The Academy of Medical Sciences

Representation of women within the Academy's Fellowship

February 2013

The Academy of Medical Sciences

The Academy of Medical Sciences is the independent body in the UK representing the diversity of medical science. Our mission is to promote medical science and its translation into benefits for society. The Academy's elected Fellows are the United Kingdom's leading medical scientists from hospitals, academia, industry and the public service. We work with them to promote excellence, influence policy to improve health and wealth, nurture the next generation of medical researchers, link academia, industry and the NHS, seize international opportunities and encourage dialogue about the medical sciences.

Foreword by Professor Sir John Tooke PMedSci

"The diversity of talent amongst the Fellowship ensures that the Academy is able to deal with issues of medical research and healthcare in their wide scientific and societal context. It is the Fellows' knowledge, influence and resources that are the Academy's most powerful assets. In 2012 I asked Professor Ros Smyth FMedSci to establish a task force to examine the representation of women in the Academy's Fellowship. This report of the task force was originally designed to inform the internal working processes of the Academy. However, I believe that an integral aspect of improving diversity is through sharing examples of success, and importantly, openly acknowledging where there is still crucial work to be done. As such, we have decided to publish this report on the data of our Fellowship in the hope that it will contribute to wider debate around what can be done to improve diversity and the representation of women in the biomedical workforce."

The Academy's core mission is to promote medical science and its translation into benefits for society. Recognising excellence in medical science therefore lies at the heart of all our work. Our elected Fellows – over 1000 – are central to our success and are drawn laboratory, clinical and population science and beyond; about half are clinical and half non-clinical (for want of a better descriptor). It is the diversity of our Fellows' talent that ensures the Academy is able to deal with complex health issues that extend across the traditional boundaries of medicine. Our 2012-2016 Strategic Plan committed us to reviewing the election process to ensure that the Fellowship fully represents excellence in medical science irrespective of gender, age, ethnicity, discipline, geographic location or workplace.

The Academy's Council has expressed concerns about the proportion of women Fellows a number of times over the years. As a result, a variety of informal processes had been established to encourage nominations of women biomedical researchers. These have certainly had some success, and in May 2012, we were delighted to announce that 15 out of 46 (33%) new Fellows were women - a significant improvement on previous years. However, to examine fully any potential discrepancies within our Fellowship election, in January 2012 the Academy's Council asked Professor Ros Smyth FMedSci to establish a small task force to explore the gender balance across the nomination and election process and to compare this with the composition of the wider academic workforce. Members were also asked to review approaches undertaken by other sectors and to identify examples of best practice from other UK and international academies, learned societies and institutions.

The work of the task force showed that, following the 2012 Fellowship election, there are 1061 Academy Fellows, and of these, 153 are women (14.4%). We were delighted that the analysis showed no significant difference in the rates of election between men and women candidates. Furthermore, comparative analysis of the composition of the Fellowship with data on the wider academic workforce indicated that the overall proportion of non-clinical women Academy Fellows is similar to the female non-clinical professorial workforce. However, this was tempered by serious concern that clinical academic women make up only 5% of the Fellowship, and that this proportion is markedly lower than the proportion of clinical female professors in medical schools.

On the basis of these considerations, the task force put forward a number of recommendations to the Academy's Council in June 2012. These included proposed adjustments to the election process to enable the Academy to more effectively monitor and encourage diversity, such as considering whether the criteria for nominations and elections could be made more explicit; requesting monitoring information for all candidates; and building on current informal practices to encourage the election of candidates from underrepresented groups, where candidates are equally strong.

The task force members also recommended that the Academy develops a model for a 'Proactive Nomination Committee', to increase diversity and encourage nomination of candidates from underrepresented areas to the Fellowship. In addition, there was strong support for the Academy to issue a public statement aimed at promoting the Academy's position towards gender equality and diversity, and to consider how the Academy may best assert its leverage in the future, perhaps in partnership with other national academies, learned bodies and funding councils, in order to encourage diversity in the wider academic workforce.

In the six months following these discussions we have already made great progress in implementing these recommendations. In July 2012 we published a public statement highlighting our commitment to encouraging diversity and equality of opportunity in the organisation, practices and work of the Academy.[1] We now request monitoring information from all candidates, to ensure that we have robust data to mark our progress against in the future, and have issued written guidance on the importance of diversity to the Sectional Committees, who assess candidates nominated to the Fellowship and make recommendations for election. I am also particularly pleased to announce that we are in the process of establishing a proactive nominations committee, which will work to ensure that the pool of candidates proposed for election to the Academy is drawn from the breadth of medical science, and is as diverse as possible with regard to gender, ethnicity, age and geography.

We continue to be actively involved in the excellent work of the Athena Forum, which seeks to advance the career progression and representation of women in science, technology, mathematics, and medicine (STEMM) in UK higher education, and to discuss these important issues with our colleagues in other Learned Societies and medical research charities. We look forward to working with the Royal Society in their programme of work aimed at increasing diversity in the scientific workforce.[2]

This report of the task force was undertaken to inform the internal working processes of the Academy. However, I believe that an integral aspect of furthering diversity is through sharing examples of success, and importantly, openly acknowledging where there is still crucial work to be done. As such, we have decided to publish this report on the data of our Fellowship in the hope that it will contribute to wider debate around what can be done to improve diversity in the biomedical workforce. I am immensely grateful to Professor Smyth, and all the members of the task force, for undertaking this important work, which I look forward to taking forward over the coming year.

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[1] Academy of Medical Sciences (2012). *Statement on diversity*. http://www.acmedsci.ac.uk/p60.html.
[2] Royal Society (2012). *Royal Society aims to bring more diversity to scientific workforce*. http://royalsociety.org/news/more-diverse-scientific-workforce/.

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Summary

The Academy of Medical Sciences promotes medical science and its translation into benefits for society. The diversity of talent amongst our elected Fellows ensures that the Academy is able to deal with complex health issues, which extend beyond traditional boundaries.

To ensure that policies and processes within the Academy encourage the nomination, election and full participation of women within the Academy's portfolio of activities, a small task force of Fellows was convened to consider the issues impacting on the representation of women in the Fellowship and within the academic workforce more widely. To assist this, an independent statistician was contracted to undertake an analysis of the gender balance across the nomination and election process, in order to identify whether there was gender bias in the Fellowship election process. This analysis looked at the gender distribution across the Fellowship as a whole, and across the candidate pool for the time period 2002 to 2012.

Following the 2012 Fellowship election, there are now 1061 Academy Fellows. Of these, 153 are women (14.4%) but only 5% are clinical academic women. The analysis showed that there was no significant difference in proportions of men and women being elected across the Academy; however, it is worth noting that for both clinical and non-clinical women, the confidence intervals are wide due to the small number of candidates in these groups, and there is likely to have been insufficient power to detect a difference (see Figure 1 and Table 1). Comparative analysis of the composition of the Fellowship with data on the wider academic workforce indicates that the overall proportion of women Academy Fellows is similar to the non-clinical professorial workforce; however, the proportion of clinical women Fellows is much lower than the proportion of women clinical professors in medical schools.

The analysis found that there was a significantly greater likelihood of non-clinical academic candidates being elected compared with clinical candidates. It also highlighted substantial geographical disparities in the Fellowship, with Fellows disproportionately located in London, the South East (including Oxford) and East Anglia (including Cambridge).

As a result of their deliberations, the task force members propose the following recommendations for consideration by the Academy's Council:

Adjustments to the existing election process

1. Consider whether the **criteria for nominations and elections can be made more explicit**.
2. Request **monitoring information** of all future candidates.
3. Build on current informal practices undertaken to increase the representation of women and other underrepresented groups within the Fellowship and **issue formal written guidance on the importance of diversity to Sectional Committees**.
4. Consider whether the additional four places recently created in the **floating Candidate pool be used to further the interests of women, where candidates are equally strong**.

New initiatives to increase the representation of women within the Fellowship

5. The task force recommends to Council that a model for a Proactive Nomination Committee be developed, to increase diversity and encourage nomination of candidates from underrepresented areas to the Fellowship.

6. Public statement of the Academy's position on diversity
7. The members of the task force would urge Council to consider issuing a public statement aimed at promoting the Academy's position towards gender equality and diversity.
8. Further, Council may wish to consider how the Academy may best assert its leverage in the future, perhaps in partnership with other national academies, learned bodies and funding councils, in order to encourage diversity in the wider academic workforce.

Introduction

The Academy of Medical Sciences promotes medical science and its translation into benefits for society. Excellent medical science and medical scientists are the key to breakthroughs in preventing and treating ill health and they underpin the UK's contribution to the international science endeavour. Recognising and promoting excellence in medical science therefore lies at the heart of all our work.

Our elected Fellows exemplify the excellence that we are seeking to promote and are central to our success. They are drawn from the biological sciences, clinical academic medicine, public and population health, health technology implementation, veterinary science, dentistry, medical and nursing care and other professions allied to medical science as well as the essential underpinning disciplines including mathematics, chemistry, physics, engineering, ethics, social science and the law.

The diversity of talent amongst our elected Fellows ensures that the Academy is able to deal with a complexity of health issues, which extend across and beyond the traditional boundaries of medicine. It is their knowledge, influence and resources that are the Academy's most powerful assets. In the 2012 to 2016 strategic plan for the Academy, we committed to strengthening the Fellowship by reviewing the election process to ensure that the Fellowship fully represents excellence in medical science irrespective of gender, age, ethnicity, discipline, geographic location or workplace.

The Academy's Officers and Council have previously expressed concern about the relatively small number of female Fellows within the Academy's Fellowship. To address this concern, a number of processes have been established over the past few years, including the circulation of written material at the start of the election cycle to encourage nominations of women candidates, along with proactive steps to ensure representation of women Fellows on Working Groups and Sectional Committees (SCs)[3] and to showcase women Fellows at Academy events. Explicit verbal guidance is also given to SCs that if all other things are equal between two candidates, then a candidate who can increase the diversity of the Fellowship would be preferred. Previous discussions at the Academy's Officers' meeting in 2009 also led to the establishment of an informal group of women Fellows to encourage the nomination of women candidates.

At the Academy's Council meeting in November 2011, and following discussion at the Officers' Meeting in January 2012 it was resolved that a small task force of Fellows should be convened to consider more formally the issues impacting on representation of women in the Fellowship and within the academic workforce more widely.

The task force was established in January 2012, chaired by Professor Rosalind Smyth FMedSci, and the following Terms of Reference agreed.

Terms of Reference

The task force will seek to:

- Explore the gender balance of the Fellowship, reviewing data available on the current Fellowship, nominations and elections across specialties/disciplines and localities. Where

[3] The annual election is overseen by the Registrar and the Fellowship Officer. All candidates are assessed by one of seven sectional committees, who make recommendations to Council. The process is governed by a set of standing orders, available at http://www.acmedsci.ac.uk/p165.html.

feasible, compare this with data on the composition of the academic workforce and identify any anomalies.

- Identify and review data available on the proportion of women who hold senior academic positions, gain prestigious academic awards and secure senior research funding.
- Identify examples of best practice from other UK and international academies, learned societies and institutions, and review approaches undertaken by other sectors.
- Recommend best practice for the Academy's processes and consider ways in which the Academy might contribute nationally to improving gender imbalance in the biomedical academic workforce.
- On the basis of these considerations the task force was able to make a number of recommendations and comments about the ways in which the Academy might contribute nationally to improving diversity in the biomedical academic workforce.

Overview of the composition of the Fellowship

An independent statistician undertook an analysis of the gender balance across the Fellowship, in order to identify whether there was gender equality in the nomination and election process. This analysis looked at the distribution of men and women in the Fellowship and the candidate pool. Fellowship data are based on the current composition of the Fellowship following the 2012 elections unless otherwise specified. Candidate data are based on the pool from 2002 to 2012; analysis of the candidate pool prior to 2002 was not feasible due to a lack of data. A brief overview of the data and the results of the analyses are provided below.

Gender equality in the nomination process

Election to the Fellowship is an annual process overseen by the Registrar and the Fellowship Officer. Nominated candidates must be supported by three Fellows of the Academy; candidates nominated for the first time are automatically eligible for election for 5 consecutive years. All candidates are assessed by one of seven sectional committees (SCs) which make recommendations to Council in April.[4] Prior to the 2012 elections, 40 Fellows were elected each year with up to 33 Fellows selected through the fixed SC allocated quota, and the remaining 7 selected through the floating candidate pool. In 2011, Council agreed to increase the total number elected each year to 44, maintaining the 33 Fellows to be selected through the SCs and increasing the number that could be elected from the floating candidate pool to 11. However, in 2012, SCs selected 34 Fellows and Council decided to elect all 12 floating candidates, bringing the total to 46 new Fellows. Council agreed that this would be an extraordinary year, and that 44 Fellows would be elected in future years.

In order to determine whether there was gender bias in the nomination process, the probability of election into the Fellowship was investigated using Kaplan Meier (KM) survival analysis, which can compare the probability of election for different groups over the 5-year election period. The KM analysis looked at all individuals nominated into the candidate pool from 2002 to 2012, categorised by gender (male, female) and academic classification (clinical or non-clinical). The distribution of the candidates was then compared across each of four categories:

- Male clinical.
- Male non-clinical.
- Female clinical.
- Female non-clinical.

The results show that:

- The majority of the candidates were male (81.9%).
- A similar proportion of the candidates were clinical (49.3%) and non-clinical (50.7%).
- Clinical candidates were significantly less likely to be elected than non-clinical candidates ($p=0.02$).
- No significant difference was found in the probability of election of men and women; however the confidence intervals were wide.
- Female clinical candidates had a low probability of early election into the Fellowship; this was an apparently large effect but not statistically significant.

The wide confidence intervals were due to the small numbers of clinical and non-clinical females candidates and there is limited power to detect a difference (see Figure 1 and Table 1 below).

[4] Academy of Medical Sciences (2009). *Standing Orders.* http://www.acmedsci.ac.uk/p165.html

Figure 1: Kaplan Meier probability of election into the Fellowship by gender and specialty

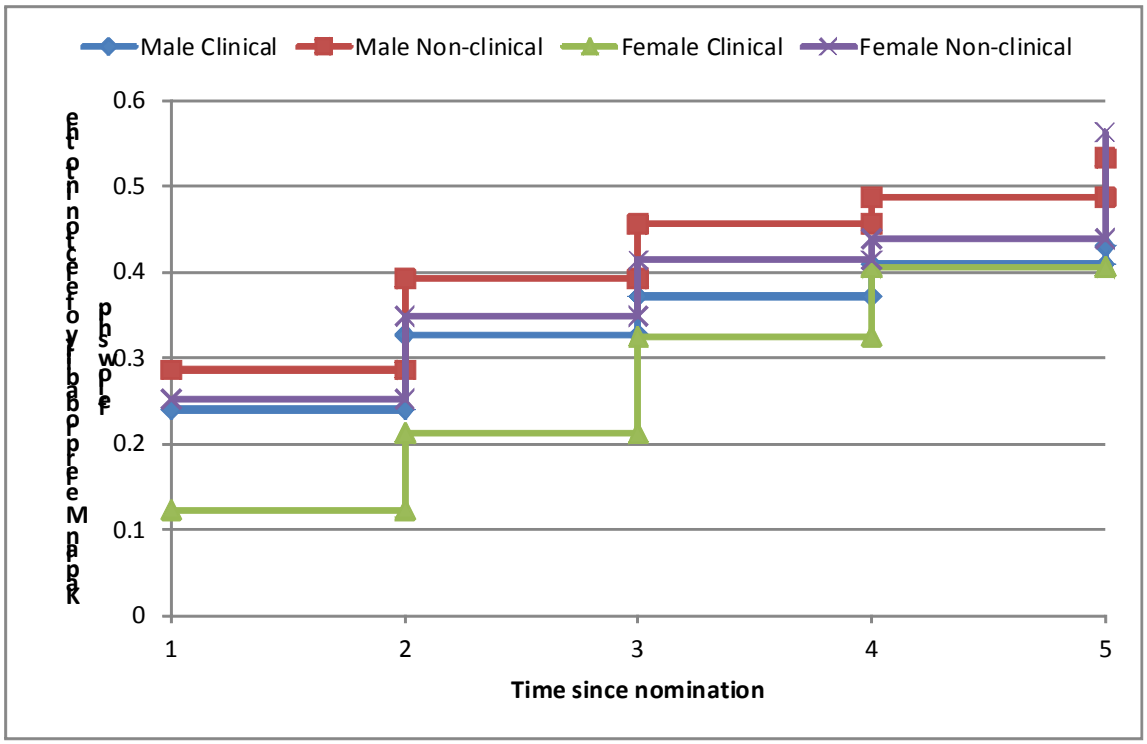


Table 1: Kaplan Meier probability of election into the Fellowship (95% confidence interval)

	Candidate group			
Year since elected	Male		Female	
	Clinical	Non-Clinical	Clinical	Non-Clinical
Year 1	0.24 (0.20-0.28)	0.29 (0.24-0.33)	0.12 (0.04-0.20)	0.25 (0.18-0.33)
Year 2	0.33 (0.28-0.37)	0.39 (0.34-0.44)	0.21 (0.11-0.32)	0.35 (0.26-0.43)
Year 3	0.37 (0.33-0.42)	0.46 (0.46-0.51)	0.33 (0.20-0.45)	0.41 (0.32-0.51)
Year 4	0.41 (0.36-0.46)	0.49 (0.49-0.54)	0.41 (0.26-0.55)	0.44 (0.34-0.53)
Year 5	0.43 (0.38-0.48)	0.53 (0.48-0.59)	0.41 (0.26-0.55)	0.56 (0.46-0.67)

After considering the candidate data in detail, the task force noted that the representation of women within the candidate pool for the period 2002 to 2012 was low (18.1%), particularly so with regard to women clinical academic candidates (6.3%), which merited further discussion. Reasons for this were thought to be broad and complex, reflecting the difficulties in achieving the highest levels of excellence in both clinical practice and academic research for both men and women working within clinical research. However, additional factors such as the nature and organisation of science and technology, long and/or antisocial working hours and the need for frequent travel, may impact disproportionately on women, who often take the lead role in child care and other family commitments alongside work.

An analysis of the gender of Fellows nominating women candidates revealed that there was no significant difference between the proportion of female Fellows (17.0%) and male Fellows (13.0%) who nominated female candidates to the pool.[5]

Gender equality in the Fellowship

Following the 2012 election the Academy has 1061 Fellows, of whom 153 are women (14.4%). In order to examine gender representation within the Fellowship, the analysis looked at the distribution of all Fellows. The variables analysed included gender (male, female) academic category (clinical, non-clinical), age at time of election and region. The distribution of the Fellows was then compared across each of the four categories outlined above.

The data show that:

- 33% of new Fellows in 2012 were female (15 of 46), an increase of more than double from the previous year (15.0% in 2011).
- The majority of Fellows are male (85.6% as of 2012).
- There are more non-clinical female Fellows (9.4% of the total) than clinical female Fellows (5.0% of the total, as of 2012).

Table 2: Cross-tabulation of gender and academic category including 2012 data (% of total Fellowship)

Gender	Academic category		Total
	Clinical	Non-clinical	
Male	507 (47.8%)	401 (37.8%)	**908 (85.6%)**
Female	53 (5.0%)	100 (9.4%)	**153 (14.4%)**
Total	**560 (52.8%)**	**501 (47.2%)**	**1061 (100.0%)**

The task force also considered if it was possible to determine whether there is a temporal increase in women coming through from nomination to election. The average election rate for women over the past four years is 19.3% (32 out of 166). This is higher than the proportion of women within the total Fellowship, currently standing at 14.3%. The 'safety net' change in policy in 2010 to ensure that all candidate applications are sent out to peer review at year 5 if they have not previously been reviewed was considered as a factor which could have improved female candidates' chances of election. However, there was considered to be insufficient data prior to 2007 to be able to determine the specific impact of this change.

Distribution of Fellows by age (up to 2011)

The following data are based on the composition of the Fellowship as it stood in 2011, as the 2012 election results were not known when the statistician undertook this analysis.

The median age of the Fellows at time of election into the Fellowship was 52 years (interquartile range 47-58 years). The age of the candidates elected into the Fellowship was similar in the four different groups (Table 3).

[5] Figures taken from Fellowship nomination data for the period 2006 to 2011.

Table 3: Median age (interquartile range) of Fellows at the time of election

	Gender	
Specialty	**Female**	**Male**
Clinical	52 (47-57)	52 (47-58)
Non-clinical	52 (47-58)	53 (49-57)

Task force members noted that this finding could be taken as either positive or negative. Members noted that it might be expected that the median age of election for women would be higher, following career breaks for family formation. The lack of a difference in the median age of election could also indicate that women who are elected into the Fellowship have tended to avoid taking career breaks, and that those who do take career breaks tend not to achieve the highest academic positions and be considered eligible for election. Task force members highlighted the need to take into account the wider social context, and the shift towards policies enabling work-life balance in recent years. However, it was also noted that the underlying culture in Science, Technology, Engineering and Medicine (STEM) still tends to marginalise women and men who adopt work–life balance policies, and that the transition into career breaks, and the transition back to work, is often poorly managed.[6]

Distribution of Fellows by geographical region (up to 2011)

The following data are based on the composition of the Fellowship as it stood in 2011, as the 2012 election results were not known when the statistician undertook this analysis.

The statistician also analysed the geographical spread of the Academy's Fellowship to examine whether geographical location had an impact on the distribution of women Fellows within the Academy.

The results show that:

- Over a third of all Fellows are located in London (35.6%).
- The remaining two thirds are disproportionately located in the South East (15.2%), East Anglia (14.3%) and Scotland (9.8%).
- Only 25.1% are located elsewhere in the UK.
- The distribution across the different regions appears to be similar for male and females.

The task force saw the lack of representation in the regions as a two-fold problem; (i) the restriction of geographical diversity in the Fellowship and (ii) the potential to disproportionately disadvantage women from election, given that previous research has indicated that women who have children have less geographical mobility than men who have children, thereby limiting their ability to relocate.[7]

It was further observed that the high density of Fellows within London, East Anglia and the South East may lead to a clustering effect, with the majority of nominations and elections coming from geographical areas that are already over-represented, thereby perpetuating the imbalance.

[6] EC (2009), *Women in science & technology: Creating sustainable careers*. Directorate-General for Research. Available at: http://ec.europa.eu/research/science-society/document_library/pdf_06/wist2_sustainable-careers-report_en.pdf.

[7] Caprile, M. And Valles, N. (2010) *Meta-analysis of gender and science research topic report: Science as a labour activity*. Luxembourg: Publications Office of the European Union. Available at: http://www.genderandscience.org/doc/TR4_Labour.pdf

How the representation of women within the Fellowship compares to the wider UK academic workforce

Gender representation of women in the wider workforce

In order to compare the representation of women within the Academy's Fellowship to the representation of women within the wider UK academic workforce, the task force examined recent data on the composition of the academic workforce in STEM and specifically working within clinical academic medicine and the biosciences. Data for this analysis were gathered from funders and other organisations such as the Higher Education Statistics Agency (HESA), the Higher Education Funding Council for England (HEFCE) and the Medical Schools Council (MSC), and included data on the numbers of women securing funding or gaining posts at both junior and senior levels.

The data demonstrate that:

- Women are still underrepresented in senior academic positions within STEM subjects, even in subjects such as the biosciences, where women are well represented at the early career stages.[8]
- At professorial level, the representation of women within the academic workforce is 15.0% in Biology, 7.0% Chemistry, 5.0% Engineering, 12.5% Computing, 5.0% Maths and 6.0% Physics.[9]
- There is clear attrition across career grades in HEIs within both the clinical and non-clinical workforce.
- Women accounted for 44.4% of positions below professorial level, but only 15.5% at professorial level within the biosciences in UK HEIs for 2010/2011. See Appendix I for supporting data (N.B. further breakdown of staff career grades below the level of professor were not available through HEFCE data).[10]
- Women accounted for 32.0% of positions below professorial level, but only 14.5% at professorial level within clinical academic medicine across UK medical schools for 2010/2011.[11]

Gender representation in the Fellowship compared to the wider workforce

The proportion of clinical and non-clinical female Fellows were compared to the wider UK distribution of female clinical professors within medical schools and non-clinical professors working within the biosciences, using data sourced from the MSC and HEFCE respectively.

The results found that:

- Within non-clinical research, the proportion of women Fellows (20.0%) is slightly higher than the average percentage of women professors (15.5%). See Appendix for supporting data.[12]
- Within clinical research, the proportion of women Fellows (9.5%) is considerably smaller than the average percentage of women professors (14.5%), suggesting that clinical women Fellows are underrepresented in the Fellowship.[13]

[8] The UKRC (2010). *Statistics: women and men in STEM, the UK statistics guide 2010.* Available at: http://www.theukrc.org/files/useruploads/files/final_sept_15th_15.42_ukrc_statistics_guide_2010.pdf

[9] Aggregation data informed by HESA Women in SET statistics 2007/08-2008/09. Available at: http://www.athenaswan.org.uk/html/athena-swan/about-the-charter/women-in-set-statistics-200506/in-women-in-set-statistics-200708200809/.

[10] Figures provided by HEFCE, sourced from HESA Data 2010/2011.

[11] Medical Schools Council (2011). *Clinical academic staffing levels in UK Medical Schools.* http://www.medschools.ac.uk/AboutUs/Projects/Documents/Clinical_Academic_Staff_Survey_as_at_July_2010.pdf

[12] Figures provided by HEFCE, sourced from HESA Data 2010/2011.

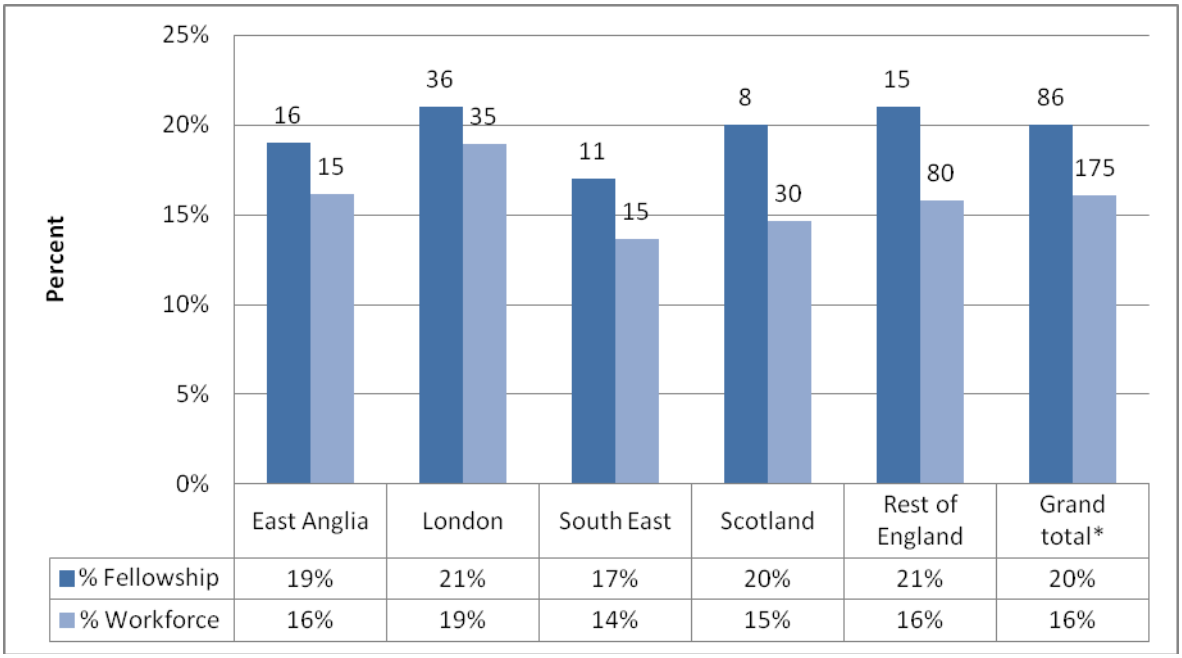
[13] Medical Schools Council (2011). *Clinical academic staffing levels in UK Medical Schools*. As before.

The proportion of clinical and non-clinical womenFellows was further compared to the wider UK workforce by regional distribution. The following data are based on the composition of the Fellowship as it stood in 2011, as the 2012 election results were not known when the statistician undertook this analysis.

The results show that:

- Within non-clinical research, the proportion of women Fellows is slightly higher than the average percentage of non-clinical women professors in each of the five regions shown below in Graph 1. See Appendix for supporting data.[14]
- Within clinical research, the proportion of women Fellows is considerably smaller than the average percentage of clinical women professors in each of the five regions shown below in Graph 2. See Appendix for supporting data.[15]

Graph 1: Proportion of women non-clinical Fellows compared to proportion of women non-clinical professors within biosciences in HEIs, by region (up to 2011)



	East Anglia	London	South East	Scotland	Rest of England	Grand total*
% Fellowship	19%	21%	17%	20%	21%	20%
% Workforce	16%	19%	14%	15%	16%	16%

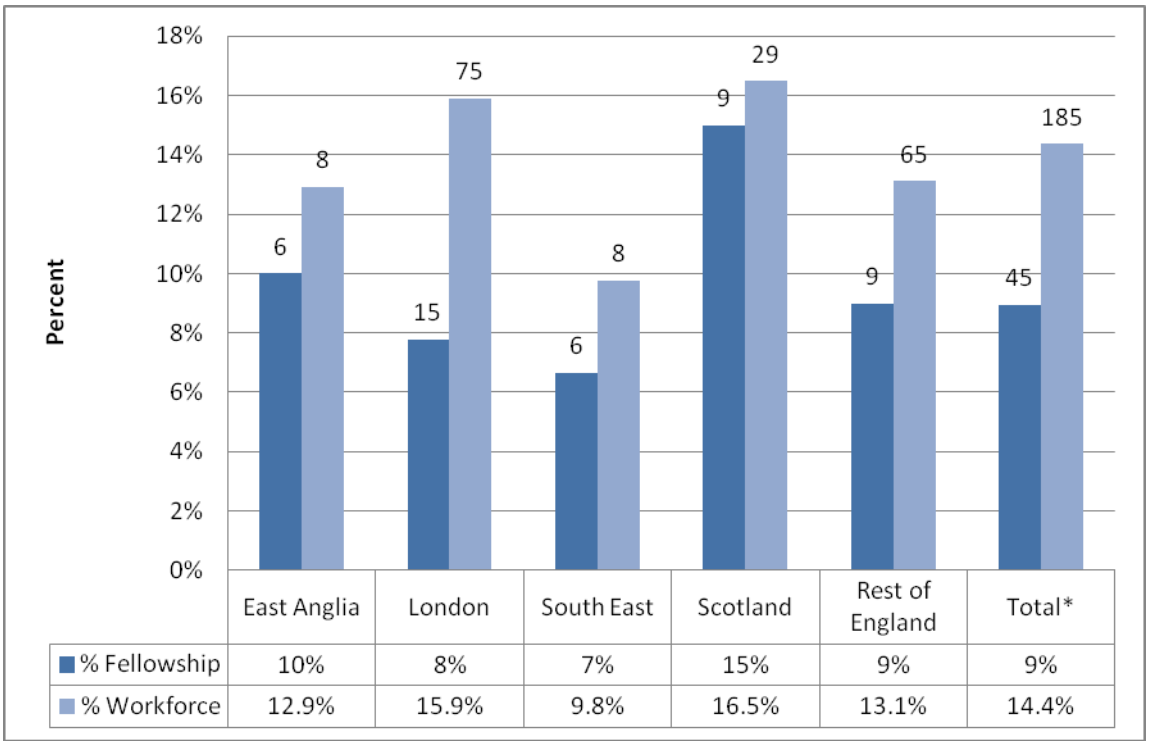
* Excluding data for NI, Republic of Ireland, Wales and International, due to very low numbers of Fellows.

** Absolute numbers are shown above the bars.

[14] Figures provided by HEFCE, sourced from HESA Data 2010/2011.

[15] Medical Schools Council (2011). *Clinical academic staffing levels in UK Medical Schools*. As before.

Graph 2: Proportion of women clinical Fellows compared to proportion of women clinical professors in medical schools, by region (up to 2011)



	East Anglia	London	South East	Scotland	Rest of England	Total*
% Fellowship	10%	8%	7%	15%	9%	9%
% Workforce	12.9%	15.9%	9.8%	16.5%	13.1%	14.4%

* Excluding data for NI, Republic of Ireland, Wales and International, due to very low numbers of Fellows.

** Absolute numbers are shown above the bars.

Differences within clinical specialties (up to 2011)

The analysis also examined a subset of the Fellowship data to compare the distribution of the women clinical Fellows, by specialty, to the Medical Schools Council data on the distribution of women clinical professors working in each specialty.

The following data are based on the composition of the Fellowship as it stood in 2011, as the 2012 election results were not known when the statistician undertook this analysis. It was not possible to do the same analysis for the non-clinical Fellows as equivalent comparison data were not available.[16]

The analysis indicates that:

- Clinical women Fellows are drawn from a wide range of specialities.
- Of all clinical women Fellows, the most highly represented speciality is the general category of Physicians/Medicine (47.0%) which is reflected in the number of clinical women working within this same category of Physicians/Medicine in the wider workforce (35.0%).
- Clinical women Fellows specialising in surgery (0%) and academic General Practitioners (2.0%) appear to be underrepresented in the Fellowship compared to the wider workforce (3.0% and 10.6% respectively).

[16] Medical Schools Council (2011). Clinical academic staffing levels in UK Medical Schools. As before.

Representation of women securing research funding across career grades

The task force also assessed data sourced from funders, professional bodies, institutes and other relevant organisations regarding the numbers of women applying for and securing clinical and non-clinical academic fellowship awards from research funders, to identify if there is attrition as women progress up the career grades. Data were obtained from the Medical Research Council, the Wellcome Trust, the British Heart Foundation, Arthritis Research UK, the Biotechnology and Biosciences Research Council, the National Institute for Health Research and the Biochemical Society.

Where funders had comparable schemes, data have been amalgamated. The awards data shown below are categorised by clinical/non-clinical status and according to the level of fellowship award. Data showing the percentage of women applying for/attaining senior awards are also shown, along with data on the respective award rates for men and women.

The data presented below show that:

- At the junior level the proportion of women and men applying for, and attaining awards is broadly equivalent across both non-clinical and clinical research.
- Within non-clinical research, there is notable attrition in the proportion of women applying for awards at the intermediate and senior level; however the award rate for women and men is broadly equivalent (see Table 4 and Graph 3 below).
- Within clinical research, there is heavy attrition in the proportion of women applying for awards at the intermediate and senior level and, at the senior level, the award rate is also markedly decreased (see Table 5 and Graph 4 below).

Table 4: Overview of the proportion of women applying for and attaining research funding across career grades within non-clinical research

Non-clinical	Total apps	No. women app's	% women applying	Total awards	No. women awards	% women awards	Award rate women	Total award rate
Junior*	378	173	46%	88	38	43%	22%	23%
Intermediate**	863	352	41%	160	64	38%	18%	19%
Senior***	221	69	31%	73	22	30%	32%	33%

* Summary of 5 yrs (06/2007 - 10/2011) data from WT.

** Summary of 5 yrs (06/2007 - 10/2011) data from WT, 2 yrs (2009 - 2011) data from MRC, and 9 yrs (2003 -2011) data from ARUK.

*** Summary of 5 yrs (06/2007 - 10/2011) data from WT and 2 yrs (2009 - 2011) data from MRC.

Graph 3: Proportion of women non-clinical academics applying for and attaining Fellowship awards

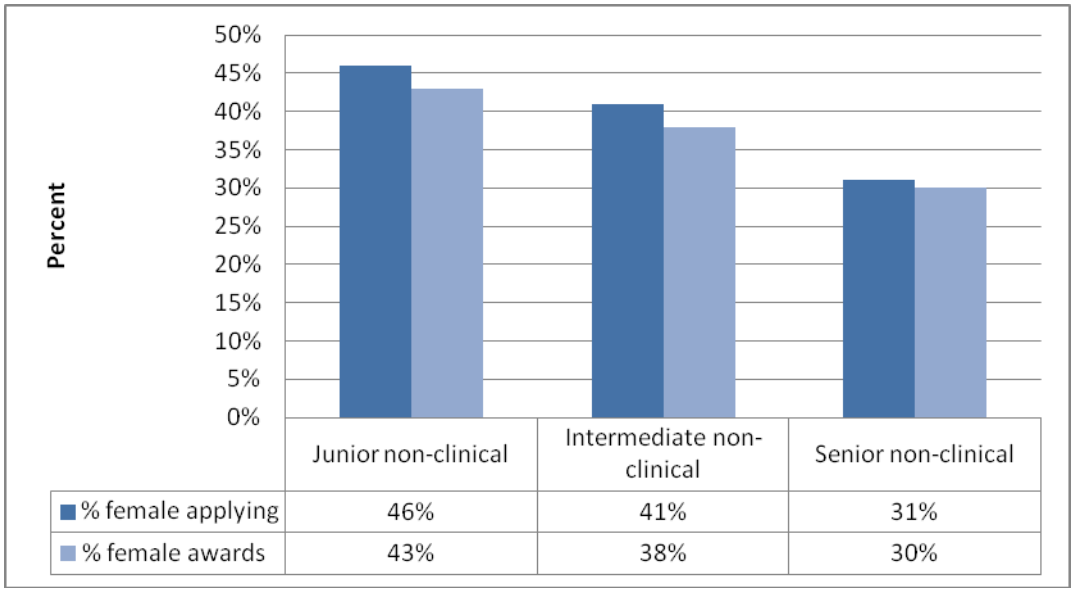


Table 5: Overview of the proportion of women applying for and attaining research funding across career grades within clinical research

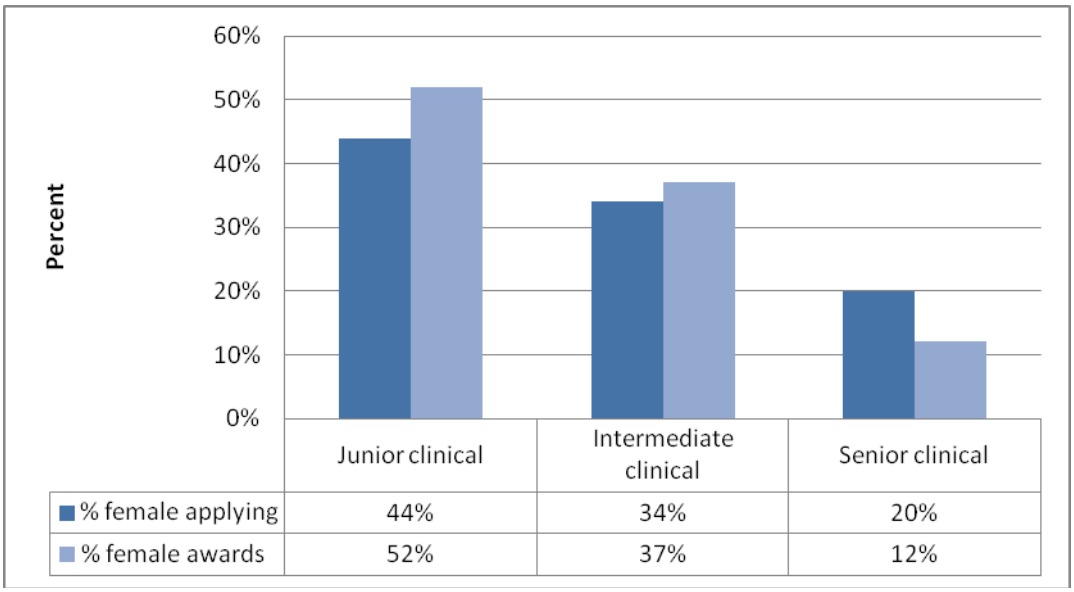
Clinical	Total apps	No. women app's	% women applying	Total awards	No. women awards	% women awards	Award rate women	Total award rate
Junior*	1485	656	44%	170	88	52%	13%	11%
Intermediate**	440	148	34%	235	88	37%	59%	53%
Senior***	127	25	20%	49	6	12%	24%	39%

* Summary of 5 yrs (06/2007 - 10/2011) data from WT, 2 yrs (2009 - 2011) data from MRC, and 9 yrs (2003 - 2011) data from ARUK

** Summary of 5 yrs (06/2007 - 10/2011) data from WT, 2 yrs (2009 - 2011) data from MRC, 9 yrs (2003 - 2011) data from ARUK and 2 yrs (2010 - 2011) data from NIHR.

*** Summary of 5 yrs (06/2007 - 10/2011) data from WT and 2 yrs (2009 - 2011) data from MRC.

Graph 4: Proportion of women clinical academics applying for and attaining Fellowship awards



Sustaining the pipeline of women clinical academics

There has been a significant increase in the proportion of women students studying medicine over the few decades (from 24.4% in 1960/61 to 56.2% in 2008/09), which has not been matched by a parallel increase in the number of women graduates pursuing academic medicine. This was noted to be of particular concern because a reduced academic workforce may severely limit the proportion and standard of clinical research conducted in the future. The Academy should use its national position to work with other stakeholders to address the disincentives to women following the clinical academic career pathway.[17]

[17] Deech (2009). *Women doctors: making a difference.* Report of the Chair of the National Working Group on Women in Medicine. Available at: http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_115374.pdf

How the representation of women within the Fellowship compares to the international academic workforce

The task force considered data available on the representation of women within the international academic workforce. The UK has comparable representation of women at professorial level across STEM departments when compared to other European countries, whilst the US is slightly ahead of the UK in terms of representation of women within clinical and non-clinical academic medicine.[18,19]

Numerous and diverse measures to address the underrepresentation of women within the biomedical sciences can be observed internationally. However, it was noted that there was little detailed work evaluating the impact of different policies to address gender imbalance in STEM in the UK. The recent Scottish strategy on women in STEM found that although the range of past and current initiatives in the UK is diverse and welcome, they have often tended to be *ad hoc,* short-term and uncoordinated with other such initiatives. It noted the need for improved co-ordination among initiatives, along with clear lines of accountability for delivery of the policies.[20,21]

The task force members debated what an appropriate target or measure of success in terms of gender representation within the Fellowship and within the UK workforce more broadly would be. Such a target was considered necessary to be able to benchmark existing and future initiatives. Data from the US indicates that the proportion of women who hold full professorial positions across clinical and non-clinical academic medicine within US medical schools has increased by 58.0% over a ten year period, from 12.0% in 1999 to 19.0% in 2009. Comparative data for the same period within the UK were not available; however, for the period 2005 to 2009, the proportion of female professors within Biology in HEIs increased from 12.6% to 14.7%, and for the period 2006 to 2010, the proportion of female clinical academic professors within UK medical schools increased from 11% in 2006 to 14.5% in 2010. [22,23,24,25]

The Royal Society of Chemistry's President-Elect has recently stated on the Radio 4 'Today' programme and in a press release that Great Britain is half a century behind the US when it comes to opportunities for women in science.[26,27] Professor Lesley Yellowlees pointed to the work of the

[18] European Commission (2009) *She Figures Report 2009, Statistics and Indicators on Gender Equality in Science*. Available at:http://ec.europa.eu/research/science-society/document_library/pdf_06/she_figures_2009_en.pdf

[19] AAMC (2011) *Women in U.S. Academic Medicine: Statistics and Benchmarking Report 2009-2010.* Available at: https://members.aamc.org/eweb/upload/Women%20in%20U.S.%20Academic%20Medicine%20Statistics%20and%20Benchmarking%20Report%202009-2010.pdf.

[20] The Royal Society of Edinburgh (2012) *Tapping all our talents. Women in science, technology, engineering and mathematics: a strategy for Scotland*. Available at: http://www.rse.org.uk/1027_Report.html.

[21] Whyte, R. (2010). *Women in Science and Engineering Research Project, Scottish Government Social Research study*. Available at: http://www.theukrc.org/files/useruploads/files/resources/women_in_science_and_engineering_research_project,_scottish_govt_,_dec_10.pdf.

[22] AAMC (2011) Women in U.S. Academic Medicine: Statistics and Benchmarking Report 2009-2010. As before.

[23] Informed by HESA Women in SET statistics 2005/06-2008/09. Available at: http://www.athenaswan.org.uk/html/athena-swan/about-the-charter/women-in-set-statistics-200506/ and http://www.athenaswan.org.uk/html/athena-swan/about-the-charter/women-in-set-statistics-200506/in-women-in-set-statistics-200708200809/

[24] Medical Schools Council (2007). *Women in Clinical Academia: attracting and developing the medical academic workforce of the future*. Available at: http://www.medschools.ac.uk/AboutUs/Projects/Documents/WomeninClinicalAcademiaReport2007.pdf

[25] Medical Schools Council (2011). *A survey of staffing levels of medical clinical academics in UK medical Schools.* http://www.medschools.ac.uk/AboutUs/Projects/Documents/Clinical_Academic_Staff_Survey_as_at_July_2010.pdf

[26] Radio 4 Today programme (2012) 9 May 2012. Available at: http://news.bbc.co.uk/today/hi/today/newsid_9719000/9719553.stm.

[27] RSC (2012) Britain half a century behind the United States when it comes to women in science, says RSC President-Elect. 8 May 2012 Press Release. Available at: http://www.rsc.org/AboutUs/News/PressReleases/2012/lesley-yellowlees-science-scotland-women.asp.

Association for Women in Science (AWIS), which was founded in 1971, as a basis for how far equality issues have progressed in the US, and noted that in the 2012 elections to the National Academy of Science, 24 of the 84 (28.6%) were women, compared to the 2012 elections at the UK Royal Society, where just 2 of the 44 (4.5%) were women. Task force members felt that the US could be taken as a useful guide when considering the success of measures taken to increase participation.

The Academy's position

The task force members were pleased to note that there was no significant difference between men and women in the Kaplan Meier probability of election into the Fellowship.
The task force also noted that the representation of women on the Sectional Committees (SCs) is good (approximately 20.0%), but encourages Council to ensure that this representation continues and increases, provided that such participation does not place an undue burden on a limited pool of women from which members are drawn.

However, the analyses did raise concerns about the underrepresentation of women clinical academics. Further, it was noted that due to the lack of power of the analysis because of the small numbers involved, an absence of evidence of bias should not be interpreted as evidence that there is no problem regarding the representation of women within the Fellowship. As such, the task force members would urge Council to consider what more the Academy could do to promote diversity and the participation of women, both within the Fellowship and within the workforce more widely.

Enabling women to enter into clinical and non-clinical research, and to attain equal representation at senior levels, will require broad cultural and structural changes within society across a wide variety of institutions. While the task force readily acknowledge that such a shift cannot be achieved by the Academy alone, the members consider that the Academy could review and refine its own policies to ensure that its internal processes encourage and promote diversity and set a leading example of best practice among professional and learned societies.

There are a number of published reports which make recommendations on how to address these issues, some of which are being followed up, and notably, the Royal Society and Royal College of Engineering recently launched a four-year equity and diversity programme to address some of the issues in the wider academic workforce.[28,29,30] The Academy's work could build on the findings of the Athena Forum (a legacy organisation of the Athena Project), who issued a 'Guide to Good Practice for Professional and Learned Societies' in 2009.[31] This recommended that professional and learned societies develop schemes to encourage, recognise and benchmark good practice, and to publicise findings on research undertaken into women's representation in order to identify, encourage and disseminate good practice.

Initiatives undertaken to increase the representation of women among other professional and learned societies

The Athena Forum report noted that there are a number of different approaches and successful initiatives amongst key professional bodies, which have varying resource commitments, and which other key bodies could learn from. As such, in order to inform the deliberations of the task force and its recommendations to Council, the members considered in detail the practices used to enhance diversity amongst a number of key professional and learned societies based on an elected Fellowship model, and found the adaptations and changes undertaken at the Royal Academy of

[28] The Royal Society of Edinburgh (2012). *Tapping all our talents*. As before.
[29] Medical Schools Council (2007). *Women in Clinical academia, attracting and developing the medical and dental workforce of the future*. As before.
[30] BMA (2008) *Women in Academic Medicine Report, developing equality in governance and management for career progression.* Available at: http://www.bma.org.uk/images/Womenacademicmedicine_tcm41-178228.pdf.
[31] Athena Forum (April 2009). Report 1, Women's Career Progression and Representation in Science, Technology, Engineering, Mathematics and Medicine (STEMM) in Higher Education. A Guide to Good Practice for Professional and Learned Societies. Available at: http://www.athenasurvey.org.uk/originals/athena_forum_report1.pdf.

Engineering (RAEng) and the Institute of Medicine (IoM) to be worthy of particular consideration by Council (see Boxes 1 and 2).[32]

The German National Academy of Sciences Leopoldina, which has very proactive positive discrimination measures whereby all women of scientific standard for membership (as deemed by the standard election process) are guaranteed membership, was also considered by the task force. However, the task force members did not think it was appropriate to pursue this model at this time. It was noted that Council may want to conduct a general review in two years time and at that point it may be appropriate to consider other models, depending on how the Fellowship composition has changed.

Box 1: The Proactive Membership Committee at the Royal Academy of Engineering

The RAEng currently has 1477 Fellows, of which 51 are female (3.5%). The majority of women within the RAEng's Fellowship have been elected in the last five to eight years. As a comparison, data from the Higher Education Statistics Agency indicate that female academics working within engineering make up 5.0% of the wider academic workforce at professorial level.

The RAEng has been working on the issue of diversity within their membership for the last few years and undertook an internal report Chaired by Sir Peter Gershon CBE FREng in 2007. On the basis of the recommendations of the Study Group, the RAEng established a Proactive Membership Committee made up of 9-10 Fellows which is tasked by the RAEng's Council to seek out and nominate candidates from minority groups.

These candidates then go through the same Selection Panel and review process as any other candidate to ensure a level playing field but the Proactive Membership Committee enables more women, candidates from ethnically diverse backgrounds, small and medium-sized enterprises, industry and novel areas of technology, to join the pool, whom RAEng Fellows, as nominators, may normally not come across.

Members of the Proactive Membership Committee actively research (and sometimes interview) the candidates to put forward for Fellowship nomination, with the assistance of a dedicated member of staff, who manages this process. Since it was established in 2008, the number of nominations of women has increased by between three to seven times (from approximately 1-2 per year pre-2008, to 7 in 2011). This has resulted in an increase of elections of women each year by nearly fivefold (under 3.5% pre-2008, to 17.0% in 2011). See http://www.raeng.org.uk/about/fellowship/council/pro_active_membership.htm for further details.

In April 2012 the RAEng received a SET Fair Standard award, which is the gender equality award for businesses and organisations in STEM, for its work in promoting gender equality best practice both in-house and to the wider engineering community.

[32] The information provided in Boxes 1 and 2 have been informed by members of the RAEng's office and IoM office respectively.

Box 2: The use of 'at large' slots to encourage diversity at the US Institute of Medicine (IoM)

The IoM currently has more than 1,700 elected members. They were unable to provide specific statistics relating to their Fellowship composition; however, they noted that they would like the representation of women within their institution to be higher. In 2011, 44 clinical Fellows were elected of which 13 (29.6%) were female, and 29 non-clinical Fellows were elected, of which 12 (41.4%) were female.

In order to encourage diversity, in 2008 the IoM established 9 'at-large' slots, over and above the base number of allocated slots for each Sectional Committee, which are specifically set aside to take into account diversity within their membership. This allows for specific consideration of candidates on the basis of gender, age, race/ethnicity and geography.

Each section is allowed to propose two candidates for the 'at large' demographic diversity slots (resulting in 24 candidates) from which 9 member places are allocated. The IoM note that, because of the increased focus on diversity and gender representation across the board, the number of women gaining base slots is increasing year on year, so the impact of the 'at-large' diversity slots goes beyond the direct number of diversity slots available.

Recommendations to Council

On the basis of the task force's discussions, the members of the task force would like to propose the following recommendations for consideration by Council. These are divided into:

- Adjustments to the Academy's current process.
- A new initiative the Academy could consider adopting to increase the representation of women within the Fellowship.
- Proposal for producing a public statement on the Academy's position on diversity.

Although this task force specifically addressed gender imbalance in the Academy, the members believe that the following recommendations could also help to increase diversity, such as ethnicity, geography and speciality, in the Fellowship more broadly and would urge Council to take this into consideration when deciding whether, and if so how, to take the recommendations forward.

Adjustments to the existing election process

1. Consider whether the **criteria for nominations and elections can be made more explicit**.
   This is based on evidence from the recent strategy on women in science, technology, engineering and mathematics for Scotland, which found evidence that the more transparent the process, the more likely women are to consider themselves good candidates; however, it would be helpful to all nominees. More specific guidance could be given on the qualities expected of successful candidates, perhaps by listing in rank-order the criteria to be used in selection.

2. Request **monitoring information** of all future candidates.
   This would enable the Academy to keep a better overview of the composition of the Fellowship and candidate pool, e.g. gender, disability and ethnicity.

3. Build on current informal practices undertaken to increase the representation of women and other under-represented groups within the Fellowship and **issue formal written guidance on the importance of diversity to Sectional Committees**.
   This could take the form of written guidance on the importance on gender balance and diversity that is normally issued to all the SC Chairs at the start of the election process, to raise awareness of the need to increase diversity within the Fellowship. This could aid SC Chairs in balancing quality against quantity of research and achievement, which may help to correct for the impact of family responsibilities.

4. Consider whether the additional four places recently created in the **floating Candidate pool be used to further the interests of women, where candidates are equally strong**.
   Council may wish to consider retaining the additional four places in the floating candidate pool, rather than allocate them to specific SCs, and use these to increase diversity, whilst ensuring current processes of nomination and assessment are retained and kept consistent. The task force felt that where two candidates in the pool are equally strong and competing for one place in the Fellowship, preference should be given to female candidates. This would implement the recommendations of the Royal Society of Edinburgh's strategy for women in STEM. Council could also consider using these to address representation of other groups including ethnic minorities. This would formalise existing verbal guidance given to SCs that if all other things are equal between two candidates then a candidate who increased the diversity of the Fellowship would be preferred.

New initiatives to increase the representation of women within the Fellowship

5. The task force recommends to Council that a model for a **Proactive Nomination Committee be developed**, to increase diversity and encourage nomination of candidates from under-represented areas to the Fellowship.
Such a committee could work across all SCs to encourage a greater range of applications, based on the values of widening participation and encouraging diversity, and would actively seek out and nominate female candidates. These candidates would still then go through the same Selection Panel and review process as any other candidate to ensure a level playing field, but the Proactive Nomination Committee (PNC) would enable more female candidates to enter the nomination process. Members of the PNC should pro-actively identify suitable candidates to put forward for Fellowship nomination, perhaps with the support of an Academy staff member. Council may wish to further monitor the impact of these measures by conducting a review. The PNC could also be tasked with defining targets or outcome measures for policies initiated to address diversity, by which future success may be measured.

Public statement of the Academy's position on diversity

6. The members of the task force urge Council to consider issuing a **public statement** aimed at promoting the Academy's position towards gender equality and diversity.
The recent strategy on women in science, technology, engineering and mathematics for Scotland recommended that the governors of academies, learned and professional bodies should publicise a statement welcoming and encouraging the full participation of women in that body and its academic discipline.[33] This would disseminate good practice and demonstrate the importance of diversity to the Academy.

7. Further, Council may wish to **consider how the Academy may best assert its leverage in the future**, perhaps in partnership with other national academies, learned bodies and funding councils, in order to encourage diversity in the wider academic workforce. The task force was particularly concerned about the representation of women at professorial level and the future impact of the current gender balance at medical school.
There have been a number of initiatives aimed at encouraging the full participation of women in the STEM workforce in recent years, including the recent strategy on women in science, technology, engineering and mathematics for Scotland, which was published by the Royal Society of Edinburgh in April 2012. Further, since April 2011, the RAEng and the Royal Society have received funding from the Department for Business, Innovation and Skills to take the lead role in addressing diversity across the sciences and engineering professions. It is suggested that the Academy maximises resources by drawing on these current initiatives and liaises with our sister academies to ensure impediments to clinical research careers for women are addressed, whilst working to monitor and further best practices within the Academy with respect to ensuring equality and increasing diversity.

[33] The Royal Society of Edinburgh (2012) *Tapping all our talents*. As before.

Task force members:

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Appendix

The following data have been sourced directly from the Higher Education Funding Council for England (HEFCE), providing data on a specific subsection of the academic workforce within Higher Education Institutions, relevant to the Academy's non-clinical Fellowship composition. The data have been summarised in Table A; data are drawn from individualised staff records.[34]

The tabulated data specifically relate to:

- Academics on a non-clinical academic contract.
- Academics with a research only, or teaching and research contract.
- Academics defined as working within **Bioscience** (specified by cost-centre on contract).
- The data have been split according to **Professor** or **Non-Professor** status. HEFCE were unable to provide further breakdown of the non-professor category.

Figures are shown as Full Time Equivalent (FTE) rather than Full Person Equivalent (FPE). FPE figures were not used as FPE datasets define an academics subject area by latest area of qualification; this does not necessarily reflect the area they are currently working in. FTE data enables academics to be defined by the departmental area they are working in. Using FTE figures provides a reasonable representation of the spread of men and women at professorial and non-professorial level.

Limitations of the data

All figures are approximate due to the low numbers represented and the fact that the Higher Education Statistics Agency (from which HEFCE data are drawn) only provide figures rounded to the nearest 5. Academics can also work across more than one cost-centre. From the data available there is no way of knowing if men work across more cost centres than women, or vice versa. However, FTE data still provides a reasonable approximation.

[34] For more information see http://www.hefce.ac.uk/.

Table A: Representation of women within biosciences in HEIs in the UK at non-professorial and professorial level as of 2010/2011[35]

Staff Level	*Non- Professor*				*Professor*			
Region	*F FTEs*	*M FTEs*	*Total*	*%F*	*F FTEs*	*M FTEs*	*Total*	*%F*
East Midlands	245	340	580	42.2%	15	70	85	17.7%
East of England	400	565	965	41.5%	15	80	90	16.7%
London	810	795	1600	50.6%	35	150	185	18.9%
North East	105	190	300	35.0%	5	50	55	9.1%
North West	375	490	860	43.6%	15	90	110	13.6%
South East	465	640	1105	42.1%	15	95	110	13.6%
South West	175	265	440	39.8%	15	65	75	20.0%
West Midlands	190	245	435	43.7%	5	45	50	10.0%
Yorks/Humber	325	425	750	43.3%	25	90	115	21.7%
Wales	155	205	360	43.1%	0	50	50	0.0%
Scotland	705	825	1530	46.1%	30	175	205	14.6%
NI	90	85	175	51.4%	5	20	25	20.0%
Open University	25	30	55	45.5%	0	5	5	0.0%
Total/National Average	**4065**	**5100**	**9155**	**44.4%**	***180***	***985***	***1160***	***15.5%***

[35] Data provided directly by HEFCE, informed by HESA datasets.

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