have taken steps to implement the Concordat receive the European Commission's 'HR excellence in research' badge. We also support in principle the Research Councils UK Statement of Expectations for Equality and Diversity.¹³
18. Initiatives such as Athena Swan and the HR excellence badge are helping to ensure that addressing gender inequality is a priority for institutions and that this work is sustainable and continues to demonstrate progress. The challenge is to embed good practice across all institutions and see long-lasting change.

Flexible career options

⁸ One was 'Other type of employee'.

⁹ http://www.esrc.ac.uk/images/career-choices-and-impact-on-graduates-report_tcm8-6388.pdf

¹⁰ <http://www.bis.gov.uk/assets/cst/docs/files/whats-new/10-584-vision-uk-research.pdf>

¹¹ <http://wellc.me/15av5kF>

¹² <http://wellc.me/17q0ipG>

¹³ <http://www.rcuk.ac.uk/documents/researchcareers/EqualityStatement.pdf>

19. We have developed our flexible careers webpage to communicate the support available for our researchers.¹⁴ Employers must ensure students and researchers are both aware of, and feel empowered to utilise, the support already available in terms of flexible working hours, parental leave, extensions to grants and career support.
20. Funders and employers should promote and develop opportunities for researchers to use their funding flexibly, including options for career breaks, grant extensions, re-entry-fellowships and working part-time. Examples of support the Wellcome Trust provides are given in Annex. A.
21. Learned or professional societies could consider free/flexible membership for people on parental leave, such as provided by the British Pharmacological Society¹⁵, as a means of keeping up to date and in touch with your profession while on leave and potentially reducing the barriers to re-entry following a career break.

Mentorship and role models

22. Good mentorship has a role to play in supporting those who wish to pursue a career in academia. Schemes such as those run by the Academy of Medical Sciences for post-doctoral clinical academic trainees are important mechanisms to assist career progression within academia.¹⁶ Research funders and employers should ensure that careers awareness and mentorship are integral components of their training provision.
23. Mentors and role models have a vital role in setting cultural norms and providing junior researchers with inspirational and achievable academic careers. Mentors should be aware of the range of careers available within science as well as the practical support available for flexible careers in academia. There should be more opportunities for a greater diversity of role models working across academia to tell their story.

Q.4 What role should the Government have in encouraging the retention of women in academic STEM careers?

Coordination and action

24. The Government has the capacity to drive change in this arena, which needs to move from a focus on scoping the extent of the problem, to solutions which address those challenges. A cross-sector approach from academia, industry, funders, learned societies and all levels of government is needed. The UK Government is well-placed to coordinate this.
25. The Government should address the challenge of a diverse and flexible workforce by placing it at the heart of its innovation and research agenda, making it a priority for the sector to act on the available evidence.
26. There is a clear economic imperative for the UK to support a diverse and flexible STEM workforce. Diverse teams lead to better innovation and more productive teams, with

¹⁴ <http://www.wellcome.ac.uk/Our-vision/Focus-areas/Supporting/Flexible-research-careers/>

¹⁵ <http://sciencecampaign.org.uk/?p=12860>

¹⁶ <http://www.acmedsci.ac.uk/p55.html>

women's increased participation in the STEM labour-market alone estimated to be worth £2 billion to the UK economy.¹⁷

27. There have been a series of high profile reports with recommendations from the European Commission¹⁸ and the Royal Society of Edinburgh in 2012.¹⁹ The Scottish report laid out specific recommendations for the UK government; in addition, several of the recommendations for Scotland could also be relevant for England and Wales, including those on data and procurement.
28. Funding drivers are another mechanism available to the Government, for example the Chief Medical Officer's stipulation that from 2015 any applicants for NIHR biomedical research centre funding will need to demonstrate at least a Silver Athena Swan award.²⁰ Organisations which hold Athena Swan awards must continue to demonstrate progress to maintain their status, which helps to ensure those participating enact real change. Funding drivers are potentially powerful but should be carefully considered to ensure they produce actual impact and cultural change, as should any resource implications involved in managing and providing awards or accreditation linked to them.

Monitoring and evaluation

29. Accurate longitudinal data and statistics on the career paths of academics in STEM are vital to make informed evidence based policy and tackle inequalities in an effective and targeted manner. The Government could coordinate a cross-sectoral approach to collate better data on the career paths of academics in STEM, potentially using resources such as data from the Higher Education Statistics Agency and innovative new tools such as ORCID.²¹ Greater sharing of career tracking data and evaluation of the impact of existing initiatives could ensure we have an accurate evidence base from which to design, implement and evaluate equality and diversity policies, including those focused on women in science.

FURTHER COMMENTS

Careers advice and guidance

30. The choice of subjects at A-level and the combinations can have a huge impact on students capacity to attain places on STEM degrees. Practical barriers, social and cultural attitudes, as well as individual choice can all impact on the subjects chosen.
31. The Wellcome Trust Monitor is a survey of 1,396 UK adults' and 460 young people's views of science, biomedical research and science education.²² The latest survey (2012) reported that 63% of young people 'knew little or nothing about careers in science'. Despite this 41% reported they were personally interested in science as a career, with no gender difference. However, more specific career interests such as nursing or biology

¹⁷ http://www.royalsoced.org.uk/877_WomeninStem.html

¹⁸ <http://wellc.me/1dwMpJE>

¹⁹ <http://wellc.me/189NuQE>

²⁰ http://www.medschools.ac.uk/SiteCollectionDocuments/Letter_from_Dame_Sally_Davies_-_Women_in_Science.pdf

²¹ <http://orcid.org/>

²² <http://www.wellcome.ac.uk/About-us/Publications/Reports/Public-engagement/WTX058859.htm>

were highly gender-stereotyped, for example 30% of young women compared with 12% of young men, said they were interested in being a biologist, while only 1% of young women rated computing/IT as a potential career interest compared with 12% of young men. Reporting on their work experience 21% of young women, compared to 35% of young men had done work experience in a STEM field.

32. Students should be supported by relevant and accessible careers guidance and the Government should ensure young women and young men are offered equal opportunities to do work experience in a STEM related field.

Annex. A – Wellcome Trust support for flexible careers

1. We believe that breakthroughs emerge when the most talented researchers are given the resources and freedom they need to pursue their goals.²³ Success in this demands

²³ http://www.wellcome.ac.uk/stellent/groups/corporatesite/@msh_peda/documents/web_document/wtp052964.pdf

diversity - of people, ideas and approaches. We recognise that different people choose different career paths, so we strive to provide flexibility in the range of scientific career opportunities that we offer.

2. We make every effort to ensure we provide a flexible and fair funding system that allows excellent applicants, both women and men, to be successful. We always take into account time (full- or part-time) spent outside the research environment when assessing grant applications.
3. When the Wellcome Trust pays researchers' salaries on our grants and they take maternity, paternity, adoption or sick leave, we will cover the employers actual cost. Grants may be extended by the period equivalent to the leave taken and we will consider requests to cover additional direct research costs for that period.
4. Our Research Career Re-entry Fellowships provide an opportunity for postdoctoral scientists to recommence a research career. Our fellows include those who have returned to research after taking a break for family commitments and those who have worked outside of research. In addition, institutions awarded the Institutional Strategic Support Fund²⁴ may use this to co-fund Daphne Jackson Trust Fellowships that fall under the Trust's biomedical or public health remit.
5. We undertake a wide range of activities designed to support the careers of those we fund, including training programmes on our early-career schemes, internships outside of academia and exposure to career options within and outside of academia.
6. We fund the INSPIRE initiative which is coordinated by the Academy of Medical Sciences at all 32 UK medical schools to engage medical and dental undergraduates with research and promote clinical academia as a career path.
7. In November 2013 we will be running the first Wellcome Trust Research Leadership Development Programme. This will be an innovative and immersive development programme to build research team and institutional leadership capability and broaden the talent pool from which to recruit tomorrow's research leaders. The Programme will be offered to selected individuals funded by the Wellcome Trust who already hold established leadership positions. The first cohort will include three women out of twelve participants and we aim to increase their representation on this programme in the future.

²⁴ <http://www.wellcome.ac.uk/News/2011/News/WTVM053639.htm>