

Written Evidence Submitted by the Academy of Medical Sciences (DIV0054)

Summary

- Lack of diversity within the STEM workforce has **detrimental consequences for the sector and the society it serves**. Underrepresentation of any group in research teams limits the applicability of research to society's needs. **Barriers to recruitment, attainment and retention in STEM careers need to be removed** to ensure that the STEM workforce becomes more diverse and inclusive, including in biomedical and health research.
- The Academy's work covers the breadth of clinical, biomedical and health research and therefore **understanding and improving the diversity of our Fellowship and wider activities is important to improving the overall diversity of the sectors which we seek to represent**.
- We are **actively working to improve representation within our Fellowship** and tackling any incidences of bias in our Fellowship election and grant award processes.
- The Academy is also **committed to working towards full equity** in our organisation, practices and work, and in the wider academic workforce. We are serious about learning both from our successes and our failures, and whilst there are positive examples of actions the Academy is taking, **we recognise that there is more to do**. We believe that **transparency is key for sector-wide improvement**.
- We recognise that the Academy and organisations across the sector **must improve data collection, analysis and transparency to ensure that what we do is driven by a solid evidence base**. Since 2016, the Academy has published annual Diversity Reports capturing diversity data across our activities. **We use these to develop initiatives to improve representation of people with underrepresented protected characteristics across all our work**.
- The Academy has developed successful programmes to **support female researchers** in their careers and in engaging with the media.
- We aim to **give autonomy to people and communities already working with groups with underrepresented protected characteristics** in order to prioritise work on their terms. In doing so, we have developed workshops on leadership and mental health for Black researchers.
- **The Academy is developing an Equity, Diversity and Inclusion (EDI) strategy and EDI Forum** with dedicated leads for different protected characteristics; we **have EDI principles and intend to centre and apply these across all of the Academy's actions**.
- Organisations across the clinical, biomedical and health research sectors are **taking action to improve representation at every career stage, but further efforts are needed**.

Introduction

1. The Academy of Medical Sciences is the independent body in the UK representing the breadth of medical science. Our mission is to promote medical science and its translation into benefits for society. The Academy's elected Fellows are the UK's leading biomedical and health researchers from hospitals, academia, industry and the public service. We work with them to promote excellence, influence policy to

improve health and wealth, nurture the next generation of medical researchers, link academia, industry and the NHS, seize international opportunities and encourage dialogue about the medical sciences.

2. The Science, Technology, Engineering and Maths (STEM) workforce is less diverse than the wider workforce in the UK. However, the extent to which different groups are underrepresented varies depending on the career stage and STEM speciality.¹ This has implications and risks for the quality of research outputs and the long-term sustainability of the STEM workforce. Across the sector, action is being taken to improve representation at every career stage.
3. Our response to this call for evidence will focus primarily on diversity within our own organisation and the medical sciences sector. Our response draws from some of the evidence we submitted to the APPG on Diversity and Inclusion in STEM inquiry in January 2021² which is referenced throughout.

Extent of the problem

4. Data collection is an important tool towards understanding the extent of underrepresentation in STEM and its causes, and to inform best practices by ensuring that what we do is driven by a solid evidence base. The Academy's work covers the breadth of medical and pre-clinical basic research and therefore our diversity data is useful in illustrating the issues prevalent in the wider medical and biomedical research sector.
5. The Academy is committed to monitoring and improving representation and experiences of people from underrepresented communities with protected characteristics (as described in the Equality Act 2010^{3,4}) across all its work. Since 2016, the Academy has published annual Diversity Reports capturing diversity data across its activities.⁵ Data is collected and presented on gender and gender identity, ethnicity, disability and sexual orientation. We are working towards 100% data collection in all areas however there is still significant work to do to achieve this. We are aware that we do not currently collect data on socio-economic backgrounds; we do collect data on age however this is not complete and could be better utilised. Better data will allow us to begin to identify the intersectional layers of an individual; it is important to establish these multiple identities that a person may hold to ensure they are included.
6. The majority of data referenced below is published in the Academy's Annual Diversity Report 2019/20.⁶ Unpublished data for 2021 has been provided in some areas which have been indicated throughout.

Terminology

¹ <https://www.britishecienceassociation.org/Handlers/Download.ashx?IDMF=d7899dce-22d5-4880-bbcf-669c0c35bda6>

² <https://acmedsci.ac.uk/file-download/39545239>

³ <https://www.equalityhumanrights.com/en/equality-act/protected-characteristics>

⁴ The Academy recognises that the nine protected characteristics described in the Equality Act 2010 are not exhaustive.

⁵ <https://acmedsci.ac.uk/about/governance/equality-and-diversity/annual-diversity-report>

⁶ <https://acmedsci.ac.uk/file-download/12969204>

7. Through the development of our Equity, Diversity and Inclusion (EDI) business plan and strategy (explored in more detail throughout this submission) we will be changing the terminology we use to collect and analyse data on protected characteristics, including ethnicity. Although 31 categories of ethnicity data are collected, the Diversity Reports⁷ used to provide data for this submission have combined these categories into two groups: Black, Asian, or Minority Ethnic (BAME) and any white background (AWB). We appreciate that these terms represent a large number of communities and that combining them in this way will limit our understanding of how diverse the Academy and its work is across different ethnicities. Where possible, further breakdowns are provided to better understand the make-up of the BAME category, however this has only been possible in cases where disaggregated data is provided in the reports. The Academy is aware that differing identities of race should be treated separately as these identity groups have a different and separate experience of discrimination and marginalisation and we are reviewing how these terms are used at our organisation. In this submission, the terms BAME and AWB have only been used to specifically reference data from the Diversity Reports.

Senior figures in medical research

8. The Academy's elected Fellows are the UK's leading clinical, biomedical and health researchers and represent talent and excellence across laboratory science, clinical academic medicine, veterinary science, dentistry, medical and nursing care, and other professions allied to medical science including: ethics, social science and the law. New Fellows are appointed each year through a rigorous election process; the majority of candidates are selected for their outstanding contribution to the advancement of medical science. We can therefore assume, with some limitations which are explored below, that the Academy's Fellowship reflects the senior medical research workforce and that data from the Fellowship can be used to gain an understanding of how diverse this workforce is.
9. Overall, 21% of the current Fellowship is female and 7% of the Fellowship identified as BAME (unpublished data correct at time of submission). Within the Academy Fellowship, there is strong female representation on governance committees. However, in 2020, fewer than 5 of 37 core governance positions were held by a BAME Fellow. Data collection for disability was poor and we are therefore unable to indicate with any certainty how well represented people with disabilities are in our governance processes.
10. Importantly, out of a total of 1,361 Fellows, only 8 are Black, of which 4 were elected since 2020. Analysis shows that a higher percentage of BAME candidates were shortlisted compared to AWB candidates (40% to 27%), but a lower percentage of BAME shortlisted candidates were elected compared to AWB shortlisted candidates (32% to 46%).⁸ There is no evidence that these differences are significant, but due to the low numbers of BAME Fellows a hypothesis test like this is likely to be under-powered. The Academy is aware that this could indicate bias in our election process, which we are committed to tackling (see the Bias section under the 'What we are doing' heading).

⁷ <https://acmedsci.ac.uk/about/ourwork/equity-diversity-and-inclusion/annual-diversity-report>

⁸ <https://acmedsci.ac.uk/file-download/12969204>

11. The diversity of our Fellowship can also be seen, in part, as a product of wider systemic issues in STEM roles. In a report commissioned by the Royal Society to look at trends in under- and post-graduate studies and higher education employment over 10 years, significant variation was observed in outcomes for people from ethnic minority groups, but Black staff and students have consistently poorer outcomes and leave STEM in greater numbers at all career stages.⁹ At senior levels, 11.9% of white staff hold a Professor post, whereas this figure is 6.6% of Asian staff and just 3.5% of Black academic staff.
12. In its Diversity Data Report for 2020/21, NIHR found that the percentage of female applicants for pre-doctoral, early career awards was significantly higher than the percentage applying for senior career awards at the latest career stages (77.8% vs 37.0%)¹⁰, resulting in underrepresentation of women in senior NIHR-funded research positions.

Grant applicants, awardees and panels

13. Funding awards allow talented researchers to pursue innovative research; the Academy supports this through a varied portfolio of grant schemes for people at different career stages.¹¹ Underrepresentation of people with protected characteristics in grant awards, and at application stage, has follow on implications for the wider research system; the Academy's diversity data can illustrate where issues of underrepresentation might be more prevalent.
14. Although gender balance in applicants to the majority of our UK funding schemes is approximately equal, there is a consistently higher number of male applicants to our Starter Grants for Clinical Lecturers scheme, apart from in one round.¹² In a review commissioned by members of the Clinical Academic Training Forum (CATF), for which the Academy holds the secretariat, researchers found that clinical academics face ongoing systemic issues which can act as barriers to career progression; these barriers disproportionately affect people with underrepresented protected characteristics, particularly those who identify as women.¹³ Clinical academics with underrepresented protected characteristics reported discrimination, imposter syndrome and an unpredictable career trajectory as reasons for not choosing or pursuing a clinical academic career. This may start to explain why fewer women apply for funding for our clinical research scheme in comparison to other non-clinical schemes. Implementation of changes following this review are explored in a later section.
15. The gender split in both clinical and non-clinical grant awards is approximately equal across the Academy's funding schemes, however, women only made up 35% of grant panel members compared to men who made up 47% (although there was no information for 18% of panel members). Across awarded grants, the percentage of BAME applicants awarded is lower than the percentage that applied, whereas for AWB applicants the award rate is higher than the percentage

⁹ <https://royalsociety.org/-/media/policy/Publications/2021/trends-ethnic-minorities-stem/Ethnicity-STEM-data-for-students-and-academic-staff-in-higher-education.pdf?la=en-GB&hash=22B252EFA4A87B0D869BE288F7EF724F>

¹⁰ <https://www.nihr.ac.uk/about-us/our-key-priorities/equality-diversity-and-inclusion/NIHR-Diversity-Data-Report-2021.pdf>

¹¹ <https://acmedsci.ac.uk/grants-and-schemes/grant-schemes>

¹² <https://acmedsci.ac.uk/file-download/12969204>

¹³ <https://www.hyms.ac.uk/assets/docs/research/inequalities-in-clinical-academic-careers-full-report.pdf>

that applied. The external organisation who performed this analysis highlighted that this indicates there may be bias at the selection stage.¹⁴ BAME panel members were only present on 8% of grant panels, and there were no Black panel members. As our grant panels are selected from the Academy's Fellowship, this underrepresentation is a consequence of a wider issue with representation within the Fellowship which we are committed to tackling (see the Bias section under the 'What we are doing' heading).

Events and programmes

16. The Academy facilitates a number of career development programmes and events for STEM researchers at every stage of the career pipeline throughout the breadth of medical science. Very few (4 out of 25) programmes and events had less than 35% female representation in 2019 and 2020, and gender split across all policy events was approximately equal. Across careers committees, competition judges, event speakers and programme participants in 2020, 10% identified as BAME however none of these individuals were Black. Although overall BAME representation at policy events was 37%, global majority¹⁵ representation was higher for attendance at international policy events (40%) compared to UK FORUM and medical science policy events (13% and 6% respectively).¹⁶ We are conscious of the need to increase our engagement with scientists from underrepresented backgrounds.

Implications

17. Lack of diversity within the STEM workforce has had, and continues to have, detrimental consequences for the sector and the society it serves. Diverse research teams contain varied perspectives, backgrounds and experiences and are more likely to ask different questions and develop innovative solutions;^{17,18} in turn, these teams are better at problem solving.¹⁹ Underrepresentation of any group in STEM roles limits diversity of thought which has implications on idea generation and the applicability of research to society's needs, as witnessed throughout the pandemic.

Research outputs

18. The emergence of COVID-19 has impacted biomedical researchers, widening the existing disparities and exacerbating the inequalities in research careers.²⁰ The COVID-19 pandemic has also highlighted health inequalities, for example, when products or services designed to be universally beneficial have been shown to be less effective for certain groups. For example, following the widespread use of pulse oximetry during the COVID-19 pandemic, researchers identified a racial bias which prevented the technology detecting occult hypoxemia at three times the rate in Black patients than White patients.²¹ Additionally, pregnant women have been excluded from 80% of COVID-19 treatment trials and all COVID-19

¹⁴ <https://acmedsci.ac.uk/file-download/12969204>

¹⁵ Although the Diversity Report continues to use the term BAME in reference to international attendees, we have assumed that the individuals in this group would not identify as a minority in their country of origin.

¹⁶ <https://acmedsci.ac.uk/file-download/12969204>

¹⁷ <https://www.tandfonline.com/doi/abs/10.5172/impp.2013.15.2.149>

¹⁸ <https://www.tandfonline.com/doi/abs/10.1111/ecge.12016>

¹⁹ <https://www.pnas.org/content/101/46/16385>

²⁰ <https://acmedsci.ac.uk/file-download/74955141>

²¹ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7808260/>

vaccine trials (the justification for which was unclear).^{22,23} This meant that pregnant women were initially unable to access the vaccine, despite being at a higher risk for severe COVID-19, and may have contributed to persisting vaccine hesitancy reported among young women.²⁴ To help avoid oversights and exclusions such as these, the STEM workforce needs to represent the society they are designing the services for; diversity of thought within research teams builds a more complete understanding of the research purpose and society's needs.

19. Through our patient and carer involvement work, the Academy has heard from people impacted by research about the detrimental effect of a lack of diversity in research teams. They suggested that more diverse research teams, in terms of gender, ethnicity and disability, would improve the generation of research questions and hypotheses by making them more relevant to the people they are working to benefit.²⁵

Research workforce

20. The UK's medical research landscape requires talented and diverse future leaders in clinical research to maintain and build on the excellent foundation that already exists. The UK government aims to cement the UK as a global science superpower with a target to spend 2.4% of GDP on R&D by 2027; to achieve this target, the UK R&D sector will need to grow by 150,000 people by 2030.²⁶ To meet this, barriers to recruitment, attainment and retention in STEM careers need to be removed and the STEM workforce needs to become more diverse and inclusive. The following section describes ways in which the medical research sector is working to achieve this.

What we are doing

EDI strategy

21. The Academy is committed to improving representation of people with underrepresented protected characteristics in our Fellowship, grants and programmes and we continue to reflect on and adopt new approaches to doing so. Critically, in light of the data described in previous sections and ongoing commitments to improve diversity in our work, the Academy is developing an EDI strategy. Led by our EDI Manager with the input and guidance of our EDI Forum and Council Diversity Champion, the business plan and ensuing strategy will focus on reviewing all our current processes, including recruitment and retention, Fellowship and governance committees, and the workstreams of each team, and applying the principles of EDI to all of the Academy's actions. Through the development of an EDI Forum with dedicated leads for different protected

²² <https://pubmed.ncbi.nlm.nih.gov/33340453/>

²³ <https://pubmed.ncbi.nlm.nih.gov/33460584/>

²⁴ <https://committees.parliament.uk/committee/328/women-and-equalities-committee/news/153480/government-failing-bame-communities-and-young-women-on-vaccine-takeup/>

²⁵ Outcomes from this patient and carer reference group for our ongoing long-term sustainability of health research in the UK Working Group project have not yet been published. Details about the project can be found [here](#).

²⁶

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004685/r_d-people-culture-strategy.pdf

characteristics, the Academy intends to centre EDI throughout all teams and outcomes.

22. Close relationships are being built and maintained with EDI professionals across the National Academies, learned societies and other STEM organisations to share and ensure best practice and cohesively start the cultural change that is needed. This will include expanding the use of our data to cover all 9 of the protected characteristics and engaging biomedical and health researchers from underrepresented communities to provide qualitative insight to our quantitative data. The Academy is also actively working to improve representation within our Fellowship.
23. Our organisation is committed to working towards full equity in our practices. As part of this commitment, the Academy is a member of the Equality, Diversity and Inclusion in Science and Health (EDIS) network which aims to build a coordinated movement to improve the diversity and inclusivity of UK Science and Health,²⁷ the Proud Science Alliance (PSA) which represents the rights and needs of LGBTQ+ STEM researchers,²⁸ and the Employer's Network for Equality and Inclusion (enei) for the development of our staff and Leadership team.²⁹

Events and programmes

24. The Academy's SUSTAIN programme³⁰ is designed to enable female researchers to thrive in their independent research careers through professional development training, mentoring and peer-to-peer coaching and support. A recent independent evaluation reported that the SUSTAIN programme has been a success by supporting participants to develop increased self-confidence, enhanced focus on strategic approaches to career decisions and resilience in the face of difficult situations.³¹ The Academy encourages adoption and modification of the programme at other institutions and we have seen successful programmes initiated at the universities of Birmingham and Edinburgh.
25. Motivated by the lack of women experts in the media, the Academy has developed a unique and award-winning media training programme for female scientists, providing access to long-term support and media opportunities.³² We have facilitated 134 women to be listed on the Science Media Centres expert database and, since its inception, widespread efforts across the sector have improved the ratio of women to men experts in the media from 4:1 to 2.2:1. However, during mass coverage of the COVID-19 pandemic in March 2020 this figure rose back to 2.7:1,³³ indicating that ongoing work is needed to rebalance gender representation of experts in the media.
26. We aim to give autonomy to people and communities already working with people and scholars of colour to prioritise work on their terms.³⁴ We have worked with Black British Professionals in STEM (BBSTEM) and the Black Women in Science

²⁷ <https://edisgroup.org/strategy/>

²⁸ <https://www.proudsciencealliance.org/>

²⁹ <https://www.enei.org.uk/>

³⁰ <https://acmedsci.ac.uk/grants-and-schemes/mentoring-and-other-schemes/sustain>

³¹ This data is not yet available but will be published in due course.

³² https://acmedsci.ac.uk/grants-and-schemes/mentoring-and-other-schemes/sustain/media_women

³³ <https://expertwomenproject.com/>

³⁴ <https://acmedsci.ac.uk/more/news/race-and-the-academy-the-president-reflects>

Network to curate and support workshops on leadership, mental health and imposter syndrome for Black researchers, along with reviewing our existing careers programmes to ensure they support fair access.

27. Across the sector, mentoring is encouraged to increase confidence and attainment within the STEM workforce. The Academy have been offering one-to-one, developmental mentoring to postdoctoral researchers in biomedicine and health for over 15 years.³⁵ As a part of this programme, Springboard and Starter Grants applicants are offered mentoring from our Fellows and senior researchers, regardless of their application outcome. Our aim is that offering mentoring to unsuccessful grant applicants will have a positive impact on funding outcomes for researchers at a critical career stage, particularly for those who may have been less supported in the career pipeline up to this point.

Data collection

28. The Academy and organisations across the sector must improve data collection, analysis and transparent publication in accessible ways. As referenced above, the Academy publishes an annual diversity report which presents data on diversity spanning across all of its activities; the last four being published openly including full data sets. Whilst this is a positive example of evidenced inclusive behaviours, the Academy recognises the need for better data collection in order to drive future improvements in diversity and inclusion as mentioned above.

Bias

29. To begin to address the issue of underrepresentation in our Fellowship, all election committee members are provided with an unconscious bias briefing which flags a preference for the familiar and implicit favouring of those who are like us and those who belong to a more socially dominant group.³⁶ In 2021, we amended the Fellowship nomination guidelines; Fellows are still permitted to nominate up to four new candidates per year, however only two of them can be from the nominator's institution. An additional candidate can be put forward from the nominator's institution if the nominee is from an underrepresented area of the Fellowship.
30. Additionally, it is clear that we need to look at what we consider 'excellent' and be clearer about how we define it.³⁷ We must appreciate more fully that some people are offered fewer opportunities and experience more barriers to research's common markers of esteem. We must find ways to recognise and support great medical and health research, wherever and however it is done.
31. We are also taking steps to minimise unconscious bias in our funding panels to help ensure decisions are made fairly and that all voices are heard in the process. All our panel members are asked to watch short videos on unconscious bias and making group decisions prior to panel meetings and funding recommendations. We know that a further sustained programme of learning and unlearning is required for our Fellows, staff, researchers and collaborators. We aim to improve our training offer, learning from others across the sector and supporting each

³⁵ <https://acmedsci.ac.uk/grants-and-schemes/mentoring-and-other-schemes/mentoring-programme>

³⁶ <https://acmedsci.ac.uk/file-download/77596321>

³⁷ <https://acmedsci.ac.uk/file-download/39545239>

other on our journey. All processes to mitigate for bias are under review for improvement.

Best practice across the sector

32. Many organisations have 'action plans', reports or statements in place to address barriers to participation for minority groups. Those of note include the Royal Academy of Engineering's commitment to elect half of all fellows from underrepresented groups by 2026,³⁸ and the Trans Inclusion Policy introduced by the Wellcome Trust.³⁹
33. To help address disparities in academic and career attainment for underrepresented individuals in STEM, the Royal Society is taking action to increase the gender and ethnic diversity of applicants to its UK early career fellowship schemes through providing mentorship to potential applicants from ethnic minority groups and socially disadvantaged backgrounds.⁴⁰
34. Some organisations across the sector, including the Academy, are now taking steps to follow the efforts of UKRI and introduce 'harmonised diversity data', where data collected on sex, age, ethnicity and disability is shown against the value, rate, and proportion of successful applications across all levels.⁴¹ Others such as the Wellcome Trust also publish an annual ethnicity pay gap report alongside a compulsory gender pay gap report.⁴²
35. Following the publication of its Diversity Data Report, NIHR calls for fellowship applications are now accompanied by targeted communications to applicants from underrepresented groups through relevant networks. Additionally, building on a previous requirement that if nominating more than one applicant at least one must be female, an institution can nominate up to three individuals to the NIHR's Research Professorships programme if at least one applicant is from an ethnic minority background.

What more can be done

36. Although action is being taken, further efforts are needed across the sector to meaningfully counter the underrepresentation of certain groups that is currently prevalent.

Clinical Academia

37. CATF brings together key stakeholders to provide strategic direction on clinical academic training in the UK. In response to stark evidence about differential attainment in clinical academic careers for people with underrepresented protected characteristics and caregivers, such as that described in the sections above,⁴³ CATF members have committed to implement actions to tackle inequalities in clinical academic careers⁴⁴. Agreed actions include better

³⁸ <https://www.raeng.org.uk/news/news-releases/2020/july/academy-sets-target-to-elect-half-of-all-new-fello>

³⁹ <https://wellcome.org/news/our-trans-inclusion-policy-latest-step-making-wellcome-more-inclusive>

⁴⁰ <https://royalsociety.org/topics-policy/publications/2021/trends-ethnic-minorities-stem/>

⁴¹ <https://www.ukri.org/our-work/supporting-healthy-research-and-innovation-culture/equality-diversity-and-inclusion/diversity-data/>

⁴² <https://wellcome.org/news/wellcomes-pay-gap-data-2019>

⁴³ <https://www.hyms.ac.uk/assets/docs/research/inequalities-in-clinical-academic-careers-full-report.pdf>

⁴⁴ The actions are not yet available but will be published in due course.

signposting to existing policies on employment protection for people with caring responsibilities, and an exploration of funder leverage to influence institute behaviour and cultural change. The group will advocate for improved long-term career opportunities for clinical academics by contributing evidence to and supporting existing calls for protected research time,^{45,46,47} and assessing the current funding and employment landscape. CATF members will share annual updates on their individual or organisational progress on the agreed actions, and the efficacy of the interventions will be continually reviewed.

38. Following publication of these actions in 2022, CATF and the Academy recommend that funders and other relevant organisations consider how they can implement them.

Research culture

39. The Government's R&D People and Culture Strategy recognises the importance of a good research culture for improving diversity in STEM, which the Academy supports through ongoing policy and career support workstreams. The Research Excellence Framework (REF)⁴⁸ has driven several positive developments within academia, including the rewarding of excellence, recognition of societal impact, and greater acknowledgement of diversity within the modern workforce. The Academy is supportive of proposals to break the link between researchers and outputs and hopes that the Future Research Assessment Programme,⁴⁹ a consultation into how new assessment methods for research performance in the UK could be implemented, will prioritise rewarding and incentivising responsible research practices; interdisciplinary research and collaboration with partners outside of universities, including the NHS.⁵⁰

Principles of EDI

40. There are no EDI principles dictated by law and it is therefore the responsibility of each individual institution to ensure that EDI is upheld for the benefit of underrepresented STEM professionals, the wider STEM sector and the society it serves. Through the Academy's EDI strategy we intend to build holistic EDI principles for use internally and when working in partnership with organisations across the sector. We must be progressive rather than reactive to avoid exacerbating underrepresentation of groups for which data collection is currently poor. It is important that we view the 9 characteristics protected in the Equality Act 2010 as a whole and implement processes to remove barriers and improve engagement for everyone, tailoring these approaches to certain groups where necessary.

(January 2022)

⁴⁵ <https://acmedsci.ac.uk/file-download/23932583>

⁴⁶ https://www.cancerresearchuk.org/sites/default/files/creating_time_for_research_february_2021_-_full_report-v2.pdf

⁴⁷ <https://www.rcplondon.ac.uk/projects/outputs/research-all-analysis-clinical-participation-research>

⁴⁸ <https://www.ref.ac.uk/>

⁴⁹ <https://www.ukri.org/news/launch-of-the-future-research-assessment-programme/>

⁵⁰ <https://acmedsci.ac.uk/file-download/85486062>