



House of Commons
Science and Technology
Committee

**Women in scientific
careers: Government
Response to the
Committee's Sixth
Report of
Session 2013–14**

**Ninth Special Report of
Session 2013–14**

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Science and Technology Committee

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Publications

The Reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the Internet at <http://www.parliament.uk/science>. A list of reports from the Committee in this Parliament is included at the back of this volume.

The Reports of the Committee, the formal minutes relating to that report, oral evidence taken and some or all written evidence are available in printed volume(s). Additional written evidence may be published on the internet only.

Committee staff

The current staff of the Committee are: Dr Stephen McGinness (Clerk); Leoni Kurt (Second Clerk); Victoria Charlton (Committee Specialist); Dr Elizabeth Rough (Committee Specialist); Darren Hackett (Senior Committee Assistant); Julie Storey (Committee Assistant); and Nick Davies (Media Officer).

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Ninth Special Report

On 6 February 2014 the Science and Technology Committee published its Sixth Report of Session 2013–14, *Women in scientific careers* [HC 701]. On 30 April 2014 the Committee received a memorandum from the Government which contained a response to the Report. The memorandum is published as Appendix 1 to the Report.

Appendix 1: Government response

Introduction

1. The Government thanks the Committee for their report on this important subject and for their recommendations. The rewards of diversity are significant: recruiting staff from the widest possible pool unlocks talent, contributes to the success of research and brings major benefits to the UK's economy and society. The Government will continue to promote and support equality and diversity at all levels.

2. The Government agrees that it is important to inspire the young to study science and to reduce barriers to retaining women in scientific careers. The Government also agrees that whilst research funders clearly have a wide sphere of influence, Higher Education Institutions (HEIs) and other employers have the most significant obligation to improve Science, Technology, Engineering and Maths (STEM) careers for all researchers.

3. Responsibility for tackling these issues lies with a range of bodies across the UK, including devolved bodies in Wales, Scotland and Northern Ireland. The UK Government is committed to working in partnership with these bodies to ensure the best possible opportunities for women in scientific careers in all parts of the United Kingdom.

Women in Technology and Engineering: A Call to Action

4. A round table on 17 December 2013, at 10 Downing Street, attended by educators, business, academics and campaigners agreed the principle of acting together in a national partnership-led campaign of activity on Women in STEM.

5. The Women into Technology and Engineering Call to Action asks organisations to work together in a national partnership-led campaign of activity to boost female participation in technology and engineering. The aim of the Call to Action is to support a step-change in how women and girls are encouraged to consider technology and engineering careers and the subject choices or vocational pathways - especially the study of maths and physics - that lead to them. Many organisations, institutions and campaigning groups are working to address this problem. However it is clear that no one organisation can solve this alone. Currently one half of the population – women – are significantly under-represented in engineering and technology careers. We believe that we need to make the most of all our talents, and that means getting more women to make the choices that can lead to these

career options. By doing this we will be substantially deepening the talent pool available to employers.

6. The Call to Action asks businesses and other partners to commit to concrete action in engaging with young people, contributing to a national campaign and increasing the numbers of women in technology and engineering in their own organisation. Specific actions will necessarily differ for each organisation dependent on organisational priorities, objectives, and on-going activities. The Women into Technology and Engineering Call to Action provides a core set of principles and a coordinated vision to help ensure the widest range of young people are inspired by science and that the barriers, (practical or cultural) to pursuing a career involving science are reduced; in particular for girls and women.

7. Call to Action signatories will commit to actions that support the shared aim of increasing diversity and in particular female representation in mathematics, physics, technology and engineering. Thus helping the UK to develop untapped talent.

8. Signatories to the Call to Action overtly demonstrate their commitment to boosting skills in mathematics, physics, technology and engineering and to promoting these careers and subject choices as accessible to all. The Call to Action will develop a network of organisations committed to these principles, and catalyse the exchange of ideas and best practice.

9. Whilst the Call to Action initiative is a new one, Government is already taking action on which it will build, including work by the Research Councils in Equalities and Diversity (<http://www.rcuk.ac.uk/funding/diversity/>); the Department for Business, Innovation and Skills (BIS) funded STEM Diversity Programme led by the Royal Society and Royal Academy of Engineering and the Equality Challenge Unit (<http://www.ecu.ac.uk/>) which runs the Athena Swan Scheme and is supported by the Funding Councils and UUK. As part of the BIS STEM Diversity Programme, the Royal Society has published 'A picture of the UK Scientific Workforce' which provides a diversity data analysis of the scientific workforce. This will provide a much-needed baseline to measure progress in this area. http://royalsociety.org/uploadedFiles/Royal_Society_Content/policy/projects/leading-way-diversity/070314-diversity-report-executive-summary.pdf

Response to the Committee's Recommendations

10. Responses to the Committee's recommendations are set out below. Many of them are for Higher Education Institutions (HEIs) and other employers. As the Committee will know, HEIs are independent of government. They are entirely responsible for recruitment, promotion and retention of their staff and students. HEIs, like other employers, are subject to the requirements of the Equality Act 2010 and must ensure they do not discriminate in their recruitment practices. HEIs are also required to meet the Public Sector Equality Duty and take a proactive approach to advancing equality of opportunity.

11. UK Research Councils expect equality and diversity to be embedded at all levels and in all aspects of normal research practice and that those in receipt of Research Council funding should:

- promote and lead cultural change in relation to equality and diversity;

- engage staff at all levels with improving the promotion of equality and diversity;
- ensure all members of the research workforce are trained and supported to address disincentives and indirect obstacles to recruitment, retention and progression in research careers;
- provide evidence of ways in which equality and diversity issues are managed at both an institutional and department level.

12. As the UK Government is not involved in recruitment and staff management decisions in HEIs it therefore does not set 'equality' targets for the sector in terms of its workforce. However, the Government is encouraging universities to promote equality and diversity in a number of ways. For example, the Government has encouraged the sector to ensure its senior management reflects the diversity evident in both the student and UK population. For instance, in England, this has been done through the grant funding letter to the Higher Education Funding Council for England (HEFCE).

13. In addition, the recent teaching capital funding announced by the Department for Business, Innovation and Skills will require universities in England to provide evidence of a broad commitment to equality and diversity, such as an Athena Swan award, in order to access government funding. This will focus investment in institutions where there is existing good practice and future plans to address issues of under-representation. Through 1:1 matched funding, the investment will give a £400 million boost for English universities to promote science and engineering.

14. The Government will be monitoring trends in the UK HEI Sector to see the effect of initiatives referenced in this response. It will ask the Strategy Group for the Concordat to Support the Career Development of Researchers to review recommendations related to research funding. Of particular interest will be the equality and diversity analysis of the Research Excellence Framework (REF) and the impact of schemes like Athena Swan. If significant progress is not observed over the next three years, Government will consider further action.

Business case for retention of women in science

Recommendation 1 - The UK economy needs more skilled scientists and engineers and this need will not be met unless greater efforts are made to recruit and retain women in STEM careers.

15. The Government agrees with this statement and believes the economy and our research base misses out when we are not drawing scientists and engineers from as wide a talent pool as possible. We are committed to ensuring that the STEM workforce is diverse, reflecting wider society and makes use of all the talents available to it. Despite positive progress, there are still too many groups under-represented in this sector, including women.

Recommendation 2 - Gender diversity in STEM can bring business benefits if well managed. The business case for diversity in science is being reviewed by the Royal Society and we expect that its findings will highlight how STEM organisations can maximise the business benefits of diversity in the workforce.

16. The Government agrees that establishing the business case for diversity in science is essential. As part of the BIS STEM Diversity Programme the Royal Society is researching the business case for diversity in the scientific workforce. Although not yet published, early results show that both external and internal benefits of diversity were identified by organisations. Increasing diversity was seen as important for the long term success of an organisation because a diverse workforce could be instrumental in creating an environment that fosters creativity and innovation.

17. The study has also found that although integration of diversity issues with the organisation's business strategy is seen as important to success, it is not the only essential factor; cultural and leadership factors and management systems inhibit progress to diversity. Whilst previous research indicates that business cases may be business context specific, they may also depend on specific organisational cultural factors, leadership behaviours and managerial practices. The study shows that some training interventions could be beneficial but that embedded cultural factors and assumptions that underpin managerial systems impede the success of these.

Recommendation 3 - We suggest that the national academies, learned societies and research funders review how gender analysis can improve research findings within different STEM disciplines and formulate guidance on the matter. Research funders should encourage the consideration of gender dimensions of research from funding applicants.

18. The Government agrees that this is important. Research Councils do in cohort and large scale observational studies stratify to understand effects of disease causative factors in different populations, Research Councils UK (RCUK) will clarify communications in this area.

The role of Government

Recommendation 4 - Although we accept that difficult financial decisions had to be made by the Government in the 2010 Spending review, it is disappointing that spending dedicated to improving diversity in science was so significantly reduced. While we have no concerns about the quality of the diversity programmes of the National Academies, we have not been assured that they could have the same reach and impact as the UKRC had.

19. The Government would like to assure the committee that alongside the BIS STEM Diversity programme, diversity is at the heart of all we do. The range of approaches to encourage and support diversity is considerable and includes for example the STEM Ambassador programme, extensions to the Athena Swan and Daphne Jackson schemes, the National Academies, Research Councils UK flexible terms and conditions for grants and fellowships, the breadth of HE Funding bodies and Research Council peer review panels, the Big Bang Fair and National Science and Engineering Competition which are all aimed at increasing and encouraging as diverse a range of people as possible (including women and girls) to study and work in STEM. Increasing the reach and impact of these efforts is a priority.

Recommendation 5 - The Government should monitor the effects of its policies on mainstreaming diversity funding. If it transpires that cutting UKRC funding and mainstreaming has had a detrimental effect on the retention of women in STEM careers, the Government should increase diversity funding.

20. All of the programmes mentioned above have measures in place for the Government to monitor their reach and effect. As part of the Spending Review process, progress in this area will be reviewed.

Recommendation 6 - It would not be practical to mandate that applicants for research funding must hold Athena SWAN awards, although we commend the Chief Medical Officer for taking this step with some NIHR funding streams. We recommend that all public research funders should require applicants and recipients to demonstrate that they are taking steps to improve equality and diversity. Each research funder should publish and disseminate this expectation and what actions will be considered sufficient to meet this criterion.

21. RCUK has already mandated that it expects those in receipt of Research Council funding to:

- promote and lead cultural change in relation to equalities and diversity
- engage staff at all levels with improving the promotion of equality and diversity
- ensure all members of the research workforce are trained and supported to address, disincentives and indirect obstacles to recruitment, retention and progression in research careers
- provide evidence of ways in which equality and diversity issues are managed at both an institutional and department level.

22. Research Councils recommend that the evidence includes:

- Participation in schemes such as Athena SWAN, Project Juno, Investors in People, Stonewall Diversity Champions and other similar initiatives to demonstrate departmental level action
- Input prepared for the Research Excellence Framework research environment at unit of assessment level
- input appropriate benchmarking data (e.g. heidi equality reports from HESA data)
- evidence of the application of the 'Every Researcher Counts resource' to support this work
- other available and pertinent management information.

23. RCUK is committed to:

- review the overall effectiveness of the approach at a Departmental / Institutional level through its Audit and Assurance Programme
- discuss equality and diversity at Institutional visits

- reserve the right to introduce more formal accreditation requirements for grant funding should significant improvement not be evidenced.

24. The UK HE funding bodies are also committed to supporting and promoting equality and diversity in research careers. As part of their broader commitment to promoting equality and advancing opportunity, they are responsible for monitoring HEI's progress with regard to equality and diversity. This forms part of their role as a funder and a regulator, and their commitment to protecting students' interest in higher education (HE).

Recommendation 7 - The Athena SWAN Charter is a comprehensive scheme that is widely supported across academia. With increasing demand, the Equality Challenge Unit may require additional resources and the Government should respond positively to any such request.

25. The Government strongly supports the Athena SWAN Charter and other schemes to improve the diversity within University STEM departments and is represented on the Athena Forum. BIS has recently announced that it will be providing funding to enable the scheme to be extended into research institutes in 2014/15. This follows a successful pilot funded by the Royal Society through the BIS STEM diversity programme. As well as this additional funding, the UK HE Funding Bodies provide support to the Equality Challenge Unit (ECU) and Research Councils have seconded staff to work in the team which administers Athena Swan.

26. We note that Committee encourages all HEIs conducting STEM research to apply for Athena SWAN awards, or similar recognised schemes. This is consistent with the requirement set out by RCUK that all those in receipt of Research Council funding must promote and lead cultural change in relation to equalities and diversity and provide evidence of ways in which equality and diversity issues are managed at both an institutional and department level. This can include for example participation in schemes such as Athena SWAN, Project Juno, Investors in People, Stonewall Diversity Champions and other similar initiatives which demonstrate departmental level action.

Recommendation 8 - We encourage the Government to work with the STEM community and schools to tackle gender stereotypes in education, particularly at primary level. In addition, we re-iterate the importance of engagement with STEM industry being part of teachers' CPD.

27. The Institute of Physics (IOP) has done some significant work looking at gender stereotypes in education, most recently in its "Closing Doors" report. The Government is funding the IOP Stimulating Physics Network (SPN) £4.3million over the period 2014-16 to provide support to schools to improve take up of physics A level. Part of this work will include trialling a series of interventions in a small number of schools to improve significantly the number of girls progressing to A level physics. The IOP has managed and developed the SPN since 2009 have been highly successful in increasing participation in A-level physics. To date, schools involved in the programme have seen a 16% increase in the number of girls progressing to A-Level physics when compared against non SPN schools.

28. As part of the Women into Technology and Engineering Call to Action, Myscience (network of Science Learning Centres and Partnerships, National STEM Centre and other programmes) will ensure that all continuing professional development provided through

the network of Science Learning Centres and Partnerships, and other programmes, embeds appropriate support on engaging girls effectively, including issues around 'unconscious bias' and guidance on good practice - by end July 2014.

29. The Research Councils support and fund a range of activities, resources and schemes across the UK to inspire young people by bringing researchers, schools and young people together.

30. BIS provides funding to STEMNET to deliver the STEM Ambassador programme and provide expert advice and support to schools across the UK. Over the next 12 months STEMNET will review all of the resources that it has developed to encourage STEM engagement, enrichment and enhancement to ensure that they do not give rise to any unintentional gender bias through the representation of its male and female role models in STEM disciplines and careers. They will also apply this rigour to any resources that STEMNET develops in future.

31. Government funded programmes such as the local science learning partnerships and the Network of Teaching Excellence in Computer Science already enable teachers to engage with STEM industry. The Department for Education is funding five regional science learning centres £8.2m over two years from April 2013 to March 2015 to provide specialist CPD for science teachers. These centres will additionally coordinate and quality assure up to 10 local Science Learning Partnerships (SLPs) each to bring together teaching schools and other outstanding schools and a range of other local partners including industry experts to deliver CPD locally. Professional development opportunities offered by the SLPs include working with scientists or industry partners such as STEM ambassadors, collaboration with practising scientists and engineers and active facilitation of education – industry links.

32. The Department for Education is also funding Computing At School through the British Computer Society. They are giving £2.1m over two years from April 2013 to March 2015 to create 400 Master Teachers who will create local networks and deliver computer science CPD to around 16,000 schools (and 24,000 by the end of the project if the funding is extended after March 2015). Over 2,000 computing professionals already voluntarily work with CAS to support schoolteachers, from companies such as ARM, BT, Microsoft and Google. These professionals are being linked with the network to maximise their impact in the schools where they help.

Women in academia

Recommendation 9 - Scientists are susceptible to the same unconscious gender biases as the rest of the population and it is unfortunate that some are unwilling to accept this simply because their professional research requires them to be objective. It is important to recognise that biases that harm women are held by both men and women.

33. The Government agrees with this statement.

Recommendation 10 - We recommend that diversity and equality training, including unconscious bias training, should be provided to all STEM undergraduate and postgraduate students by their Higher Education Institution (HEI). In addition, such

training should be mandatory for (i) all members of recruitment and promotion panels for STEM jobs in HEIs; and (ii) all line managers and supervisors of staff.

34. The Government agrees that equality and diversity training is important for all including students, researchers and academic staff. The Government will, through HEFCE [and UUK, look at existing practice and use our influence to drive forward improvements.

Recommendation 11 - All research funders should also ensure that diversity and equality training is provided to all members of grant application review panels. This is particularly important where women are under-represented on those panels and in the STEM discipline being considered.

35. Research Councils take very seriously the responsibility of ensuring robust and unbiased peer review. All reviewers, boards and panels are required to act in a manner consistent with the Nolan principles of conduct underpinning public life; that is selflessness, integrity, objectivity, accountability, openness, honesty and leadership. Research Councils provide induction for reviewers in a variety of ways to highlight these obligations and are currently introducing, in certain areas, training on unconscious bias. Progress on this will be reported later in 2014.

36. HEFCE provides research funding to universities in England via block-grant, based on quality assessment through the RAE/REF, with the HE funding bodies for Scotland, Wales and Northern Ireland responsible for providing equivalent funding to their respective HEIs. The assessment phase of REF2014 is currently underway, the REF team has ensured that all assessment panels were briefed on equality and relevant employment legislation that will affect the REF. Panel members have been instructed to take account of equality issues that may have a bearing on the volume of research undertaken and published by submitted researchers in the REF.

37. The REF Equality and Diversity Advisory Panel (EDAP) advised on the implementation of equality and diversity measures, as well as during the development of the arrangements for the exercise. Institutions were required to develop, document and apply a Code of Practice on selecting staff to include in their REF submissions. The EDAP examined these Codes of Practice and advised on their adherence to REF requirements. All Codes were approved and will be published in early 2015, following publication of the REF results.

38. Further information about equality and diversity in the REF can be found on the REF website: <http://www.ref.ac.uk/equality/>.

Recommendation 12 - Universities should ensure that recruiters and search committees identifying potential candidates for senior roles give particular consideration to encouraging suitably qualified female candidates, in line with the principles of positive action.

39. See paragraph 10.

Recommendation 13 - Role models are important for inspiring males and females to study STEM subjects and pursue STEM careers. The lack of senior or high-profile

women scientists reduces the availability of female role models, which particularly affects girls and women.

40. The Government agrees this is an important issue. As part of the BIS STEM Diversity Programme, the Royal Society's oral history project will promote accessible role models from different ethnic backgrounds to inspire people from all backgrounds to pursue a career in science. The Society also recently put out a call for best practice case studies in recruitment and retention which will provide more examples of accessible role models. They will promote and showcase the best examples in recruitment and retention where actions, policies, practices or initiatives have successfully improved the diversity of the scientific workforce, in particular the representation of women, disabled people and those from minority ethnic groups.

41. The Government funds the STEM Ambassadors programme which both raises awareness amongst children of the range of careers that science and technical qualifications offer and provides stimulating scientific activities to increase their interest in STEM subjects. 40% of the 27,000 STEM ambassadors are women.

42. Government also welcomes the work of other organisations to provide role models such as STEMETTES, Science Grrl and the Women's Room.

Recommendation 14 - The National Academies, learned societies and HEIs should emphasise both male and female role models who have successfully combined a STEM career with family life. In particular, highlighting male scientists who have combined career with childcare and family responsibilities could help to counter perceptions that these are women's issues rather than matters that concern all parents.

43. The Government agrees this is an important issue. The Royal Society Dorothy Hodgkin fellowship scheme specifically provides for outstanding scientists in the UK (both men and women) at an early stage of their research career who require a flexible working pattern at the time of application, due to personal circumstances such as parenting or caring responsibilities or health issues. The Society is currently carrying out a career tracking study of the first five years of Dorothy Hodgkin Fellows to find out what past research fellows went on to achieve following their fellowships which will include case studies by male scientists who combined career with childcare and family responsibilities.

44. The Daphne Jackson Trust, highlighted by the Committee in their report, provides fellowships for both men and women to help with their return to the scientific workforce following a career break. Case studies of the fellows highlight that there are similar issues for both men and women returners.

45. Research Councils through the flexibility of terms and conditions and fellowships provide opportunities to combine flexibility to manage work and non work commitments. Work is on-going to highlight useful case studies to better illustrate this. The Royal Society and Royal Academy of Engineering also offer similar flexibility within their Fellowships.

Recommendation 15 - There is strong support for mentoring schemes and evidence that it encourages women to apply for promotions and other opportunities. We recommend that HEIs and other STEM employers should implement mentoring

schemes for all staff, with particular attention paid towards mentoring for women and other groups that are under-represented at senior levels.

46. The Government agrees that this is an important issue and will encourage STEM employers to implement such schemes. This is also a matter for HEIs which are independent of government (see paragraph 10).

The nature and funding of research careers

Recommendation 16 - Balancing the benefits of short term contracts with the needs of Post-Doctoral Researchers was examined by our predecessor committee in 2002. We are disappointed at the lack of progress in the last decade. The system of short term employment contracts for post-docs results in job insecurity and discontinuity of employment rights that is difficult for any researcher, but disproportionately deters women from continuing with science careers. It also has implications for workforce productivity.

47. The Government does accept that the nature of short term contracts can prove challenging for individuals. However, universities are autonomous and it is for them to decide what contracts they offer and ensure that they are complying with any legal requirements. It must be recognised that the short term nature of some research contracts is balanced against the need to maintain the competitive edge that UK research is recognised for. The benefit of the short term contract system is that it allows the research base to be flexible and responsive.

48. The Government has however taken steps to address the challenges of short term contracts, through HEFCE and RCUK's support of Vitae's Concordat to Support the Career Development of Researchers. The Concordat sets out a vision of working practices, roles and responsibilities that will further the attractiveness and sustainability of research careers. The sixth principle of the Concordat focuses on equality and diversity. It is strongly recommended that all members of the UK research community actively address the disincentives and indirect obstacles to retention and progression in research careers which may disproportionately impact on some groups more than others. The Concordat recommends that research posts should only be advertised as fixed-term where there is a recorded and justifiable reason.

Recommendation 17 - We are pleased that some research funders are recognising the benefits of long term contracts to academic careers and encourage others to follow this example. We encourage Higher Education Institutions (HEIs) to provide longer term posts for post-docs, recognising the benefit to scientific progress of continuing expertise.

49. In its evidence to this Inquiry, RCUK flagged the increase in the number of longer, larger grants and the benefits that these could bring in terms of contract length. HEIs have significant flexibility to manage these creatively.

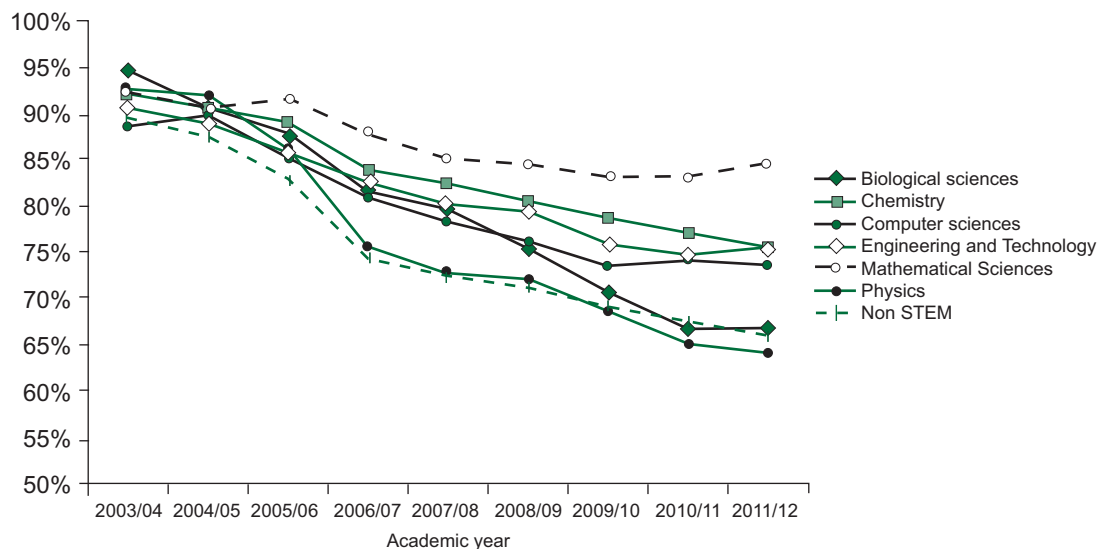
50. This is however a matter for HEIs which are independent of government (see paragraph 10).

Recommendation 18 - We recommend that the Government should work with the Higher Education sector to review the academic career structure and increase the number of more stable and permanent post-doc positions.

51. This response refers to a number of initiatives which should help to shape research careers in such a way that talented women are not deterred from remaining and progressing in academic STEM careers. These include Vitae's Concordat to Support the Career Development of Researchers, the HE funding bodies, Research Excellence Framework (REF) and RCUK's Statement of Expectations for Equality and Diversity. The Government will continue monitor the impact of these initiatives and if it does not see significant progress will consider undertaking a review of the academic career structure.

52. Figure 1 shows the percentage of full-time research-only academic staff on fixed term contracts from 2003/2004 to 2011/2012 in the UK. It shows a decrease in the percentage of full-time research-only academic staff on fixed term contracts in all subjects (actual data can be found at Appendix A). This demonstrates that progress is already being made in reducing the number of fixed term contracts. (The data does not extend to 2012/2013 as several changes were made to the staff record including revised methods for the reporting of academic staff and professors. Direct comparisons can therefore not be made with the figures presented for previous years.)

Figure 1: Percentage of full-time research only academic staff on fixed term contracts from 2003/2004 to 2011/2012



Source: Higher Education Statistics Agency

53. This is a positive trend and one which Government will continue to monitor. There is further evidence that initiatives are having a positive effect. For example, a three-year review of the implementation of the Concordat to Support the Career Development of Researchers, published in March 2012, notes that “despite being a voluntary instrument, the Concordat is having a significant impact across the higher education sector”. The intention to implement the principles of the Concordat is now widespread in institutions, and the corresponding infrastructure is increasingly in place. The review highlights that the

majority of researchers surveyed believe their institutions are committed to equality and diversity and are signing up to Athena SWAN Charter, and that they are treated fairly by their institution. The Concordat Strategy Group will conduct a further review in 2015 to test that progress has been sufficient.

Recommendation 19 - International collaboration brings benefits to science but requiring researchers to relocate is not the only way to promote it. We suggest that research funders should remove from fellowship conditions any requirements for researchers to move institute or country and instead provide funding for shorter visits to other institutes for collaboration purposes. We recommend that research funders work with HEIs to create funding for permanent post-doc positions.

54. The Government has clear evidence that mobility is healthy for scientists. It's good for science – good for growth – when our researchers operate in a range of countries, building networks and identifying potential commercial applications linked to their work. According to a report by Elsevier those researchers who spend more than two years working abroad before returning to the UK are the most productive. UK researchers affiliated with an overseas institution are, on average, 75 per cent more productive than researchers without such a relationship. In addition, the UK benefits significantly as an attractive place for transitory researchers who are often highly productive during their stay.

55. Research Council Fellowships and studentships do not require researchers to move institutions or countries. Applicants can and do request funds to visit other institutions for collaboration either as part of their fellowship application or in separate grant applications. The emphasis is on excellence with impact. This is the same for fellowships from the Royal Society and the Royal Academy of Engineering.

56. With regard to funding for permanent post-doc positions, as described in paragraph 47 The Concordat to Support the Career Development of Researchers states that positions should only be advertised as fixed term where there is a recorded and justifiable need. HE funding bodies block grant Quality Related research funding and the indirect costs from Research Council grants can be used to bridge the gaps between research grants.

Recommendation 20 - Wherever possible, HEIs should provide three months of bridging funding for post-docs, to allow them time to apply for new contracts.

57. HEFCE provides research funding to universities in England via block-grant, with equivalent funding provided by the HE funding bodies for Scotland, Wales and Northern Ireland to their respective HEIs. This funding is non-hypothecated and can be used flexibly by institutions to fund research in keeping with their own strategic missions. HEIs therefore have the flexibility to provide bridging funding to support researchers between grants.

58. As mentioned previously, the UK HE Funding bodies are signatories of the Concordat to Support the Career Development of Researchers and the second principle of the Concordat, states that organisational systems must be capable of supporting continuity of employment for researchers, such as funding between grants, other schemes for supporting time between grant funding, or systems for redeploying researchers within organisations where resources allow.

Recommendation 21 - We appreciate that funding from research councils and the REF must be based on scientific and research excellence and support the continuation of this principle. We are satisfied that HECFE takes seriously the issue of monitoring the gender impact of the REF.

59. There is a strong focus on equality and diversity in the REF. We are pleased that this has been recognised by the Select Committee.

Recommendation 22 - We recommend that HEIs and heads of research groups should ensure that important non-research activities are recognised in performance appraisals and promotion boards.

60. The Government agrees with this recommendation and welcomes calls from within the STEM academic community recently for this to happen. Though not directly linked to performance appraisals and promotion boards, the Research Excellence Framework will recognise and reward excellence in research broadly through the assessment of both academic outputs and broader impact. The latter recognises and rewards the efforts of researchers to disseminate research, engage with stakeholders and the public, and realise the non-academic benefits of research.

Recommendation 23 - There appears to be a lack of coordination and communication between research funders and HEIs which, exacerbated by the use of short term contracts, results in women falling into cracks in the funding system when maternity support is required. Research funders need to make their maternity provisions clearer to researchers and their employers.

61. RCUK have recently updated its briefing on support for Maternity, Paternity, and Adoptive leave and pay for students, supervisors, researchers and Investigators. This will be published in Q1 2014/15.

62. There is a strong focus on equality and diversity in the REF – units must provide information about their research environment, including staff development strategies and equal opportunities; and individuals whose circumstances have constrained their ability to work productively throughout the assessment period could be returned with fewer outputs without penalty in the assessment. This would include researchers who have taken maternity leave but also others with different circumstances.

Recommendation 24 - We have recommended a review of the academic careers system which should examine how to better support women taking maternity leave and help them integrate back into the workplace. A move towards longer-term employment of academic researchers should encourage maternity provisions in line with other employment sectors.

63. Employers should recognise that, for parents and others who have taken career breaks, this may be a time where the actual and perceived barriers to return to research employment are most acute. Account should also be taken of the personal circumstances of groups of researchers. Working conditions should allow both female and male researchers to combine family and work, children and career. It is important for employers to respond flexibly to requests for changed working patterns.

64. Under the Concordat to Support the Career Development of Researchers, employers should ensure that working conditions for researchers provide the flexibility necessary for successful research performance in line with legal requirements, including the sharing of parental leave, as recently introduced.

Management of research careers by higher education institutions

65. The Government notes that the recommendations included in this section of the report are aimed at HEIs. As stated previously (paragraph 10) HEIs are independent of government. They are entirely responsible for recruitment, promotion and retention of their staff and students. HEIs, like other employers, are subject to the requirements of the Equality Act 2010 and must ensure they do not discriminate in their recruitment practices. HEIs are also required to meet the Public Sector Equality Duty and take a proactive approach to advancing equality of opportunity.

Recommendation 25 - We support the shared parental leave system being proposed by the Children and Families Bill, as shared parental leave is an important step towards creating equality for everyone in the workplace. However, simply introducing a new system will not in itself change workplace attitudes towards maternity, or the difficulties caused by taking parental leave. Academia will still need to address the real and perceived career damage which can be caused by taking parental leave.

66. See paragraph 10.

Recommendation 26 - All HEIs should review the working hours of their academic staff and the management of research groups to ensure that practices are in keeping with the needs of those employees with caring responsibilities. Such matters should not be devolved down to research groups. Line managers who pressure staff into working unreasonably long working hours should be held to account by their employer. In addition, every academic researcher should have a named contact within the HEI's human resources team to whom they can confidentially direct queries.

67. See paragraph 10.

Recommendation 27 - Scientific research cannot always take place within regular working hours. However, we recommend that research departments should determine and operate appropriate core working hours with flexibility outside of those core hours. This would ensure that most staff members are available for key meetings while ensuring that those with caring responsibilities are not disproportionately disadvantaged. Fellowships and academic positions should be advertised with the option of working part time unless there are insurmountable obstacles to such an arrangement.

68. See paragraph 10.

Recommendation 28 - A key way to increase the participation of women in STEM careers is to enable them to return following career breaks. We are pleased that the Government is providing financial support to the Daphne Jackson Trust so that it can develop a new fellowship in engineering. We encourage more HEIs to sponsor and host Daphne Jackson Fellows.

69. The Government agrees that enabling women to return to work after a career break is extremely important to increase the participation of women in STEM Careers. This is why BIS is funding the Daphne Jackson Trust to carry out a feasibility study into extending their fellowship model to industry. This is part of a package of measures highlighted in the Perkins review of Engineering Skills aimed at increasing the number and diversity of engineers. The Government would also encourage HEIs to sponsor and host Daphne Jackson Fellows and other similar schemes.

Recommendation 29 - Careers advice and support for academic STEM researchers is important for both men and women, but a lack of it can affect women disproportionately. HEIs and learned societies should encourage mentoring, support networks and seminars at the research group level and monitor this practice. We note that such activities are encouraged by the Athena SWAN charter.

70. See paragraph 10.

Recommendation 30 - Authoritative and impartial careers advice on options outside academia should be available to all undergraduate and postgraduate students, as well as researchers.

71. The Concordat to Support the Career Development of Researchers highlights that a wide variety of career paths are open to researchers. Vitae also have a range of information about researcher careers both inside and outside academia and a wide selection of career stories.

72. RCUK Careers in Research hosts an online suite of stories providing an insight about life as a researcher and the different career paths which researchers take. The case studies highlight the opportunities research skills can give, not only in academia but also in the wider world of business, industry and commerce. Research Councils will continue to work to find new ways of communicating and supporting those working in STEM in career choices.

Recommendation 31 - Identifying the reasons why staff choose to end their employment in an organisation is crucial to identifying and challenging where poor behaviours and practices may exist. We are disappointed that information on the reasons why women leave academic STEM careers is patchy and largely anecdotal.

Recommendation 32 - Higher Education Institutions (HEIs) should routinely conduct exit interviews and/or questionnaires with all researchers leaving their employment. Each HEI should publish this data in a suitably anonymised form so that organisations working to improve diversity in STEM can make use of it. Organisations such as the WISE Campaign, Equality Challenge Unit and national academies should advise HEIs on the best way to gather and publish this data in a consistent manner.

73. The implementation of the Concordat to Support the Career Development of Researchers has ensured significant changes to the HESA Staff Record. From 2012/13 academic year data collections will enable better analysis and support actions by institutions to understand the profile of the research staff cohort and track their mobility between institutions and sectors. The record includes the following new fields: activity after leaving; location after leaving; parental leave and reason for end of contract.

74. The 2012/13 data was published on 27th February 2014 and HESA is currently assessing the responses provided by HEIs in these new fields. The Government would welcome a review of the data by sector specific bodies such as the learned societies and national academies and would encourage these organisations to share their findings with the STEM community.

Conclusions

Recommendation 33 - Our inquiry has not uncovered any new issues on the topic of gender diversity in STEM subjects. This indicates that the problems and solutions have long been identified, yet not enough is being done to actively improve the situation. While competitiveness for jobs is beneficial for science, careers should not be constructed in such a way that talented women are deterred from remaining and progressing in STEM. It is astonishing that despite clear imperatives and multiple initiatives to improve diversity in STEM, women still remain under-represented at senior levels across every discipline.

Recommendation 34 - The under-representation of women in STEM is caused by a wide range of factors. Emphasis is often placed on inspiring young girls to choose science, which is commendable, but such efforts are wasted if women are then disproportionately disadvantaged in scientific careers compared to men. It is disappointing that biases and working practices result in systematic and cumulative discrimination against women throughout STEM study and academic careers.

Recommendation 35 - Universities and other HEIs are the employers of academic STEM researchers so they have ultimate responsibility for employment conditions and the greatest obligation to improve STEM careers for all researchers. While there are many examples of good practice in diversity management, some HEIs appear to be too content to devolve responsibility for working hours, careers support and promotion down to research groups. More standardisation is required across the higher education (HE) sector. We encourage all HEIs conducting STEM research to apply for Athena SWAN awards, or similar recognised schemes.

Appendix A - Percentage of full-time research only academic staff on Fixed Term Contracts by terms of employment allocated to STEM cost centres

UK HE Institutions

Academic years 2003/04 to 2012/13

	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012
Anatomy and Physiology	97%	91%	83%	70%	70%	85%	82%	79%	75%
Biological Sciences	94%	91%	88%	82%	80%	75%	71%	67%	67%
Chemistry	92%	91%	89%	84%	82%	81%	79%	77%	76%
Computer Sciences	89%	90%	85%	81%	78%	76%	74%	74%	74%
Earth marine and environmental sciences	83%	79%	77%	71%	70%	67%	67%	67%	68%
Engineering and technology	90%	89%	86%	82%	80%	79%	76%	75%	76%
Mathematical sciences	92%	91%	92%	88%	85%	84%	83%	83%	85%
Pharmacy and pharmacology	91%	90%	86%	82%	81%	83%	80%	78%	78%
Physics	93%	92%	86%	76%	73%	72%	69%	65%	64%
Non-STEM	89%	88%	83%	75%	72%	71%	69%	67%	66%

Source: Higher Education Statistics Agency

Note:

1. Science, Technology, Engineering and Mathematics (STEM) have been defined by HEFCE as the sum of the cost centre groups: Anatomy and physiology, Biosciences, Chemistry, IT, system sciences and computer software engineering, Earth, marine and environmental sciences, General engineering, Civil engineering, Chemical Engineering, Electronic, electrical and computer engineering, Mechanical, aero and production engineering, Minerals, metallurgy and materials engineering, Mathematical sciences, Pharmacy and pharmacology, and Physics.

2. Subject information is shown as Full Person Equivalent (FPEs) in the table. FPEs are derived by splitting staff instances between the different subjects that make up their course aim.