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Narrowing the gap in careers in clinical research and academia for healthcare professionals: A scoping review on the role of major funding bodies in the UK

Abstract:
Differential attainment (DA) exists in research and academia, where individuals with protected characteristics face barriers to progression at different stages from selection in training or career pathways through to obtaining funding and getting research published. The causes of DA are multifactorial, however more barriers are associated with an individual's gender, race, ethnicity, sexual orientation, disability or other social and economic factors rather than academic factors related to research. DA is seen across medicine and healthcare therefore it is likely a manifestation of wider inequalities experienced by these individuals within society. This scoping review takes a first step at exploring DA through the lens of equality, diversity and inclusion in research and academia, specific to healthcare professionals in medicine, in the UK. Given the paucity of published data, benchmarking and investigation of the causes of DA and access in this area, this review seeks to identify what published reports exploring this issue reveal. There has been mixed success in the area of gender equality with the Athena Swan benchmarking exercise; however differences in outcomes exist within gender when other protected characteristics, such as ethnicity, are also explored. The DA observed among women despite the Athena Swan programme demonstrates other factors such as allyship, apprenticeship, sponsorship and mentoring which may be accessible to some individuals, but not others. Furthermore, ethnicity appears to be a barrier to accessing this form of support, and non-Black and Minority Ethnic (BAME) women appear to be more privileged to receiving this type of support. Without more research into the lived experiences of individuals from non-traditional backgrounds at the micro-level, as well as data across the career progression pathway over time at the macro-level, the problem of DA is unlikely to improve. If anything, lack of openness and transparency around such data at an organisational level, may exacerbate the sense of injustice within research and academia among individuals with protected characteristics, especially given that the perceived sense of DA is very real for them. The purpose of this paper is to start the conversation with stakeholders within research and academia, about DA and commence the process of reducing the gap using equality, diversity and inclusion as fundamental concepts for achieving a level playing field for all. This type of accountability is essential for developing trust and in the system. Such open conversations need to happen across every organisation, that is a stakeholder of research and academia in the UK.

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Introduction

Every training and practising doctor should become familiar with research processes and conduct, and where possible have the opportunity to engage with research or pursue an academic career as part of their professional choices (1). However, in the UK, less than 10% of doctors have a career in academia, at a time when the entire world has woken up to the value of high quality research and researchers during the current pandemic. Clinical academics play a vital role in advancing our understanding and ability to treat existing and future disease.(2) A diverse academic workforce has been associated with greater scientific impact and growth (3). However, not all individuals will progress in research and academia, with data showing that in fact, diversity across clinical academics reduces as one progresses through career milestones. Further analysis into diversity demonstrates that a range of factors, (e.g. gender, race, disability) (4) appear to contribute to limited progress in research and academia. In recognition of these barriers to progression, the Research Excellence Framework (REF) – (a system for assessing the quality of research in the UK), places greater emphasis on organisations to demonstrate their commitment to reducing inequality and increasing inclusivity. The Athena Swan Charter was specifically developed to minimise the impact of gender on career progression, with little doubt the programme did much to highlight the problem of gender inequality in particular. All stakeholders of research and academia have a statutory duty towards reducing inequality and increasing inclusivity, including funding bodies. In this paper, we explore the extent to which, publicly available information shared by key grant awarding bodies, report on outcomes relevant for career progression (or along research journey) in academia, and across individuals with a range of protected characteristics, with a focus on ethnicity among healthcare professionals.

Equality, diversity and inclusion (EDI)

Equality is defined as treating people fairly, impartially and without bias and creating conditions in the workplace and society that value diversity, promote dignity and encourage inclusion.(5) Diversity is an inclusive concept, concerned with creating an environment supported by practices, which benefit the organisation and all those who work in or with it. (5) Diversity takes account of the fact that people, whilst similar in many ways, differ including (but not exclusively) on the basis of gender, age, race, sexual orientation, physical ability, mental capacity, religious belief, education, economic status, personality, communication style and approach to work. (5) Inclusivity means that everyone feels able to be themselves, valued and safe to express different ideas, comfortable in raising issues and suggestions to others, knowing that this is encouraged, and being creative to try different ways of doing things. There is more awareness about equality, diversity and inclusivity following the 2010 Equality Act, which legally protects people from discrimination in the workplace, and in society.(6)

EDI in research and academia

Research across multiple sectors and work settings has demonstrated the value of diversity within teams, for increased productivity.(7–11) A study analysing over 10 million published papers, showed a strong correlation between the diversity of research teams and higher citations within five years of publication (and thus higher scientific impact).(3) Problem solving is better with diversity of 'problem solvers' as compared to teams with 'high-ability' problem solvers.(12) Thus, EDI should be seen as a driving force for growth and research impact.

Differential career trajectories

In the UK, a clinical academic career involves a complicated training programme, with competitive multiple entry points across Foundation, Core and Specialist training, some of which, but not all, may be integrated within clinical training programmes.(13) However, across all these entry points, there are marked differences in success, for individuals who identify with a protected characteristic - starting with selection into programmes and success in obtaining funding awards. These differences continue beyond training, and extend to career progression as well as development opportunities, or achievement of senior academic posts. The factors that contribute to disadvantage are wide ranging and are commonly considered to interact with each other.

a) Gender

The Athena Swan Charter (14) was a system-wide programme to address the structural inequalities facing women progressing with their careers in science, technology, engineering and maths (STEM). As a sector, higher education is relatively diverse, with almost equal representation from men and women. However, the trend is different when looking at contract type (fixed term vs. permanent) and appointment into senior positions such as Readership and Professorships. These senior positions in STEM were, and still appear to be male dominated (78.7% male Professors).(15) Although >50% of early career researchers are women in clinical medicine and biosciences, the proportion drops dramatically at more senior levels (16) [Figure 1]. The Athena Swan Charter attempted to reduce some of this gender disparity in a number of ways.(17) The 2011 announcement by the National Institute for Health Research (NIHR) to only shortlist clinical academic

departments with a 'silver' Athena Swan award for (certain) research grants, resulted in an increase in the number of female clinical academics in senior positions.(14) An independent review of impact suggested the Charter was successful in bringing about cultural and behavioural change for the benefit of women in research and academia, but questioned whether the pace at the 'most senior levels' was fast enough.(14) Addressing inequalities, especially where factors operate at multiple levels, is difficult and the success of the Charter to address these challenges appears to have been limited. There is evidence that gender inequality may have improved for White women academics but not necessarily for Black, and minority ethnic women, and in some instances, White women may now have an advantage over Black and minority ethnic men.(15,18) Often, more than one protected characteristics could play a role in attainment; for example there are less than 20 Black Professors in the UK (19) thus the combination of multiple protected characteristics causing greater barriers - also known as intersectionality - is important. (20)

a) Ethnicity

Although individuals from Black and minority ethnic backgrounds make up 34% of the total population of doctors, they account for less than 17% doctors in academia. (22,23) In terms of senior leadership positions held by individuals from Black and minority ethnic backgrounds in the NHS and academia, the evidence demonstrates a lack of representation in both contexts (22). Likewise, individuals from Black and minority ethnic backgrounds are also under-represented across most levels in academia, suggesting significant barriers still exist around progression along career pathways [Figure 2].

The lack of representation appears to extend across different institutions and organisation within research and academia. Diversity data from the Research Council 2018 shows that 84% of the academic population in the Medical Research Council (MRC) identify as White, with 4% and 1% belonging to Asian and Black backgrounds, respectively. Further, 79% of the student population at MRC was from a White ethnicity despite most medical schools having greater proportion of their cohort, made up of individuals from Black and minority ethnic backgrounds.

Success rates for principal investigator funding across MRC grants and awards in 2016-17, demonstrated a higher proportion of applicants identifying as White (24.1%) compared to successful applicants from Black and minority ethnic backgrounds (16.3%). Data describing successful new investigator research grants from 2017-18 demonstrated higher success rates for applicants identifying as White (24%) compared to applicants from Black and minority ethnic backgrounds (7%).(24) Data from UK Research and Innovation (UKRI) in 2019 suggest the gap may be widening with a higher success rate observed again among individuals identifying as White (27%) compared to those identifying as Black and minority ethnic (17%).

Data from the Wellcome Trust on grant funding awards, identified the majority of successful applicants identify as White (87%), and there was a consistent gap in success rates over a three-year period between 2016-2019. Across this data, Black and minority ethnic applicants were also under-represented among those who were successful at obtaining more senior awards and fellowships. (25) Furthermore, the odds of non-White applicants receiving funding were 0.68 times those of White applicants. (25)

The Higher Education Statistics Agency (HESA) suggested that 91.2% Professors identified as White compared with 3.5% who identified as Asian and 0.6% who identified as Black.(15) Only 3.2 % of Heads of the Institutions identified as Black and minority ethnic. Students from Black and minority ethnic backgrounds were also less likely to progress to scientific jobs after graduating than students identifying as White. (16)

a) Other protected characteristics

Reporting of outcomes from individuals with protected characteristics can be limited due to need for protecting anonymity when group sizes are small. Individuals with visible and non-visible disabilities are under-represented in a range of work settings, and the trend is no different in the scientific workforce. (16) Only 2% of UK-based applicants for Wellcome grants declared a disability at the point of application (19% of working-age adults are disabled according to the UK Government family resources survey 2016/17). There is some data to suggest that people with a disability have less success at grant award rate (13% versus 15%)(25). Although not strictly a protected characteristic, deprivation is associated with poorer outcomes especially among individuals with protected characteristics. Individuals from a lower socio-economic backgrounds, irrespective of ethnicity, are less likely to enter research and academia, and are also less likely to progress in their careers as well as take longer to get to professional level.(16) Similarly, 2017 data from the Wellcome Trust, suggested inequalities in entry to doctoral studies due to socio-economic background, despite same attainment level in graduate studies. (26).

The need and scope of this review

The factors contributing to differential attainment (DA) and differential career progression in research and academia are complex and multifactorial, with responsibility for reducing the

problem, shared equaly across all stakeholders. Examining the approach towards EDI of funding bodies is important, because 'bridging the gap' first involves identifying the extent of disparity in clinical-academic and research careers, as a function of identifying with a protected characteristic. Individuals from all backgrounds apply to funding bodies for supporting their research as well as their career development; therefore funding bodies are responsible for ensuring equal opportunity, as well as reducing differential outcomes due to factors, such as protected characteristics.

This rapid scoping review aimed to identify publicly available policy documents or reports from funders and stakeholders of research in the UK to: 1) evaluate the extent to which reports related to equality, diversity and inclusivity detailed outcomes, and investigated for evidence of differential success rates among people with protected characteristics with a focus on ethnicity and intersectionality; 2) mapping the extent to which reports investigated or at least acknowledged drivers of disparity in the '*Bridging the Gap 2020*' Thematic Series document (27); 3) identifying emerging themes to further reduce differential outcomes for clusters of researchers and academics who are most disadvantaged in the career cycle.

Methods

A rapid scoping review was designed to find out what kind of evidence is available from funding bodies in relation to the extent to which their activities address equality, diversity and inclusivity. The process aligned with the framework for scoping reviews suggested by Levac and et. al (28) to ensure consistency of procedure and ensure rigor despite the limited range of literature under analysis. The review specifically targeted publicly available information from reports and other documents from major UK based funding bodies.

Inclusion criteria

Any reports published by a funder or stakeholder of research in the NHS, UK, within the last 10 years were considered eligible for review. Reports were included that: 1) investigated equality, diversity or inclusivity issues within the organisation, or within a partner organisation; 2) assessment of equality, diversity or inclusivity outcomes within the organisation, or within a partner organisation, or across research in the NHS; 3) explorations of research career progression in the NHS through the lens of equality, diversity or inclusivity; 4) evaluations of academic training pathways in NHS through the lens of equality, diversity or inclusivity; 5) primary studies investigating barriers or drivers to engaging with research or research careers in the UK aligned to the '*Bridging the Gap'* programme of work

Screening and selection of reports

Initial searches were conducted and screened according to the selection criteria by two review authors (SKD and NB). The full text of any potentially relevant report was retrieved for closer examination by the review team (CD, CCL, DR, MS and RP). The inclusion criteria were then applied again to the full text version of the reports independently by each reviewer. Any uncertainty about the inclusion criteria were discussed at weekly review meetings throughout the duration of this study. Reviewers also screened the references of all full texts to identify source data or studies referred to within reports, in order to verify statistics or data presented in the reports. Likewise, any relevant documents cited in the references of these full texts were also retrieved depending on the relevance to the aim of the review. A narrative synthesis that summarised the different primary reports was undertaken so conclusions could be drawn into an integrated interpretation and achieve the aims of the review. (29,30)

Data extraction

Greenhalgh et al.'s (2018) principles and recommendations for undertaking narrative reviews guided the creation of a data extraction template that detailed: the organisation publishing the review, the title of the document, year of publication and the funder where applicable.(31) We also detailed a description of the report's presentation about the range of protected characteristics covered; barriers to career progression in research or academia; data of EDI success.

Data analysis

Findings from the included reports were synthesised using tables and a narrative summary. Data were summarised in descriptive terms depending on their alignment with the aims of the review with a specific focus on reporting of protected characteristics, career progression and successful outcomes. Emergent themes were regularly discussed by reviewers to ensure consistency of coding and classification of data as well. The iterative process of extraction and discussion ensured the themes were aligned with the aims of the review, rather than suffered from scope creep or bias when making interpretations from reports that may not make explicit specific data or outcomes.

Thereafter, all reviewers (CD, CCL, DR, MS and RP) discusses the emergent themes from across all reports in order to highlight the way data aligned with predefined factors associated with DA in the Bridging the Gap 2020 Thematic series (27). The way these themes mapped across these factors

(present or absent) were presented in Table 4 below.

Results

1. Types of reports

Fourteen reports met the inclusion criteria, and their full texts were retrieved for analysis. A further 5 reports were identified through lateral search techniques. The total number of reports included in the final review was 19, and they covered a total of 31 organisations [Figure 3] and 43 funding bodies [Table 1]. These reports can be found in (16,32,41–49,33–40), and a full list is given in appendix 3.

A total of 6 reports were undertaken by government bodies/agencies (19%) and 6 were by universities/medical schools (19%). A further 7 were by charities (23%), 5 by national academies (16%), 2 by Royal Colleges (6%) and 2 by independent groups (6%). Finally, a further 2 reports were originated from non-departmental public bodies (6%). Only 1 report was produced by a representative body. See appendix 1 for a full list of organisations conducting report.

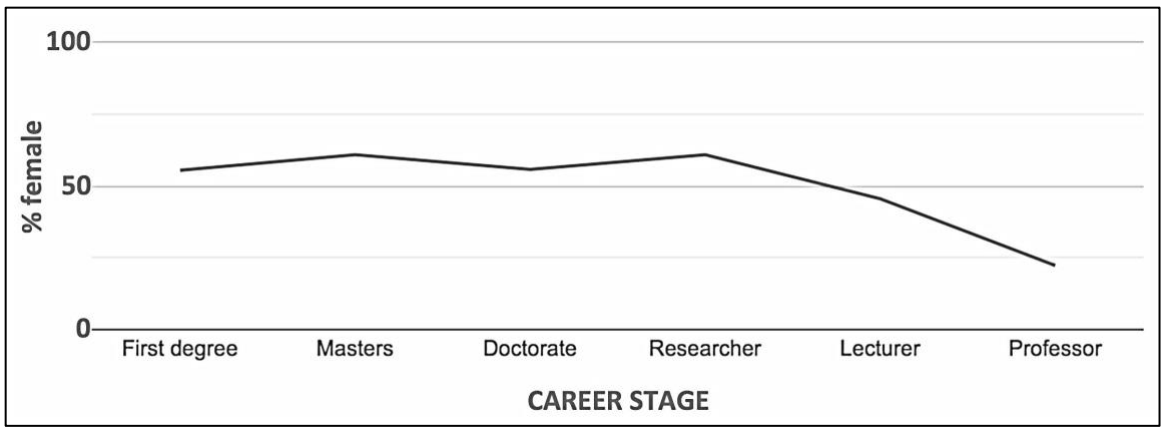

Figure 1: Percentage of scientists with female gender at different stage of career in Clinical Medicine as per Royal Society. Figure adapted from(21).

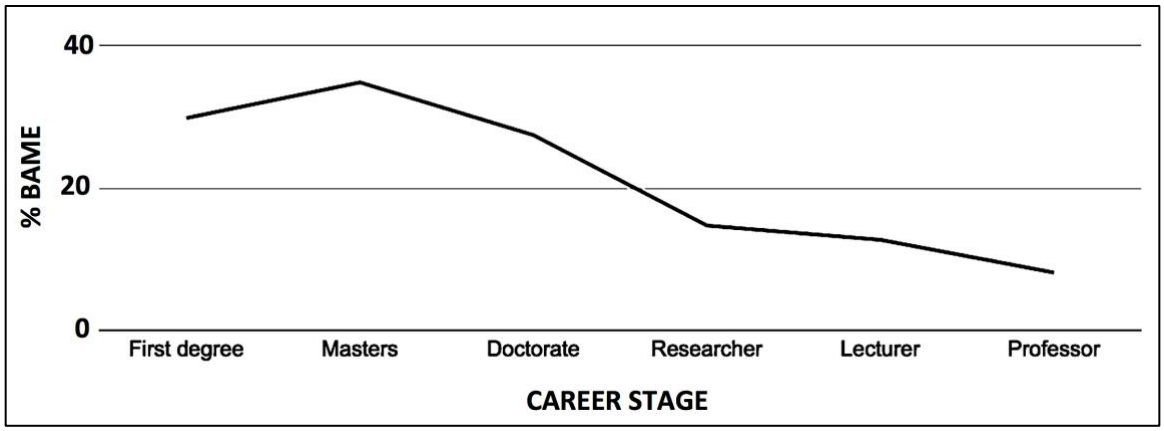

Figure 2: Percentage of scientists from BAME communities at different stage of career in Clinical Medicine -as per Royal Society. Figure adapted from(21)

1.1 Description of organisations involved in reports

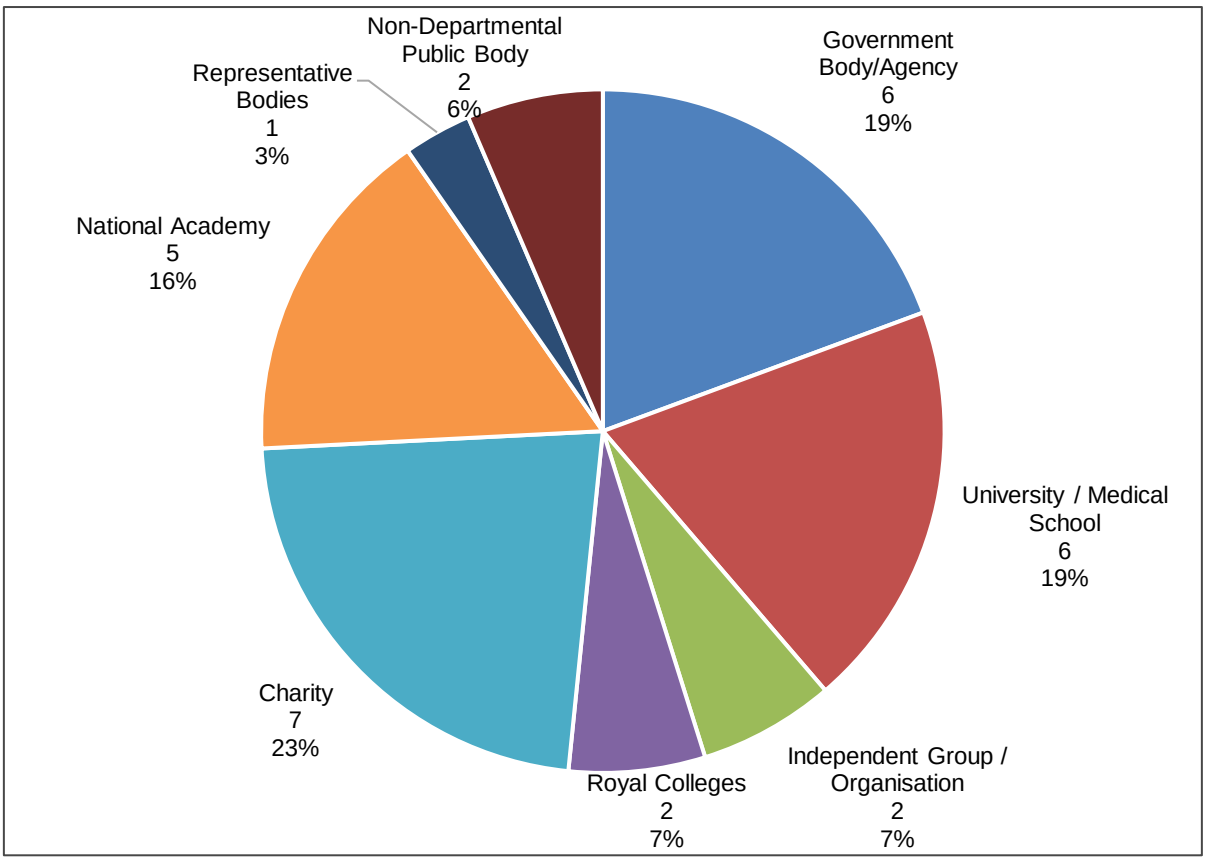

Figure 3: Organisation conducting report (see appendix 1)

1.2 Funders represented within reports

Funder	Frequency
Government Body / Agency	13
University / Medical School / NHS Trust	3
Royal Colleges	1
Charity	12
National Academy	4
Non-Departmental Public Body	6
Not stated or No grant	4

Table 1: Funders represented within the reports (see appendix 2)

The funders producing the reports were for the large part government bodies/agencies (30.2%, n=13) and charities (27.9%, n=12). See appendix 2 for a full list of funders.

1.3 Date of Publication and Publisher

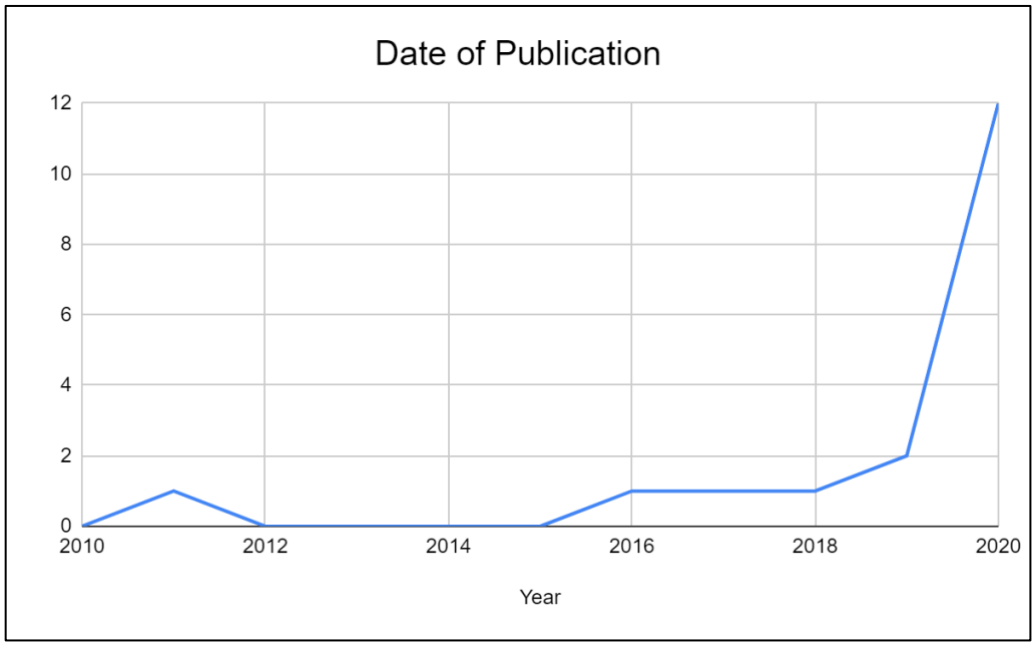

Figure 4: Date of publication of report

Nearly two-thirds of reports (n=12) were conducted in 2020, with only seven conducted in the previous nine years from 2010-2019 [Figure 4].

The majority of reports were self-published by the organisation or published within organisational journals e.g. the NIHR was the publisher for 11% of the reports. Only 6 external journals were listed.

2. Data collected and analysed in reports

2.1 Protected characteristics and intersectionality

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Ethnicity																			
Gender																			
Disability																			
Age																			
Socioeconomic Background																			

Table 2: . In the table above, the *Blue* colour shading signifies presentation of data about the specific protected characteristic in the published report. The *Orange* colour shading signifies the absence of data about the specific protected characteristic in the published report. Reports here are listed as 1-19; see appendix 3 for a full named list of reports included.

Gender was the most common protected characteristic for which outcome data was presented (79%), followed by ethnicity (53%), disability (21%) and then both age and socioeconomic background (11%). Other protected characteristics, such as sexual orientation, disability and religion were not specifically evaluated across any of the reports.

All 19 reports covered one or more of four protected characteristics – gender, ethnicity, disability, age and socioeconomic background [Table 2]. However, only a few reports focused on more than one protected

characteristic [Figure 5]. Seven reports covered two or more protected characteristics, whilst 4 reports covered three or more characteristics, and only 3 reports covered four or more characteristics. None of the reports covered more than five protected characteristics.

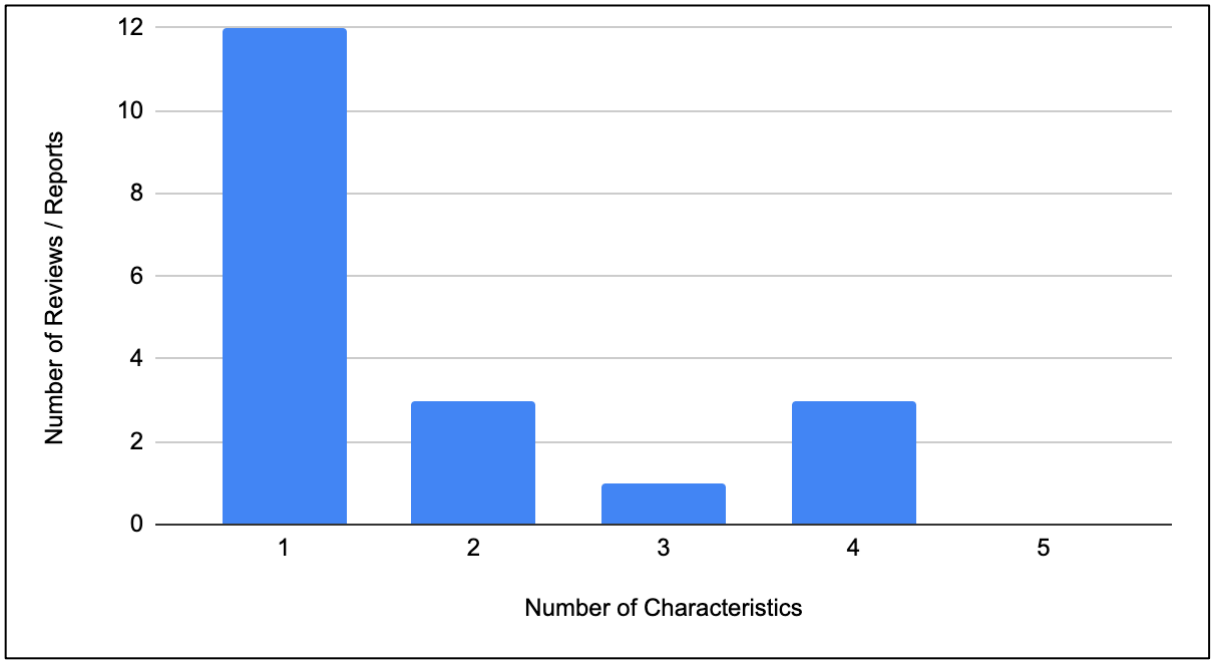

Figure 5: Number of protected characteristics covered in the reports

3. Mapping of data from reports to factors identified in the Bridging the Gap 2020 Thematic series (27)

Data identified from the 19 reports (see appendix 3) that mapped onto factors from the Bridging the Gap 2020 Thematic series(27) associated with DA is presented below [Table3].

Table 3:, The colour *Blue* signifies presence of a factors from the Bridging the Gap 2020 Thematic Series(27) that were presented in a published report. The colour *Orange* signifies absence of any of those factors presented in a published report. Reports here are listed as 1-19; see appendix 3 for a full named list of reports included.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Total Yes
Educational																				
Learning styles (problem based/ taught/ self-directed)																				0
Access to resources, guidance or tutoring																				3
Schooling (independent or state)																				1
Impact of economic status on educational opportunity																				1
Parental/ family (influence of parental education, support, expectation or motivation)																				0
Assessment (multiple choice, viva, observed clinical assessments)																				1
Impact of unrecognised dyslexia or dyspraxia																				0
Cultural																				
Linguistics (IELTS)																				0
Previous life experiences																				1
Conflict/ refugees																				0
Societal norms/ expectations (introvert vs extrovert)																				0
Influence of reverence of those more senior/in authority																				0
Segregation (wilful or forced)																				0
Bias																				
Racial, ethnicity, gender, disability																				19
Impact of illness or health impairment																				0
Support																				
Family, friends																				0
Formal supervision																				0
Mentorship																				1
Networking																				0
Economic																				
Deprivation																				1
Access to bursaries																				2
Cost of examinations/ preparation																				1
Family responsibilities																				2
Others																				
Health (physical/ mental)																				1
Immigration related stresses																				0
Wellbeing, Stress and Burnout																				0
Caring responsibilities																				6

All reports documented the impact on outcomes from factors such as age, disability, race and socioeconomic status on the immediate outcomes in research and academia such as failure to obtain a successful award or progress in a career. However, no reports explored the subsequent short- or long-term impact of these factors on the personal well-being, or physical and psychological health outcomes of individuals, as a potential risk factor for further or future disadvantage. Among the educational factors associated with differential career outcomes (27), access to resources, guidance or tutoring were reported in 6 reports (32%). Learning styles, schooling type, impact of economic status on educational opportunity and impact of potential unrecognised dyslexia/dyspraxia were only mentioned in one (5%) report.

Among the cultural factors associated with differential outcomes (27), no reports investigated the role of linguistics, conflict/refugee status or segregation as a cause for DA in a research or academic context. Four reports noted the influence of accessing support from a senior (21%) and 2 reported noted societal norms/expectations (11%). No reports investigated the impact of limited networking opportunities in a research and academic context. Four reports (21%) investigated the availability of formal supervision and 6 (31.6%) mention accessibility to mentorship as contributing factors.

Among the economic factors associated with differential careers (27), the impact of deprivation, access to bursaries, cost of examinations/preparation and a family responsibility was investigated in part. Access to bursaries was reported in 3 reports (16%), with family financial responsibility reported in 2 reports (11%). Deprivation and cost of exam/exam preparation were also reported on one occasion.

Within the factors classed as "other" were immigration related stresses, wellbeing/stress/burnout and caring responsibilities.(27) Immigration related stress was not reported on as a potential driver of differential carers. Health and wellbeing/stress/burnout was only reported on in 2 reports (11%). That said, caring responsibilities was reported in 7 reports (37%).

Discussion:

This rapid scoping review was undertaken to evaluate the extent to which funding bodies reported equality, diversity and inclusivity outcomes, with a specific focus on evidence of DA among individuals with protected characteristics and the impact of intersectionality among individuals from Black and minority ethnic backgrounds. The findings demonstrated DA across funding body outcomes is also prevalent, and the impact of multiple protected characteristics (e.g. gender and ethnicity) appear to particularly amplify the achievement gap between Black and minority ethnic and white individuals in research and academia. Furthermore, the mapping data presented in the published reports with factors associated with DA identified in the Bridging the Gap 2020 Thematic Series document (27) demonstrate an 'awareness gap' between funding bodies and individuals from Black and minority ethnic backgrounds about barriers to success as well [Table 3]. The findings from the review highlight a number of issues that need further exploration and discussion with all stakeholders of research and academia in the UK.

Broadening the EDI lens to consider the full range of career limiting factors

Firstly, there is a need to reflect over the starting point for this scoping review and the lens through which it was undertaken – equality, diversity and inclusivity (EDI). Although the review demonstrated greater awareness of EDI over the last decade, many of the reports have only been conducted in the last year or so, and thus few reports have been able to be repeated, to evaluate change in outcomes. Likewise, across many reports, gender outcomes have been the focus of improvement, but in some respects, gender appears to have been conflated with EDI in the broadest sense, more so than ethnicity or disability. This foregrounding of gender over and above other protected characteristics is multifactorial and likely includes interventions by funders such as NIHR after 2011, stipulating specific conditions related to gender targets before awarding funding to organisations. (14)

This is perhaps unsurprising given the focus on gender through statutory gender pay gap reporting since 2017, and the Athena Swan Charter. This target-driven approach has led to positive change with respect to actions to progress gender equality, though outcomes are still far from equal, especially at senior levels. Conversely the danger of focusing on one particular characteristic over another is the risk of fuelling a sense that one group's injustice is more or greater. For this reason, there is a real need for funders and stakeholders to consider all programmes of work on EDI within their

organisations, and to evaluate the extent to which they acknowledge individuals across the range of protected characteristics.

Another reason for the focus on gender rather than other protected characteristics such as ethnicity, may involve a degree of blindspot bias.(50) Given the lack of general awareness and/or data collection about EDI within research and academia, conceptualisations of inequality among funding bodies appear to focus on gender rather than being fully inclusive of individuals belonging to groups with all protected characteristics. Further, this general bias as a whole appears to have led to a general lack of recognition about broader EDI issues, especially for people from Black and minority ethnic backgrounds. (51,52) In fact, the notion of 'White privilege' was not reported in any report further suggesting a lack of awareness, or understanding about this concept despite the recognition of it in the wider literature (53), despite many higher education institutions committing to Advance HE's Race Equality Charter (REC).(54) The same is no doubt true for other protected characteristics where there are workplace initiatives to advance inclusivity such as Disability Confident and Stonewall Diversity Champions. This is perhaps due to fatigue of one program but also not having similar linked intervention by funders such as NIHR for Athena Swan Charter. (14)

The interaction of different protected characteristics should be focal in advancing inclusive research and academic careers for doctors

Secondly, and related to the concept of protected characteristics, is the notion of intersectionality.(20) Defined as 'the interconnected nature of social categorizations such as race, class, and gender as they apply to a given individual or group, regarded as creating overlapping and interdependent systems of discrimination or disadvantage', intersectionality is a particular issue for individuals from Black and minority ethnic backgrounds but also is important for individuals from White backgrounds. Although well described in wider literature to date, the issue of intersectionality was conspicuous by its absence among research and academics in this review. The problem appears to strike a chord among Black and minority ethnic doctors when describing their experiences of overcoming barriers in research and academia. For example, whilst addressing gender inequality, will no doubt help Black and minority ethnic women progress in research or academia, there is little doubt that Black and minority ethnic women also face additional barriers as a consequence of their ethnicity. Put another way, ethnicity was one less barrier non- Black and minority ethnic women had to face, or one more barrier Black and minority ethnic women had to face in order to advance in research and academia. However, the general lack of understanding or acknowledgement of the problem demonstrated across reports suggests much progress needs to be made in this area.

Many of the reports focused on factors such as gender, ethnicity, disability, age and socioeconomic background. These factors were most likely chosen because they are easy to measure, given many funders and stakeholders already have this type of data. The usefulness of this data is limited for a number of reasons. Ethnicity is often used as a catch all term for any individuals from Black and minority ethnic backgrounds, and ignores the observation that there is as much, if not more variation between different Black and minority ethnic versus non-BAME backgrounds. Outcomes in higher education are not to be the same for Black people or people who self-identify as Bangladeshi or Pakistani, as compared to people who self-identify as Indian, British Indian or Chinese, with the latter achieving better outcomes on some measures than the reference non-BAME group.(55) The homogenisation of individuals from Black and minority ethnic backgrounds into one ethnic category does little to acknowledge the significant variation among people in this group, as well as their specific perceived barriers in research and academia. This form of categorisation can also lead to reductionist interventions to mitigate the impact of unconscious bias are undermined since the problem - ethnicity - has been oversimplified to the point where it doesn't really mean anything that matters. Whilst there is an acknowledgement that the numbers may preclude meaningful analysis in variation, and so some aggregate data is required, more transparent and considered analysis is required. Hence, future analysis using disaggregated ethnicity categories (for both Black and minority ethnic and White) would highlight where the widest gaps are.

The need to acknowledge personal and socio-cultural factors may influence the BAME attainment gap in ways non-BAME groups may not fully understand so should take time to do so

Prior to this review, the Bridging the Gap programme of work highlighted many possible factors which impact differential outcomes in dual academic and research careers for doctors.(27) These factors are span multiple domains including education, culture, and social circumstances, yet many of the reports reviewed in this paper did not appear to acknowledge their existence or effect on progression for doctors from Black and minority ethnic backgrounds. For example, none of the reports acknowledged the significant positive influence of parents and family on the motivation levels and resilience among doctors from Black and minority ethnic backgrounds. Instead beyond the research and academic context, there has been negative stereotyping that characterises the families of Black and minority ethnic doctors as coercive and demanding on individuals.(56) Despite there being a large body of literature demonstrating the value of parental or family support to individuals for achieving many academic and non- Black and minority ethnic doctors appear not to be provided specific support with linguistics even when there is evidence sophisticated communication support and coaching may improve outcomes for Black and minority ethnic doctors at assessment.(57) In contrast, when individuals with specific learning require support due to various information processing challenges they face, organisations are prepared to fund it without too much delay. When Black and minority ethnic doctors struggle with language, dialect and academic writing, the perceived response is often for individuals to work harder or attend extra training rather than a form of developing coaching or performance enhancement intervention (58), thus focusing on the deficit model rather than looking at wider institutional change. Even for some factors such as immigration and visa related issues, particularly unique to non-UK Black and minority ethnic doctors, there was no acknowledgement of this challenge as a factor affecting research and academic outcomes, demonstrating the general lack of awareness or blindspot among funders and stakeholders about these problems.

Avoiding simplistic population or BAME-based interventions for overcoming barriers related to attainment gap

The findings from the review demonstrate the very real gap between the perceptions of individuals from Black and minority ethnic backgrounds about the factors preventing them from achieving their full potential, and the focus of stakeholders such as funding bodies about drivers of progression in research and academia and their role in addressing this. Interventions for addressing EDI issues seem to focus on the 'bias' as the main cause of the doctors from Black and minority ethnic backgrounds progressing in their careers. Although de-biasing interventions are well-reported in the wider literature, their effectiveness for improving individual outcomes for doctors from Black and minority ethnic backgrounds remain unclear. Furthermore, de-biasing interventions or unconscious bias training assume that 'bias' is something that can be trained out of those who demonstrate it. The extent to which there is evidence that such strategies are able to achieve this outcome in any meaningful or long-term way is also lacking. Conversely, doctors from Black and minority ethnic backgrounds who report being subject to forms of bias, are often referred to communication, leadership or resilience training courses. The assumption underpinning all of these interventions is that individuals can be trained to become resilient to the problem however there is little evidence in the wider literature for effectiveness of these approaches either. These types of organisational interventions or responses infer a deficit model within the individual rather than acknowledgement by funders and stakeholders of a problem within the system being the cause for poorer outcomes in research and academia among doctors from Black and minority ethnic backgrounds.

Moving away from EDI 'projects' to sustained and embedded practice

Many of the reports included in this review also appeared to detail single pieces of work or projects related to EDI, rather than a long-term programme of work committed to achieving change in research or academia for individuals with protected characteristics. This scoping review evidenced elements of positive practice from funders about their focus on EDI, mostly in relation to gender, but the opportunity now

exists for widening the breadth and depth of those EDI programmes of work. Whilst there was a particular absence of attention towards intersectional factors that could be career limiting, the findings from this review may help develop specific, measurable actions that can help to reduce DA in a meaningful way. The success of narrowing gender disparity was likely driven by a statutory focus on the gender pay gap reporting as well as the Athena Swan Charter. There is now an opportunity to fully embrace and embed the REC into policy making at all levels across research and academic environments.

Moving Forward

As a result of this review, a number of areas have been identified for further discussion with funders and stakeholders in small-group workshops to guide further research and policy developments.

1. The collection, analysis and sharing of data relating to progress in research and academia for people with protected characteristics

Possible areas for exploration include:

- Creating a uniform framework of what EDI data should be collected by stakeholders and organisations including funding bodies
- Longitudinal reporting of outcomes for all people, including those with protected characteristics from selection into academic training pathways through to grant/funding awards and career progression
- Working together with HEIs and NHS Trusts to develop a framework for monitoring their own data and ensure reducing the attainment gap is a priority
- Meaningful reporting of data analysis incorporating effect of intersectionality and multiple protected characteristics as compared to single or few.

2. The development of EDI strategy that is inclusive for all, and not just exclusive to the few

Possible areas for exploration include:

- EDI strategy development that accurately reflect the challenges faced by people across the range of protected characteristics
- EDI strategy that includes training of staff to raise awareness about the barriers faced by people with protected characteristics, e.g. BAME doctors as reported in the wider literature

3. Representation from people with protected characteristics across leadership and management structures

Possible areas for exploration include:

- Efforts to increase representation from people with protected characteristics feeding into committees and decision making policy within your organisation
- Positive action to accelerate the pace at which representation is improved at senior academic and research levels e.g. targeted fellowships for mid-career etc.

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Appendices

Appendix 1

Type of Group Conducting Review / Report							
Government Body / Agency	**University / Medical School**	**Independent Group / Organisation**	**Royal Colleges**	**Charity**	**National Academy**	**Representative Bodies**	**Non-Departmental Public Body**
National Institute for Health Research	Cardiff University	Nexialog Consulting Paris	The Royal College of Physicians	British Heart Foundation	The Academy of Medical Sciences	Medical Schools Council	UK Research and Innovation
Higher Education Statistics Agency	University College London	Independent Working Group on position and participation of women in the medical profession		Cancer Research UK	The Royal Society		Medical Research Council
	Bournemouth University			Wellcome Trust	Academy of Medical Royal Colleges		
	University of York / Hull-York Medical School			General Medical Council			

Appendix 2

Funder					
Government Body / Agency	**University / Medical School / NHS Trust**	**Royal Colleges**	**Charity**	**National Academy**	**Non-Departmental Public Body**
National Institute for Health Research	University College London Hospital NHS Trust	The Royal College of Physicians	British Heart Foundation	The Academy of Medical Sciences	UK Research and Innovation
Chief Scientist Officer	Bart's Health NHS Trust		Cancer Research UK		Higher Education Funding Council for England Leadership Governance and Management Fund
Health and Care Research Wales	Bournemouth University		Wellcome Trust		Medical Research Council
Higher Education Funding Council			Action Medical Research		Health Education England
Public Health Agency			Alzheimer's Research UK		
Department for Business, Innovation and Skills			Stroke Association		
Higher Education Statistics Agency			General Medical Council		

Appendix 3
Reports included in the present study, as listed in tables 2 and 3

Report number	Full title of report
1	Diversity results for UKRI funding data 2014-15 to 2018-19
2	Promoting equality, diversity and inclusion in research
3	NIHR stands by Black Lives Matter
4	Gender and Academic Rank in the UK
5	Research for all? An analysis of clinical participation in research
6	Women and academic medicine: a review of the evidence on female representation
7	Women in Clinical Academia
8	A Cross-Funder Review of Early-Career Clinical Academics: Enablers and Barriers to Progression
9	Factors that influence career progression among postdoctoral clinical academics: a scoping review of the literature
10	2017 UK-Wide Survey of Clinical and Health Research Fellowships
11	A picture of the UK scientific workforce
12	"Playing Mother": Channelled Careers and the Construction of Gender in Academia
13	From the sticky floor to the glass ceiling and everything in between: protocol for a systematic review of barriers and facilitators to clinical academic careers and interventions to address these, with a focus on gender inequality
14	Ethnicity and academic performance in UK trained doctors and medical students: systematic review and meta-analysis
15	Race inequality in the NHS
16	2018-19 Annual Diversity Report
17	All staff (excluding atypical) by equality characteristics 2018/19
18	A 2020 Vision An independent report into Diversity and Inclusion at the Royal College of Physicians
19	Independent Review of the Membership of the Royal College of General Practitioners Examinations (MRCGP)