

Submission by the Daphne Jackson Trust to the Science and Technology Committee Call for Evidence into Diversity in STEM.

The Daphne Jackson Trust is the UK's leading organisation dedicated to realising the potential of returners to research careers following a career break of two years or more taken for a family, caring or health reason. The Trust was established in 1992 in memory of Professor Daphne Jackson – the UK's first female Professor of Physics.

The Trust offers Fellowships across all fields of research in universities, research institutions and industry across the UK and Republic of Ireland. It has supported over 430 individuals to return to research careers. Up to 25 new Fellowships are awarded each year, and over 60 are currently in place at host institutions, sponsored by a range of organisations. Without the Trust's Fellowship scheme, significant volumes of knowledge, talent and experience would be lost from the sector.

1. The nature or extent to which women, ethnic minorities, people with disabilities and those from disadvantaged socioeconomic backgrounds are underrepresented in STEM in academia and industry

Our comments in this submission focus predominantly on women, and returners generally. We do not currently have a sufficiently robust data set to comment authoritatively on ethnic minorities, people with disabilities and those from disadvantaged socioeconomic backgrounds, although anecdotal evidence suggests that many of our observations hold true for these groups.

In July 2021, the Trust made a submission to the APPG on Diversity and Inclusion in STEM Inquiry into Equity in the STEM Workforce¹, referenced in the preamble to the STC's inquiry. The final report contains a wealth of data on underrepresented groups within STEM. Specifically on gender, women are significantly underrepresented in STEM subjects (just 27% of roles are filled by women) – a pattern that is repeated at senior management level, professorial positions and research and teaching roles. A wealth of research has examined why women are underrepresented in these roles. From the perspective of the Daphne Jackson Trust, women are more likely to take on non-work commitments than men², a precedent that has been amplified during the Covid-19 pandemic³. Such non-work commitments often involve providing family and caring commitments that necessitate taking a career break.

Career breaks are potentially devastating for a STEM researcher's career. Highly qualified and skilled individuals that temporarily step back from their research area can find themselves lagging behind their peers due to a lack of recent research outputs, being perceived as 'behind the curve' in knowledge and technical skill and a lack of self-confidence. When seeking to return to work, they often

¹ <https://www.britishtscienceassociation.org/Handlers/Download.ashx?IDMF=3d51130a-458b-4363-9b2b-d197afc8382a>

² [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/658190/IPOL_STU\(2020\)658190_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/658190/IPOL_STU(2020)658190_EN.pdf)

³ <https://ifs.org.uk/publications/14860>

struggle to find research-based employment that fully utilises their knowledge and experience. Many leave their preferred profession entirely or are forced to take jobs outside of their area of expertise and below their skill level. The deleterious effect of a career break can be compounded by issues such as relocation, dealing with complex health issues and the availability and affordability of childcare or eldercare.

2. The reasons why these groups are underrepresented

Specifically regarding returners, the Daphne Jackson Trust has identified some of the main reasons why returners are underrepresented in STEM:

- Relocation is a significant barrier to a return to a research career. Within the research sector, there is a commonly held viewpoint that staying within a single institution for a prolonged period of time is seen as being unambitious, lacking commitment and detrimental to developing a more rounded research and workplace experience. For returners, relocation is often incompatible with their personal obligations such as raising a family, caring for relatives and dealing with health issues. This is further compounded by the fact that many research contracts are short term – in some cases just 12 months duration – and relocation is simply not practical or affordable on that scale;
- Bias, in the following forms (singularly and in combination):
 - Age: most returners are, by nature of the fact they have had a career break, older than their colleagues at the same stage in their careers. In some cases, colleagues misinterpret a returner's older age with somehow 'failing' earlier in their career, drawing false conclusions because they have fewer published papers.
 - Skills: returners may require additional training to refresh their skills, experience, confidence, management and leadership capabilities.
 - Gender: all too often, women returners report they are treated differently than their male colleagues. This is reported as being in part due to self-sustaining male-dominated hierarchies that exist in senior levels within academia. Fear of confronting the status quo and/or professional reprisal prevents many women from challenging this.
 - Other forms of bias including race, disability and sexual orientation are hugely problematic within academia but, as stated in section 1, these issues are beyond the purview of the Trust at the current time.
- Part-time working is viewed negatively by many within academia, with 'presenteeism' a corroding influence. Managers often have unrealistic expectations about part-time research outputs - in the worst cases, expecting publication parity with full-time colleagues. Furthermore, the funding landscape is heavily weighted towards full-time contracts and the majority of research jobs advertised are on a full-time basis. Yet part-time working is a significant enabler in reducing the barriers for returners to re-start their careers, while still managing non-work commitments.

3. The implications of these groups being underrepresented in STEM roles in academia and industry

Highly trained STEM women researchers who do not return to STEM careers are a substantial loss to UK PLC. Once on a career break, there are few opportunities for women to return to research at the level commensurate with their skills and experience without help from a returner programme such as the Fellowship scheme offered by the Daphne Jackson Trust. According to the 2016 PwC Women Returners Report, 76% of professional women want to return to work after a career break, although 65% of those that do return are forced to take roles below their potential. The economic benefit to the UK of addressing the professional women career-break penalty is calculated as providing an additional £1.7bn to the country's economic output.

Returning individuals to STEM research careers is complex. Individuals require more than a brief and intensive skills update. Instead, they often need a longer and in-depth immersion in the knowledge area in which they previously operated. Training is required to refresh, refine and develop existing technical skills and learn new techniques and technologies. It also takes time to accumulate more recent research outputs and scientific impacts. This creates significant inequity for returners. Without the opportunity and support offered by schemes such as the Daphne Jackson Trust, this inequity would be further exacerbated, and the majority would be lost to the research sector.

The Trust's own calculations confirm that over the last two decades:

- Daphne Jackson Fellowships have saved over 1250 years of research experience and talent from being lost from the sector – worth over £37m of gross institutional costs.
- Daphne Jackson Fellows go on to leverage over £23m of new research funding from national and international funders, philanthropic donors, and industry. That means on average that for every £1 invested in a Daphne Jackson Fellow, they secure nearly £2 in subsequent funding.
- Nine out of ten Daphne Jackson Fellows stay in research or teaching at least five years after they finish their Fellowship, demonstrating high levels of returner retention to the sector.
- Ten former Daphne Jackson Fellows are now Professors - a rate which is five times higher in the Daphne Jackson cohort compared with the national average.

4. What has been done to address underrepresentation of particular groups in STEM roles

There are some examples of initiatives that aim to address underrepresentation within STEM:

- The Daphne Jackson Trust's Fellowship scheme to successfully return researchers to their careers after a break. This is the only scheme that provides a Fellowship, mentoring, training, and additional support to maximise the chances of a successful return.
- Advance HE's Athena Swan charter to support gender equality within higher education.
- Increasing interest from Learned Societies and funders to address issues with research culture and underrepresented groups in STEM^{4, 5, 6, 7}.

⁴ <https://royalsociety.org/topics-policy/diversity-in-science/>

⁵ <https://www.raeng.org.uk/publications/reports/closing-the-engineering-gender-pay-gap>

⁶ <https://wellcome.org/reports/what-researchers-think-about-research-culture>

⁷ <https://www.bps.ac.uk/publishing/pharmacology-matters/august-2019/diversity-and-inclusion-in-research-beyond-the-re>

5. What could and should be done by the UK Government, UK Research and Innovation, other funding bodies, industry and academia to address the issues identified

It is self-evident that additional support is needed for researchers returning to their careers after a break. Without this, the research community faces the continuation of a damaging exodus of knowledge, skills and experience from the sector. Covid-19 has taught us that research expertise is vital for the nation. After the pandemic, pre-existing challenges will remain and new ones will emerge – from tackling climate change to disease, technological advancement to food production: we need as many skilled and talented researchers as possible. Research returners are a vital component to this.

There are opportunities to change the overarching culture and dynamics of the UK STEM research environment. These changes should include:

- Changing the criteria for the recruitment and assessment of researchers to encourage part-time and flexible working and to recognise that career breaks are not a barrier to progression. Career progression and success should not be sacrificed for family, caring or health reasons.
- Making it easier to diversify career pathways and increase opportunities for researchers outside of academia. Greater collaboration and cohesion with industry and the charity sector – with researchers interchanging roles between them – should be facilitated through grants or ‘career diversification fellowships’. Such a culture change would complement the Government’s Research and Development Roadmap.
- A move away from the prevalence of fixed-term research contracts which, combined with current research assessment criteria being focussed on cumulated research outputs and impacts, does not create a supportive sectoral environment for early career researchers that have taken a career break. Reforming the REF to move away from an over-reliance on traditional assessment criteria to a more nuanced definition of what ‘excellence’ really means would help.
- Increased Government and UK Research and Innovation funding and support for Daphne Jackson Fellowships to increase their number and length (from two to three years) in line with demand and to further benefit Fellows by giving them more time for retraining and reskilling. In addition, further funding and support for other returner schemes aimed at returners to STEM - not specifically research - would help a broader pool of candidates wishing to return with expertise in technical, technological or other specialities.
- Support from the appropriate Minister(s) and Department(s) championing the cause of returners, codifying best practice, promoting initiatives that encourage sustained change, awarding success and identifying high profile champions would demonstrate the vital role returners can play.
- A voucher scheme to enable returners to access sectoral-specific retraining, via appropriate professional bodies, trade associations and charities.
- Government could also consider the feasibility of introducing a scheme allowing for a paid period of ‘carers leave’ of up to one year similar to parental leave. This would help those who leave employment to get care in place for elder relatives or for short term end of life care for elder relatives.

Committee may be interested to learn that the Trust has recently made a proposal to BEIS to host a group specifically tasked with improving the experience of returning researchers to their careers in the

context of the People & Culture Strategy's Talent section. This would have the greatest impact on an area most relevant to our expertise and represents an important niche that no other organisation can fill.

In a final comment we should like to suggest that change will never happen unless someone is bold and makes radical proposals that may initially seem impossible to implement. An example of this would be for the STC to advocate for a change to research contract systems, whereby more Early Career Scientists (ECRs) are given permanent contracts after a probationary period while very late career Scientists (LCRs) move to shorter term contracts. This would give more ECRs greater career security in the crucial early years of their careers. This suggestion was made by the Chief Executive of the Daphne Jackson Trust at a recent roundtable event at the Royal Society convened to discuss changing working lives and the research environment. However, whilst some roundtable participants welcomed this radical approach and thought it was an inspired solution to the issues that can cause under-representation of minority groups in academic STEM research, it was noted that there are many complex barriers that would need to be addressed.