Experiences of Minoritised Groups at Life Science Research Conferences in the UK

For Wellcome Connecting Science

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Contents

Figures 4
1. Executive summary 5
1.1. Scope 5
1.2. Key findings 5
1.3. Survey 6
1.4. Interviews 6
1.5. Key recommendations 6
2. Introduction 8
2.1. Background to the review 8
2.2. Terminology 9
2.3. Sea-Change Consultancy 9
3. Methodology 10
3.1. Key lines of enquiry 10
3.2. Project team 10
3.3. Desktop review 11
3.4. Rapid evidence review 11
3.5. Experiences of researchers: survey 12
3.6. Experiences of researchers: Interviews 13
4. Findings and results 14
4.1. Desktop review 14
4.2. Rapid evidence review 16
4.3. Experiences of researchers: survey 21
4.4. Experiences of researchers: Interviews 24
5. Conclusions and recommendations 33
5.1. Increasing the representation of ethnically minoritised researchers at conferences and events across the sector 33
5.2. Increasing diversity of speakers 33
5.3. Informal networks, mentoring and sponsorship 34
5.4. Virtual/hybrid/in person conferences 34
5.5. Marketing 35
5.6. Reduce financial barriers to attendance 35
5.7. Personal circumstances and caring responsibilities 36
5.8. Minimise differences in experiences of conferences 36
5.9. Governance and resourcing 37
5.10. Measure progress 37

Appendices 38
Appendix A: Detailed Methodology 38
Appendix B: Documents reviewed 45
Appendix C: Summary of relevant literature 46
Appendix D: Survey 48
Appendix E: Interview questions 49
Appendix F: Further interview findings 50
Appendix G: References 61
Appendix H: Report authors 62

Figures

Number	Title	Page
Figure 1	WCS conference attendance by ethnicity	21
Figure 2	WCS conference attendance by in person/online	21
Figure 3	WCS and other conferences attendance	21
Figure 4	Barriers to conference attendance	24
Figure 5	Positive factors by ethnicity (14 respondents)	26
Figure 6	Overwhelming factors by ethnicity (7 respondents)	27
Figure 7	Conference impact highlighted by ethnicity	28
Figure 8	Barriers by career stage	50
Figure 9	Institutional barriers by career stage	51
Figure 10	Barriers by ethnicity.	51
Figure 11	Institutional barriers by ethnicity	51
Figure 12	Interviewees reporting being overwhelmed	52
Figure 13	Conference impact highlighted in interviews	53
Figure 14	Impact of networking by ethnically minoritised and white interviewees	53
Figure 15	Issues related to discomfort based on identity	54
Figure 16	Experiences of identity cited as uncomfortable by ethnicity	55
Figure 17	Conference organisers and inclusion	56
Figure 18	Ways in which learning is shared	58
Figure 19	Strategies for facilitating sharing of learning	58

1. Executive summary

1.1. Scope

Researchers from an ethnically minoritised background make up over 20% of those receiving grants from the Medical Research Council and the Biotechnology and Biological Sciences Research Council yet it is reported that ethnically minoritised researchers appear to be disproportionately less likely to attend life science conferences either as panellists or as participants compared to their majority counterparts. The aim of this project was to understand the conference experiences of minoritised groups, especially in relation to race/ethnicity; and to identify the barriers to attending life science conferences. Understanding these factors will enable conference organisers to plan how to address these barriers and to implement possible enablers to improve the inclusivity of life science conferences in the UK.

The project focused on four main areas:

- What are researchers' experiences at conferences? Is there a difference between experiences of minoritised researchers and majority groups?
- What are the barriers to attending a research conference? What factors support attendance, especially attendance of researchers from minoritised groups?
- What are the positive impacts of attending a conference? Are the impacts the same for minoritised researchers and majority groups?
- What practical steps have conference organisers taken to improve experiences for minoritised researchers?

A mixed methods approach was used to explore these questions:

Desk review: A best practice and bias audit of the website, applications process, key documents and analysis of diversity data, specifically relating to Wellcome Connecting Science conferences.

Rapid literature review: Assessment of good quality academic and grey literature on what can help to facilitate increased representation and participation of minoritised groups at science conferences.

Survey: An online survey exploring life sciences conference attendance and experiences of life sciences researchers from universities and health institutes.

Interviews: Interviews with ethnically minoritised and majority group researchers to enable a comparison between the experiences and outcomes of researchers with different identities.

1.2. Key findings

1.2.1. Desk review

The desk review identified a number of improvements to increase diverse representation on the Wellcome Connecting Science (WCS) website and the annual report and ways to strengthen the collection of monitoring data during the application and evaluation process. The review also identified policies such as the gender balance policy and the carers policy which have been effective in relation to gender; there were notable gaps in respect to ethnicity and disability.

1.2.2. Rapid evidence review

Few empirical studies that investigated conference attendance and experiences of ethnically minoritised groups were found. This led to the inclusion of studies that looked at gender and conference improvements to facilitate better experiences for scientists that are underrepresented. Not surprisingly, correlational studies found less positive experiences for underrepresented minority groups. These studies also concluded that minority racial and ethnic groups are overly represented in the student and early career stages which are associated with having fewer opportunities for delivering talks and poster presentations. Given that, interventions which focus on improving the participation of early career researchers (ECRs), could also have an impact of increasing the representation of ethnically minoritised researchers. Interventions included:

allocating a proportion of presentations to ECRs or always taking the first question from an ECR, an ethnically minoritised individual or a woman. The review also identified that career development interventions such as sponsorship and supporting individuals to overcome career and work/life barriers was an important enabler. Continuing hybrid conferences was found to be an enabler because of the likelihood that ethnically minoritised researchers will have less access to financial resources and are more likely to live internationally and have caring responsibilities.

1.3. Survey

Although the numbers involved are small, an interesting trend regarding access to financial support emerges from the findings. Although also falling into the ECR category, the only people reporting that funding or bursaries from WCS had enabled them to attend were white (n=2). All respondents who self-funded their attendance at WCS conferences were from ethnically minoritised groups (n=2). Further, of the students who responded to the survey, white students were more likely to have their Masters/PhD funded by a funding organisation (100%), and Black students are less likely than all others (0%). This bears further investigation since our survey information also suggests that ethnically minoritised individuals are less likely to attend non WCS conferences (0% of Black respondents had attended conferences other than WCS conferences) while 87% of white researchers had) and that lack of financial resources is key. Ethnically minoritised researchers reported that advertising that reaches them (54.5%), external funding/bursaries (54.5%), and reduction of cost (36%) would help to enable them to attend other life science conferences.

Our survey also showed a difference in experience at conferences. Only 33% of ethnically minoritised researchers who attended WCS conferences felt welcomed or included in comparison to 100% of white researchers. In relation to WCS conferences, 'More diversity in relation to race or ethnicity' was the measure selected by the largest number of ethnically minoritised respondents (n=5) that would enable a better experience. In addition, 50% of ethnically minoritised respondents (n=3) stated that more diversity in relation to gender would enable a better experience.

1.4. Interviews

All interviewees commented on institutional barriers relating to funding or lack of time due to teaching or lab work and these were often linked to the nature of support from supervisors. There were generally no differences between ethnically minoritised and white interviewees in the themes highlighted or in the content of those themes, suggesting potentially more differences across role/career stage than ethnic group. Ethnically minoritised researchers were however more likely to express that family responsibilities were a barrier. Of the five interviewees who discussed these concerns, four were from ethnically minoritised groups.

In terms of differences in experiences at conferences, both white and ethnically minoritised researchers expressed having negative experiences but for different reasons. Some white interviewees, for example, cited the negative impact of Covid-19 in how breaks were structured at conferences (n=4) whilst ethnically minoritised interviewees highlighted their identity, not fitting into the community and a sense of imposter syndrome (n=5).

When asked what conference organisers can do to make everyone feel more included, most ethnically minoritised interviewees highlighted the need for changes in policies and behaviours related to EDI (n=8). Promotional material with explicit EDI policies and expectations for behaviour, activities and initiatives to foster inclusion and positive action to increase the number of ethnically minoritised keynote speakers were mentioned.

1.5. Key recommendations

Although this research was commissioned by WCS and there are findings and recommendations that are specific to them as an organisation, many of the findings have broader applicability to the life science conference sector as a whole. Our key recommendations are outlined below. The full list of recommendations are included in Section 5: Conclusions and recommendations.

Increasing the representation of ethnically minoritised researchers at conferences and events across the sector

R1. Create a sector wide advisory group to develop an ethnic diversity balance policy for conferences, events and courses.

Increasing diversity of speakers

R3. Set targets for panel speakers in relation to ethnicity.

Informal networks, mentoring and sponsorship

R6. Use the influence of Genome Research Ltd in the research sector to advocate and promote positive action schemes to facilitate the advancement of ethnically minoritised researchers.

Virtual/hybrid/in person conferences

R7. Produce guidelines for effective and inclusive hybrid options for conferences, including detail on how remote participants of hybrid conferences can benefit from a similar level of networking and collaborative benefits to in-person participants.

Marketing

R9. Include content that is specifically designed to attract and address the priorities, concerns, and needs of ethnically minoritised individuals.

R12. Increase the proportion of images of ethnically minoritised individuals, attending to the intersectionality between race and gender when choosing images. In particular, avoid reinforcing the stereotype that researchers are white and or male.

Reduce financial barriers to attendance

R13. Provide and promote targeted bursaries for researchers from ethnically minoritised groups to attend.

Personal circumstances and caring responsibilities

R15. Promote the support available for researchers with caring responsibilities.

R16. Develop an access policy for the WCS covering digital and physical and people factors.

Minimise differences in experiences of conferences

R18. Produce guidelines for the organisation of diverse and inclusive conferences, making compliance with these guidelines a prerequisite for being part of the WCS conference programme.

Measure progress

R23. Where diversity data are recorded, systematically analyse these to assess what actions can be taken. In particular, monitor conference attendance and bursaries to measure progress in increasing attendance by those from ethnically minoritised groups.

2. Introduction

2.1. Background to the review

2.1.1. Racial inequalities in higher education

The racial inequalities that persist in society are mirrored in academia, where there is a lack of diversity amongst senior leaders and an underrepresentation of historically excluded people progressing within the sector. In the UK, when the data is disaggregated, we see that ethnically minoritised groups, and those specifically from a Black background are particularly disadvantaged, and this flows along the whole of the educational pipeline. There are degree awarding gaps at undergraduate level – students from ethnically minoritised backgrounds at UK universities are less likely than their majority white counterparts to graduate from undergraduate programmes with a first or upper second-class degree, with the largest gap (23.4%) between Black and white groups[1]; there are proportionally fewer numbers of Black people at postgraduate and professorial levels; and Black researchers have lower success rates with funding councils and granting agencies.[2,3] However data from UK Research and Innovation (UKRI) shows that when looking at the Black Asian and Minority Ethic researchers overall, the proportion of grants being awarded to researchers from that background by the Biotechnology and Biological Sciences Research Council (BBSRC) and the Medical Research Council (MRC) has increased from 16% in 2017-2018 to 21% in 2019 -2020. This suggests that if there is a lack of proportionate representation by ethnically minoritised researchers at life science research conferences in the UK, the explanation cannot simply be due to their lack of representation in the researcher community.

2.1.2. Inequalities in access to conferences

Research conferences, symposia, and meetings, form a key part of academic life across all subject areas from the life and physical sciences to the arts and humanities. Conferences provide a platform for the sharing of the latest knowledge in a scientific research field, networking with colleagues and collaborators, and building connections which enable career development and the creation of new projects and research applications. With opportunities for poster and spoken presentations usually limited, for those selected to appear on a conference programme, this can be a pivotal moment in their careers. However, it is also clear that not everyone who attends a research conference will have the same experience or representation, whether due to gender, being part of another minoritised group, or the intersection of any of these categories.[4]

For example, one study reported that the total proportion of all abstracts submitted for underrepresented minority group was less than 10% in comparison to the 90% of non-underrepresented minorities (Ford et al., 2019). Among the underrepresented minority authors, approximately 80% of all abstracts were submitted by students and early career scientists due to having fewer senior scientists. In comparison, approximately 60% of abstracts from non-underrepresented minorities were from students and early career scientists due to having significantly more scientists in their middle and senior career stages. Another study by DeVilbiss et al., (2019), reported that being White or male was associated with feeling more welcome at conferences (56% and 55%) compared with racial/ethnic minority or being a female (42% and 45%).

Wellcome Connecting Science (WCS) provide high quality life science conference events. It already has some arrangements in place such as gender balanced event programmes and bursaries for those with caring responsibilities alongside a code of conduct for participants. WCS attendees are broadly gender balanced, and the majority come from the UK and Europe. However, there is a concern that there may be lack of representation for those from minoritised ethnic groups. This means they are not only missing out on the content but also the career enhancing impact conferences can have through the contacts they make, and the ideas and collaborations generated as a result.

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[1] hesa.ac.uk/data-and-analysis/students
[2]theguardian.com/education/2020/feb/27/fewer-than-1-of-uk-university-professors-are-black-figures-show
[3] ukri.org/wp-content/uploads/2020/12/UKRI-15122020-DetailedEthnicityAnalysisOfFundingApplicantsAndAwardees2014-15to2018-19.pdf
[4]theafricanscientist.com/2018/04/07/academic-conference/

The aim of this project was to understand the conference experiences of minoritised groups, especially in relation to race/ethnicity, and to identify the barriers to them attending life science conferences. WCS can then plan how to address these barriers and to implement possible enablers to improve the inclusivity of WCS events, and influence the life science conference sector as a whole.

2.2. Terminology

As is well known, there is much debate around the most appropriate terms to use when considering differential experiences based on a person's race or ethnicity. For the purposes of this project, we are using the term *ethnically minoritised researchers* to describe researchers who self-identify their ethnicity as other than the majority group in the UK, namely 'white British/Welsh/Scottish/N Irish'. There are instances where we use other terms:

- In the literature review, we use the term the author has selected in order that the author's analysis remains intact.
- Direct quotes from interviewees retain the original words used.
- In the analysis of interviewee responses, Black, Asian and Minority Ethnic (BAME) was used as the coding word.

2.3. Sea-Change Consultancy

Sea-Change Consultancy were commissioned by WCS to carry out this project. Sea-Change is a unique consultancy dedicated to delivering innovative, evidence based, individual, group and organisation wide interventions which will deliver client organisation's equality, diversity and inclusion aims. We combine expertise in equalities, academic scholarship, and a track record of using action orientated methodologies that make a difference. More information about Sea-Change and the report authors is found in Appendix H.

3. Methodology

3.1. Key lines of enquiry

In this project we have assessed conference experiences of researchers from minoritised groups in the UK, with a particular focus on race and ethnicity. We have focused on four main areas:

- What are researchers' experiences at conferences? Is there a difference between experiences of minoritised researchers and majority groups?
- What are the barriers to attending a research conference? What elements support attendance, especially attendance of researchers from minoritised groups?
- What are the positive impacts of attending a conference? Are the impacts the same for minoritised researchers and majority groups?
- What practical steps have conference organisers taken to improve experiences for minoritised researchers?

We have used a mixed approach to explore these questions, both reviewing existing literature and primary research methods. Our method is summarised below (for a detailed description of the methodology please see Appendix A):

1. Desktop review	Review and bias audit of application process and communications Analysis of diversity data Review of corporate policies, objectives, evaluations
2. Rapid literature review	Literature review of relevant academic and grey literature
3. Survey	Online survey for researchers in universities and health institutes
4. Interviews	In-depth interviews with minoritised and majority group researchers

Table 1: Overview of review methods

3.2. Project team

Our project team and their responsibilities were:

- Tinu Cornish Chartered Organisational Psychologist, Director of Sea-Change Consultancy: Overall project lead: Desk review, interviews
- Dr Kathlyn Wilson, Chartered Organisational Psychologist: Interviews and thematic analysis of interviews
- Dr Ashlee Kristofferson: Survey design and analysis
- Janice Prentice: Data analysis, project management and interviews
- Victor Penda, Organisational Psychologist: rapid evidence review, project support, coding check

3.3. Desktop review

3.3.1. Overview

The purpose of a desk review is to enable an assessment to be made as to whether there is anything in the formal processes, procedures and policies of an organisation that may act as a blocker or facilitator to access by minoritised groups. The review is done through two broad lenses. The first is to compare whether what is done by WCS is in line with best practice in the sector (research and higher education). Best practice will also include relevant academic research on a particular area. For example, there is a large body of research on the practices that increase the validity and utility of various recruitment, selection and assessment processes. The second lens is to consider whether there is bias present or if any policies, procedures or processes are at risk of being impacted by bias or of causing bias.

The review consisted of the elements below.

3.3.2. Review of corporate policies, objectives

For context, we reviewed a range of relevant corporate documents including the Wellcome Connecting Science (WCS) Five-year review, Annual reports, Race and Research Equity Action Plan, Conference Code of Conduct and Gender balance policy. A full list is provided in Appendix A.

3.3.3. Review and bias audit of registration process and communications

This consisted of an assessment of whether there is anything that would deter or encourage people from minoritised groups to apply for a conference, course or event. This involved a review of relevant webpages and communications, and a mystery shopper exercise in which the researchers went through the process of applying for a conference, course or event as though the researchers were actual applicants. A specific review of the bursary application process was also carried out.

3.3.4. Analysis of diversity data

We reviewed the following in order to understand what demographic data WCS collect, how this information is analysed and how this information is used. A comparison was made with the EDI monitoring typically carried for sector comparators such as Athena Swan and the Race equality charter. National comparators such as the way that diversity data is collected for the purposes of demonstrating meeting duties in respect to the Equality Act 2010 were also used. The following were reviewed:

- Institutions represented on the mailing list
- Diversity characteristics of conference participants
- Successful and unsuccessful bursary applications
- Diversity characteristics of panel members

3.4. Rapid evidence review

Rapid evidence reviews provide a more structured and rigorous search and quality assessment of the evidence than a narrative literature review. By ensuring that the search strategy is agreed in advance and that only good quality evidence is considered, the reviewer's own beliefs about what should be significant do not bias the results of the review[5]. They are, however, not as exhaustive as a systematic review. Our review included academic and grey literature of existing research and studies around attendance at life science and medical conference by minoritised individuals, the impact of conference attendance on career advancement and experiences of those from different ethnicities attending conferences. We also looked for research around barriers to conference attendance, especially for those from Black and other ethnically minoritised groups. The objective of the rapid literature review was to document the current state of knowledge about the experiences

[5] https://cebma.org/wp-content/uploads/Briner-Barends-The-Role-of-Scientific-Findings-in-Evidence-Based-HR.pdf

of Black and other minority ethnic researchers who have attended UK life science conferences. The search was based on the following questions:

- What is known about the extent to which academics/researchers from different ethnicities attend conferences?
- What are barriers to conference attendance for academics/researchers from different ethnicities?
- What is known about the experiences of academics/researchers from different ethnicities in attending conferences?
- What is known about the extent to which academics/researchers from different ethnicities speak at conferences?
- What is known about the impact of conference attendance on the career advancement of academics/researchers from different ethnicities?

Following screening a total of 7 studies met the eligibility criteria from the 400 studies that emerged from the initial search. (Detailed information and search criteria can be found in Appendix A.)

3.5. Experiences of researchers: survey

In designing the survey, we wanted to not only sample the experience of ethnically minoritised researchers, we also wanted to compare their experience with that of white majority researchers. This would enable us to assess whether the barriers and enablers experienced by ethnically minoritised researchers were an experience in common with all conference goers or were the barriers worse for people from a specific background. It would also help us to identify where some barriers were unique to people from a particular background. The survey was therefore analysed with respect to differences between white and all Black, Asian and minority ethnic respondents; differences between aggregated ethnicity categories created from respondents' self-reporting (Arab, Asian, Black, Chinese, White, Mixed and Other); and finally, differences between Black respondents and all other respondents in order to understand specific barriers experienced by Black researchers.

3.5.1. Survey content

Our survey is provided as an Appendix D and broadly covered:

- Detail of prior conference attendance
- How funding and support for attendance was obtained
- Reasons for non-attendance, any support that could have made it possible to attend
- Experience and impact of the following as a result of attendance:
    - networking
    - collaboration
    - career development
    - knowledge sharing

3.5.2. Research sample

In order to reach as wide a range of researchers as possible, we used the following methods:

- Direct mailshots from WCS to all those on their mailing list
- Contact via collaborative organisations such as EDIS, the British Science Association Inclusive Science Engagement Network, Higher Education Race Action Group and Vitae
- Direct emails to Life Sciences departments at universities and NHS trusts Life Sciences research units
- Direct emails to Heads of School, Deans, Research Directors, Group Leaders, Professors, EDI representatives at university Life Sciences and related fields departments

The survey was open from Mar 1 2022 until May 27 2022.

Unfortunately, it was a somewhat of a challenge getting researchers to engage with the survey and after two further calls, participants were offered an inducement of a £20.00 voucher.

3.6. Experiences of researchers: Interviews

This phase involved collecting qualitative primary data from a sample of survey respondents who were invited to participate after completing the survey. The interviews aimed to gather insight into the experience of minoritised ethnic groups in terms of conference attendance, their experiences at conferences and positive impact after attendance. The use of qualitative data allowed us to elaborate on the findings from the survey, providing explanatory richness to themes highlighted.

3.6.1. Research protocol

Interviews were carried out with a range of researchers, including:

- ethnically minoritised researchers and white researchers;
- conference attendees and non-attendees;
- researchers atdifferent career stages.

This has enabled us to identify systemic, logistical and personal barriers, and helping factors that are specific to ethnically minoritised group researchers, as opposed to those typical across both minority and majority groups. Thus, our findings are specific, practical and more robust than simply hearing lived experiences from minoritised groups, or only hearing from people who have successfully attended conferences.

We carried out 16 50-minute interviews on Teams or Zoom between July and August 2022. (A detailed breakdown of our sample can be found in Appendix A). Survey respondents volunteered to be interviewed. Analysis of this sample suggested data saturation had been reached after analysis of the first 13 interviews[6]. 56% of interviewees were from ethnically minoritised groups and 69% were female. Demographic characteristics and career stage were generally evenly distributed within the sample. In order to facilitate a safe space, all interviews with respondents from ethnically minoritised groups were carried out by ethnically minoritised consultants. Interviews were video recorded and transcribed. Content analysis was undertaken with the aid of qualitative software (NVivo).

[6] Guest, G., Bunce, A and Johnson, L (2006) How many interviews are enough? An experiment with data saturation and validity, *Field Methods*, 18(1), 59-82

4. Findings and results

Findings and results are presented below in respect of the distinct methods used in the project, rather than on the basis of overarching themes. In the conclusion section, common themes that emerge from the different research methods are presented, alongside recommendations which address each theme.

4.1. Desktop review

4.1.1. EDI governance

Although a distinct entity, WCS is part of the Genome Research Ltd family which also includes the Wellcome Sanger Institute and the Wellcome Genome Campus. The, three person strong Equality, Diversity and Inclusion Team at the Sanger Institute are seen as inspiring EDI across the whole group and they aim to work closely with not only their Wellcome family siblings, but also to work in partnership with the other commercial and scientific organisations on the Wellcome Campus. What became apparent though, is that not having a discrete EDI resource at WCS had a direct impact on the level of EDI output that occurred. EDI is often couched in terms of values, commitment and passion, but both research and experience are clear that what makes measurable difference in respect to EDI is action[7]. To achieve EDI objectives, inevitably some form of change is required which needs to be managed like any other project is managed by the organisation. This requires resources both in terms of personnel and budget. Lines of accountability also have to be effective to steer organisations through what can often be complex and challenging programmes of work. Furthermore, EDI is increasingly recognised as a distinct profession that requires a level of specialist knowledge and experience[8].

4.1.2. EDI policies

WCS has a range of policies that could be classified as relevant to EDI. The findings from our review of these policies is reported below.

Code of conduct

The code of conduct sets out WCS expectations of attendees at its conferences, courses, and events. The code covers conflict of interest, language and images that could offend, bullying and harassment and damage to property. The code makes clear that WCS reserves the right to require any individual to leave if they break the code. What is missing from the code is any information to attendees about what to do if they want to report an incidence of code breaking and how that complaint will be handled. Sexual harassment is a continuing problem in science[9], and conferences where younger researchers are hoping to seek collaboration with more senior and established researchers could provide fertile ground for this type of behaviour.

WCS needs to develop a policy and procedure on how they are to handle any complaints of this nature and who will be responsible for providing any support during a conference if that is needed[10]. Although the focus of much of the discussion around harassment in science is around gender, the same issues can apply across any protected characteristic and so any policy needs to be generic in its coverage, but practical in nature.

Gender balance policy

Implemented immediately after it was published in November 2016, WCS has a simple and clear gender balance policy. All conference committees and all session chairs and invited speakers must comprise equal numbers of men and women.

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[7] Kalev, A., Dobbin, F., & Kelly, E. (2006). Best practices or best guesses? Assessing the efficacy of corporate affirmative action and diversity policies. American sociological review, 71(4), 589-617.
[8] https://www.advance-he.ac.uk/knowledge-hub/race-equality-charter-review-phase-2
[9] National Academies of Sciences, Engineering, and Medicine. (2018). Sexual harassment of women: climate, culture, and consequences in academic sciences, engineering, and medicine.
[10] https://smartsconsulting.com/digital-products/open-secrets-and-missing-stairs-sexual-and-gender-based-harassment-at-scientific-meetings

For courses the policy is more nuanced, with the flexibility of having less than 50% of either gender, but a requirement that there will be no single sex instructor panels. For discussion based courses the 50/50 requirement still applies. Further across the whole programme the number of selected participants must also equal 50/50.

Taking just two years to be fully implemented, we have been informed that this policy has been notably effective in changing the gender balance across WCS conferences, courses and events.

The immediate success of the gender balance policy suggests that having clear quotas and specific deadlines does work to drive change in respect to diversity. Since this approach has worked for gender, there is potential to build on this success by developing an equivalent policy relating to ethnicity. Although it is not as straightforward to identify a target percentage as it is with gender, the sensible use of the data available from UKRI and Advance HE on the proportion of ethically minoritised individuals active in life sciences research could suggest a suitable figure. Such an approach could radically transform the representation of minoritised individuals in conferences and events in the same way it has for gender.

A quick win for WCS would be to build on the work done by the Cultural Evolution Society[11] on organising a diverse conference[12]. Foremost of these is the need for diverse and gender balanced conference organising committees and the need for an overt speaker policy with explicit targets.

Bursary policy

WCS current bursary policy states that there are a limited number of bursaries available to PhD students submitting abstracts who are facing financial barriers to attend the conference in person (up to 50% of the registration fee). The reality is that nearly everyone who applies for a bursary is given one. Since the wording suggests that it is going to be highly competitive to get a bursary, it may put off minoritised groups to apply, since their experience of success in other funding applications is more likely to have been a negative one. Research into the 'Mathew effect'[13] for funding in science found that being turned down for the first grant deterred ECRs from applying for future grants. As will be discussed elsewhere, one of our findings is that on the whole, our ethnically minoritised sample were more likely to be self-funding their attendance at conferences. Attention needs to be paid to how the bursary policy could be used as a tool for positive action and to promote inclusion.

Race Equity Action Plan

In response to the murder of George Floyd, and the impact of the COVID 19 pandemic on ethnically minoritised groups, and in recognition that their mission and objectives have largely been developed to be inclusive by default, WCS developed a Race Equity Action Plan. This action plan makes clear commitments aimed at specific UK and global communities. These commitments cover:

- reaching and reflecting Black and other ethnically minoritised communities;
- the recognition of structural inequalities and the use of targeted initiatives to address these in the Global North and in the Global South;
- Improving representation, progression and inclusion within the organisation.

For each commitment, the plan sets out actions, organisational responsibility, success measures and a timeline. Data monitoring and analysis is important to be able to identify opportunities for improvement and to measure progress. [14] The challenge WCS now faces is identifying the resources needed to implement this comprehensive plan.

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[11] https://culturalevolutionsociety.org/

[12] https://culturalevolutionsociety.org/files/ces_conferenceworkshop_guidelines_3_nov2020-20201112075628.pdf

[13] Bol, T., de Vaan, M., & van de Rijt, A. (2018). The Matthew effect in science funding. *Proceedings of the National Academy of Sciences*, *115*(19), 4887-4890.

[14] Hirsh, E., & Tomaskovic-Devey, D. (2020). Metrics, accountability, and transparency: a simple recipe to increase diversity and reduce bias. *What Works? Evidence-Based Ideas to Increase Diversity, Equity, and Inclusion in the Workplace*, 16-23.

Carers policy

A recent addition, the carers grant provides help to delegates with the costs of caring for children or dependent family members while attending WCS events at the Wellcome Genome Campus. This is a positive step as caring responsibilities have meant that some of our respondents felt that they would have to limit attendance to one in person conferences per year.

Access policy

During the conference registration process, particpants can tell conference organisers about their access needs, and click though to information about the Campus. However, WCS does not have an access policy, nor is accessibility information on the website. A priority for WCS will be to develop a comprehensive access policy. The policy would need to cover the physical environment on campus, the digital environment, and the interpersonal environment.

4.1.3. Diversity data

WCS develop and deliver around 17 conferences a year with attendance ranging from around 400 (hybrid meeting combining in-person and virtual) to 2,000 (virtual only meeting).

There is reliable data available on gender, ticket type and location. For around the last 12 months, when people register to attend a conference, there are directed to fill in an optional diversity monitoring survey. Whilst this is a positive step, unfortunately there were a number of elements that mean that this data has not been able to inform our review. In summary, whilst WCS have made steps to analyse the diversity of conference participants, the process needs to be refined in order for this data to be used effectively. In addition, we saw no evidence that WCS had carried out any analysis of this diversity monitoring.

WCS has made a start in monitoring the diversity of conference attendees. In order for this to support measurement of progress, an update to the monitoring form and data analysis against appropriate targets, perhaps developed with UKRI, is needed. The data will be further enhanced by collating diversity data for conference evaluation and using this analysis to drive focused actions.

4.2. Rapid evidence review

We carried out a rapid evidence review which included academic and grey literature of existing research and studies around conference attendance, the impact of conference attendance on career advancement and experiences of those from different ethnicities attending conferences. We also looked for research around barriers to conference attendance, especially for those from Black and other ethnically minoritised groups.

Unfortunately, we struggled to find empirical studies that investigated experiences of conference attendance for ethnically minoritised groups. Nonetheless, we found some correlational evidence that are further discussed in the following sections.

Overall, most studies looked at gender equality or conference transformation to facilitate better experiences for scientists that are underrepresented or are at an early stage of their careers. We decided that there was relevance from these papers, even though most of the included studies did not specifically look at race or ethnicity, since the researchers discussed their findings and recommendations in relation to underrepresented groups. Where consideration of their potential implications on Black and other ethnically minoritised groups was made, this was particularly noted.

4.2.1. Search results and study information

A total of seven studies that met the set inclusion criteria were included in the literature review. All of these studies were conducted post 2016 with half of them conducted in 2019 alone. While over 50% of the studies were conducted in the USA, the remaining studies had a heterogeneous sample from over 20 countries and 260 in person national and international academic conferences. The researchers from these studies were primarily from the USA and UK. All studies provided data on their participants except for the study conducted by Sarabipour et al (2021) whose data is based on the examination of 260 conferences without providing any specific participants data. Nonetheless, the other studies have a total approximate sample size of 33,685.

The most common form of study was correlational in nature, in an attempt to establish a statistical relationship between conference attendance and the experiences of minority underrepresented groups.

The most common reported subject was talks or speaking opportunities and this relationship was mainly investigated in association with attendance of women, closely followed by racially/ethnically minoritised groups. A total of three studies provided correlational evidence of the relationship between conference attendance and the experiences of women or racially/ethnically minoritised groups (DeVilbiss et al, 2019; Ford et al, 2019; Sardelis & Drew, 2016).

Two studies looked at conference transformation to facilitate accessibility and engagement for underrepresented groups and researchers worldwide (Sarabipour et al, 2021; Niner & Wassermann, 2021). The main reported transformation was adopting an online and hybrid model for conferences while exploring innovative ways to reduce barriers.

One study looked at the experimental manipulation of allocated time for questions, asking to achieve gender balance in question asking at conferences (Carter et al, 2019). Another study reported narrative data on the experiences of 14 women biological anthropologists with a focus on the increased number of talks and poster presentations given by women authors (Turner et al, 2018).

Our flow chart for literature selection is shown below and all details for relevant literature are summarised in Appendix C.

Our findings from the rapid evidence review are outlined below:

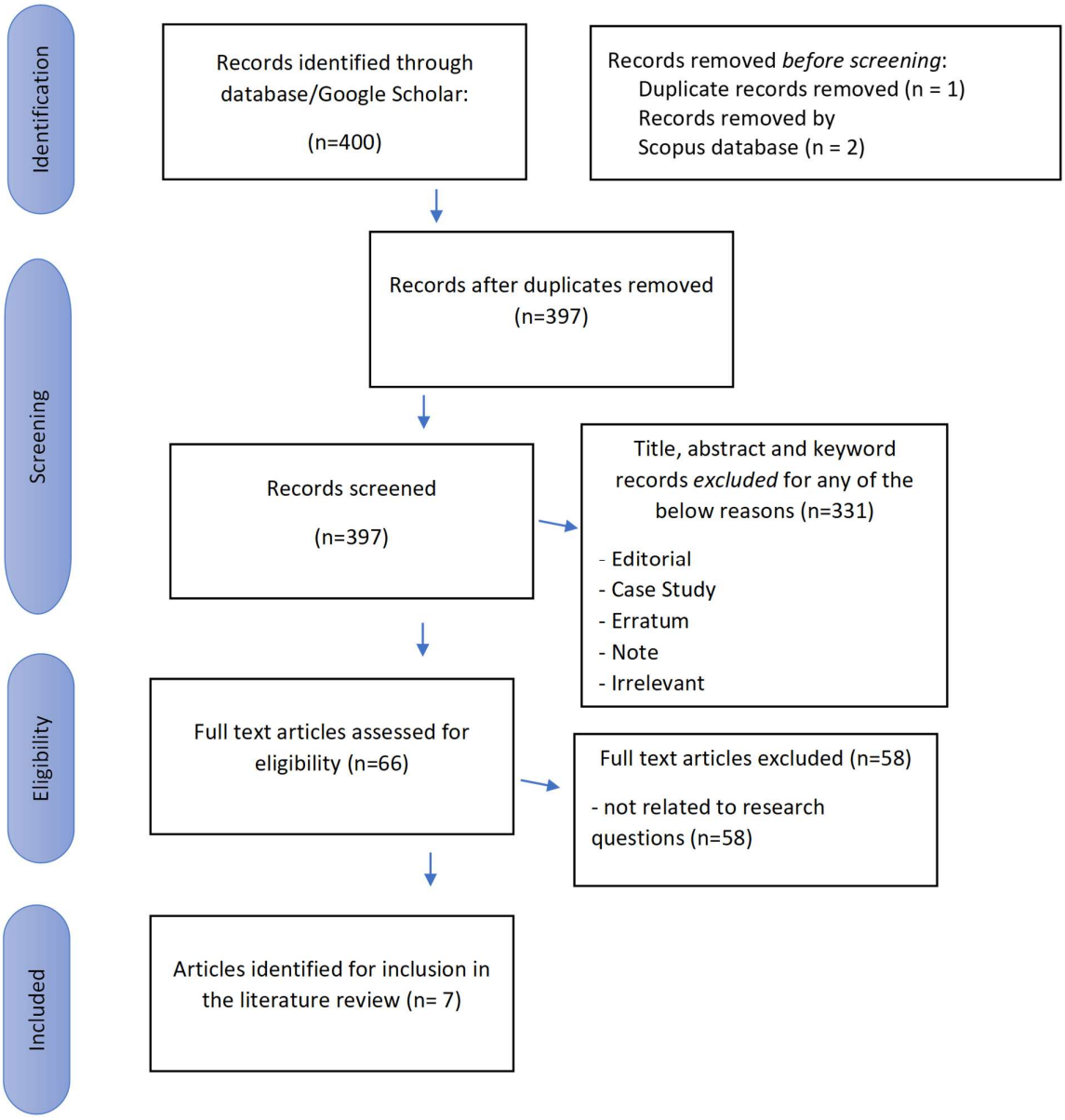
Minoritised participants report less favourable experiences at conferences

The findings from the correlational studies suggests that there is a strong relationship between under-represented minority groups and less favourable experiences at conferences. For example, it was reported that women and ethnic/racial minority groups were less likely to feel welcome, participate and have equal speaking opportunities (Ford et al., 2019; DeVilbiss, et al., 2019). In contrast, participants who were white or male were more likely to report feeling welcome; and that feeling welcome was positively associated with high self-initiated participation. Moreover, Ford et al (2019) reported that minority racial and ethnic groups are overly represented in the students and early career stages which is associated with having less talks and posters presentations.

Organisers' characteristics influence the representation of speakers

A significant positive relationship was found between the number of women involved in organising a symposium and the number of females speaking in that symposium (Sardelis & Drew, 2016). This suggests that symposium or conference organisers can benefit from having more women involved in organising a symposium as this can lead to increased gender equality and engagement at the symposium. We may make the same assumption that having more people from ethnically minoritised groups on the organising committee is likely to increase the likelihood of more ethnically minoritised speakers.

4.2.2. Summary flow chart of search and inclusion strategy[15],[16]



[15] Source: Khangura S, Konnyu K, Cushman R, Grimshaw J, Moher D. Evidence summaries: the evolution of a rapid review approach. Systematic Reviews. 2012 Feb 10;1:10. doi: 10.1186/2046-4053-1-10. PMID: 22587960; PMCID: PMC3351736.

[16] Adapted from: McLaren, H., Star, C., & Widianingsih, I. (2019). Indonesian women in public service leadership: A rapid review. Social sciences (Basel), 8(11), 308. https://doi.org/10.3390/socsci8110308

Improving accessibility, efficiency and inclusivity of conferences

Two studies looked at how conferences can be transformed to improve their accessibility, efficiency and inclusivity (Sarabipour et al, 2021; Niner & Wassermann, 2021).

Sarabipour et al (2021) reported that:

1. National and international meetings should be replaced with more regional meetings as this helps to reduce transportation costs and the carbon footprint usually associated with air travel. Such transformation can be facilitated by providing shared transportation options such as a bus and opting to host the meetings in economic or public venues with low hosting costs (e.g schools or universities).
2. Organisers should maximise digital opportunities such as live streaming and semi-virtual conferences as this can reduce costs and increase accessibility to researchers worldwide.
3. Organisers should foster digital networking by maintaining an interactive experience through online platforms such as Slack and Twitter to encourage discussions and poster sharing.
4. Organisers should increase the availability of pre-printing research outputs, abstracts and poster presentations as this will reduce the number of conferences held as researchers can learn about new developments much earlier before their publication. This also enables less privileged researchers who are unable to attend conferences to stay on top of new developments.
5. Organisers should promote intersectionality and career stage equity by ensuring that the gender breakdown of the speakers and chairs reflects the actual attendance breakdown. Gender equity guidelines and policies should be implemented and a number of talks should be allocated to early or mid-career scientists.
6. Organisers should sponsor and promote trainee and early career scientists, especially women and minorities. This can be achieved by providing career development and mentoring workshops. At in-person or digital conferences, organisers should adopt a policy to specifically ask or take the first question from a trainee, minority or woman as these demographics are less likely to ask questions and engage in discussions.

Another study by Niner and Wassermann (2021) found that the responses to having more virtual conferences depended on differences in participants' personal experiences:

- Participants who otherwise would not have been able to attend an in-person conference reported excitement with the increased accessibility provided by online conferences.
- Participants with an already established sense of community preferred in-person conferences.

Thus, adopting a hybrid model may benefit both parties although there is a general fear that this may potentially widen systemic inequalities as the online community and in-person community may be disconnected. According to the authors, travelling cost is the single most reported barrier associated with in-person conferences.

Methods to increase equal question asking

One piece of experimental research tested whether extending the time allocated for question asking improved gender equality in question asking at conferences. This experiment was reported to be unsuccessful (Carter et al., 2019). In a data set involving 600 academics in over 20 countries, researchers found that internal factors such as not working up the nerve and structural factors were factors inhibiting women's question-asking behaviour. According to the findings, women were less likely to ask questions when a man was first to ask a question or when there were fewer questions overall. Therefore, the researchers recommended organisers to actively promote a women-friendly environment by increasing the proportion of women in the audience, choosing a female-first question protocol and increasing the number of questions asked. Although, they note that the latter may be taxing for the speaker (Carter et al., 2019).

Success factors for women scientists

As for the study by Turner et al, the researchers initially surveyed participants to identify general trends in conference speaking opportunities and posters presentations. They found that the numbers of women speaking or presenting posters has increased. They then looked at the life story of successful women scientists and academics concerning increased symposium talks and poster presentations. Next, they conducted qualitative interviews focusing on the life trajectory of 14 successful women scientists. Success factors were identified as:

- **Mentors** were particularly important to cope with personal factors such as the decision to become a mother, celebrating individual differences and overcoming limited work experience.
- **Work-life balance** was particularly important to manage childcare and professional responsibilities by setting realistic personal goals, prioritising personal meaningful experiences above professional accolades, having a supportive spouse, and flexible work arrangements.
- **Non-traditional career paths** such as part-time and online positions helped offset competing demands associated with motherhood. Another mentioned that a non-traditional path was to leverage previous skills and experience to adopt an interdisciplinary approach.
- **Overcoming challenges and the unexpected** was a theme that mainly related to the conflict between personal life events and professional development. Some mentioned strategies were utilising one personal story to guide professional aspirations, taking necessary time off to cope with personal life events, and the motivation to change the status quo.

Summary of factors that have a positive impact on EDI

Intervention Type	Factors
Correlational	Increasing the number of women involved in organising a symposium
Transformation	Using more regional meetings
	Offering live-stream and semi virtual conferences
	Fostering digital networking through online platforms e.g. Slack, Twitter
	Increasing the availability of research preprints, abstracts and posters
	Promoting intersectionality and career stage equity e.g. allocating specific talks to minorities
	Sponsoring and promoting minorities and early career scientists e.g. career development and mentoring workshops
	Adopting a hybrid model
Experimental	Increasing the proportion of women in the audience
	Adopting a women or minority first protocol in question asking
	Increasing the number of questions asked
Personal Narrative	Having good mentors
	Achieve work-life balance e.g. setting realistic expectations
	Considering non-traditional career paths e.g. part time tenure
	Overcoming challenges and the unexpected e.g. taking necessary time off

4.3. Experiences of researchers: survey

We collected information on researchers' experiences of conferences via an online survey which focused on conference attendance, barriers to attendance and the impact of conferences. The survey also included demographic questions, including ethnicity and gender.

55 UK-based researchers with roles ranging from Research Director to Research Masters/PhD student responded. Respondents covered a good range of seniority and institution type and 48% of respondents were from ethnically minoritised groups. The survey was analysed with respect to differences between ethnicities.

4.3.1. Conference attendance

The findings support a general pattern of exclusion of Black researchers in particular from the life sciences conference sector.

- Ethnically minoritised researchers are less likely to attend conferences organised by other providers. Only 54% of ethnically minoritised researchers had attended a conference organised by another provider, compared with 87% of white researchers. In particular, no Black respondents had attended conferences other than WCS conferences.
- No statistically significant difference was observed for WCS conference attendance based on ethnicity among these respondents, since similar proportions had attended WCS conferences. The lack of observed difference here is likely owing to the methods of survey circulation via WCS databases.

The charts below show more information around conference attendance:

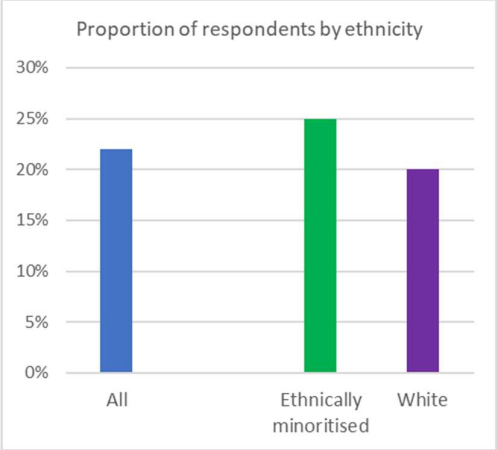


Figure 1: WCS conference attendance by ethnicity

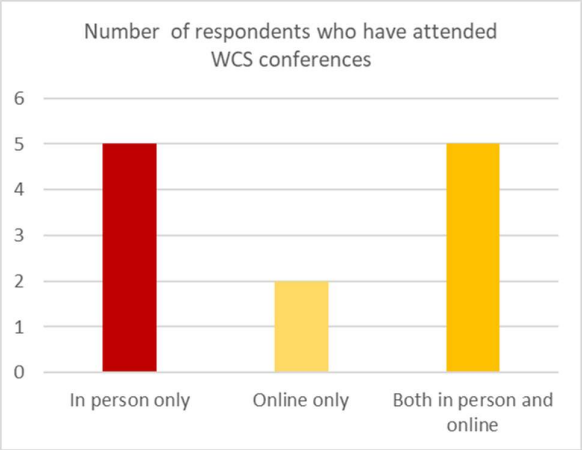


Figure 2: WCS conference attendance by in person/online

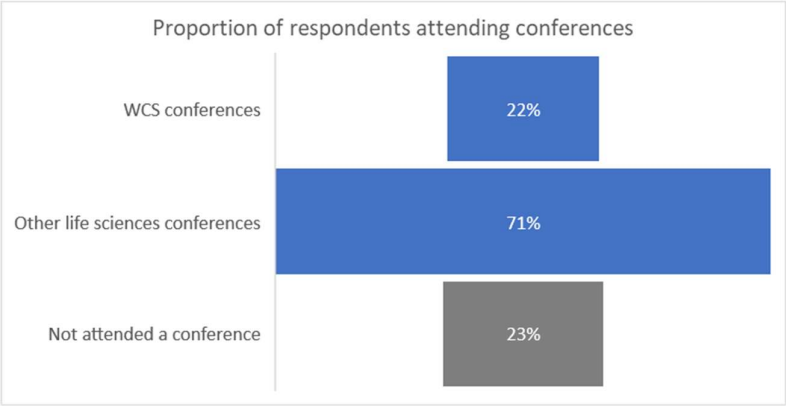


Figure 3: WCS and other conferences attendance

- Conference attendance was not correlated to seniority or Russell Group membership.
- Overall the largest share of respondents who attended life science conferences (other than WCS conferences) found out about these from colleagues/word of mouth – a finding that supports a general pattern of exclusion of those who are not part of these formal and informal networks.

4.3.2. Support, funding, bursaries

WCS conferences

- All respondents who attended WCS conferences and reported that Funding/bursaries from WCS had enabled them to attend were white (n=2). Whilst all respondents who self-funded their attendance at WCS conferences were from ethnically minoritised groups (n=2), despite being in the PhD/ECR stage of their career.
- 37.5% of ethnically minoritised researchers said that reduction of cost would help to enable them to attend WCS conferences and 44% identified external funding/bursaries as enabling factors. This compared with 29% of white researchers for both options respectively.
- All those who selected support for caring responsibilities as a measure that would enable them to attend WCS conferences were from ethnically minoritised groups (n=2).

Life sciences conferences other than WCS conferences

- All those who said that a reason they had not attended other life science conferences was because they were too expensive were from ethnically minoritised groups (n=3 – 27% of ethnically minoritised respondents compared with 0% of white respondents).
- The top three enabling factors for conference attendance for ethnically minoritised researchers were reported as advertising that reaches them (54.5%), external funding/bursaries (54.5%), and reduction of cost (36%).
- All those who selected support for caring responsibilities as a measure that would enable them to attend other life science conferences were from ethnically minoritised groups (n=2).

4.3.3. Experience of conferences

- 100% of white researchers (n=6) who had attended WCS conferences agreed or strongly agreed that they felt welcomed and included, compared with 33% of ethnically minoritised researchers (n=2). 50% of ethnically minoritised researchers stated that they neither agreed nor disagreed while 1 disagreed.
- Ethnically minoritised researchers are less likely to strongly agree/agree that they felt welcomed and included at other life science conferences (62%), and white researchers more likely (96%). Feelings of being welcomed and included were not correlated to role seniority or Russell Group membership.
- In relation to WCS conferences, 50% of ethnically minoritised respondents (n=3) stated that more diversity in relation to gender would enable a better experience, and 83% (n=5) stated the same for more diversity in relation to race or ethnicity. The latter was the measure selected by the largest number of ethnically minoritised respondents that would enable a better experience.
- Similar patterns were observed for other life science conferences. 61.5% of ethnically minoritised researchers (n=8) stated that more diversity in relation to gender would enable a better experience (compared with 29.2% of white researchers), and 77% stated the same for more diversity in relation to race or ethnicity. The latter was the measure selected by the largest number of ethnically minoritised respondents that would enable a better experience.

4.3.4. Virtual vs in person

When comparing virtual with in person conferences, survey respondents had the following views:

Virtual

- good for information transfer
- can be less intimidating to ask questions, easier to rate questions by popularity
- lower costs and carbon footprint
- easier to fit in with other commitments
- no visa requirements
- potentially greater access to diverse/internationally based speakers

In person

- better for networking, incidental meetings and 'getting noticed'
- Two respondents (an Asian man and an Asian woman) said 'cliques' can still inhibit this.

4.3.5. Impact of conferences

Without looking at differences of ethnicity, overall respondents were mainly positive about the impact of conferences. However, the data suggest that differences in experience by ethnicity also affect what participants take away from conferences:

- For example, white respondents were more likely to agree or strongly agree that they applied learning than Asian and Chinese ethnic groups.
- White respondents were also more likely to agree or strongly agree that they shared learning (96% for white researchers, 77% for ethnically minoritised researchers) from the other life science conferences they attended. These differences were not correlated to seniority or Russell Group membership.

4.3.6. Other information

- White students are more likely to have their Master's/PhD funded by a funding organisation (100% of white students), and Black students are less likely than all others (0%).
- Ethnically minoritised ECRs are more likely to have a mentor who is in addition to their PhD supervisor(s) or line manager, and Black ECRs in particular.

4.4. Experiences of researchers: Interviews

This section of the report summarises findings arising from analysis of qualitative primary data obtained from a sample of survey respondents. We carried out interviews to further investigate:

a. the critical success factors, specific to minoritised ethnic groups in terms of conference attendance;

b. positive experience during conferences; and

c. positive impact after attendance.

Appendix A provides a full description of the sample and research methodology for this phase of the research.

4.4.1. Emergent themes

Success factors to attendance

Five factors emerged as impacting conference attendance:

1. Institutional factors
2. Conference characteristics
3. Conference environment
4. External factors
5. Personal characteristics.

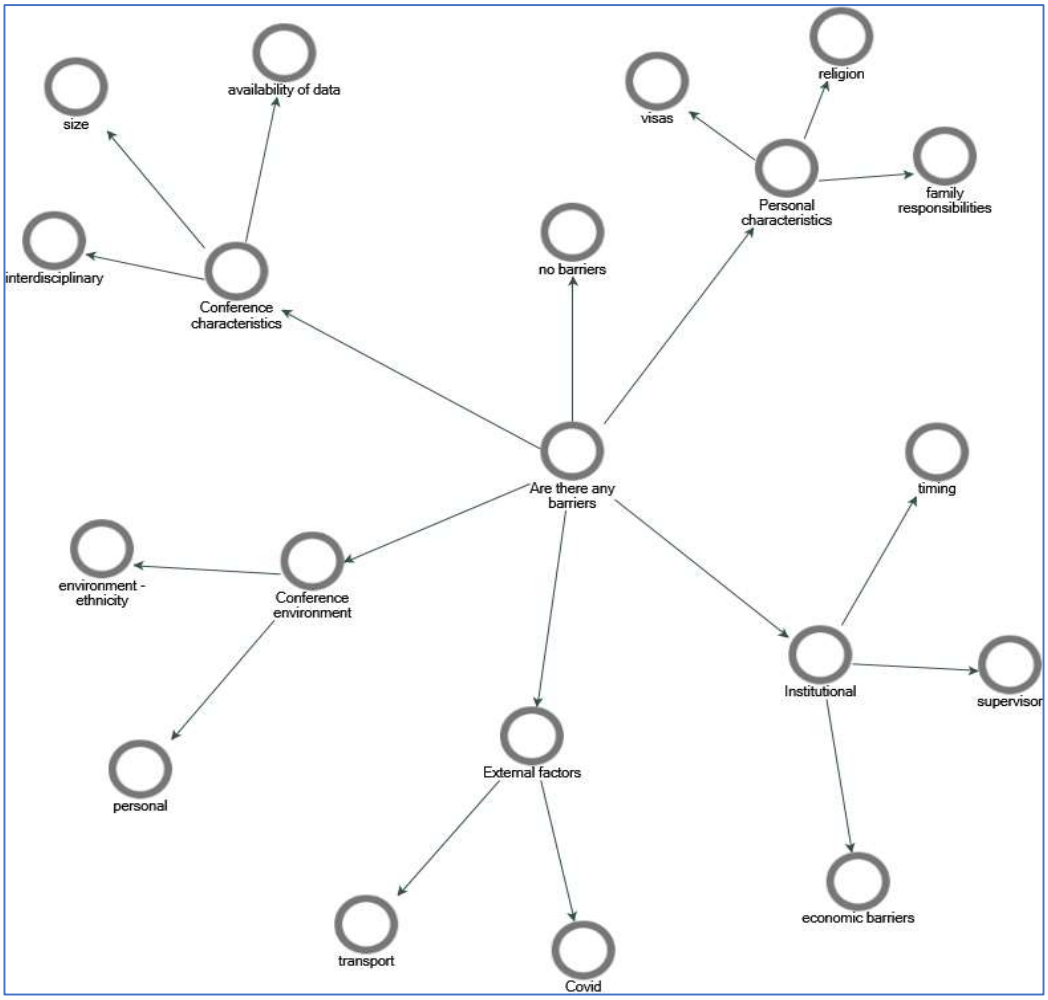


Figure 4: Barriers to conference attendance

Institutional factors

Institutional factors was a strong theme (n=15). All interviewees commented on institutional barriers relating to funding or lack of time due to teaching or lab work and these were often linked to the nature of support from supervisors. The exception was one interviewee who said there were no barriers to conference attendance.

> "…it's two different things with the supervisors. They have their sort of agenda. And as a young early career researcher, I have mine as well, though they don't always quite align. So that's a barrier."
>
> (Ethnically Minoritised Female Research Associate)

Conference characteristics

Conference characteristics (n=4) reflect the availability of the right kind of conference in terms of size, the extent to which they are interdisciplinary or require provision of data to present.

> "…you're trying to bridge computer science or a bit of biology. Sometimes it's kind of hard to find, those opportunities are … solely based on computational science.…I will go to, but obviously, you know, my heart is where biology is."
>
> (Ethnically Minoritised Male Student)

External factors

External factors (n=3) impacting attendance were primarily a reduction in face-to-face conferences due to Covid and associated issues.

> "…the general state of our transport at the moment, significant barriers, but that's a common barrier to everyone."
>
> (Ethnically Minoritised Female Associate Professor)

Conference environment

Conference environment (n=4) reflects the environment being potentially difficult to navigate although this did not necessarily deter interviewees; and some comments recognised issues that did not pertain to them personally.

> "I am aware of my privilege, which is I'm a guy you know… because I was single. I didn't have to ever worry about partner or kids or you know, things like that which I'm sure other people have to and for me personally, I would say I'm only aware of barriers for other people."
>
> (Ethnically Minoritised Male Research Associate)

Personal characteristics

Personal characteristics (n=6) include personal circumstances that are potential barriers. The biggest of these was family responsibilities (n=5; 3 male and 2 female) and included visa requirements and religious observance. Of the five interviewees who discussed these concerns, four were from ethnically minoritised groups.

"…some of the Wellcome courses that I've benefited (from) when I was supposed to work on I think it was genome wide association statistics and I went, it was a residential course. And lovely and it was this nice accommodation and good for networking etc. And I had some of my students go pre COVID, but I do feel now that if you want to have all this battery of childcare around you to go for a luxury five days course it's just not going to be possible… So I would say I would go still now with the support of my family. I would just try and go once a year."

(Ethnically Minoritised Female Professor)

4.4.2. Barriers by career stage

Institutional barriers, specifically costs, were highlighted at all career stages, with senior academics speaking of the challenges experienced by junior staff and students. Key concerns for students were costs and timing (taking time away from teaching or lab work). Research Associates highlighted a wider range of barriers to attendance than other groups and were the only group who cited supervisors as barriers. See Figures 8 and 9, Appendix F.

4.4.3. Barriers by ethnicity

There were generally no differences between ethnically minoritised and white interviewees in the themes highlighted or in the content of those themes, suggesting potentially more differences across role/career stage than ethnic group.

However, there were some differences albeit small numbers. Ethnically minoritised interviewees were more likely to highlight family responsibilities (*personal characteristics*) as a barrier (n=4) relative to white interviewees (n=1). Visa requirements were cited by one ethnically minoritised interviewee and one white non-British interviewee. Two ethnically minoritised interviewees highlighted their ethnicity as anxiety producing in the conference environment and something they have worked to overcome. See Figures 10 and 11, Appendix F.

4.4.4. Experience of conferences

Overall, interviewees' experiences of conferences were very positive (n=14).

Analysis by ethnicity

There were differences in factors highlighted by ethnically minoritised and white participants with most ethnically minoritised interviewees citing networking opportunities as a key benefit. See Figure 5.

Factor	Ethnically minoritised	White
1 : confidence boosting	1	0
2 : Covid impact	0	1
3 : exchange of ideas	2	3
4 : exciting - enjoyable	4	2
5 : networking	7	1
6 : sense of community	2	0

Figure 5: Positive factors by ethnicity (14 respondents)

"I think the time they open up for networking, and they do the themes that we go to discuss this topic and this breakout session or this one, and I find it very helpful. And in putting people who are coming with the same interests or the same questions … just to get together and I've really had really good experiences."

(Ethnically Minoritised Female Professor)

However, some interviewees expressed feelings of being overwhelmed, having difficulty talking to people, not necessarily fitting in or having to work to overcome those feelings (see Figure 6 below). The emphasis varied across ethnic groups. Some white interviewees questioned the value of conferences and cited the negative impact of Covid-19 in how breaks were structured at conferences (n=4) whilst ethnically minoritised interviewees highlighted their identity, not fitting into the community and a sense of imposter syndrome (n=5).

Factor	Ethnically minoritised	White
1 : Covid impact	0	1
2 : identity	2	0
3 : imposter syndrome	1	0
4 : personality	1	1
5 : sense of community	1	0
6 : value	0	2

Figure 6: Overwhelming factors by ethnicity (7 respondents)

> "I'm always conscious of my identity. I can't let that go. It's never a neutral thing. I'm, you know, my father was Indian. So I have mixed heritage. I've always been aware that I look different. At least in some people's eyes. That has been there since my early childhood when I experienced some racism and it shaped my personality, has shaped how I think about myself, it shaped my identity. And so if I attend a conference, if I go to a workshop, if I enter a room, if I'm at a staff meeting, every time I attend those things, I'm conscious of that identity, and I might be aware of the fact that I'm the only person with that identity in the room for instance. And I, you know, that's an aspect of privilege, isn't it that some people with different backgrounds don't have to think about that?"
>
> (Ethnically Minoritised Male Professor)

Analysis by career stage

There was no pattern across career stage in the 7 interviewees who expressed these concerns, see Figure 12, Appendix F.

4.4.5. Impact on career

The impact of conference attendance was generally positive. This impact was not necessarily directly on the interviewees' careers but also on the standing of the institution, personal growth and the direction of research (see Figure 13, Appendix F). Both ethnically minoritised (n=6) and white (n=5) interviewees reported a positive impact on their career. White interviewees (n=4) were more likely to discuss positive impacts on their research compared to ethnically minoritised interviewees (n=1).

Analysis by ethnicity

Factor	Ethnically minoritised	White
1 : impacts (all)	8	5
2 : neutral	2	1
3 : positive career	6	5
4 : positive institution	1	0
5 : positive personal	2	0
6 : positive research	1	4

Figure 7: Conference impact highlighted by ethnicity

"…Another point I should probably mention is I also got a placement at a university abroad as a result of another interaction at one of these conferences. And obviously, the person was visiting UK and attending an event, but they invited me to go abroad to Italy and do a collaboration at the university where they were teaching at and that was very, very interesting, completely different culture, completely different way of working. And it was a very positive experience. So yes, I think I've actually been very lucky. I've had internships and placements abroad as a result of attending conferences."

(White Female Research Associate)

Most positive impacts were through networking influencing both career and the direction of research (see Figure 14, Appendix F). Although interviewees felt networking impacted their career, some raised questions about the value of formal and informal networking, personal challenges and the extent to which it represents "selling".

"100% I feel like conferences are really positive for networking because you meet a huge range of people that aren't within your everyday network, who are in your research facilities. … and also people are from a variety of places across the world when you go, so … that sort of international networking, I found really positive;,… people who I wouldn't necessarily speak to everyday but also nationally, other people based in London, I was in (redacted) at the time. So sort of like yeah, wide-reaching people but also networking."

(Ethnically Minoritised Female Research Associate)

"I have in the back of my mind if I'm being if I'm being sort of brutally honest because you're pushing me I sort of there's a part of me that feels slightly inadequate that I haven't been able to do. All that glad handling that goes on at conferences that networking. I haven't been a good networker. And that's partly because I feel awkward in those situations. And I think part of the reason I feel awkward in those situations is because of my personal identity and feeling a little bit othered and feeling a little bit like an outsider."

(Ethnically Minoritised Male Professor)

4.4.6. Identity

The themes identified in the sections above reflect what was salient to interviewees in response to semi-structured questions around the three main themes outlined above. The following sections relate to specific questions asked in response to specific themes highlighted in the survey and in discussion with WCS (see Appendix E).

Identity positive

When asked whether they have ever had an occasion at a conference where they became aware of their identity in a way that was positive, most ethnically minoritised respondents reported positive experiences in terms of both ethnicity and gender (n=7). One male respondent reported being aware of his male privilege, making him less likely to be a target for sexual advances. There was no clear pattern amongst white interviewees with some highlighting gender (n=2) or not being able to think of any specific instances (n=3).

> "…sometimes it's my ethnic background or where I'm from, makes some people interested to know more about me or tell me where they came from and find similarities. So I think for me, it was in a good positive way."
>
> (Ethnically Minoritised Female Professor)

> "…I think you do have this. Yeah, a mom of a young child…and sometimes it makes the conversation much easier. So if you…meet someone…and they happen to be, you know, in a similar situation as you, young mom with young children, it just opens up the conversation. We all face the same challenges so it's very easy to connect. And there is this support among the single parents."
>
> (Ethnically Minoritised Female Professor)

Identity uncomfortable

When asked whether they have ever had an occasion at a conference where they became aware of their identity in a way that made them feel uncomfortable, some interviewees described uncomfortable experiences based on their ethnicity and/or gender (n=5); some feeling that the intersection of these rather than a specific attribute may have been a factor; the sense of isolation felt when they were the only Black person (n=2) or woman in the room (n=1; whilst some reported not experiencing any discomfort based on their identity (n=6) (see Figures 15 and 16, Appendix F).

> "I remember thinking and feeling, you know, perhaps not many people are just coming up to me and interacting with me that I've got that quality and sadness. I don't really mind just approaching people. So I would…speak to them. And then once I engage in conversation, you know, you realise that we all have a common like subject, you know, … sphere of interest… And then that then provides that similarity. But yeah, I would say that it can be quite isolating, isolating attending a conference like that by yourself. And when you know power in numbers, if there are other people there, are three of them or four of them that are gathered then that would make me feel more comfortable."
>
> (Ethnically Minoritised Female Research Associate)

One interviewee suggested that conferences, per se, are not the problem as they reflect the wider issues in the academic community:

> "I found going to conference is very hard, because I didn't really know anyone, and I didn't always feel like I was someone who naturally fit into that environment….I suppose, you know, part of it is my ethnicity…the conference environment is just part and parcel of academic life in general. And the part outside the conference can also be challenging you know, I often went to conferences and felt like felt a little bit of an outsider. … I managed to go to those conferences and it didn't prevent me from going it just made me feel uncomfortable at the time. "
>
> (Ethnically Minoritised Male Professor)

Interviewees described practical issues associated with their identity such as visas, family obligations, dietary laws and weekend conferences conflicting with religious observance (n=5). Ethnically minoritised interviewees (n=4) were more likely to cite practical issues compared to white interviewees (n=1).

> "I do feel that more can be done to support researchers or young mothers or mothers of young children just to help them with what is needed. So for example, I attended a grant panel and it was virtual because of COVID not for any other reason. And then when we were asked to give the feedback after the meeting, I would say four out of the six women on the call they said they are single mums and the only reason they could attend this meeting is because it's online… ."
>
> (Ethnically Minoritised Female Professor)

4.4.7. Experience of WCS conferences compared to other providers

Four interviewees were able to comment on WCS conferences compared to other conference providers. Three were complimentary of WCS conferences, highlighting their experience of international participants, the structure and the content of WCS conferences. One interviewee was critical of the sector in general.

> "I think there's been a very low bar in this in this field, and you know, relative to that very low general standard on addressing diversity issues Wellcome (Connecting Science) have been slightly ahead of the curve. I mean, … there are a lot of august institutions that are very fuddy-duddy and sort of pushing back against EDI initiatives and attempts to make conferences more diverse and more inclusive, I think. I think Wellcome (Connecting Science) have been good relative to many of those organisations. But that's not really saying very much"
>
> (Ethnically Minoritised Male Professor)

4.4.8. Conferences organisers and inclusion

When asked what conference organisers can do to make everyone feel more included, most ethnically minoritised interviewees highlighted the need for changes in policies and behaviours related to EDI (n=8), with one commenting that gender or lower income countries might be more significant factors than ethnicity but that in his experience policies were neither explicitly welcoming nor unwelcoming. One ethnically minoritised interviewee referred to this research as a positive initiative. White interviewees highlighted costs (n=3) with one white Head of Centre stating that he had no experience of issues in this context (see Figure 17, Appendix F).

Suggestions for changes to policies and behaviours included promotional material with explicit EDI policies and expectations for behaviour, activities and initiatives to foster inclusion and potential positive action to increase the number of ethnically minoritised keynote speakers.

> "……. I think, also, please, it's clear statements and rules that I've seen some organisers do is very even just the smallest thing at the end of the email just saying like this is meant to be a safe space for everyone. We don't tolerate this this and this and outlining those policies and adhering to them in the extreme case that something does happen... and just protecting people in that space, I think is really important... I've seen it in the past and there's been that little kind of circle of like, okay, like I can go there I feel safe."
>
> (Ethnically Minoritised Female Student)

4.4.9. Sharing learning from conferences

Half of interviewees share their learning from conferences at research group meetings (n=8), whilst others share their learning online and via blogs (n=2), with specific individuals (n=2) or not all (n=1). There was no obvious pattern of differences between ethnically minoritised and white interviewees. See Figure 18, Appendix F.

Interviewees suggested that conference providers can facilitate the sharing of learning primarily through online methods (n=5) such as social media, digital uploads of presentations and speakers and conference websites; sharing slides (n=2); recording presentations (n=2); building more time for interaction into conferences, this was dependent on the conference setting and size (n=3); and through publications, beyond typical published proceedings (n=1). There were no clear differences across ethnic groups in strategies highlighted.

> "…feel that programming books and abstracts have to be online. Because having paper versions is … just harder work. … if you want to, like you know, have that easily searchable in the future or something like you just remember a keyword in one of the talks … you're never gonna find it in the program. Whereas if you then type … into a PDF or you type it into a website that has the archived abstracts, then it will come up … that's also an inclusion issue because if somebody … finds it harder to read, then they have it in a digital way which they can either use a screen reader or they can enlarge the font so they can do whatever they want."
>
> (Ethnically Minoritised Male Research Associate)

4.4.10. Additional comments

When asked if they had any additional comments, interviewees highlighted a range of areas for improvement as well as ways in which Wellcome Connecting Science can show leadership.

Suggestions for improvement

Half (n=8) highlighted areas for improvement including training materials to support junior academics, more input from non-Russell group universities and people from ethnically minoritised groups in conference planning, adjustments for less visible disabilities and the desire to see the continuation of hybrid conference options. The numbers are small, however, issues around EDI were all raised by all ethnically minoritised interviewees apart from one.

> "… because we feel as though sometimes we'll be left behind…I'm a full-time member of staff at (non-Russell Group). Let's see more input from us as well…when they're planning a conference, why can't we be on a committee? Why can't we be reviewing abstracts we have a master's bioinformatics department here at (redacted). Run by (redacted), invite him…he wants to be more involved in giving his thoughts about things contributing to these programs. Conferences, because he's got a lot of knowledge. He's a Black man. You know, we want to see more people like him on these panels."
>
> (Ethnically Minoritised Female Associate Professor)

The following comment regarding training materials by a white Research Associate underscores the importance of qualitative data supplementing quantitative (survey) data; she self-identifies as White Other but talked extensively about her experience of discrimination due to her ethnicity and country of origin.

> "I think it would also help that the same way that we have educational material on harassment and other issues at workplaces that we basically have provide some training on issues that students experience at conferences to seniors because I'm speaking for myself, I'm now very capable of dealing with them. I'm used to them unfortunately. But … if I'm supervising someone or working with someone, Junior, I really don't want them to experience the same thing… I'm working with a number of people but one of them is also from (redacted). And I know exactly how … people are going to react to her when she attends conferences and unlike me, who has a very light skin and can pass as European, she's Brown and she's not going to be able to do that. So she'll probably get even more negativity and she's younger than me. Her English is not perfect. Obviously mine is not either. So I would like to shield her and prevent her from being the target of this negativity as much as I can. But I think the whole community needs to be aware of it and support each other. Otherwise, it's not going to work. I can't attend every single event with her. So yeah, I think it would be good to just … maybe comment on this in the training materials that we have to do at our Institutes and it's obligatory."
>
> (White Female Research Associate)

WCS Leadership

Some interviewees spoke positively about the fact that WCS commissioned this research and suggested how WCS might show leadership in driving an EDI agenda (n=4).

> "Wellcome (Connecting Science)…they could have the opportunity they want to be leaders, they could push through a diversity agenda if they want to, if the will is there ….They could really show leadership in this and that would be wonderful for the academic community. So that's what I'd love to see."
>
> (Ethnically Minoritised Male Professor)

5. Conclusions and recommendations

Although this research was commissioned by WCS and there are findings and recommendations that are specific to them as an organisation; many of the findings have broader applicability to the life sciences conference sector as a whole.

5.1. Increasing the representation of ethnically minoritised researchers at conferences and events across the sector

The success of gender balance policies at WCS and elsewhere demonstrate that targeted positive action approaches can be used to improve access and experiences of conferences for all researchers, especially those from minoritised groups. There are already some thought leaders [17] in the sector who have developed discussion papers, policy and guidelines that could be used to form a common approach by the sector. If WCS and others of a similar stature in the research sector adopt and advocate positive action approaches to increase the representation of ethnically minoritised presenters and participants, the impact could be as significant as the impact of gender balance policies have been. This would apply not only to any conferences they are directly involved in, but research funders could also require any conference that receives funding from them, or reporting research they have funded, to use the same guidelines.

In our interviews, we heard that the fact that WCS had commissioned this research was positive and the potential role for WCS as leaders of this agenda was highlighted.

> "So I guess the question is where will Wellcome sit… are they willing to take the lead? Because I do think there is a need for leadership…They could really show leadership in this and that would be wonderful for the academic community."
>
> (Ethnically Minoritised Male Professor)

R1. Create a sector wide advisory group to develop an ethnic diversity balance policy for conferences, events and courses.

R2. Open a conversation with UKRI to explore whether their data could be used in combination with the Advance-HE data set on ethnically minoritised PhD students to enable the development of a benchmark against which participation targets for conferences and events could be set.

5.2. Increasing diversity of speakers

Ford et al (2019) reported that minority racial and ethnic groups are overly represented in the student and early career stages which are associated with delivering fewer talks and posters presentations. This suggests that direct intervention will be needed rather than simply removing barriers to participation. Some interventions that might be effective are:

- Sarabipour et al, 2021 suggest that organisers should promote intersectionality and career stage equity by ensuring that the gender breakdown of the speakers and chairs reflects the actual attendance breakdown.
- They additionally advise that a number of talks should be allocated to early or mid-career scientists to increase diversity.
- Research from Sardelis & Drew (2016) demonstrates that the diversity of organisers influences the level of diversity of speakers.

Adopting initiatives such as these would not only increase representation but also improve the experience of minoritised attendees. 61.5% of ethnically minoritised survey respondents stated that more diversity in

[17] https://culturalevolutionsociety.org/files/ces_conferenceworkshop_guidelines_3_nov2020-20201112075628.pdf

relation to gender would enable a better experience (compared with 29.2% of white researchers), and 77% stated the same for more diversity in relation to race or ethnicity. Increasing diversity was the measure selected by the largest number of ethnically minoritised respondents that would enable a better experience.

R3. Set targets for panel speakers in relation to ethnicity.

R4. Promote intersectionality and career stage equity, for example by allocating specific talks to minoritised researchers or having some form of minimum percentage of presenters from ethnically minoritised backgrounds

R5. Produce guidelines to increase the diversity of conference organising committees, particularly integrating input from non-Russell Group universities.

5.3. Informal networks, mentoring and sponsorship

We know that informal networks are key to both career progression and feelings of inclusion. Sarabipour et al (2021) suggest that sponsoring trainees, especially women and minorities is one of the keys to inclusivity whilst Turner et al (2018) suggested that having a mentor is one of the success factors for the women scientists they studied. They found that the numbers of women speaking or presenting posters have increased and that the reasons for this was due to a number of structural actors such as having mentors, work-life balance, non-traditional career paths and overcoming challenges.

Sarabipour et al (2021) found that factors affecting the talent pipeline such as sponsorship and mentorship, and access to grants and career development, also appear to impact the proportion of minority groups presenting at conferences.

These findings suggest that improving access to conferences at the point of entry, may not be sufficient to improve representation. A more active form of sponsorship and mentorship of ethnically minoritised researchers over the longer term, and particularly in the early career stage, will be needed.

R6. Use the influence of Genome Research Ltd in the research sector to advocate and promote positive action schemes to facilitate the advancement of ethnically minoritised researchers.

5.4. Virtual/hybrid/in person conferences

No research paper on conferences in 2022 would be complete without reference to the question of virtual, hybrid and in person delivery methods. Not surprisingly, there is a difference in make-up of participants depending whether conferences are virtual or in person. Specifically, at WCS virtual conferences, the proportion of UK based researchers is 34% as compared to 44% for in person conferences. This change comes primarily from an increase in actual numbers of conference attendees from 'rest of world' for virtual conferences.

A study by Niner and Wassermann (2021) found that the responses to having more virtual conferences depended on differences in participants' personal experiences; participants who otherwise would not have been able to attend an in-person conference reported excitement with the increased accessibility provided by online conferences. However, participants with an already established sense of community, preferred in-person conferences.

This study aligns well with what we heard from survey respondents: that virtual conferences are excellent for the logistical benefits they bring and are effective for information sharing. However, for successful networking and collaboration, in person conferences remain more effective. Respondents felt that digital networking methods, whilst sometimes useful, were not as fruitful. In addition, two survey respondents (an Asian man and an Asian woman), made the point that 'cliques' can still inhibit effective networking, even at in person conferences.

Interviewees expressed a desire to see the continuation of hybrid conference options, especially as a way to balance the need of caring responsibilities and conference attendance.

R7. Produce guidelines for effective and inclusive hybrid options for conferences, including detail on how remote participants of hybrid conferences can benefit from a similar level of networking and collaborative benefits to in person participants.

R8. Consider the role of regional events when designing hybrid events in order to retain the networking and support benefits of in person events for participants who find travelling to the main conference problematic.

5.5. Marketing

Taking an active stance to purposely include or target information at underrepresented or minoritised groups can have significant impact. This relates both to increasing the diversity of conference attendance, but also minoritised participants' experiences. In addition, 54.5 % ethnically minoritised researchers survey respondents reported that advertising that reaches them would enable them to attend conferences.

Since research on attraction within the context of recruitment and selection supports the suggestion that minoritised individuals are more attracted when organisations portray diverse images but that white people are not dissuaded[18], diversifying the range of people represented, especially avoiding an emphasis on white males, is an important next step.

R9. Include content that is specifically designed to attract and address the priorities, concerns, and needs of ethnically minoritised individuals, once these initiatives have been established.

R10. Consider how informal networks can be used to further promote conferences to ethnically minoritised researchers.

R11. Carry out a picture audit to review the diversity of images used on any public facing documentation, including webpages.

R12. Increase the proportion of images of ethnically minoritised individuals, attending to the intersectionality between race and gender when choosing images. In particular avoid reinforcing the stereotype that researchers are white and or male.

5.6. Reduce financial barriers to attendance

Niner and Wassermann (2021) state that travelling costs are the single most reported barrier associated with in-person conferences.

Our study indicates that access to finance may be different between white and ethnically minoritised researchers. In our survey, of those who had attended WCS conference, the two respondents for whom funding/bursaries from WCS had enabled them to attend were white and conversely, the two respondents who self-funded their attendance were from ethnically minoritised groups. In addition, ethnically minoritised researchers said that reduction of cost (37.5%) and external funding/bursaries (44%) would help them to attend compared with 29% of white researchers for both options respectively. Three ethnically minoritised researchers said that a reason they had not attended other life science conferences was because they were too expensive. No white researchers cited this reason.

However, since our interviews found there were generally no differences between ethnically minoritised and white interviewees in barriers highlighted, this area deserves further investigation. We found there were potentially more differences in relation to barriers to attendance across role/career stage, than ethnic group.

Collecting and analysing diversity data on who funds researchers' attendance at conferences, alongside bursary applications and awards would provide evidence upon which to base decisions around improving and/or targeting support, such as amending bursary policies and other initiatives to promote representation by underrepresented or minoritised groups.

[18] Avery, D. R., & McKay, P. F. (2006). Target practice: An organizational impression management approach to attracting minority and female job applicants. *Personnel Psychology*, *59*(1), 157-187.

R13. Provide and promote targeted bursaries for researchers from ethnically minoritised groups to attend.

R14. Broaden the criteria for bursaries to be not just for those presenting a paper or poster to widen participation for ethnically minoritised researchers.

5.7. Personal circumstances and caring responsibilities

Three male and two female interviewees (four of whom were from ethnically minoritised groups) cited family responsibilities as a barrier to attending conferences. The two survey respondents who selected caring responsibilities as a measure that would enable them to attend conferences were from ethnically minoritised groups.

This is supported by findings from the literature review that two of the four areas highlighted as success factors for women scientists (who had spoken at conferences) were 'managing work-life balance' effectively and 'non-traditional career paths' for example part time or online positions.

Disability was another area that appeared to need a specific focus as highlighted in the desk review.

R15. Promote the support available for researchers with caring responsibilities.

R16. Develop an access policy for the WCS covering digital and physical and people factors.

5.8. Minimise differences in experiences of conferences

It is clear from both our research and the literature, that minoritised researchers experience conferences differently and that ethnically minoritised researchers are less likely to feel welcomed.

Our survey found that ethnically minoritised researchers are less likely to strongly agree/agree that they felt welcomed and included at other life science conferences (62%), and white researchers more likely (96%). Some interviewees expressed feelings of being overwhelmed, having difficulty talking to people, not necessarily fitting in or having to work to overcome those feelings. Ethnically minoritised interviewees highlighted their identity, not fitting into the community and a sense of imposter syndrome.

This was similar to the findings of the literature review in which DeVilbiss et al., 2019 found that women and ethnic/racial minority groups were less likely to feel welcome and that feeling welcome was positively associated with high self-initiated participation

In looking at one specific example of equality and inclusion at conferences, Carter et al., 2019 found that while providing more time to ask questions did not have an impact on the gender balance of question asking, when a woman asks the first question there is no gender discrepancy in question asking.

One survey respondent also highlighted that one benefit of virtual conferences is the ability to rate questions before they are asked; this removes the risk of prioritising certain people's questions based on their characteristics rather than the content of their questions.

R17. Produce training materials for conference organisers and staff supporting conferences which outline practical steps to improve experiences of minoritised groups at conferences.

R18. Produce guidelines for the organisation of diverse and inclusive conferences, making compliance with these guidelines a prerequisite for being part of the WCS conference programme.

R19. Develop a comprehensive behaviour, complaints and bullying and harassment policy that not only sets out expectations but also how infractions are to be reported, the recipient supported and the perpetrator managed.

R20. Adopt a minoritised first protocol in question asking.

5.9. Governance and resourcing

EDI is often couched in terms of values, commitment and passion; but both research and experience are clear that what makes the impact in respect to EDI is action[19]. Inevitably, progressing EDI will require some form of change so it needs to be managed like any other project in the organisation. This requires resources both in terms of personnel and budget. Lines of accountability also have to be effective to steer organisations through what can often be complex and challenging programmes of work. Furthermore, EDI is increasingly recognised as a distinct profession that requires a level of specialist knowledge and experience[20]. Although the research sector has made progress in respect to gender, particularly through the influence of Athena SWAN, this now needs to happen across the full range of diversity strands. Priorities for WCS and the sector as a whole are race and ethnicity, disability and socio-economic background.

R21. Identify the effective EDI governance structures and EDI resourcing levels needed to deliver the recommendations in this report

R22. Consult with stakeholders and thought leaders in the sector on EDI action plans

5.10. Measure progress

WCS, like other research organisations, are generally accustomed to collecting and reporting on gender monitoring data. The priority therefore is the collection of ethnicity data. Once collected this data needs to be analysed and reported so that the analysis can be used to drive focused actions.

R23. Where diversity data is recorded, systematically analyse it to assess what actions can be taken. In particular, monitor conference attendance and bursaries to measure progress in increasing attendance by those from ethnically minoritised groups.

R24. Add diversity characteristics to conference evaluation surveys. Analyse this conference evaluation data to identify any differences in conference experience by attendees' characteristics. Use this data to identify where improvements should be focused. Prioritise analysis of questions relating to:

- whether people feel welcomed and included
- whether they share learning after the event.

[19] Kalev, A., Dobbin, F., & Kelly, E. (2006). Best practices or best guesses? Assessing the efficacy of corporate affirmative action and diversity policies. American sociological review, 71(4), 589-617.
[20] https://www.advance-he.ac.uk/knowledge-hub/race-equality-charter-review-phase-2

Appendices

Appendix A: Detailed Methodology

1.1. Desktop review

1.2. Review of corporate policies, objectives

For context, we reviewed a range of relevant corporate documents including the Wellcome Connecting Science (WCS) Five year review, Annual reports, Race and Research Equity Action Plan, Conference Code of Conduct and Gender balance policy. A full list is provided in Appendix B.

1.3. Review and bias audit of registration process and communications

This enables an assessment of whether there is anything in the attraction of individuals to enrol on a conference, course or event that would deter or encourage people from minoritised groups to apply. Additionally going through the process as though the researchers were actual applicants enables an assessment of whether there is anything in the process that would facilitate, encourage or deter minoritised applicants from applying.

- A full 'mystery shop' of the conference registration process for potential barriers and bias.
- Review of bursary application process
- Review of relevant webpages and communications, for potential barriers.

1.4. Analysis of diversity data

We reviewed the following in order to understand what WCS record and how this information is used:

- Institutions represented on the mailing list
- Diversity characteristics of conference participants
- Successful and unsuccessful bursary applications
- Diversity characteristics of panel members
- Conference evaluation

1.5. Rapid evidence review

Our review included academic and grey literature of existing research and studies around conference attendance, the impact of conference attendance on career advancement and experiences of those from different ethnicities attending conferences. We also looked for research around barriers to conference attendance, especially for those from Black and other ethnically minoritised groups.

1.6. Aims of the rapid review

The objective of the rapid literature review is to document the current state of knowledge about the experiences of Black and other minority ethnic researchers who have attended UK life science conferences. The search was based on the following questions:

- What is known about the extent to which academics/researchers from different ethnicities attend conferences?
- What are barriers to conference attendance for academics/researchers from different ethnicities?
- What is known about the experiences of academics/researchers from different ethnicities in attending conferences?
- What is known about the extent to which academics/researchers from different ethnicities speak at conferences?
- What is known about the impact of conference attendance on the career advancement of academics/researchers from different ethnicities?

1.7. Search strategy and inclusion criteria

1.7.1. Inclusion criteria

Date range: since 2010

Type of evidence:

- empirical research studies (no case studies, no narrative studies, no discussions)

- intersectional analyses where available, particularly race and gender

- conference attendance from the perspective of race/ethnicity of delegates

Language: English

Geographical context: global

1.7.2. Eligibility criteria

A search was conducted in July 2022. Studies selection was based on three main criteria.

1. Publication data was limited to English and published between 2010-2022.
2. Studies were restricted to medicine and life sciences subjects. The specific subjects of interest were Biochemistry, Genetics and Molecular Biology (Bioc), Chemistry (Chem), Agricultural and Biological Sciences (Agri), Immunology and Microbiology (Immu), Pharmacology, Toxicology and Pharmaceuticals (Phar), Medicine (Medi), and Veterinary (Vete).
3. Empirical studies only with a focus on intersectional analyses and from the perspective of conference attendees. Particularly on race, ethnicity and gender. Exclusion criteria were case studies, discussions and narrative studies.

1.7.3. Search strategy and study selection

The databases searched were Scopus and the Google Scholar search engine (results from the first 20 pages). The search terms were a combination of key words associated with the eligibility criteria as agreed with the Wellcome project team. Some examples are GENDER, CONFERENCE, LIFE SCIENCES, MEDICINE, RACE, VETERINARY, ATTENDANCE, CHEMISTRY, ETHNICITY, EXPERIENCES, DIVERSITY, SYMPOSIUM, MINORITY, EMPIRICAL, COLOR OR COLOUR. Studies were pre-screen by looking at the title to see if it was related to the search terms. Next, the abstract was read to ensure that it fulfilled the three eligibility criteria. It had to be clear to extrapolate from the abstract that the study was conducted post 2010 with a focus on life or medicine sciences and an interest in exploring the perspectives of attendees. Ideally, the intersection of race, ethnicity, and gender. Studies that partially met the criteria were kept apart and discussed with the research team before reaching a final consensus on their eligibility. Studies that met the criteria were then investigated further to gain a better understanding of the specific subject of interest and the empirical data associated with the perspectives of attendees with a focus on race/ethnicity and gender.

1.8. Experiences of researchers: survey

We used an online survey created in Jisc Online Surveys to do our initial data gathering. The survey was designed in consultation with WCS.

1.8.1. Survey circulation

We circulated this survey via an email to researchers in Life Sciences departments and institutes identified though engagement with the science and equality networks such as EDIS[21], the Wellcome Foundation anti-racist expert group and staff network[22], the BSA[23] and HERAG[24] , Vitae[25]and through targeted contact with 18 universities, including 8 Russell Group universities and 10 non-Russell Group universities.

1.8.2. Survey content

Our survey is provided as Appendix D and broadly covered:

1. Detail of prior conference attendance
2. How funding and support for attendance was obtained
3. Reasons for non-attendance, any support that could have made it possible to attend
4. Experience and impact of the following as a result of attendance:
    - knowledge sharing
    - networking
    - collaboration
    - career development
5. Any further comments
6. Ethnicity, gender and other characteristics of delegates

1.8.3. Survey methodology

The survey was analysed with respect to differences between white and all Black, Asian and minority ethnic respondents; differences between aggregated ethnicity categories created from respondents' self-reporting (Arab, Asian, Black, Chinese, White, Mixed and Other); and finally differences between Black respondents and all other respondents in order to understand specific barriers experienced by Black researchers.

Chi-square tests were conducted to assess the statistical significance of observed differences.

1.8.4. Research sample

This survey provided rich data on experiences of conference attendance, and barriers to attending. We also used the survey as a recruiting tool for our in-depth interviews to ensure our sample provided representation across ethnicities, stages of career, institution type and included some people who had not attended conferences. Specifically, we heard from:

- 55 UK researchers with roles ranging from Research Director to Research Masters/PhD student
- Respondents from higher education institutions (36) and those based in both the NHS and a higher education institution (7)
- Respondents in Biosciences (43) and Medicine, Dentistry and Health (5)
- Respondents on open-ended (28) and fixed term contracts (24)

[21] https://edisgroup.org/
[22] https://wellcome.org/what-we-do/our-work/anti-racism-expert-group
[23] https://www.britishscienceassociation.org/news/join-the-inclusive-science-engagement-network
[24] https://www.advance-he.ac.uk/equality-charters/your-equality-networks/higher-education-race-action-group-herag
[25] https://www.vitae.ac.uk/about-us

Of them:

- 15% were Black researchers and 30% were from other ethnically minoritised groups
- 28% from non-Russell Group universities and 20% from research institutes
- 65% were women, of whom 49% (17) were from ethnically minoritised backgrounds
- Equal proportions of white and ethnically minoritised respondents were from Russell Group institutions
- White respondents were more likely to be in senior leadership positions, but seniority was not significantly related to conference attendance

1.9. Experiences of researchers: Interviews

This phase involved collecting qualitative primary data from a sample of survey respondents. The interviews aimed at gathering insights to

- the critical success factors, specific to successful minoritised ethnic groups in terms of conference attendance;
- positive experience during conferences and
- positive impact after attendance.
- Interviewees were invited to participate when they completed the survey. Volunteers were contacted by the research team.

1.9.1. Interview methodology

We carried out 16, 50-minute semi-structured interviews on Teams or Zoom. Three main questions aimed to gather insights about success factors to attendance, experience of conferences and impact after attendance. These were followed with semi-structured questions on themes highlighted by the survey as well as those identified in discussion with Wellcome Connecting Science. Specifically, identity, experience of WCS conferences, conference organisers and inclusion and sharing learning from conferences. (See Appendix E). Interviewees volunteered by ticking a box during survey completion to confirm they were willing to be interviewed. All volunteers were contacted due to the small numbers. Potential interviewees were contacted with potential interview dates. Interviews were video recorded, transcribed and content analysed. All interviews and transcripts were saved in password-protected files.

1.9.2. Interview sample

Our sample was comprised as follows:

Career Stage (n)	Female	Male	Ethnically minoritised	White
Student (4)	3	1	2	2
Associate professor (2)	2	0	2	0
Professor/Head (3)	1	2	2	1
Research Associate (4)	3	1	2	2
Research Fellow (1)	0	1	0	1
Other* (2)	2	0	1	1
Total (16)	11 (69%)	5 (31%)	9 (56%)	7 (44%)

*Operations Assistant; Technician

Demographic characteristics and career stage were generally evenly distributed within the sample

1.9.3. Content analysis

Content analysis of the interview transcripts was undertaken with the aid of qualitative data analysis software (NVivo). Transcripts were coded for emergent themes per question. Through an iterative process of coding, [26] themes were developed. Emergent categories were discussed and categories were added as coding progressed. To check for consistency in coding, two transcripts were coded independently by two team members. A coding comparison analysis showed high agreement between the coders (see below). The remaining transcripts were coded by one team member. Consistent with the iterative approach, coded transcripts were discussed and the coding dictionary was revised.

[26] Creswell, J. (2007). *Research design: Qualitative, quantitative, and mixed methods approaches.* Thousand Oaks, CA: Sage.

Code	File	File Size	Agreement (%)	A and B (%)	Not A and Not B (%)	Disagreement (%)	A and Not B (%)	B and Not A (%)
Frequency of attendance	Interview-1	30639 char	98.82	0.13	98.68	1.18	0.48	0.7
Frequency of attendance	Interview-2	32593 char	98.82	0	98.82	1.18	1.18	0
Frequency of attendance\1 per year	Interview-1	30639 char	99.71	0.13	99.58	0.29	0.1	0.19
Frequency of attendance\1 per year	Interview-2	32593 char	100	0	100	0	0	0
Frequency of attendance\2 per year	Interview-1	30639 char	100	0	100	0	0	0
Frequency of attendance\2 per year	Interview-2	32593 char	98.82	0	98.82	1.18	1.18	0
Frequency of attendance\3-4 per year	Interview-1	30639 char	99.62	0	99.62	0.38	0.38	0
Frequency of attendance\3-4 per year	Interview-2	32593 char	100	0	100	0	0	0
Frequency of attendance\5+ per year	Interview-1	30639 char	100	0	100	0	0	0
Frequency of attendance\5+ per year	Interview-2	32593 char	100	0	100	0	0	0
Frequency of attendance\Covid	Interview-1	30639 char	99.48	0	99.48	0.52	0	0.52
Frequency of attendance\Covid	Interview-2	32593 char	100	0	100	0	0	0
Frequency of attendance\Less than annually	Interview-1	30639 char	100	0	100	0	0	0
Frequency of attendance\Less than annually	Interview-2	32593 char	100	0	100	0	0	0
Main Questions	Interview-1	30639 char	100	0	100	0	0	0
Main Questions	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers	Interview-1	30639 char	89.08	4.39	84.7	10.92	7.82	3.1
Main Questions\Are there any barriers	Interview-2	32593 char	96.43	0	96.43	3.57	3.57	0
Main Questions\Are there any barriers\availability of data	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Are there any barriers\availability of data	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\Covid	Interview-1	30639 char	99.27	0.38	98.9	0.73	0.34	0.39
Main Questions\Are there any barriers\Covid	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\economic barriers	Interview-1	30639 char	99.19	0.15	99.05	0.81	0	0.81
Main Questions\Are there any barriers\economic barriers	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\environment - ethnicit	Interview-1	30639 char	91.64	2.66	88.98	8.36	7.9	0.46
Main Questions\Are there any barriers\environment - ethnicit	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\family responsibilities	Interview-1	30639 char	99.22	0	99.22	0.78	0.78	0
Main Questions\Are there any barriers\family responsibilities	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\interdisciplinary	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Are there any barriers\interdisciplinary	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\no barriers	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Are there any barriers\no barriers	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\personal	Interview-1	30639 char	96.57	0	96.57	3.43	0.78	2.65
Main Questions\Are there any barriers\personal	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\religion	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Are there any barriers\religion	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\size	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Are there any barriers\size	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\supervisor	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Are there any barriers\supervisor	Interview-2	32593 char	96.43	0	96.43	3.57	3.57	0
Main Questions\Are there any barriers\timing	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Are there any barriers\timing	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\transport	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Are there any barriers\transport	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Are there any barriers\visas	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Are there any barriers\visas	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Experience at conferences	Interview-1	30639 char	97.5	0	97.5	2.5	2.5	0
Main Questions\Experience at conferences	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Experience at conferences\confidence boost	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Experience at conferences\confidence boost	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Experience at conferences\Covid impact	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Experience at conferences\Covid impact	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Experience at conferences\exchange of idea	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Experience at conferences\exchange of idea	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Experience at conferences\exciting - enjoyab	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Experience at conferences\exciting - enjoyab	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Experience at conferences\Identity	Interview-1	30639 char	97.64	1.32	96.32	2.36	2.23	0.13
Main Questions\Experience at conferences\Identity	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Experience at conferences\Imposter syndrom	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Experience at conferences\Imposter syndrom	Interview-2	32593 char	98.88	0	98.88	1.12	1.12	0
Main Questions\Experience at conferences\networking	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Experience at conferences\networking	Interview-2	32593 char	98.94	0	98.94	1.06	1.06	0
Main Questions\Experience at conferences\personality	Interview-1	30639 char	100	0	100	0	0	0
Main Questions\Experience at conferences\personality	Interview-2	32593 char	100	0	100	0	0	0
Main Questions\Experience at conferences\sense of commun	Interview-1	30639 char	99.12	0	99.12	0.88	0	0.88
Main Questions\Experience at conferences\sense of commun	Interview-2	32593 char	98.97	0	98.97	1.03	1.03	0
Main Questions\Experience at conferences\value	Interview-1	30639 char	100	0	100	0	0	0

Main Questions\Experience at conferences\value	Interview-2	32593	char:	100	0	100	0	0	0
Main Questions\Impact on career	Interview-1	30639	char:	93.23	1.25	91.98	6.77	5.87	0.9
Main Questions\Impact on career	Interview-2	32593	char:	95.59	0	95.59	4.41	4.41	0
Main Questions\Impact on career\Informed the direction	Interview-1	30639	char:	100	0	100	0	0	0
Main Questions\Impact on career\Informed the direction	Interview-2	32593	char:	100	0	100	0	0	0
Main Questions\Impact on career\networking	Interview-1	30639	char:	95.61	0	95.61	4.39	4.39	0
Main Questions\Impact on career\networking	Interview-2	32593	char:	97.09	0	97.09	2.91	2.91	0
Main Questions\Impact on career\networking\neutral	Interview-1	30639	char:	98.24	0	98.24	1.76	1.76	0
Main Questions\Impact on career\networking\neutral	Interview-2	32593	char:	100	0	100	0	0	0
Main Questions\Impact on career\networking\positInterviewe	Interview-1	30639	char:	100	0	100	0	0	0
Main Questions\Impact on career\networking\positInterviewe	Interview-2	32593	char:	97.09	0	97.09	2.91	2.91	0
Main Questions\Impact on career\personal growth	Interview-1	30639	char:	99.1	0	99.1	0.9	0	0.9
Main Questions\Impact on career\personal growth	Interview-2	32593	char:	98.51	0	98.51	1.49	1.49	0
Main Questions\Impact on career\personal growth\confidenc	Interview-1	30639	char:	100	0	100	0	0	0
Main Questions\Impact on career\personal growth\confidenc	Interview-2	32593	char:	100	0	100	0	0	0
Main Questions\Impact on career\personal growth\personal	Interview-1	30639	char:	98.71	0	98.71	1.29	0	1.29
Main Questions\Impact on career\personal growth\personal	Interview-2	32593	char:	100	0	100	0	0	0
Main Questions\Impact on career\speaker	Interview-1	30639	char:	97.81	0.54	97.27	2.19	1.48	0.72
Main Questions\Impact on career\speaker	Interview-2	32593	char:	100	0	100	0	0	0
Probing questions 5 to 9	Interview-1	30639	char:	95.05	3.13	91.92	4.95	4.63	0.33
Probing questions 5 to 9	Interview-2	32593	char:	86.03	0	86.03	13.97	13.97	0
Probing questions 5 to 9\Bursaries knowledge and experienc	Interview-1	30639	char:	99.33	0.81	98.52	0.67	0.67	0
Probing questions 5 to 9\Bursaries knowledge and experienc	Interview-2	32593	char:	95.5	0	95.5	4.5	4.5	0
Probing questions 5 to 9\Bursaries knowledge and experienc	Interview-1	30639	char:	99.19	0	99.19	0.81	0	0.81
Probing questions 5 to 9\Bursaries knowledge and experienc	Interview-2	32593	char:	98.22	0	98.22	1.78	1.78	0
Probing questions 5 to 9\Identity neutral	Interview-1	30639	char:	100	0	100	0	0	0
Probing questions 5 to 9\Identity neutral	Interview-2	32593	char:	100	0	100	0	0	0
Probing questions 5 to 9\Identity positInterviewe	Interview-1	30639	char:	98.64	0.77	97.87	1.36	1.36	0
Probing questions 5 to 9\Identity positInterviewe	Interview-2	32593	char:	98.01	0	98.01	1.99	1.99	0
Probing questions 5 to 9\Identity uncomfortable	Interview-1	30639	char:	100	0	100	0	0	0
Probing questions 5 to 9\Identity uncomfortable	Interview-2	32593	char:	94.27	0	94.27	5.73	5.73	0
Probing questions 5 to 9\Identity uncomfortable\Change in n	Interview-1	30639	char:	100	0	100	0	0	0
Probing questions 5 to 9\Identity uncomfortable\Change in n	Interview-2	32593	char:	100	0	100	0	0	0
Probing questions 5 to 9\Identity uncomfortable\ways to imp	Interview-1	30639	char:	100	0	100	0	0	0
Probing questions 5 to 9\Identity uncomfortable\ways to imp	Interview-2	32593	char:	100	0	100	0	0	0
Probing questions 5 to 9\Networking	Interview-1	30639	char:	97.08	1.55	95.53	2.92	2.6	0.33
Probing questions 5 to 9\Networking	Interview-2	32593	char:	98.25	0	98.25	1.75	1.75	0
Probing questions 5 to 9\Networking\networking negatInterv	Interview-1	30639	char:	95.86	0	95.86	4.14	4.14	0
Probing questions 5 to 9\Networking\networking negatInterv	Interview-2	32593	char:	100	0	100	0	0	0
Probing questions 5 to 9\Networking\networking negatInterv	Interview-1	30639	char:	100	0	100	0	0	0
Probing questions 5 to 9\Networking\networking negatInterv	Interview-2	32593	char:	100	0	100	0	0	0
Probing questions 5 to 9\Networking\networking positIntervi	Interview-1	30639	char:	100	0	100	0	0	0
Probing questions 5 to 9\Networking\networking positIntervi	Interview-2	32593	char:	98.25	0	98.25	1.75	1.75	0
Probing questions 5 to 9\Networking\personality	Interview-1	30639	char:	100	0	100	0	0	0
Probing questions 5 to 9\Networking\personality	Interview-2	32593	char:	100	0	100	0	0	0
Y Additional Qs	Interview-1	30639	char:	100	0	100	0	0	0
Y Additional Qs	Interview-2	32593	char:	100	0	100	0	0	0
Y Additional Qs\Attended Wellcome conference	Interview-1	30639	char:	100	0.48	99.52	0	0	0
Y Additional Qs\Attended Wellcome conference	Interview-2	32593	char:	96.88	0	96.88	3.12	3.12	0
Y Additional Qs\Shared learning	Interview-1	30639	char:	99.24	0.37	98.87	0.76	0.33	0.44
Y Additional Qs\Shared learning	Interview-2	32593	char:	99.1	0	99.1	0.9	0.9	0
Y Additional Qs\Shared learning\Facilitating shared learning	Interview-1	30639	char:	100	0	100	0	0	0
Y Additional Qs\Shared learning\Facilitating shared learning	Interview-2	32593	char:	95.03	0	95.03	4.97	4.97	0
Y Additional Qs\Wellcome conference differences compared	Interview-1	30639	char:	99.12	1	98.12	0.88	0.88	0
Y Additional Qs\Wellcome conference differences compared	Interview-2	32593	char:	94.77	0	94.77	5.23	5.23	0
Y Additional Qs\What can Wellcome do in relation to inclusio	Interview-1	30639	char:	94.19	0	94.19	5.81	2.77	3.04
Y Additional Qs\What can Wellcome do in relation to inclusio	Interview-2	32593	char:	96.12	0	96.12	3.88	3.88	0
Y Additional Qs\What can Wellcome do in relation to inclusio	Interview-1	30639	char:	100	0	100	0	0	0
Y Additional Qs\What can Wellcome do in relation to inclusio	Interview-2	32593	char:	100	0	100	0	0	0
Y Additional Qs\What can Wellcome do in relation to inclusio	Interview-1	30639	char:	100	0	100	0	0	0
Y Additional Qs\What can Wellcome do in relation to inclusio	Interview-2	32593	char:	100	0	100	0	0	0
Z Any other comments	Interview-1	30639	char:	91.55	1.13	90.42	8.45	8.45	0
Z Any other comments	Interview-2	32593	char:	98.73	0	98.73	1.27	1.27	0
Z Any other comments\suggestions for improvement	Interview-1	30639	char:	100	0	100	0	0	0
Z Any other comments\suggestions for improvement	Interview-2	32593	char:	100	0	100	0	0	0
Z Any other comments\visas	Interview-1	30639	char:	100	0	100	0	0	0
Z Any other comments\visas	Interview-2	32593	char:	100	0	100	0	0	0
Z Any other comments\Wellcome positInterviewe	Interview-1	30639	char:	100	0	100	0	0	0
Z Any other comments\Wellcome positInterviewe	Interview-2	32593	char:	100	0	100	0	0	0

Appendix B: Documents reviewed

Operational documents

- Annual review
- Organisational chart
- Race and Research Equity Action plan

Website

https://www.wellcomeconnectingscience.org/

https://www.wellcomegenomecampus.org/aboutus/connecting-science/

https://www.wellcomeconnectingscience.org/what-we-do/#

Conferences

- Five Year Review
- Courses and conference evaluation 2016
- Conference code of conduct
- Gender Balance policy
- Bursary application process

Conference participants

- conference application form
- conference attendees diversity data including:
    - career stage
    - job title
    - organisations represented (2019 only)
    - diversity characteristics
- Data on bursaries provided

Appendix C: Summary of relevant literature

Author (Year)	Sample	Intervention or focus	Result/findings	Author's comments
Carter, Croft, Lukas, & Sandstrom (2019)	600 academics in 20 countries	Increasing observed allocated time for questioning to achieve gender balance in equal question-asking	Intervention attempt was unsuccessful	However, our data show that women are not inherently less likely to ask questions when the conditions are favourable—there is no gender discrepancy when a woman asks the first question
Ford, Brick, Azmitia, Blaufuss, & Dekens (2019)	24,000–28,000 people	Assessing equal speaking opportunities	Less speaking opportunities for racial, ethnic and gender minorities	Racial, ethnic and gender biases harm individuals and undermine the quality of science
Sardelis & Drew (2016)	2891 symposia speakers	Correlational	More women symposia organisers are associated with an increased in female speakers at conferences	The most important finding from our results was that there is a strong, positive relationship between the number of women involved in organising symposia and the number of women speaking in those symposia
Sarabipour, et al., (2021)	260 in-person national and international academic conferences	Improving scientific conferences	Aim for virtual conferences, go paperless, provide free childcare, code of conduct/ethics and more	Concerted efforts in organisation are needed alongside new conferencing formats to ensure scientific meetings improve for researchers worldwide
DeVilbiss, et al., (2019)	1631 society members	Correlational	Women and persons of specific racial/ethnic minority or minority religious affiliations were less likely to participate in events initiated by the Society	The current data will establish a baseline for assessing longitudinal trends and future initiatives aimed at improving diversity and inclusion
Niner & Wassermann (2021)	329 conference participants	Online and hybrid conferences	Moving online increases accessibility and helps overcome challenges	Hybrid events are heralded as the solution to these challenges, but there is no consensus on how to integrate in-person and online attendance in a way that does not exacerbate these barriers.

Author (Year)	Sample	Intervention or focus	Result/findings	Author's comments
Turner, Bernstein, & Taylor (2018)	14 women biological anthropologists	Personal narratives	Increased in first authors women talks at symposia is associated with mentoring in career trajectory, achieving work-life balance and resilience during unexpected events	Recognition of differences in the life histories of men and women scholars may be the easy part and only a first step toward achieving gender equality and equity.

Full references

Carter, J. A., Croft, A., Lukas, D., & Sandstrom, G. M. (2019). Women's visibility in academic seminars: Women ask fewer questions than men. *Plos One, 14*(2).

DeVilbiss, E. A., Weuve, J., Fink, D. S., Morris, M. D., Arah, O. A., Radoc, J. G., . . . Schisterman, E. F. (2019). Assessing Representation and Perceived Inclusion among Members in the Society for Epidemiologic Research. *American Journal of Epidemiology, 189*(10).

Ford, H. L., Brick, C., Azmitia, M., Blaufuss, K., & Dekens, P. (2019). Women from some underrepresented minorities are given too few talks at world's largest Earth-science conference. *Nature*.

Niner, H. J., & Wassermann, S. N. (2021). Better for Whom? Leveling the Injustices of International Conferences by Moving Online. *Front Mar Sci*.

Sarabipour, S., Khan, A., Seah, Y. F., Mwakilili, A. D., Mumoki, F. N., Saez, P. J., Mestrovic, T. (2021). Evaluating features of scientific conferences: A call for improvements. *Nature Human Behaviour*, 296-300.

Sardelis, S., & Drew, J. A. (2016). Not "Pulling up the Ladder": Women Who Organize Conference Symposia Provide Greater Opportunities for Women to Speak at Conservation Conferences. *Plos One*.

Turner, T. R., Bernstein, R. M., & Taylor, A. B. (2018). Participation, representation, and shared experiences of women scholars in biological anthropology. *American Journal of Biological Anthropology*.

Appendix D: Survey

The final survey can be accessed via this link.

Appendix E: Interview questions

- Introduction (1 minute)
- Purpose of the interview (1 minute)
- Process and timing (1 minute)

Questions

Warm-up question

- How often do you attend conferences?

Main questions

- Are there any barriers to attending conferences? If so, what are they?
- What is your experience when attending conferences?
- What has been the impact of conference attendance on career?

If there has been no mention of the following, ask these:

- Are you aware of bursaries available for conference attendance? What is your experience of using or applying for bursaries?
- If you haven't used bursaries, how have you funded conference attendance?
- Do you find conferences useful for networking? What has been your experience?
- Have you ever had an occasion at a conference where you became aware of your identity in a way that made you feel uncomfortable?
- Have you ever had an occasion at a conference where you became aware of your identity in a way that is positive?

Additional Questions:

- If you have attended a Wellcome conference, are there any differences compared to other conferences that you would like to highlight?

Probe: What's your perspective of Wellcome as a conference provider in relation to inclusion?

- What could conference organisers do to make you and everyone feel more included?
- Have you shared learning from the conference(s) you attended with colleagues? What else could conference organisers do to facilitate this?

Wrap-up question

- Are there any comments you would like to add, given your expectations for the interview?

Closing – next steps

Appendix F: Further interview findings

4.4.1. Emergent themes

Institutional factors

"…finding the funding to go to those conferences, so they are not always the grant that funds a postdoc or a PhD student...I think more bursaries, I think for people to attend."

(Ethnically Minoritised Female Professor)

"Another barrier that I would say most people deal with in my field is trying to convince your line manager that is worth attending. So sometimes, if you're not presenting your work at the conference, or if you're presenting a poster, even if your line manager is okay, with you taking the time out and attending that conference, the department might be opposed to that because they don't see it worth your time.... "

(White Female Research Associate)

4.4.2 Barriers by career stage

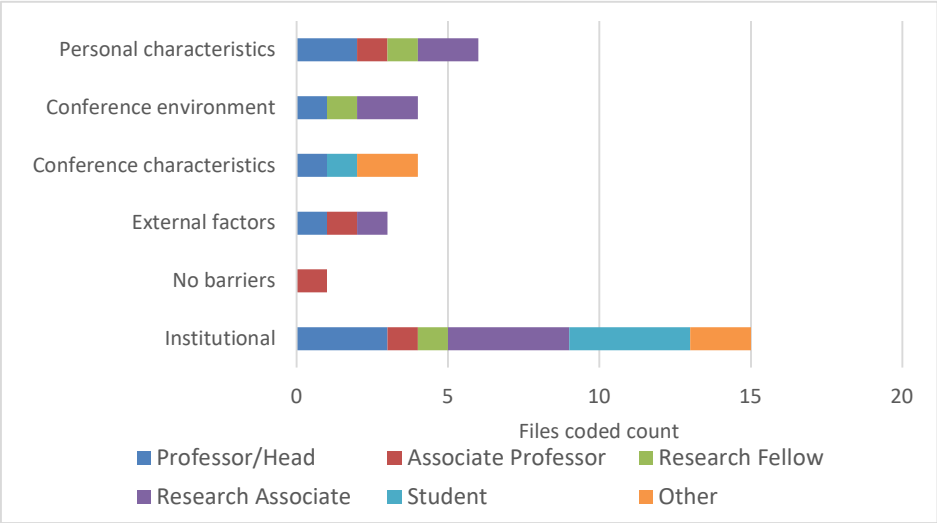


Figure 8: Barriers by career stage

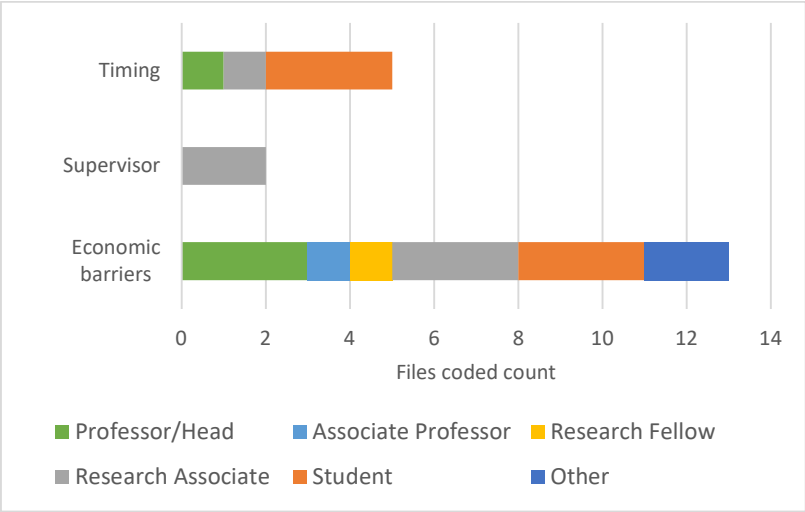


Figure 9: Institutional barriers by career stage

4.4.3 Barriers by ethnicity

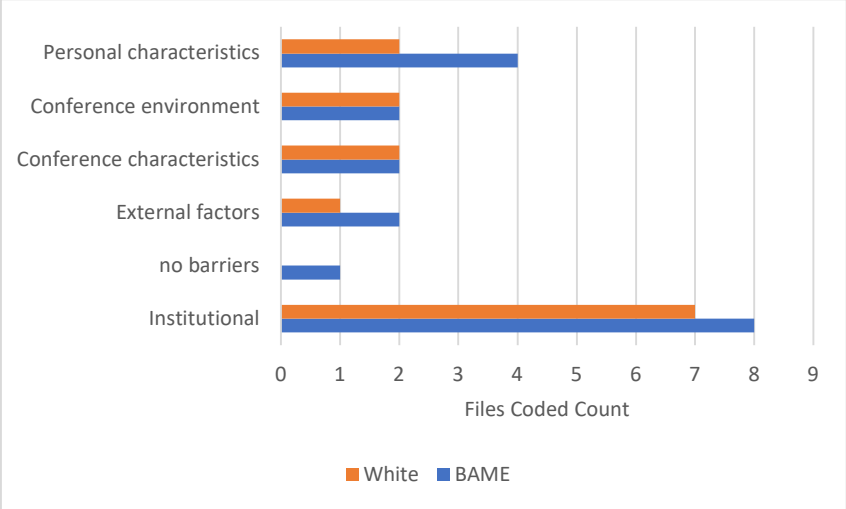


Figure 10: Barriers by ethnicity.

Figure 11: Institutional barriers by ethnicity

4.4.4. Experience of conferences

Analysis by ethnicity

> "I think the time they open up for networking, and they do the themes that we go to discuss this topic and this breakout session or this one, and I find it very helpful. And in putting people who are coming with the same interests or the same questions or the same things, that just to get together and I've really had really good experiences."
>
> (Ethnically Minoritised Female Professor)

> "It's important to exchange ideas and to discuss ideas so that's one important thing, yeah, but also to keep in touch with colleagues in a similar field and with similar challenges in similar situations. I think that's the main thing and that's, obviously that's also a major, major aspect."
>
> (White Male Centre Head)

Analysis by career stage

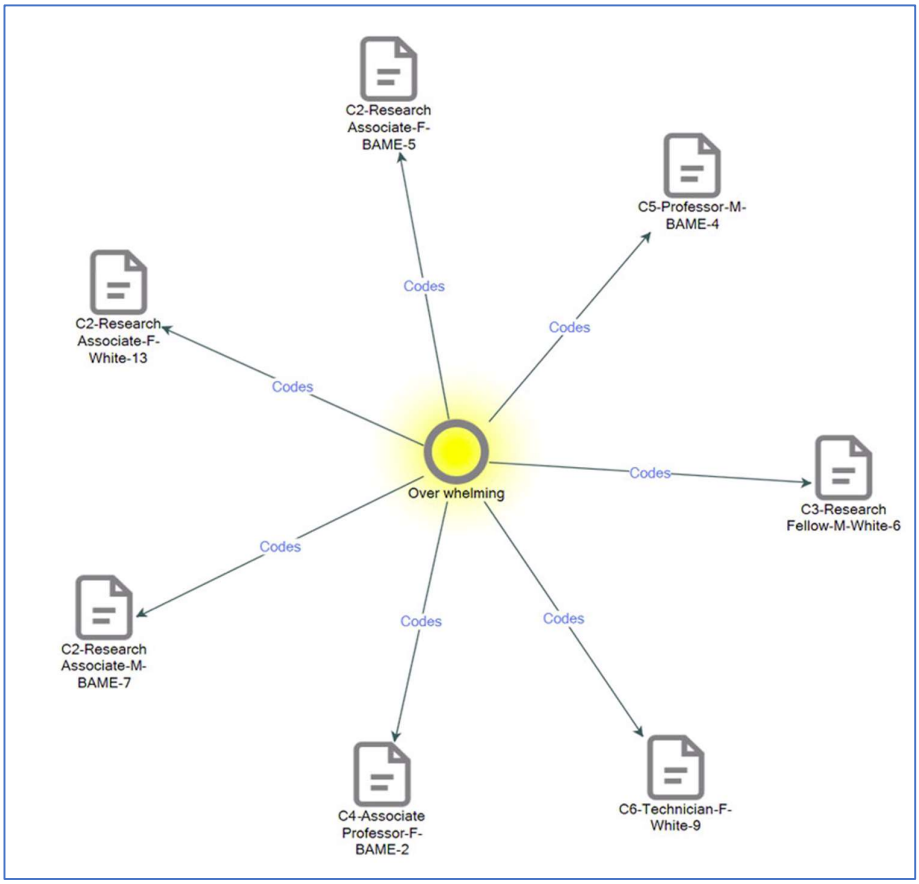


Figure 12: Interviewees reporting being overwhelmed

4.4.5. Impact on career

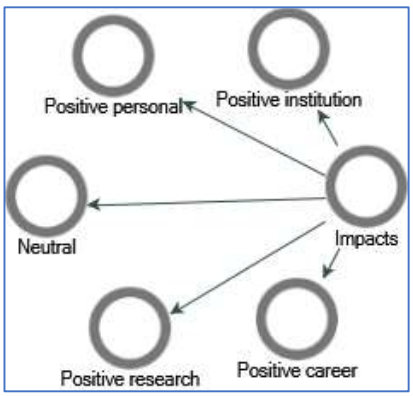


Figure 13: Conference impact highlighted in interviews

Analysis by ethnicity

Factor	Ethnically minoritised	White
1 : neutral	2	1
2 : positive career	5	4
3 : positive institution	1	0
4 : positive personal	0	0
5 : positive research	1	3

Figure 14: Impact of networking by ethnically minoritised and white interviewees

4.4.6. Identity

Identity positive

"…I have had some rewarding conversations with fellow academics who are also active in equality, diversity and inclusion initiatives, anti-racism initiatives, and we talked about that. So I suppose that's the closest I would get to that, you know, come away from those conversations really, really happy that there are other people out there who will working on these things and you know, who care about those issues... And I suppose, without, without really knowing this, I suppose it's possible that those conversations might not have been had had I looked different."

(Ethnically Minoritised Male Professor)

"I've had instances where another female researcher felt more comfortable spending time with me and going to presentations with me or approaching other researchers together because they were feeling the same thing as me, that they are a bit in a minority there…so we teamed up if you like to help each other, reduce our anxiety and approach people together."

(White Female Research Associate)

Identity uncomfortable

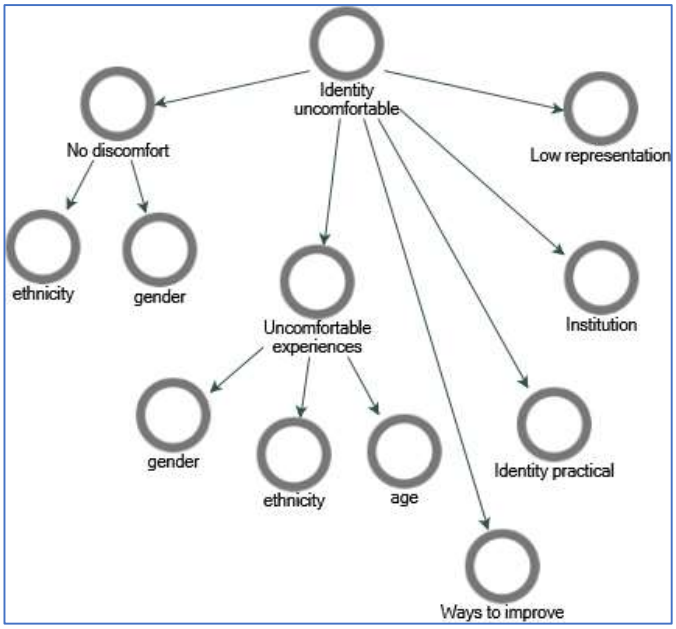


Figure 15: Issues related to discomfort based on identity

"A huge barrier for me was visa getting because I was in the UK. So I already had a big advantage that at least I was in the UK,… (but) if I were to go to a European conference, I would have to apply for a Schengen visa. This is even before Brexit. So because I'm from India, and that's fine. You know, if the conference gave me a letter, I could just go and apply. But if I went to two conferences here, … I had to apply for a visa twice. And that's like a day out of your time each time. I mean, it's just ridiculous. You have to go to the embassy or you have to go to the application centre. And you can do this and you fill out a whole bunch of paperwork to get ready for it. So for me as an immigrant, it was definitely an issue getting visas to go overseas."

(Ethnically Minoritised Male Research Associate)

"So for example, the (male) professor in question said that, oh, you know, I can get you an invitation for this conference, it'd be very good for you, because you'll meet all these people… And of course, it's a yes, it's, that would be fantastic. Because, of course, you're going somewhere you hang out with some, you know, people. … But then comments, such as you might think I'm here because I'm helping you out, because you're really smart. But I am a man after all. And you know, and you think hmmm. Okay. All right. And… you're in trouble because you're kind of at the meeting to achieve something, and network and so on. And the price of being there has now been named."

(Ethnically Minoritised Female Professor)

"…if you've got young kids or something like that, then I mean, there'll be periods when my wife understandably was not happy for me to be away from the family because it was tough, a tough period for the family with young kids."

(Ethnically Minoritised Male Professor)

"there's some practical logistics I mean, I'm an, I'm an Orthodox Jew. There aren't that many of us in the scientific world (and) there are certain Jewish laws that you know, like the dietary laws of Kosher, so the logistics of finding food that's appropriate wherever you're travelling, and also Sabbath observance. So I

can't attend … the part of it that goes between Friday night and Saturday night. Yeah, and actually a lot of conferences are weekend based so they would either involve travelling on or being at the conference on Saturday. So those conferences are out of the question."

(White Male Research Fellow)

Interviewees discussed the coping strategies used and made suggestions for improving experiences (n=3).

"…another factor that helps me deal with these cases is the fact that now I'm more established in my field. I'm no longer attending events alone. Usually I have a colleague or a collaborator or a PI attending with me, because now I'm a senior. And so we hang out in groups and usually when you hang out in groups at the conference, you're less likely to be the target of such nasty comments."

(White Female Research Associate)

"I've had cases where someone from (redacted) Africa that I met at a conference who is a British citizen and lives and works in the UK, but was born in (redacted) Africa, basically kept an eye on me because he noticed that a couple …of times I was approaching the stands. … with other people, they would jump up and be very welcoming and explain what they are offering and provide freebies like USB sticks or pens or notebooks (but) with me they were kind of a bit dismissive. And they weren't showing as much excitement, whether it was because I looked very junior or because of my gender, ethnicity, I'm not sure to be honest. But they weren't taking me as serious. So basically, he approached me and started acting very friendly with me as if we are colleagues or we've known each other for a long time. And because he's a senior in his field, and he's well known in that conference, they instantly changed their approach to me. And I really, I really appreciated that because for the rest of the conference, I didn't have to deal with that negativity."

(White Female Research Associate)

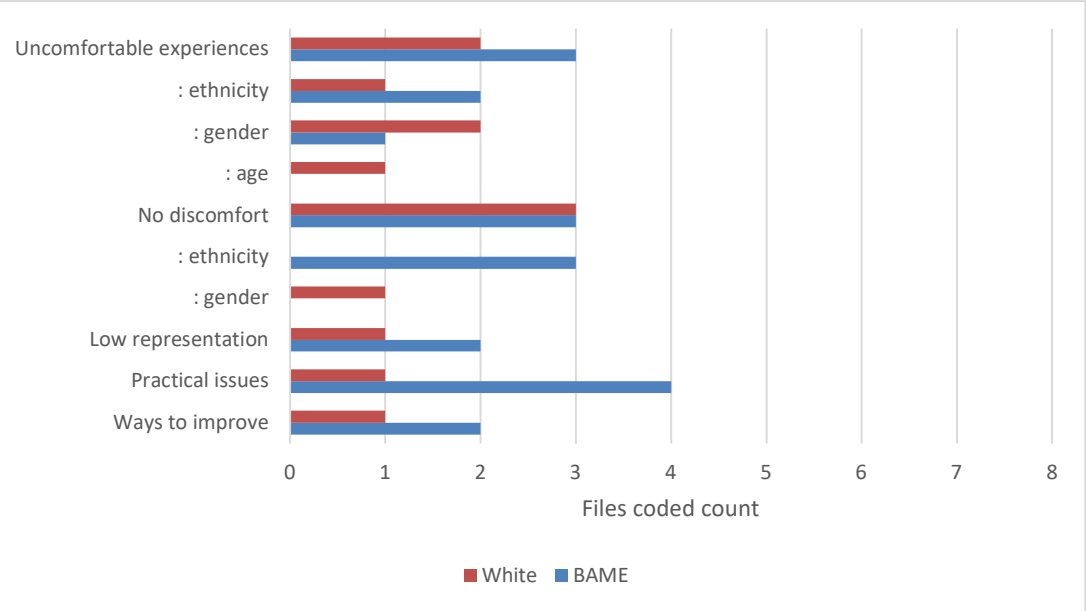


Figure 16: Experiences of identity cited as uncomfortable by ethnicity

4.4.7 Experience of WCS conferences compared to other providers

"…you could show that they actively were seeking international participants. And I found that very striking because there was a lady from like South Africa, for example, online, which I thought was really nice that they were actually like disseminating this course, not just for people within the Wellcome Trust or within the UK, but also internationally."

(Ethnically Minoritised Female Research Associate)

"Wellcome (Connecting Science) conferences are different and I think that the networking aspect and the communication aspect is very important. And the teaching aspect is very important… (they) try to give an overview, inform about the background and yeah, teach a lot. Which is advantageous and I think…it's important, the field …in terms of research…diversifies. it develops many different aspects. And so genetics, genomics has broadened into different areas in different sectors. And so a conference like … Wellcome (Connecting Science) conferences, which try to give an overview and try to connect different threads. That's I think that's quite helpful."

(White Male Head Of Centre)

4.4.8 Conference organisers and inclusion

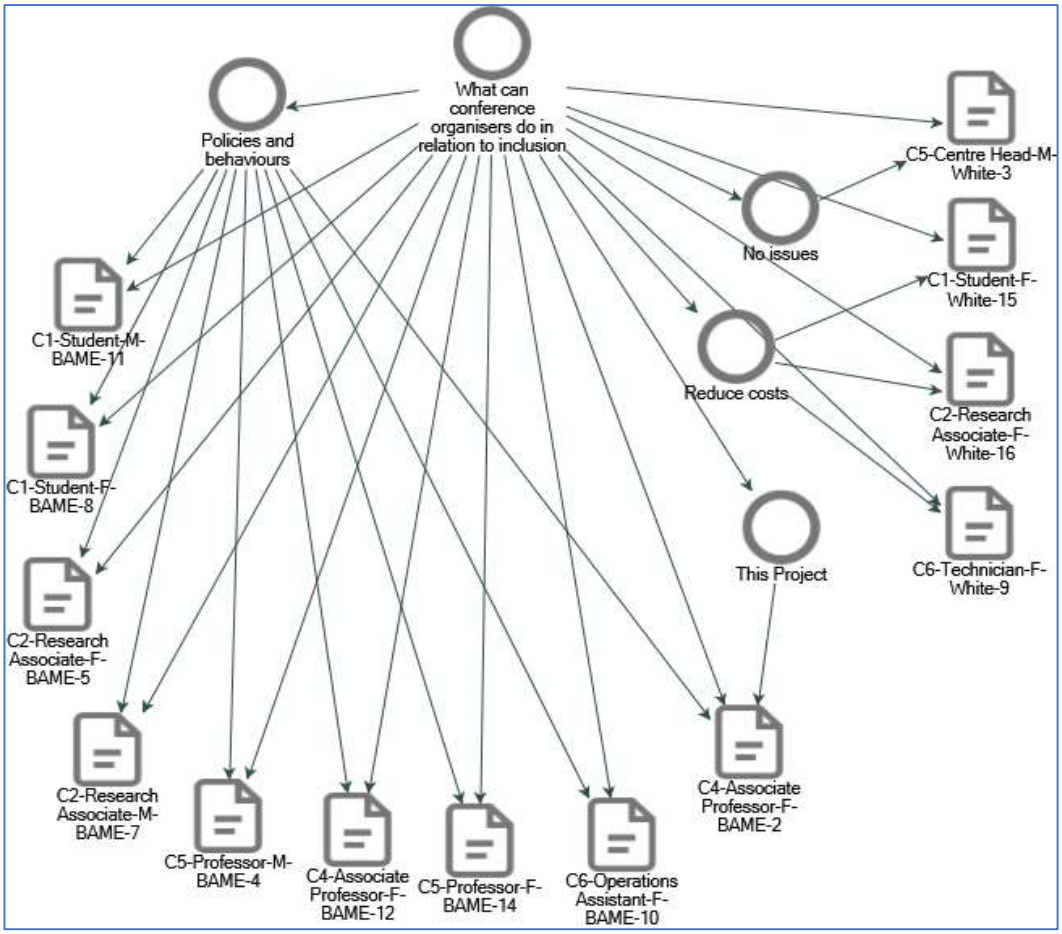


Figure 17: Conference organisers and inclusion

"… we have produced guidelines for the organisation of diverse and inclusive conferences which we provide for our staff and basically anybody else who's organising a conference within the remit of our school department. …I don't know whether Wellcome (Connecting Science) have anything like that, but it would be great if they did produce that and EDI initiatives are all about sharing, sharing resources. So I'd be more than happy to send you our guidelines or provide the link...as kind of an illustrative exercise of what could be done."

(Ethnically Minoritised Male Professor)

"…actively showing that actually skin colour doesn't matter…if you sat on a table, for example, and two people are talking and then there's a person of ethnic minority, for example, so actively speaking to that person, simply asking them questions, actively making them feel like they belong. Even just saying, you know, it's great to see you or, yeah, welcome. Something very small like that. I'm not saying that you should do that more with ethnic minorities, but…I am saying that you should do that a little bit more with ethnic minorities just because they are underrepresented. More things like that, and then make them feel comfortable…showing that you're interested in them as a person as well."

(Ethnically Minoritised Female Research Associate)

"I think what could be very good is whenever you have a member of a certain group that has been included, it would be a good idea for them to recommend or introduce another member of that subgrouping into the next meeting."

(Ethnically Minoritised Female Associate Professor)

"…They must have a BAME person presenting, a BAME keynote speaker. If we're lucky, you may see one or two persons of colour so when I say BAME, I mean Black really, but you'll see an Asian person perhaps to the poster or something. But Black, someone that looks like me, why is someone not like me presenting because (if) I saw that I'd be like wow, that's amazing. So we need to ensure, I don't know if you want to call it positive action, but (that) we are there in every category. We are around, make us feel like we are meant to be there… We don't want to be the only one in the room anymore. It's tiring."

(Ethnically Minoritised Female Associate Professor)

4.4.9 Shared learning from conferences

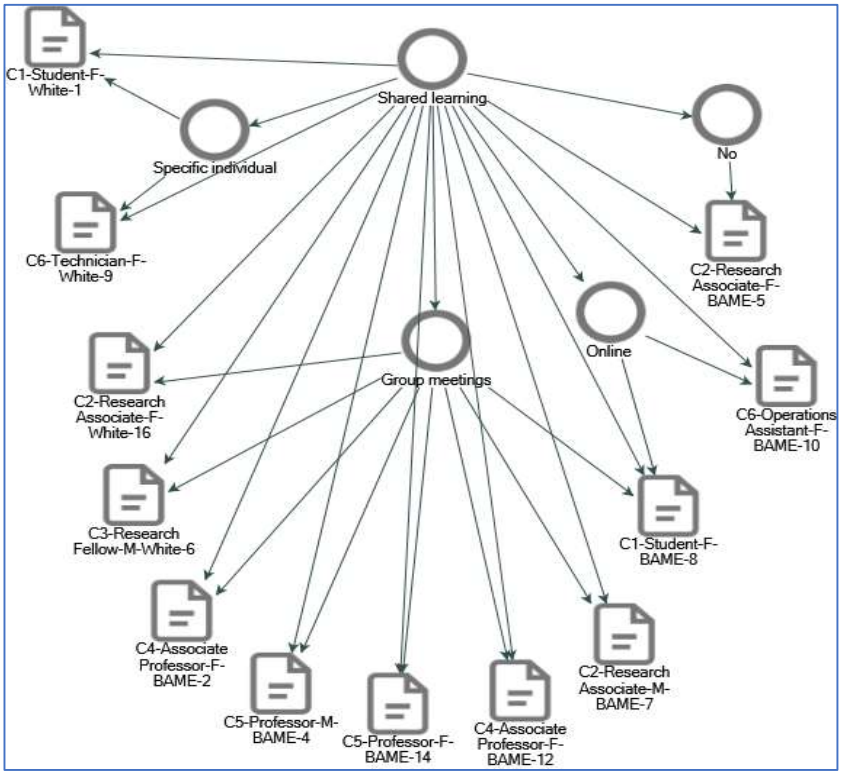


Figure 18: Ways in which learning is shared

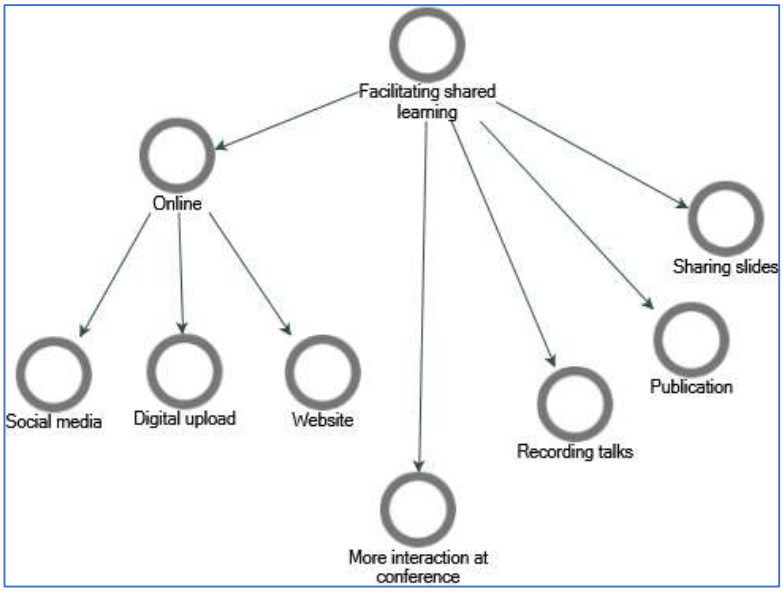


Figure 19: Strategies for facilitating sharing of learning

…he's a postgraduate scientist and also a professional illustrator. And he does illustrated summaries of talks, and then they're posted on social media."

(White Male Research Fellow)

"What was quite good about (redacted), although I didn't use it, they had almost like an online … sort of platform for it, where you could then message people from a conference. That was good because then you could get people's details and stuff. That worked really well."

(White Female Research Associate)

"…that kind of time where you … get people talking on a coffee break and so forth. Try and make those as long as possible and kind of cut down on the presenter speaking, maybe…"

(Ethnically Minoritised Male Student)

4.4.10. Additional comments

Suggestions for improvement

"…disability, especially things that are not so obvious, visible, that might be coming in with old age, that sort of thing. So I've noticed now that some of my mentors were maybe 10, 15 years older than me, they are not disabled, they're getting older. And, for example, you know, someone who couldn't climb the stairs easily. And the conference was upstairs. And in the long queues for the lifts, everyone is taking the stairs. And he found it really difficult to go up and down all the time…So…it's not really giving, even … a named disabled person, the same opportunity as everybody else who would be up and down the stairs. So little things like this. And, it's hard for organisers actually to even know, and very difficult to ask."

(Ethnically Minoritised Female Associate Professor)

"I think continuing to offer hybrid options, …is important…the soul and spirit of a conference is not the same when people are…distant. But nevertheless, I'm evaluating now about attending a conference and they don't offer a distance option. I've got to balance family and stop doing duties. And I'm not sure that I'm gonna attend…"

(White Male Research Fellow)

WCS Leadership

"I love that they're looking into this. I'm not surprised."

(Ethnically Minoritised Female Student)

"…nice for you to ask about, like, how it felt as an ethnic minority and going to these conferences because that's not something that a I've ever discussed with anybody."

(Ethnically Minoritised Female Research Associate)

“Wellcome (Connecting Science)…they could have the opportunity they want to be leaders, they could push through a diversity agenda if they want to, if the will is there… my university is starting to do it, sort of grasped the nettle and acknowledged the problem… I mean, there's a long way to go. But I'm really happy that steps are being taken where for instance, we just began the process of applying for (the) Race Equality Charter. So I guess the question is where will Wellcome (Connecting Science) sit in that sort of range of responses? Are they willing to take the lead? Because I do think there is a need for leadership. And if an organisation like Wellcome started encouraging, not just in the conferences it organises,…but saying if you get Wellcome funding, and you organise a conference, we expect you to do so using these diversity guidelines. If they start showing leadership along those lines, or providing money and resources to help people to make it more, you know,…there are many things that they could do to really be leaders as opposed to, you know, worrying about their image and their reputation….They could really show leadership in this and that would be wonderful for the academic community. So that's what I'd love to see.”

(Ethnically Minoritised Male Professor)

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Appendix H: Report authors

Sea-Change Consultancy

Sea-Change Consultancy is a unique consultancy dedicated to delivering innovative, evidence based, individual, group and organisation wide interventions which will deliver your equality, diversity and inclusion aims. We combine expertise in equalities, academic scholarship and a track record of using action orientated methodologies that make a difference.

Report authors

Tinu Cornish is a Chartered Organisational Psychologist with over 30 years' experience in equality, diversity and inclusion. Tinu is one of the UK's leading diversity psychologists and has expert knowledge of unconscious bias and diversity and inclusion in recruitment and selection methods and throughout organisational systems. She has previously delivered a presentation to the HR team of the European Parliament on recruitment and selection and race. Tinu has built up this experience through delivery of consultancy and training for over 30 years. She uses behavioural science to enable organisations to design innovative and effective diversity and inclusion interventions and enables individuals and organisations to benefit from an evidence-based approach to integrating psychological science into the way that they manage and develop individuals, teams and leaders.

Dr Kathlyn Wilson is an Associate Professor with extensive commercial and academic experience in equality, especially focusing on minimising adverse impact in selection and appraisal processes for Black and minority ethnic people. A Chartered Organisational Psychologist, she has 15 years' multinational consulting experience in employee and organisation research in the UK and the US. She has carried out multiple projects relating to competency definition and the design and implementation of selection methods in a variety of sectors. She has worked with a number of government departments and private sector organisations. Her combination of US and UK experience give her a particularly insightful view across equality and diversity matters. She is a judge and presenter for BiTC Race awards since 2013 and chairs the Chartered Association of Business Schools (CABS) Race Equality Action Group.

Dr Ashlee Christoffersen has fifteen years of experience as a mixed methods equality researcher in the academic and third sectors, including four years at Advance-HE, and latterly as a consultant. Her areas of expertise are research design and methodology; inequalities in higher and further education; intersectionality; inequalities relating to race, ethnicity, gender and gender identity, and sexual orientation; equality policy; the third sector; and knowledge exchange. She has developed, designed and led many research projects, and has experience of leading research teams.

Janice Prentice brings experience of managing consultancy projects for 12 years, including a particular focus on those relating to EDI. She has experience in all areas of EDI including using EDI monitoring for customers, staff and suppliers to prioritise action and developing meaningful actions to advance equality, promote diversity and increase inclusion and belonging.

Victor Penda is an Organisational and Consulting Psychologist who is passionate about mental health, performance and group dynamics in the workplace. He has experience working with high performance individuals, teams and organisations including FIFA World Cup athletes, the NHS, and Salesforce. He aims to apply psychological research from different disciplines to achieve measurable outcomes.