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Women in STEM careers

Written evidence submitted by the Medical Schools Council and Dental Schools Council to the House of Commons Science and Technology Committee

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1. The Medical Schools Council (MSC) and the Dental Schools Council (DSC)

1.1 Both organisations represent the interests and ambitions of UK medical and dental schools as they relate to the generation of national health, wealth and knowledge through biomedical research and the professions of medicine and dentistry.

1.2 This submission includes contributions received from individual responses, UK medical and dental schools and the Equality Challenge Unit, Athena SWAN Medical and Dental Schools Advisory Group.

2. Executive Summary

2.1 Difficulties related to working in STEM *clinical and non-clinical* academic careers are faced by both men and women. However, wider issues affect the *retention and progression of women in academic STEM careers*¹ for example, limited *senior women role models*, women often having a greater proportion of teaching/pastoral student roles, limited opportunities for part-time/flexible working, women taking on the majority of caring responsibilities, the cycle is self-perpetuating.

2.2 There is a *gendered conception of merit in clinical and non-clinical academia*, especially one that values a full-time/long-hours, uninterrupted career trajectory and research success. The achievements that women make are often unrecognised, as women are often too modest and do not market themselves enough, or reaching the same level of achievement either takes longer, or does not occur to the same level, due to career breaks, work-life balance and return to work challenges. Women Professors have increased by only 5% since 2004 (from 11% to 16%¹), and more work is required to ensure gender balance at senior academic levels.

¹ Bogg, J. and Prescott, J. (2012) *Gendered Occupational Differences in Science, Engineering, and Technology Careers*. IGI Global, Philadelphia

- 2.3 The drain of women from academic medicine and dentistry represents a significant *loss of talent and expertise to the HE and research sectors*, to the detriment of research innovation and leadership. There is some evidence that the number and proportion of women in senior roles is increasing – however, this is occurring very slowly and needs urgent attention.
- 2.4 Medical and dental school initiatives to support academic women are commended and should be sustained and expanded. Such initiatives support the goals and ambitions of the Athena SWAN Charter for Women in Science,² which UK medical and dental schools are working towards and several have achieved Silver or Bronze awards.
- 2.5 Structured clinical academic training pathways e.g. NIHR should be protected and marketed as aspirational.
- 2.6 There is a need to provide affordable, quality childcare.

3. Context

- 3.1 The most recent data on academic staffing in medicine and dentistry (2012) shows that, as in other STEM subjects, there continues to be a small proportion of women Professors (16%), particularly when compared with Senior Lecturer/Readers (32% medicine, 39% dentistry) and Lecturers (44%). Yet HESA data show that 54% of medical students and 59% of dental students are women. Progression from Lecturer grade is a key challenge for female academics.
- 3.2 The number and proportion of women at each academic grade has increased since 2004 (Figures 1 and 2), with women professors increasing by 5% since 2004 (from 11% to 16%).

Figure 1: Clinical academic staffing level by gender and grade, medicine and dentistry, July 2012³

	Medicine, 2012				Dentistry, 2012			
	Men (head-count)	Men (%)	Women (head-count)	Women (%)	Men (head-count)	Men (%)	Women (head-count)	Women (%)
Professor	1,159	84.1%	219	15.9%	98	83.8%	19	16.2%
Senior Lecturer/Reader	1,001	68.0%	470	32.0%	81	60.9%	52	39.1%
Lecturer	348	56.3%	270	43.7%	126	55.8%	100	44.2%
Total	2,508	72.3%	959	27.7%	305	64.1%	171	35.9%

² www.athenaswan.org.uk

³Sources: Medical Schools Council (2013) *A Survey of Staffing Levels of Medical Clinical Academics in UK Medical Schools as at 31 July 2012* and Dental Schools Council (2013) *A Survey of Staffing Levels of Clinical Academic Dentists in UK Dental Schools as at 31 July 2012*

Figure 2: Clinical academic staffing level by gender and grade, medicine and dentistry, July 2004⁴⁵

	Medicine, 2004				Dentistry, 2004			
	Men (head-count)	Men (%)	Women (head-count)	Women (%)	Men (head-count)	Men (%)	Women (head-count)	Women (%)
Professor	1,037	88.9%	129	11.1%	83	89.2%	10	10.8%
Senior Lecturer/Reader	1,212	76.3%	376	23.7%	140	74.5%	48	25.5%
Lecturer	317	64.4%	175	35.6%	215	59.7%	145	40.3%
Total	2,566	79.1%	680	20.9%	438	68.3%	203	31.7%

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

4.1 Work-life balance:

4.1.1 An academic career is usually less well-defined than one in the NHS and is perceived to be more stressful, particularly in the early career stages. It demands a significant investment of time, including out-of-program training, and contracts may be short-term, without clear progression routes. Success is dependent on factors such as research grant income or proof of outstanding contributions to education. Promotion prospects are less attractive, as it takes longer to achieve equal clinical status, and there are fewer opportunities e.g. for on-call or private work.

4.1.2 Many staff experience busy workloads, often involving heavy teaching and administrative duties, which reduces the time available for research within core hours, leading to a long-hours culture. Part-time or job-share opportunities do not necessarily fit with the cultural image of 'total commitment to the academic agenda', and women tend to apply for jobs that they perceive to offer a better work-life balance.⁶ Moreover, it is difficult to maintain an active research programme with external funding and high quality publications in a part-time or job share context for clinical or non-clinical academics.

4.1.3 There are very few part-time opportunities, and virtually none at Clinical Academic Consultant level. Complex responsibilities in clinical, teaching and research roles – in addition to family commitments, mean that even working full-time, women with clinical responsibilities tend to complete PhDs over 6+ years, or more if they have maternity leave. Women feel their career progression rates may be compromised unless they attend networking, conferences or national meetings.⁷ Expectations have been increased with the impact of the 2014 Research Excellence Framework (REF).

⁴ Sources: Medical Schools Council (2005) *A Survey of Staffing Levels of Medical Clinical Academics in UK Medical Schools as at 31 July 2004* and Dental Schools Council (2005) *A Survey of Staffing Levels of Clinical Academic Dentists in UK Dental Schools as at 31 July 2004*

⁵ There were an additional 31 Lecturers, Senior Lecturers and Professors whose gender was not recorded (Medicine). These numbers therefore do not represent the total clinical academic staffing level in 2004.

⁶ Barbalescu, R. and Bidwell, M. (2012) 'Mechanisms of applications Segregation in the Market for Managerial Workers', *Organization Science*

⁷ Institute of Physics (2010) *Survey on Childcare*

4.1.4 The challenges of work-life balance in academia tend to be exacerbated for women with children or other caring commitments, who generally take on the majority of responsibilities.⁸ As one medical school reported 'More often than not, very successful men will have partners or wives that have less pressured work roles and are thus better able to support them. The reverse is rarely true.'

4.2 Lack of confidence:

4.2.1 Women tend to wait until they meet all the criteria for promotion, whereas men tend to be more speculative in their applications. Consequently, women are less likely to submit themselves for consideration for promotion without encouragement or mentoring. Evidence from the Advisory Committee on Clinical Excellence Awards⁹ and medical/dental schools internal records show that when women do apply, they are just as likely to be successful.

4.3 Lack of opportunities:

4.3.1 Appointments and promotions processes are one of the four key barriers to a women's progression.¹⁰

4.3.2 Search committees frequently comprise predominantly men, who may only consider their networks and potential female candidates may not be identified.

4.3.3 A requirement to move institution for career advancement may not fit with family commitments. Many early career researchers need to be geographically mobile, a disincentive, which inhibits continuity of employment rights.

4.3.4 Support for moving from PhD to post-doctoral posts is often inadequate, and often dependent on the PhD supervisor communicating events, opportunities and helping to access funds for future roles.

4.3.5 There is a significant disparity in the number of women on fixed-term contracts with external rather than core funding compared to their male counterparts.¹¹ The insecurity of fixed-term contracts, which often coincides with the timing of childbearing decisions, is another reason why women do not progress in their academic careers.¹²

4.3.6 Women can spend too much time on activities that benefit the school, for example being an admissions/year tutor, with less time to focus on research or teaching activities that warrant promotion or progression.

4.4 Career breaks:

4.4.1 Career breaks in science academia can have a severe long-term effect on a career than in other professions. It takes time to build up a research group and facilities, its associated

⁸ Ceci, S.J. and Williams, W.M. (2010) 'Understanding current causes of women's underrepresentation in science', *PNAS*

⁹ ACCEA (2012) *ACCEA Annual Report 2011*

¹⁰ Medical Women's Federation (2008) *Developing Equality in governance and management for career progression*

¹¹ <http://psychsource.bps.org.uk/details/journalArticle/3239961/The-Consequences-for-Women-in-the-Academic-Profession-of-the-Widespread-Use-of-F.html>

¹² UKCRC (2009) *Female Attrition, Retention and Barriers to Careers in SET Academic Research*

funding and a line of research showing results. This, and the fast-pace of research, means it can require a great deal of effort for women to get back on track.¹³

- 4.4.2** There is a lack of fellowship schemes for female academic clinicians returning to pursue an academic career after having a family, although some do exist for non-clinicians (e.g. Daphne Jackson and Dorothy Hodgkin schemes).

4.5 Unconscious bias:

- 4.5.1** Social assumptions and norms around gender can have a huge impact. The assumed identity of an academic in STEM tends to be linked to masculinity, with resulting traditional perceptions that men are more suited to the role. Women are then left in a contradictory situation, judged as being 'unfeminine' for having these traits, or unsuitable if judged to not have certain traits.

- 4.5.2** Several studies have demonstrated unconscious bias against women at interview and in the peer review process, whereby people similar to that of the recruiter are employed.¹⁴ This can result in a visible lack of women in senior academic positions. Without role models, it is difficult for young women to see academia as a viable option. With few women available to act as mentors, or sit on promotion committees, those who do can become overloaded, which then can inhibit their research achievements.

- 4.5.3** Students can be biased in their perceptions of leadership, with medical school students of both genders reporting that men generally make better leaders. This bias requires challenging within the context of leadership/management/professionalism teaching on image and stereotype.¹⁵

5. When women leave academia, what careers do they transition into?

- 5.1** A full-time clinical job is perceived to offer more job security, faster salary progression, no commitment to further examinations, more geographic flexibility and a better work-life balance. Other staff leave for a career in teaching, or industry which pays higher and where promotion prospects are not linked to research income or publications, which currently is particularly challenging.

6. What are the consequences of scientifically trained women applying their skills in different employment sectors?

- 6.1** Academic STEM loses highly trained and valuable employees who have invested a decade or more in their scientific development. The full range of academic excellence is lost. There are fewer female role models for aspiring clinical academics.

- 6.2** There is a business case for mixed gender teams.¹⁶ Diversity of knowledge and social capital in teams is vital in production of new ideas.¹⁷ A lack of women may have a significant impact on the robustness of policy decisions and research innovation.¹⁸

¹³ Royal Society of Edinburgh (2012) *Women in science, technology, engineering and mathematics: a strategy for Scotland*

¹⁴ Moss-Racusin et al (2012) 'Science faculty's subtle gender biases favour male students', *PNAS*

¹⁵ Crolla, E., O'Sullivan, H., and Bogg, J. (2011) 'Gender and Medical Leadership: Student Perceptions and Implications for Developing Future Leaders in Primary and Secondary Care - a Pilot Study', *Journal of Primary Care & Community Health*, vol 2, issue 4, pp 225-228

¹⁶ <http://www.genderinscience.org/index.php/consensus-seminars/seminar-briefing-documents>

7. What should universities and the higher education sector do to retain women graduates and PhD students in academic careers?

7.1 Overarching:

7.1.1 Universities should establish working groups to continually review staff recruitment, progression, retention and practices that support and enable women's career progression. Many university departments are working towards or have gained an Athena SWAN award, which supports the advancement of women on science, and several have now achieved Silver or Bronze awards. An example of good practice is the establishment of the Gender Equality Office within a School of Medicine, Dentistry and Biomedical Sciences.

7.2 Work-life balance:

7.2.1 Universities should promote a culture of flexible working.

7.2.2 Where possible meetings, networking and other activities should be held within core hours.

7.2.3 Advocate flexible working to suit the individual and the specialty – for example, clinical work may be in a block of several months, or several days a week.

7.2.4 Universities should adopt schemes that support female research staff during pregnancy and on returning to work after a period of maternity leave. This should include protected time to concentrate on re-establishing a research portfolio, for example through reduced teaching and administrative workloads. Job applications should provide the opportunity for candidates to explain any career breaks.¹⁹

7.3 Lack of confidence:

7.3.1 Mentoring and networking schemes should be in place for all early career research staff and postdoctoral students.

7.3.2 Promote the visibility of women, ensure the abilities and achievements of women are highlighted i.e. speakers, presentations and media representation.

7.3.3 Support and encourage women to consider applying for promotion.

7.3.4 Performance and Development Review should include activity and guidance for promotion. Routes for promotion should be transparent and accessible.

7.4 Lack of opportunities:

7.4.1 Part-time working should not be a barrier to promotion or opportunities that lead to promotion.

7.4.2 Women require development opportunities in areas that lead to promotion, with teaching administrative/pastoral roles distributed equitably.

¹⁷ <http://www.genderinscience.org.uk/consensus.report.html>

¹⁸ NY Times: Why we need women in science: 5 March 2010

<http://www.nytimes.com/2010/03/06/world/europe/06ihtffscience.html?pagewanted=all>

¹⁹ <http://www.newscientist.com/article/mg21128216.200-the-high-cost-of-being-a-woman-in-science.html>

7.4.3 Trainees require support and guidance as to next steps. Trainees can feel they are undertaking two jobs at once, this can lead to significant stress levels and drop-out. Improved information and communication on internal jobs may help to increase opportunities for the PhD student to remain at the institution.

7.5 Career breaks:

7.5.1 Career breaks require appropriate management, to reduce impact on research and avoid the attrition of talented individuals. Sufficient time planning the break is required and support to retain links i.e. 'Keep in Touch' days or email updates. Funding for staff absence, to avoid overburdening colleagues and to assist the returner i.e. teaching assistance or conference attendance, requires consideration.

7.5.2 Identify or create funding streams where the eligibility criteria reflect the protean nature of academia i.e. acceptance of bids from non-core/ non-permanent staff members.

7.6 Role models:

7.6.1 Celebrate successful women academics. Encourage women to accept offers to speak at conferences and engage with the media, so that women in STEM are more visible.

7.6.2 Hold events (including online) where women graduates can see/hear that it is possible to be a mother and an academic, include local case studies and signpost support available before/following maternity leave.

7.7 Unconscious bias:

7.7.1 Universities should put in place positive measures to address the gender imbalance across senior roles, within university management and on senior executive committees.

7.7.2 Recruitment and promotions processes should be transparent, unbiased, and based on merit, regardless of gender, ethnicity or background.

7.7.3 Unconscious bias training for staff conducting annual reviews, or recruitment panel.

8. Are there examples of good practice?

8.1 The Athena SWAN Charter recognises and celebrates good employment practice for women working in science, engineering and technology (SET) in higher education, awarding departments with bronze, silver and gold awards. Departments within all UK medical and dental schools in the UK are working towards the higher levels of awards. A great deal of good practice has resulted from medical and dental schools working towards or gaining Athena SWAN awards, for example:

8.1.1 Visibility - visible women and men during open days, speakers for events and interviewers, events specifically to promote the achievements of women academics.

8.1.2 Support - to attend within working hours groups such as a Peer Support Group for Women Returning from Maternity Leave, International Staff Network Group, Women in Science, Engineering and Technology (WiSET), 'SpringBoard' workshops²⁰ and formalised mentoring schemes and buddy schemes.

²⁰ <http://www.springboardconsultancy.com/springboard.htm>

8.1.3 Promotion - workshops to identify and support women ready to apply for promotion, research development support. Establish an opportunities committee, to enhance academic careers for women.

8.1.4 Family-friendly policies - flexible working, career-breaks, return to work schemes following parental or adoption leave, provision of part-time posts with an honorary NHS contract, six month sabbatical for research on return to work, or a dedicated budget to support research whilst women on maternity leave.

8.2 International good practice examples include the focus on institutional change on the National Science Foundation's ADVANCE programme in the US²¹ and the University of California, School of Medicine.²² The Canadian Council of Academies (2010)²³ reported on the career trajectory of Canadian women researchers and advocated more flexible models for career progression.

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

9.1 Research Councils should ensure that consideration of gender issues is included in research funding application forms, as is required for EU grants.²⁴

9.2 Funding for STEM programs should allow for universities and institutes to focus on institutional change, and encourage outreach and engagement activities.

9.3 Advocate that women should be adequately represented on decision-making panels.

9.4 Advocate unconscious bias training for those in senior positions.

9.5 Advocate that undergraduate teaching should include a discussion on stereotypes, image and bias training to challenge false perceptions and encourage female students to view themselves as potential future leaders.

9.6 The MSC and DSC supports the commitment of NIHR and other funding bodies for structured clinical academic training pathways, and urge that this investment be protected. There remains the opportunity to restructure the academic career pathway to avoid the bottleneck at postdoctoral level, and to remove the time-based criteria for fellowships and progression/promotion assessments.

9.7 To address specific contractual issues relating to moving between the NHS and an academic career, the Government should review the current admission process to the NHS pension scheme, to allow joiners from clinical and allied health professionals employed by universities.

9.8 Family-friendly policies are vital. Childcare should be affordable and high-quality to allow parents to return to work, with adequate provision for affordable after-school care. Shared maternity/ paternity leave would enable flexibility. Improved support for women returning from career breaks is vital.

²¹ http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383

²² Amparo et al (2013) 'Improving Knowledge, Awareness, and Use of Flexible Career Policies Through an Accelerator Intervention at the University of California, Davis, School of Medicine', *Medicine*, Vol. 88, No. 6 / June 2013

²³ <http://www.scienceadvice.ca/en/assessments/completed/women-researchers.aspx>

²⁴ http://ec.europa.eu/research/fp7/index_en.cfm?pg=gender