THE ROYAL SOCIETY

Royal Society submission to the Science and Technology Committee's inquiry on Women in STEM careers

Introduction

1. The Royal Society welcomes the opportunity to respond to the UK Science and Technology Committee's Inquiry on 'Women in STEM careers'.

2. This response has been approved by John Pethica, Royal Society Vice President and Lead Officer for Diversity, on behalf of the Council of the Royal Society, and has been prepared with input from Professor Dame Julia Higgins, Chair of the Royal Society's Diversity Programme and Professor Ed Hinds, Chair of the Royal Society's Equality and Diversity Advisory Network.

3. The Royal Society is the national Academy of science in the UK. It is a self-governing Fellowship of many of the world's most distinguished scientists and is the oldest scientific academy in continuous existence.

4. The Royal Society is concerned with excellent science wherever and by whomever it is done. We are committed to promoting diversity in UK science, technology, engineering, mathematics, and medicine (STEMM) by seeking to increase participation from underrepresented groups.

5. A lack of diversity across the scientific community represents a large loss of potential talent to the UK. Restricted opportunity and diversity limits not only UK competitiveness and prosperity, but also vitality in the wider scientific workforce and creativity in society. Individuals from lower socio-economic backgrounds, certain ethnic minorities, women, and disabled people are all currently under-represented in education, training and employment related to STEMM.

6. There has been a long standing awareness of the issues regarding attracting, retaining and progressing women in science in academia. However, the Royal Society encourages the Committee to look more widely and consider diversity in its fullest sense. Other groups are underrepresented in science, particularly certain ethnic minorities and disabled people. Women are also not a homogeneous group and the Royal Society urges the Committee to consider the intersectionality of other protected characteristics and the barriers that particular groups of women may disproportionately face compared to women as a whole, for example BME women[1] or women with caring responsibilities.

7. As the majority of those in the scientific workforce work in industry, particularly in small and medium-sized enterprises (SMEs) (61.8% of the science workforce work in SMEs), the Society encourages the Committee to look more widely than academia and consider the scientific workforce in its entirety.

8. The Royal Society is tackling some of the issues on two fronts, internally through the Society's Equality and Diversity Advisory Network (EDAN) and externally through its four-year BIS funded diversity programme which is investigating ways to remove barriers to entry, retention and progression within the scientific workforce. This programme focuses on gender, ethnicity, disability and socio-economic status in the first instance and aims to cultivate leadership in the scientific community towards removing barriers to increased diversity.

Diversity at the Royal Society

9. EDAN advises the Royal Society on all matters relating to equality and diversity. EDAN reviews annually the diversity of the Society (Fellows, research fellows, awards and activities); holds events, produces

[1] BME female academics had the lowest rate of professors: 3.7% of UK BME female academics and 1.3% of non-UK BME female academics were professors, compared with 16.1% of UK white males and 12.0% of non-UK white males (ECU, 2012).

reports, and undertakes other activities that increase diversity at the Society. It reports annually on progress and makes recommendations for action. This year the EDAN Annual Report 2013 will be published in full for the first time. This report looks at impact of equality and diversity activities on the numbers of awards, Fellows, research fellows and meeting/event attendees by gender as well as other protected characteristics so we can track progress in these areas.

10. The first women were elected to the Fellowship in 1945 and since then there has been a steady stream of women joining the Fellowship. In this year's Royal Society Fellowship elections 9 women were on the list out of the 44 Fellows elected and 1 female Foreign Member out of 8, an improvement on last year when there were only two women on the list out of the 44 Fellows elected and 1 female Foreign Member out of 8. The longer term trend has seen women account for around ten per cent of newly elected Fellows since the year 2000. This is about the same proportion as women holding professorships in the sciences in the UK, from which a good proportion of the Fellowship is drawn.

11. The President and Council of the Royal Society are seriously committed to improving the representation of women in the Fellowship and the Society has a number of activities aimed at improving this. To help stimulate a wider pool of nominated candidates the Society has set up temporary nominating groups to address a number of underrepresented areas within the Fellowship, including women and candidates from industry. Our Equality and Diversity Advisory Network is also investigating ways of mobilising our funded research fellows to participate in identifying a range of credible candidates for nomination to the Fellowship in collaboration with the temporary nominating group for women and Council. The Council of the Royal Society itself consists of 21 Councillors. This year 5 of the 7 new incoming councillors are female giving a total of 8 female Councillors out of 21.

12. The Royal Society Rosalind Franklin Award is awarded annually for an outstanding contribution to any area of science, technology, engineering or mathematics. The recipient of the award is expected to spend a proportion of the grant on implementing a project to raise the profile of women in STEM in their host institution and/or field of expertise in the UK. The award is supported by BIS and was first made in 2003. Professor Polly Arnold was awarded the 2012 Rosalind Franklin Award and recently launched her project online, *A Chemical Imbalance*, which consists of a short film, a book, and ultimately a call for action, highlighting some of the obstacles still faced by women in STEM and academia. Professor Sarah-Jayne Blakemore was recently awarded the 2013 Royal Society Rosalind Franklin Award and Lecture.

13. All Royal Society research fellowships have flexibility built into them: they can be put on hold for a maximum of 12 months for a career break, held part-time, and allow for sabbaticals, secondments or international experience. In addition, the Royal Society Dorothy Hodgkin fellowship scheme specifically provides for outstanding scientists in the UK 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 scheme is open to men and women, but the majority of applicants and fellowship holders are women. Since the scheme opened in 1995, 212 appointments have been made (94% female). The scheme offers holders the opportunity to:
    a. hold appointments on a part-time basis or convert from full-time to part-time and back again to help match work and other commitments, such as parental or caring responsibilities etc.
    b. claim back time spent deferring the fellowship and/or working part-time at the end of the fellowship.
    c. claim some funds for family support where these can be justified on scientific grounds, e.g. the cost of child care during a conference or collaborative visit abroad (those funds can be applied for during the Fellowship).

14. Many Dorothy Hodgkin Fellows have gone on to take up Royal Society University Research Fellow posts among others. Some notable examples include:
    a. Professor Nicole Grobert (DHF 2002/ URF 2006) http://www.materials.ox.ac.uk/peoplepages/grobert.html
    b. Professor Sarah-Jayne Blakemore (DHF 2004/ URF 2007) - http://royalsociety.org/people/sarah-jayne-blakemore/
    c. Dr Kristine Krug (DHF 2001/ URF 2005) - http://www.dpag.ox.ac.uk/academic_staff/kristine_krug/

d. Dr Ashleigh Griffin (DHF 2005 / URF 2009) - http://www.zoo.ox.ac.uk/people/view/griffin_as.htm
e. Dr Holly Bridge (DHF 2004 / URF 2008) - http://users.fmrib.ox.ac.uk/~hb/index.php
f. Dr Jenny Bizley (DHF 2009) was awarded a Sir Henry Dale Fellowship in 2012
g. Professor Emily Holmes (DHF 2005) http://www.psych.ox.ac.uk/team/PIs/emily-holmes

15. The Royal Society also funds a number of industry fellowships and other awards. In 2012, 4% of the industry fellowship appointments were female; this was down from 6% in 2011, and the 8% average from 2005 - 2010. However, the actual figures are too small to report meaningfully on changes in percentages but the Society does monitor fellowship appointments year on year.

16. Following strong pressure from EDAN a Pictures Working Group has considered how the Royal Society could better represent both the diversity of science and the Society's history through the pictures and artefacts displayed throughout the building. A proposal has been put forward that will better represent diversity in science which includes rehanging existing pictures on display throughout the building, commissioning new works of contemporary art, and running a competition for artists to feature their work at the Society. The recent Royal Society 'Scientists' exhibition, curated by Uta Frith FRS, brings together recent portraits of the greatest female Fellows of the Royal Society together with newly commissioned drawings featuring Royal Society research fellows and Rosalind Franklin prize-winners.

The Royal Society's diversity programme - Leading the way: Increasing diversity in the scientific workforce

17. The diversity programme is investigating ways to remove barriers to entry, retention and progression within the scientific workforce. It focuses on gender, ethnicity, disability and socio-economic status in the first instance and aims to cultivate leadership in the scientific community towards removing barriers to increased diversity. We are particularly focused on individuals making key career transitions for example from further education to university or to the workforce or from one level within the workforce to another. For the purposes of the project, the 'scientific workforce' is taken to comprise all those for whom their scientific knowledge, training, and skills are necessary for the work that they do.

18. The diversity programme has a number of specific activities which cover women in STEM careers along with more general data gathering and research activities. A recent example is the internet activity described in the next two sections and aimed at raising the profiles of successful women scientists.

19. In October 2012 the Royal Society held a very successful Wikipedia 'edit-a-thon' focusing on improving the online records of women in science using the Royal Society archives and library followed by a panel session led by Professor Uta Frith FRS on this topic. The Royal Society received a 'Wikimedia UK' award – Educational Institution of the Year – for the 'edit-a-thon' and there have been calls to hold more events like this.

20. Indeed, as part of their Centenary celebrations, the Medical Research Council, in conjunction with the Royal Society, has planned a series of Wikipedia Women in Science "Edit-a-thon" events throughout 2013 that will highlight the wealth of outstanding female scientists across science over the last century. As well as the edit-a-thon, each event will include a discussion led by leading female academics on the challenges faced by women in science and how we can look to address gender under-representation in the future. One of the events will be held at the Royal Society on the 11 October 2013 in celebration of Ada Lovelace day.

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

21. The drop-off of women through the STEM academic pipeline all the way from GCSE, through undergraduate to master, PhD, post doc, lecturer and professor is well documented.

22. A large part of the diversity programme has been in relation to improving our understanding of the scientific workforce and identifying where there are gaps in existing quantitative data, and carrying out primary qualitative work to identify existing good practice and areas where the Royal Society could add value. There are three main areas of data gathering;

- Research investigating socio-economic status and diversity within the scientific workforce including a literature review, quantitative data analysis of the Annual Population Survey, and qualitative research (interviews and focus groups) with the scientific community.
- Research into social mobility in the scientific workforce using 1970 British Cohort Study
- Analysis of HESA data on staff and students to identify at what point people leave academia, and when they do leave, where it is that they go.

23. Our data gathering exercise is not yet complete. We will be combining all of the research and findings into a single report to help answer a number of questions about what the scientific workforce looks like which will be published in December 2013/January 2014. However we have included for the Committee some interim findings in relation to gender in this response.

24. It is important to note that the pipeline through academia and drop-off rates vary between STEMM subjects and not to generalise with statements such as 'girls don't choose science' (very low numbers choose *physics).* Some emerging findings around the pipelines of different STEM subjects for gender can be found in Appendix 3.

25. The Royal Society is aware that there are key issues and barriers around recruitment/retention of underrepresented groups in science. These are well-known and have been well documented in the past. Key issues include;
    a. The provision and availability of child care in academia.
    b. The transition from post-doctoral or fixed-term contracts to first academic posts
    c. Support on return from a career break
    d. The transparency of promotion policies and access to career development opportunities (such as mentoring and networking, attendance at international conferences, committee-membership).
    e. The availability of role models, confidence building sessions and addressing the culture of departments, all of these good practice examples are not exclusive to STEM departments.

26. There are many examples of good practice initiatives focused on women in STEM careers, the Athena SWAN Charter and Project Juno are two such examples. Equality Challenge Unit (ECU), who manage the Athena SWAN Charter, will be submitting their own response to this consultation so we confine ourselves here to some key points and refer the Committee to their submission for further details on Athena SWAN. Both Athena SWAN and Project Juno have case studies and examples of good practice available which cover good practice in recruitment, retention and progression within academia.

27. The Royal Society has been involved from the beginning of the Athena SWAN Charter. The Society is represented on the Athena SWAN steering group, on panels and the Society is also involved in the formal evaluation of the Charter. The evaluation will assess the impact of the Athena SWAN Charter across the higher education sector to determine its effectiveness as a vehicle for sustainable change. The outcomes of the research will contribute to the future development of Athena SWAN and enhance the support ECU provides to institutions that are committed to promoting gender equality.

28. The Society also provides £20k of funding per year to Athena SWAN to contribute to the running of the Charter but also to a pilot study with research institutes. The pilot project is looking at the compatibility of the current Athena SWAN framework with research institutes, with a view to extending the Charter to research institutes in due course. This pilot is underway with a range of BBSRC, MRC, NERC, EPSRC and independent research institutes participating. The pilot aims to explore research institute management structures, career pathways, and policies and procedures, identifying where the current Athena SWAN framework may need to be adapted. The pilot should be completed by the end of September 2013, when we should be able to report on key findings and recommendations.

29. The Royal Society's diversity programme is currently developing new project areas around recruitment and retention which include building up a body of case studies on a number of issues within recruitment/retention across academia and industry to share good practice and experiences across academia and industry. More details on this will be published in the autumn and we will be consulting more widely with learned societies and relevant organisations on the areas the case studies should cover.

30. The Royal Society works closely with members of the scientific community to promote and raise awareness of the diversity programme and its activities. We provide the Secretariat to the STEM-Disability Committee and work collaboratively with other members to deliver a number of projects relating to supporting students and staff with disabilities. A virtual network of professional bodies, learned societies, and research funders provide feedback and support for the programme and a quarterly e-newsletter to relevant bodies and organisations has been developed to communicate the diversity programme activities and relevant diversity related events in the scientific community. Engaging the community is a key element of the diversity programme and which will be carried forward in future activities.

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?

31. It is important not to take the view that women leaving academia and moving into industry or into other sectors is a loss to science. Such women may use their science skills elsewhere and combine with other skill sets to inspire and promote interest in and the development of science in the UK.

32. Emerging findings from our research in the destination of leavers using HESA data can be found in Appendix 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?

33. As stated earlier there are many examples of good practice in the retention of women in academic careers from initiatives such as the Athena SWAN Charter, Project Juno and schemes such as Daphne Jackson trust returners' scheme and the Royal Society Dorothy Hodgkin fellowship scheme. We believe these schemes are all valuable role models for further activity.

34. The Royal Society urges the committee to look beyond academia when considering people working in research science as 64 per cent of the research and development undertaken in the UK in 2011 was by UK business[2]. Academia is important as it provides role models for those in university and studying science but industry should also be considered. Some of the successful schemes mentioned in the previous section may provide templates for action in the wider community

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

35. Consistent data collection – through our data gathering activities (see Appendixes 1-3 for further details) we often found it difficult to obtain accurate and relevant data on diversity and career progression in the scientific workforce due to weaknesses with data sets. The lack of consistency between data sets and linking of data also hindered robust comparisons and tracking of underrepresented groups through the STEM pipeline. One of recommendations at the end of the Royal Society's diversity programme therefore will be the joining/linking of data sets to be able to fully understand the diversity of the scientific workforce and community, from school through to university to workplace (whether academia or industry).

36. More funding to be available for initiatives such as the Dorothy Hodgkin Fellowship. We currently can only fund 5 per year; this number needs to be substantially increased in order to support and promote women in academic careers.

37. The government's remit should be wider than just women, considering gender, ethnicity and disability as well as socio-economic status along with any groups that may be underrepresented in science that fall under the Equality Act 2010.

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[2] http://www.nao.org.uk/report/nao-memorandum-research-and-development-in-the/

38. The Royal Society continues to be interested in women in STEM and awaits the outcomes of the Committee's review. If you have any questions about our diversity programme please contact Polly Williams on diversity@royalsociety.org who will be able to assist you.

Appendix 1 – Research into socio-economic status composition of the scientific workforce

As part of the Royal Society's diversity programme, TBR and the Science Council were commissioned to undertake research into the equality and socio-economic composition of the scientific workforce. In addition to a literature review and qualitative work, the research included secondary data analysis of the Office of National Statistics (ONS)'s Annual Population Survey (APS); this analysis cross-tabulated the eight ONS socio-economic classifications against equality and sector/work characteristics of the workforce[3].

Interim findings related to gender

It is useful to consider the intersection between gender and socio-economic status as an aspect of women's progression and retention in science. Women make up a slight majority of the science workforce (50.3%). This is not the case for the non-scientific workforce and the total workforce as a whole.

There are, however, gender disparities within socio-economic status categories, with women in the scientific workforce under-represented in all but three of the eight SEC categories.

Men in the scientific workforce are more than twice as likely to be in the highest level SEC category than women: nearly 1 in 2 (47.5%) are in higher managerial and professional occupations, compared with only 23.6% of women. Conversely, women are concentrated in the lower level SEC 2 - lower managerial and professional occupations (54.5% of women, compared with 30.1% of men). This suggests a 'glass ceiling' situation – a concentration of women in lower managerial and professional roles and marked underrepresentation in higher senior management positions.

[3] Socio-Economic Status: within national government statistics, the Socio Economic Classification (SEC) is used to determine socio-economic status. The classification groups workers into the following 8 categories, with SEC 1 being the highest level and SEC 8 being the lowest.

- SEC 1: Higher managerial and professional occupations
- SEC 2: Lower managerial and professional occupations
- SEC 3: Intermediate occupations
- SEC 4: Small employers and own account workers
- SEC 5: Lower supervisory and technical occupations
- SEC 6: Semi-routine occupations
- SEC 7: Routine occupations
- SEC 8: Never worked and long-term unemployed

Appendix 2 – Research into social mobility and the scientific workforce

As part of the Royal Society's diversity programme research was commissioned to define and understand the pathways, progression routes and key transition points in science careers and how this varies according to socio-economic background (SEB). Specifically, this research provides insight into the interplay of socio-economic background and gender, ethnicity, disability and socio-economic status. This supports research already undertaken that assesses how representative the science workforce is of the wider population in terms of socio-economic status (see Appendix 1).

The research undertaken by TBR Ltd uses data from the British Cohort Study of 1970 (BCS70). The BCS70 collected about the births and families of babies born in the UK in one particular week in 1970. Survey information was collected at key points in survey respondents lives.

The following table provides a record of respondent's ages at different sweeps.

Table 1: BCS70 sweeps

Sweep number	Year of Sweep	Age at Sweep
0	1970	0
1	1975	5
2	1980	10
3	1986	16
4	1996	26
5	1999-2000	30
6	2004-05	34
7	2008-09	38

Socio-economic background
Socio-economic background describes the conditions of the household in which an individual lived as a child and is often closely related to the individual's future life chances. Parental socioeconomic position is frequently used a as a proxy for SEB. Following review of other studies exploring SEB, the indicators used in this research include parental occupation, household income during childhood, the educational achievements of parents and an individual cohort member's education (itself often used as a proxy measure of socioeconomic background). The SEB measures adopted were a mixture of the most useful indicators suggested by the literature review, and what it was possible to measure using BCS70 data.

Specifically, the following variables within BCS70 were used:

- Parental social class based on occupation, using the Registrar General's Social Class (SC) classification:
  - SC I - Professional occupations
  - SC II - Managerial and technical occupations
  - SC III N - Skilled non-manual occupations
  - SC III M - Skilled manual occupations
  - SC IV - Partly skilled occupations
  - SC V - Unskilled occupations
- Household income at age 16, using figures not adjusted for inflation.
- Parents' education:
  - Highest age of either parent on leaving continuous full-time education.
  - Highest qualification of either parent
- Cohort member's education:
  - Age the cohort member left continuous full-time education
  - Highest qualification on leaving continuous full-time education

Interim findings related to women in science
Emerging results from the research into the impact of socio-economic background on pathways in and out of science, progression routes and key transition points in science careers indicate that the higher an individual's socio-economic background, measured in terms of parental social class parental education, the more likely they are to work in science. Women tend to take longer to enter science after leaving continuous full-time education than men.

This research found that 27% of science workers have spent their entire working life to date in science. Men are more likely to have spent their entire working life in science than women. Half of the women who have worked in science started work in another sector, compared with around a third of men.

Around a quarter (23%) of those who have worked in science have worked in the health sector. Smaller proportions have worked in education (17%) and manufacturing (15%), while around half (51%) have worked in other science sectors. Gender, ethnicity, socioeconomic background and education each appear to influence the science sectors in which people work. Among science workers, women are more likely to work in education or health than men. Men are more likely to work in manufacturing than women.

People who have worked in science (from the 1970 cohort) are more likely to reach higher occupational levels than those who have never worked in science. In part, this reflects the high level of technical skills and knowledge needed to work in science, but it appears that working in science can also impact on career progression in other sectors. Compared with those who have never worked in science, people who work in science are more likely to reach higher level occupations *even if they leave the sector*. The higher the occupational skill level at which an individual enters science, the more likely they are to progress to higher levels. Women working in science, however, are significantly less likely to progress to technician level occupations than men, and less likely than men to progress to professional level occupations. It also takes women in science longer to progress to technician level occupations than men.

In terms of the impact of career and employment breaks on women's progression and retention in science fewer women working in science (in the 1970 cohort) take careers breaks than the wider population. Their career breaks are more often connected to the birth of a child than other reasons and are often shorter. Women in science who take a career break are more likely to progress to Level 3 occupations[4] than those who do not take a career break. However, they are less likely to progress to degree-level occupations, suggesting career breaks hinder progression to the highest occupational levels. Women in science taking a career break to have a baby are more likely to return to work part-time than those who have never worked in science and take a career break to have a baby. Women in science who take a career break to have a baby are more likely to return to work at a lower occupational level than those who take a career break not associated with the birth of a baby.

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[4] An individual's occupations are categorised according to the level of skill associated with each occupation. Skill levels reflect the length of time it normally takes someone to become fully competent in a job, including the time needed for work-related training, to achieve any formal qualifications required, or to acquire the necessary experience. Occupations are described in terms of four skill levels:
Level 1 – Entry level occupations usually require the completion of compulsory education, but may not require formal qualifications. They typically involve little work-related training. Examples include postal workers, hotel porters, cleaners and catering assistants.
Level 2 – Semi-skilled occupations usually require a good general education, often signalled by the achievement of a satisfactory set of school-leaving examination grades. They typically involve more work-related training than Level 1 occupations. Examples include machine operation, caring occupations, retailing, and clerical and secretarial occupations.
Level 3 – Technician level occupations usually require qualifications from further education or training after the completion of compulsory schooling, though not normally degree-level qualifications. They include skilled trades, and may involve a lengthy period of vocational training. Examples include electricians, chefs and laboratory technicians.
Level 4 – Professional level occupations usually require Higher Education qualifications, or an equivalent period of relevant work experience. They include senior management positions. Examples include pharmacists, engineers, doctors and teaching professionals.

Appendix 3 – Secondary Analysis of Higher Education Statistics Agency (HESA) data to find out at what point do people leave academia and where do they go

Oxford Research and Policy (ORP) are undertaking an analysis of HESA data for the Royal Society to find out the "destinations" of undergraduates, taught masters graduates and doctoral graduates studying STEM subjects based on their:

- Gender
- Ethnicity
- Disability
- Parental occupation (socio economic status)
- Degree class (where applicable)
- Nationality (UK/non-UK)

The destinations of higher education staff data will also be examined by:

- Cost centre
- Grade (professor, senior lecturer/lecturer, researcher, other)
- Gender
- Ethnicity
- Nationality
- Disability

Interim findings – students

- A top level analysis of the activities of graduates from STEM courses at first degree, masters and doctoral level suggests that at subject level there are relatively few differences between the graduate activities of men and women. In most subjects, similar proportions of men and women are found to be working in STEM, possibly-STEM and non-STEM occupations[5], or going on to further study, six months after completing their courses.
- There are large differences in the proportions of graduates from different subjects and at different levels going on to STEM, possibly-STEM or non-STEM occupations or to further study.
- In a relatively small number of subjects there are obvious gender differences in the patterns of activity – see below for some examples, a more detailed analysis will be published towards the end of the year.
- More detailed analysis of the nature of the occupations undertaken by men and women may well reveal differences but at the top level, there are few obvious subjects where there are clear gender differences in the activities undertaken on completion.

Considering individual subject groups:

- There are no differences between the post-completion activities of men and women graduating from vocational courses in the veterinary sciences, agriculture and related subjects group, but there are some differences in the activities of men and women from agriculture and food & beverage studies. Men are more likely than women to be in STEM activities after completing agriculture courses, and less likely than women to be in STEM activities after completing food & beverage studies.
- There are few differences between patterns of activity after completing courses in individual physics science subjects. On the whole men are more likely than women to undertake research after completion, but there are few clear cut differences in patterns of employment.

[5] We have identified occupations using standard occupation lists and classified these into those that use STEM training, qualifications and skills, those that may use STEM training, qualifications and skills and those that do not use STEM training, qualifications and skills For example, on standard occupation lists teachers are listed as non-STEM but STEM teachers may use STEM training, skills and qualifications so we re-classified teachers as possibly-STEM.

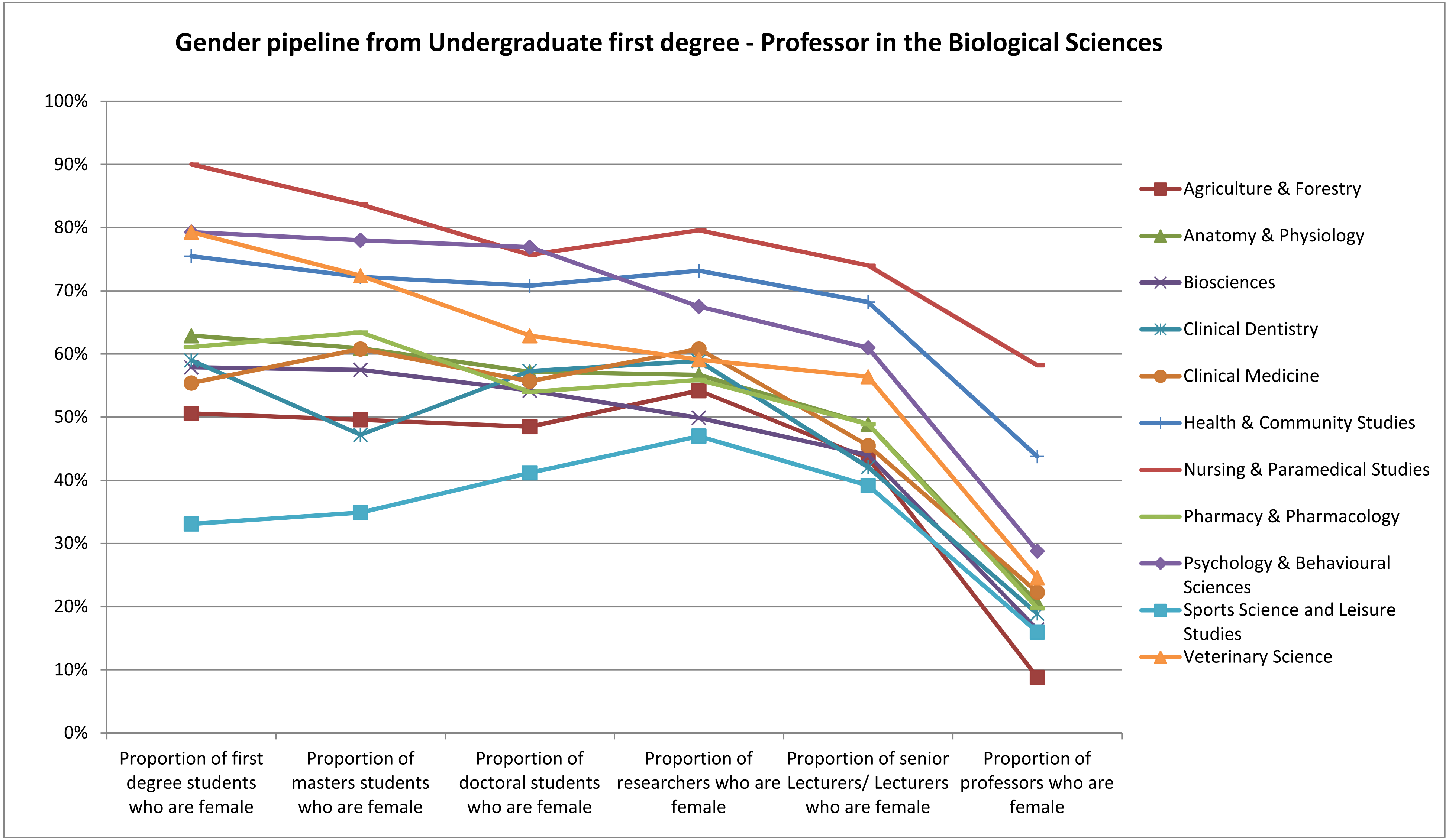
- Among the mathematical and computer sciences subject group, at individual subject level, there are relatively few differences between the post-completion patterns of activity of men and women. In computer science men are more likely than women to be in STEM occupations, and overall men are more likely than women to undertake research degrees.
- At individual subject level, in the architecture, building and planning subject group, there are some differences between men's and women's patterns of activities after completion, although in the majority of subjects there are no clear differences in the patterns of activity. Among graduates from building courses, women are more likely to enter STEM occupations than men, while the opposite is the case for graduates from planning (urban, rural & regional) courses.

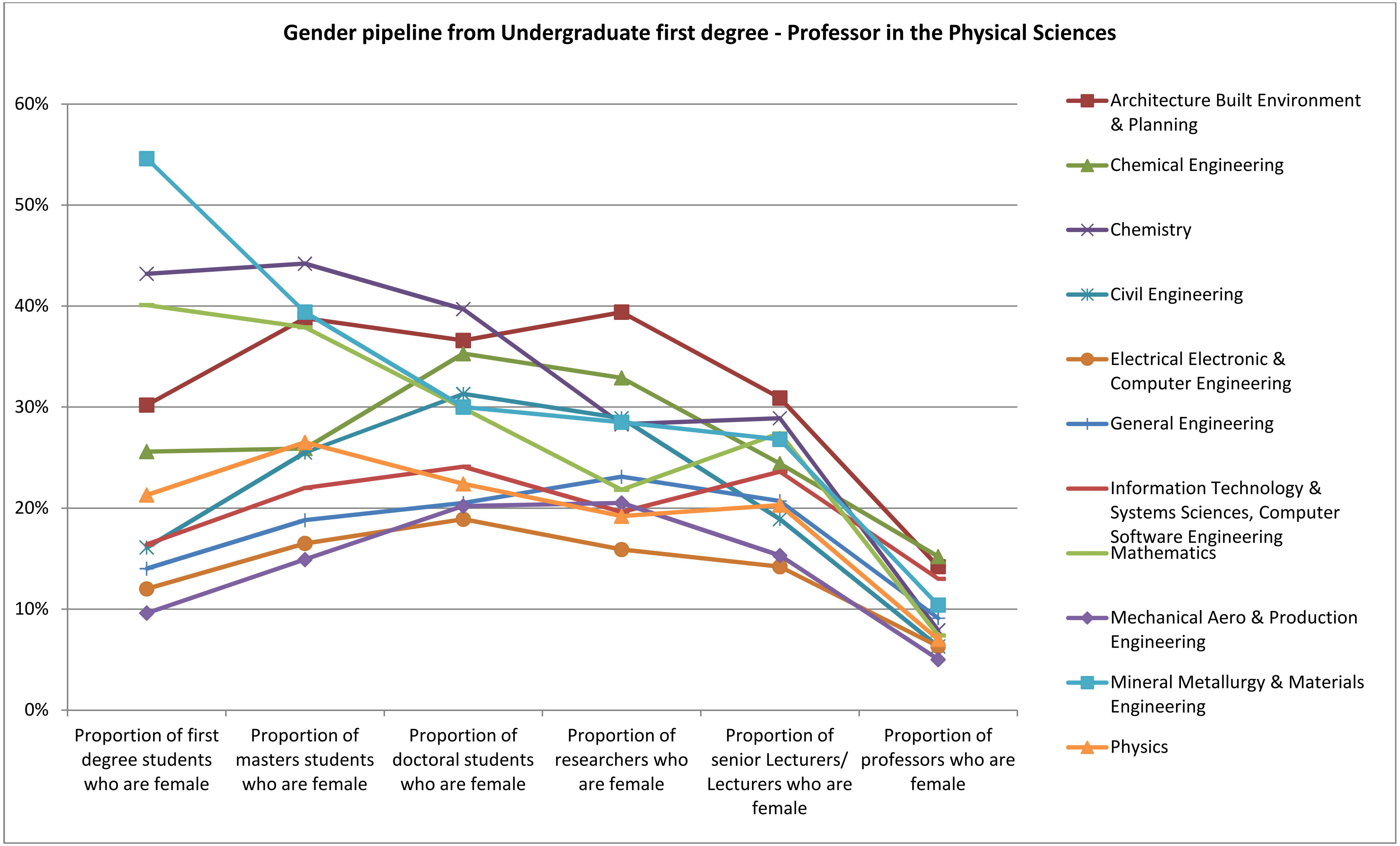
Interim findings – staff

We have some early interim findings related to certain subjects and the pipeline from undergraduate first degree to professor level. Students are classified by the subject they are studying and staff are allocated to a cost centre. For some subjects, e.g. physics and chemistry, the subject studied and staff cost centre map across easily, however other subjects have no obvious home cost centre so a selection of cost centres for physical and biological sciences that have been mapped at this stage are shown in the table and graphs below.

Data on leaving destinations for staff is currently being analysed and will be published in December with the other findings from a big data gathering exercise on diversity and the scientific workforce.

HESA Cost centre	Proportion of first degree students who are female	Proportion of masters students who are female	Proportion of doctoral students who are female	Proportion of researchers who are female	Proportion of senior Lecturers/ Lecturers who are female	Proportion of professors who are female
Agriculture & Forestry	50.60%	49.60%	48.50%	54.20%	43.50%	8.80%
Anatomy & Physiology	62.90%	60.90%	57.20%	56.70%	48.90%	20.60%
Architecture Built Environment & Planning	30.20%	38.80%	36.60%	39.40%	30.90%	14.20%
Biosciences	57.90%	57.50%	54.20%	49.90%	44.00%	16.40%
Chemical Engineering	25.60%	25.90%	35.30%	32.90%	24.40%	15.20%
Chemistry	43.20%	44.20%	39.70%	28.30%	28.90%	7.90%
Civil Engineering	16.10%	25.50%	31.30%	28.90%	18.90%	6.30%
Clinical Dentistry	59.00%	47.20%	57.30%	58.90%	42.10%	18.90%
Clinical Medicine	55.40%	60.80%	55.70%	60.80%	45.50%	22.30%
Electrical Electronic & Computer Engineering	12.00%	16.50%	18.90%	15.90%	14.20%	6.30%
General Engineering	14.00%	18.80%	20.50%	23.10%	20.70%	9.10%
Health & Community Studies	75.50%	72.20%	70.80%	73.20%	68.20%	43.80%
Information Technology & Systems Sciences, Computer Software Engineering	16.40%	22.00%	24.10%	19.60%	23.60%	13.00%
Mathematics	40.10%	37.90%	29.90%	21.80%	27.40%	7.40%
Mechanical Aero & Production Engineering	9.60%	14.90%	20.20%	20.50%	15.30%	5.00%
Mineral Metallurgy & Materials Engineering	54.60%	39.40%	30.00%	28.50%	26.80%	10.40%
Nursing & Paramedical Studies	90.00%	83.70%	75.70%	79.60%	74.00%	58.20%
Pharmacy & Pharmacology	61.10%	63.40%	54.00%	55.90%	48.90%	19.80%
Physics	21.30%	26.50%	22.40%	19.20%	20.30%	7.00%
Psychology & Behavioural Sciences	79.30%	78.00%	76.90%	67.50%	61.00%	28.80%
Sports Science and Leisure Studies	33.10%	34.90%	41.20%	47.00%	39.20%	16.00%
Veterinary Science	79.30%	72.40%	62.90%	59.10%	56.40%	24.60%


Gender pipeline from Undergraduate first degree - Professor in the Biological Sciences
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Proportion of first degree students who are female
Proportion of masters students who are female
Proportion of doctoral students who are female
Proportion of researchers who are female
Proportion of senior Lecturers/ Lecturers who are female
Proportion of professors who are female
Agriculture & Forestry
Anatomy & Physiology
Biosciences
Clinical Dentistry
Clinical Medicine
Health & Community Studies
Nursing & Paramedical Studies
Pharmacy & Pharmacology
Psychology & Behavioural Sciences
Sports Science and Leisure Studies
Veterinary Science


Gender pipeline from Undergraduate first degree - Professor in the Physical Sciences
60%
50%
40%
30%
20%
10%
0%
Proportion of first degree students who are female
Proportion of masters students who are female
Proportion of doctoral students who are female
Proportion of researchers who are female
Proportion of senior Lecturers/ Lecturers who are female
Proportion of professors who are female
Architecture Built Environment & Planning
Chemical Engineering
Chemistry
Civil Engineering
Electrical Electronic & Computer Engineering
General Engineering
Information Technology & Systems Sciences, Computer Software Engineering
Mathematics
Mechanical Aero & Production Engineering
Mineral Metallurgy & Materials Engineering
Physics