APPG on Diversity and Inclusion in STEM

The State of the Sector: Diversity and representation in STEM industries in the UK

Data Analysis Brief

Inquiry into the STEM Workforce

Secretariat:

BRITISH SCIENCE ASSOCIATION

NOVEMBER 2020

About the APPG

The All-Party Parliamentary Group (APPG) on Diversity and Inclusion in Science, Technology, Engineering and Maths (STEM) was established in 2018 and aims to promote the inclusion and progression of people from underrepresented backgrounds in STEM, and to encourage government, parliamentarians, academics, businesses and other stakeholders to work towards a STEM sector that is representative of the UK population. We also want to consider and influence changes in policy that will lead to this outcome.

The British Science Association acts as Secretariat to the Group. The Group is made up of Members of Parliament and Lords and is a focus for collaboration with businesses and other organisations in the STEM sector. The Officers of the APPG are:

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The State of the Sector: Diversity and representation in STEM industries in the UK

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The views expressed in this data analysis brief are those of the All-Party Parliamentary Group on Diversity and Inclusion in STEM. The briefing note does not necessarily represent the views of any of the sponsors, witnesses, contributors and reviewers, unless stated.

This brief was compiled by the British Science Association who provide the Secretariat to the APPG. The information in this brief, including reference to policies and Government status on issues, is correct at the time of writing (November 2020).

The Secretariat would like to thank George Bangham, Daniel Tomlinson, Abigail Hilditch, Jon Fitzmaurice, Jason Arday, Sarah Bond, Cary Funk, Martin Hollins, Sandra Kerr, Ian Moore and Peter Trevitt for their contribution towards producing this brief.

Introduction

This data analysis brief presents an overview of people working in the STEM workforce in 2019 to inform the APPG's inquiry into Equity in the STEM workforce in the UK. It does not comment on the future of the workforce, or on issues related to inclusion and retention for those with protected characteristics within the workforce. The data was collected before the COVID-19 pandemic, but it is very likely that the pandemic will significantly impact the STEM sector as the global economy shrinks this year (World Bank, 2020).

This data analysis brief seeks to address the diversity and representation of the workforce, before the inquiry looks at the realities of 'inclusion' (CIPD, 2020). It does not seek to solve the issues of representation but rather, highlight the current situation and the quantitative evidence available before inviting further insight from a call to evidence to individuals and organisations in and beyond STEM. The research aims to take an intersectional view (Crenshaw, 1989) of the data, moving away from the narrower focus of just gender or ethnicity, to understand the complex narrative of representation within the STEM workforce.

Limitations of this data analysis brief

Several limitations of this document must be acknowledged. To measure representation in the STEM workforce and to achieve an intersectional view, four of the nine Equality Act Protected Characteristics - age, disability status, ethnicity and gender – are used. Other characteristics (for example, sexual orientation) are excluded due to a lack of available data within the UK labour market overview provided by the Office for National Statistics. The lack of detail of the 'disability status' data, and the incomplete picture it provides should also be noted, as well as the data only allowing for binary definitions of gender, and a limited representation of ethnicities. The APPG aims to use the call for evidence to generate qualitative information in these areas and the final inquiry report will highlight any limitations with the UK's labour data collection.

About the inquiry on Equity in the STEM Workforce

In 2020, the COVID-19 pandemic and the Black Lives Matter movement has shone a light on the lack of equal opportunities facing people and communities across the UK (e.g. Black, Asian and minority ethnic groups, disabled people and those with low socio-economic status). STEM careers will experience some of the highest levels of growth of any industry (EDF, 2016) yet skills gaps remain and diversity is sorely lacking. Women make up less than a quarter of the core STEM workforce in the UK (WISE, 2019), Black and minority ethnic men are 28% less likely to work in STEM than White men (CaSE, 2014), 29% of LGBTQ+ people surveyed would not consider a career in STEM due to fear of discrimination (IET, 2018), and disabled people represent only 5% of the engineering workforce (CaSE, 2018).

In 2017, the Industrial Strategy recognised the value of STEM to the UK economy, and it is more important than ever that the UK engages meaningfully in activities and interventions that will help to create an inclusive STEM sector. As research, development and innovation becomes increasingly integral to the UK's future prosperity outside of the European Union and against the backdrop of a global recession, a diverse STEM workforce is likely to give the UK an economic and social advantage.

Following on from the APPG on Diversity and Inclusion in STEM's 2020 inquiry into Equity in STEM Education that focused on the education pipeline, this inquiry will focus on how the Government and organisations employing STEM workers are helping to create a diverse and inclusive environment. This inquiry will build on the problems in education identified in the preceding report, it acknowledges that inequities in the talent pipeline influence the diversity of the workforce but aims to examine the other factors at play in the reality of the working world. It will bring together evidence on the UK's STEM workforce and provide recommendations to ensure it is more equitable, inclusive and enables individuals and communities that are currently underrepresented within STEM to flourish and progress. The inquiry will also investigate the current availability of data on diversity and inclusion within and the STEM workforce, identifying areas for improvement in reporting.

Executive Summary

This 'State of the Sector' brief provides an overview of the diversity of the STEM (including health) workforce as it stood in 2019. The findings presented here aim to provide the analytical underpinning to lead the way in encouraging changes within the sector where they are needed most.

In the UK's labour force at the end of 2019, 5.9 million (18%) out of a workforce of 32.8 million worked in STEM occupations. However, the STEM workforce has a lower share of female workers (27% vs. 52%) and disabled people (11% vs. 14%) than the rest of the workforce. The share of ethnic minority workers in STEM is on a par with the rest of the economy, as a result of a workers with Indian ethnicity being more likely to work in STEM than elsewhere. People of other ethnic minorities tend to be under-represented in STEM.

The challenge of diversity looks different in the various disciplines within STEM. This briefing follows the definition of the STEM workforce devised for a 2014 Gatsby Charitable Foundation report (and updated in 2019), which also allows us to split it in to four disciplines in order to contrast their particular characteristics.[1] For engineering the greatest challenges are gender – just 9% of those working in the discipline are female – and ethnicity, given that the field is 93% White. In the health discipline, many groups less well represented in STEM are better represented: for example, 19% of health workers are from ethnic minorities. Technology has a higher share of ethnic minority workers than the working-age population (16% vs. 14%) but four-in-five tech workers are male. Like other STEM disciplines, science and maths underperforms on representation of disabled people: 10% of workers in this field are disabled compared to 14% in the rest of the workforce.

This data analysis brief takes an intersectional approach to look across multiple dimensions of diversity to identify those particularly under-represented in STEM. Four key insights are:

- Disabled people of all ethnicities are underrepresented in the STEM workforce. The gap in representation between STEM workers and others, is larger for disabled women than disabled men. While a majority of non-STEM disabled workers are female (59%), only one-third (33%) of STEM disabled workers are female.
- 65% of the STEM workforce are White men.
- Proportionally, White women are less likely to be STEM workers than ethnic minority women: 10% of White female workers are in STEM, compared to 13% of ethnic minority female workers.
- There is little difference in the gender balance of the STEM workforce when the youngest age group (16-29), within which 29% of STEM workers are female, is compared to those aged 30-49 in STEM, a group which is 28% female.

[1] This report uses the wider of the two Gatsby Foundation definitions of STEM, technically called STEM(H), which includes health. See glossary for details. It aggregates together Science and Maths, two of the five disciplines defined in the original Gatsby Foundation work, to ensure sufficient sample size for its analysis, giving four final disciplines for the purpose of this work.

This data analysis brief also shows that the STEM workforce is not particularly geographically concentrated, although it does comprise a slightly larger proportion of the workforce in London, the South East and the East of England than in other regions. The regional representation of ethnic minority workers in STEM broadly mirrors the differences in the population across the country. For example, ethnic minorities comprise 31% of the STEM workforce in London (compared to 34% of the workforce as a whole), compared to shares of below 5% in the North East, South West, Wales, Scotland and Northern Ireland (a slight over-representation compared to the whole workforce).

The underrepresentation of women in the STEM workforce extends across all seniority levels and is particularly pronounced in mid-level jobs of low supervisory requirements and small employers. In contrast, ethnic minority workers make up a larger share of higher managerial roles (17%) than they do non-managerial roles – this reflects the fact that within STEM, ethnic minority workers are more likely to be found in disciplines with a high rate of managerial employment, disciplines outside engineering.

Defining and categorising the STEM workforce

To define the STEM workforce, this briefing follows a methodology developed by the Gatsby Charitable Foundation in a report published in 2014 and updated in 2019. Using detailed data about millions of workers, it pinpoints STEM workers using a combination of their occupation, classified by the Standard Occupational Classification 2010 (SOC-10), and their level of education. This analysis uses the wider of the two Gatsby Foundation definitions of the STEM workforce, 'STEM(H)', which includes all workers in the original STEM fields plus those working in health and related fields. This definition also includes STEM educators of all levels.

The data in this analysis compares numbers from the STEM workforce to the 'rest of the workforce', rather than the 'total workforce', as might be expected. This is because the STEM workforce makes up almost one fifth of the UK workforce, so its inclusion in a total figure would impact comparisons. Rather than standard 10-year age bands the analysis uses three main groups (16-29, 30-49 and 50+) this is to avoid sample size issues within the available data. It should be noted as well that Wald tests for equality of means have been run on all data, to ensure confidence in the figures.

In 2019, within the UK, a total of 32.8 million people were in work, either in employment or self-employment. Of this workforce, 5.9 million worked in occupations that involve science (including health), technology, engineering and mathematics (STEM). Figure 1 shows the different disciplines of the STEM workforce as a proportion of the total workforce, showing that almost one in five workers (18%) worked in STEM. Throughout this report the science and mathematics disciplines are considered together, due to data limitations resulting from their relatively small size.

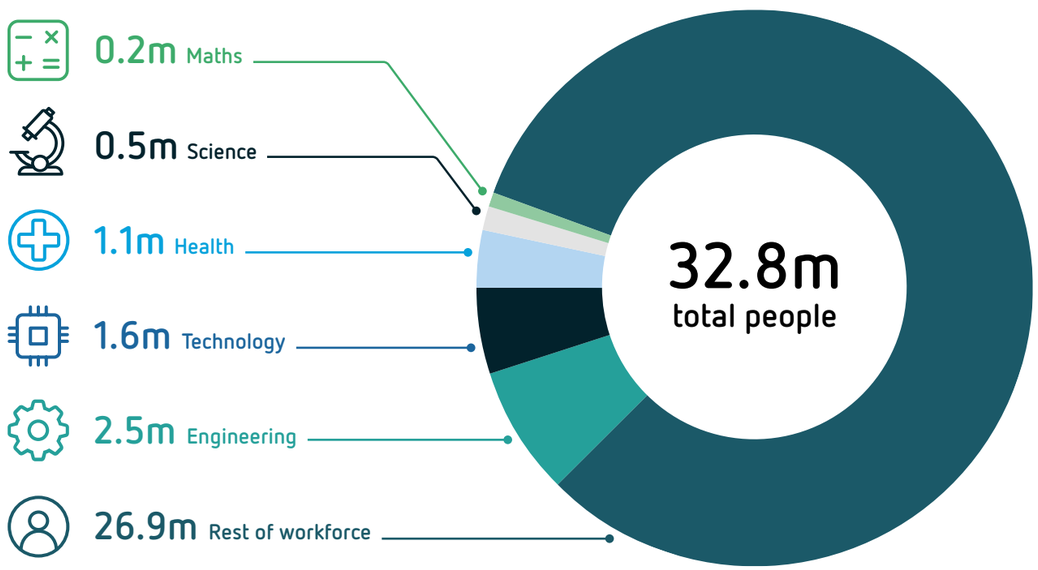


Figure 1: *The composition of people in the STEM workforce within the wider UK labour force, UK, 2019*

Source: Analysis of ONS, Labour Force Survey

Diversity in STEM and its disciplines

This section examines the characteristics of the STEM workforce, and of the engineering, health, technology, and science and mathematics disciplines. The focus is on four protected characteristics – age, disability status, ethnicity and gender – looking at how representative the STEM workforce is along these lines and how this compares to the wider workforce. For more detail on the definitions of these groupings, see the report Glossary.

The STEM workforce is less diverse than the wider workforce

The story of underrepresentation of women in the STEM workforce is well known. But this does not make it any less stark: as Figure 2 shows, only 27% of the STEM workforce is female, compared to 52% of the wider workforce.

Gender is not the only characteristic by which the STEM workforce lacks diversity. Compared to the rest of the workforce, STEM workers are less likely to have a disability (under the Equality Act definition, which does not include some milder or intermittent conditions). They are less likely to be aged 50 or older, with one-third of non-STEM workers aged 50 plus, compared to 28% of STEM workers.

Around 12% of the STEM workforce are from ethnic minorities, a similar proportion to that in the rest of the workforce. But it is important not just to group all ethnic minorities together: while people of Indian ethnicity are over-represented, people from other ethnic minorities are underrepresented in the STEM workforce.

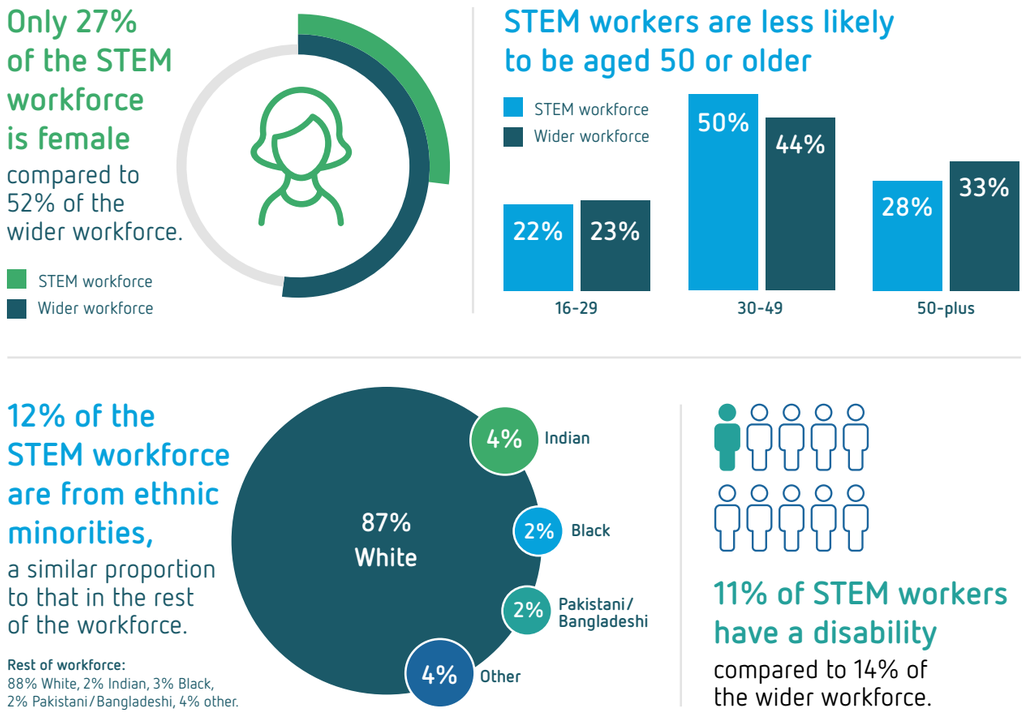


Figure 2: *The composition of the STEM workforce in terms of age, disability status, ethnicity and gender UK, 2019*

Note: In this and subsequent figures, due to rounding not all labelled data points sum to 100 per cent.

Source: Analysis of ONS, Labour Force Survey

The engineering workforce is predominantly comprised of White males

Engineering is the largest of the four disciplines that the STEM workforce can be divided in to. The stand-out findings here are in relation to ethnic and gender diversity.

The engineering STEM workforce is more likely to be White than the rest of the workforce. Ethnic minorities comprise 14% of the working-age population and 12% of the employed population, not dissimilar from the 12.5% in the STEM workforce. In the engineering discipline alone, however, only 7% of workers are from ethnic minorities. In other words, to be representative of the working population, the proportion of ethnic minority workers in engineering would need to be almost twice as high.

The gender composition of engineering is skewed, as shown in Figure 3. Over nine-in-ten workers in engineering are male, vastly more than in the non-STEM workforce where a majority of workers are in fact, female.

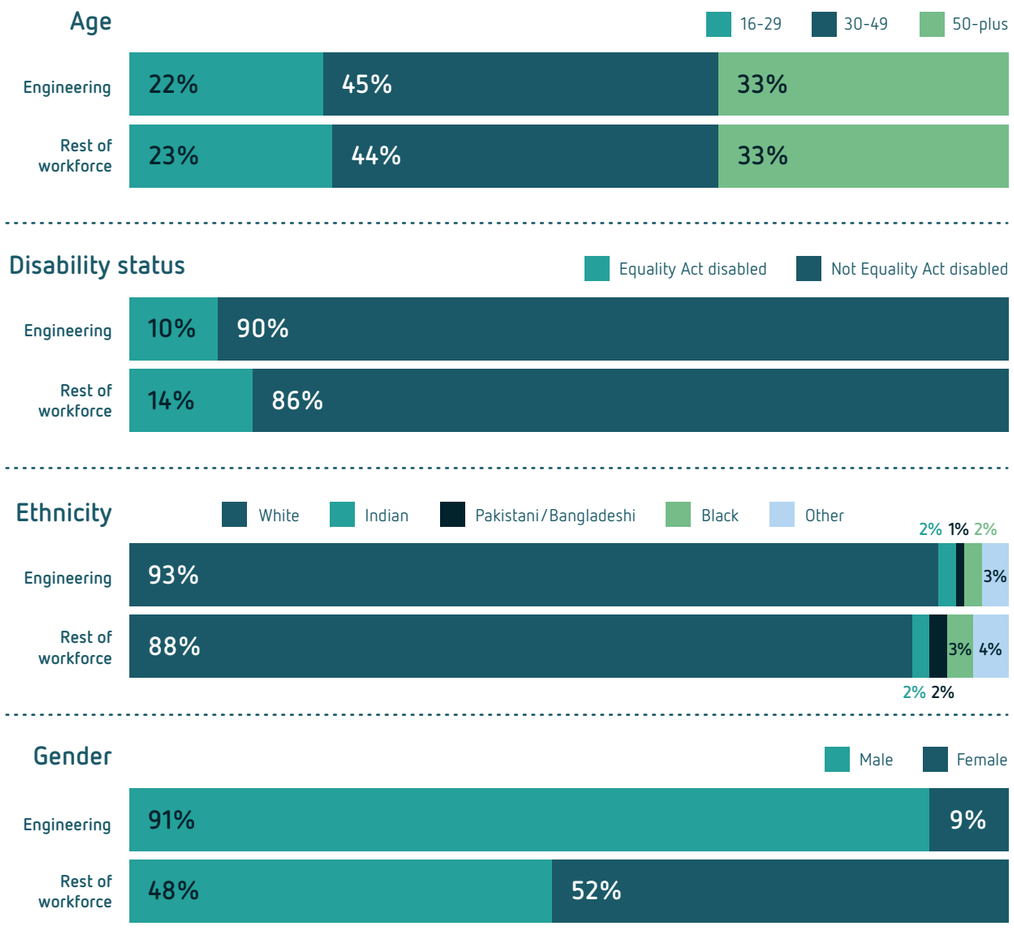


Figure 3: *The composition of the engineering STEM workforce in terms of age, disability status, ethnicity and gender, UK, 2019*

Source: Analysis of ONS, Labour Force Survey

Women and ethnic minority employees are over-represented in the health workforce

The part of the STEM workforce that works in health (see Figure 4) has the highest share of disabled employees, and female and ethnic minority employees are over-represented. This statistic largely explained by the fact that the discipline includes a few specific occupations that employ a lot of women, disabled people and people from ethnic minorities. For example, there are 280,000 'medical practitioners' (around a quarter of the STEM health workforce) and one-third of these are from ethnic minority backgrounds. The greatest over-representation of people from ethnic minorities in health is among people of Indian ethnicity and those of Pakistani and Bangladeshi ethnicity. Examples of female dominated health occupations include 'animal care services' whose 73,000 female workers make up 87% of the occupation's workforce) and 'dental practitioners', whose 54,000 female workers make up almost three-quarters of the occupation's workforce (for more information of detailed occupational groupings see the Annex).

In terms of age, however, older workers are underrepresented: workers in this field are less likely to be aged 50 or over than those in other disciplines.

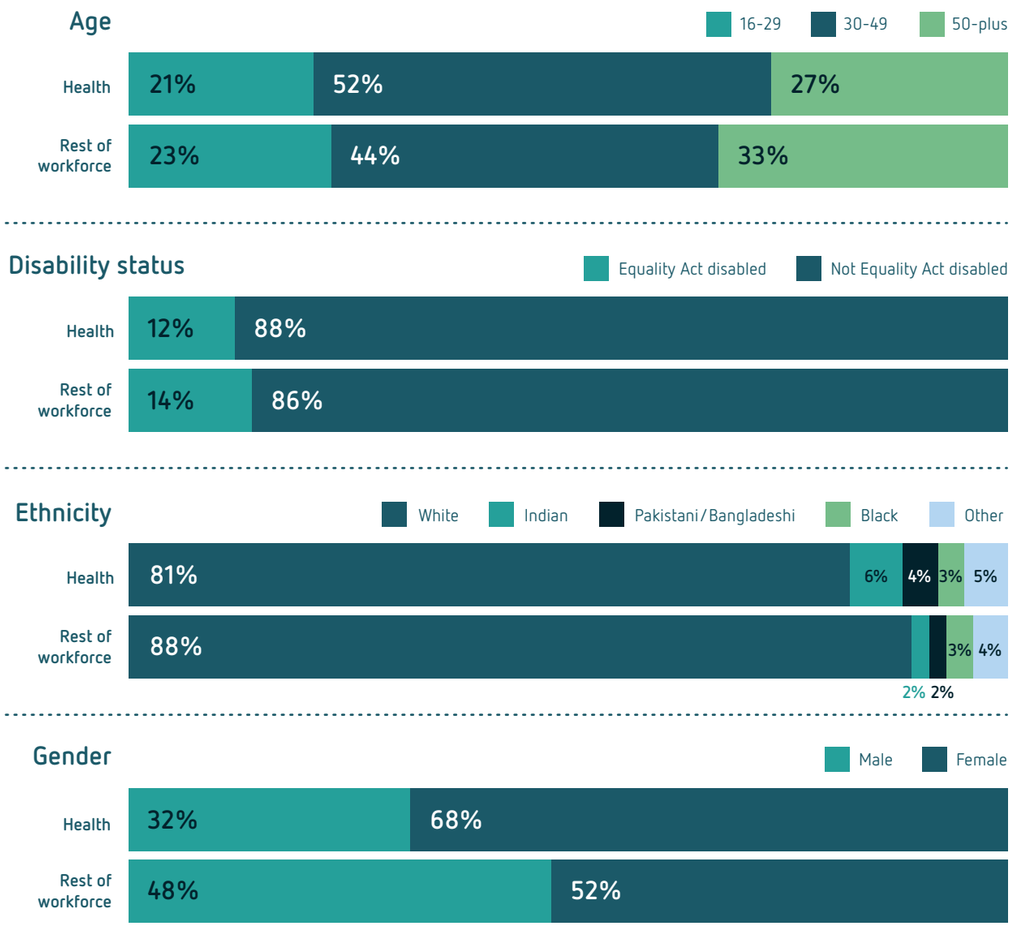


Figure 4: *The composition of the health STEM workforce in terms of disability status, gender, age and ethnicity, UK, 2019*

Source: Analysis of ONS, Labour Force Survey

The science and maths workforce is more gender-balanced than other sectors but has a larger underrepresentation of disabled people than other STEM sectors

The science and maths workforce are the smallest component of the wider STEM workforce, with just 710,000 workers in 2019. It has a broadly representative proportion of people from ethnic minorities, overall, and it is significantly more gender balanced than both engineering and technology (see Figure 5). This overall figure for ethnic minorities masks imbalances for particular ethnicities, though the share of people of Indian and 'other' ethnicities is significantly higher than that in the non-STEM workforce, whereas the share of people of Bangladeshi and Pakistani and Black ethnicities is significantly lower.

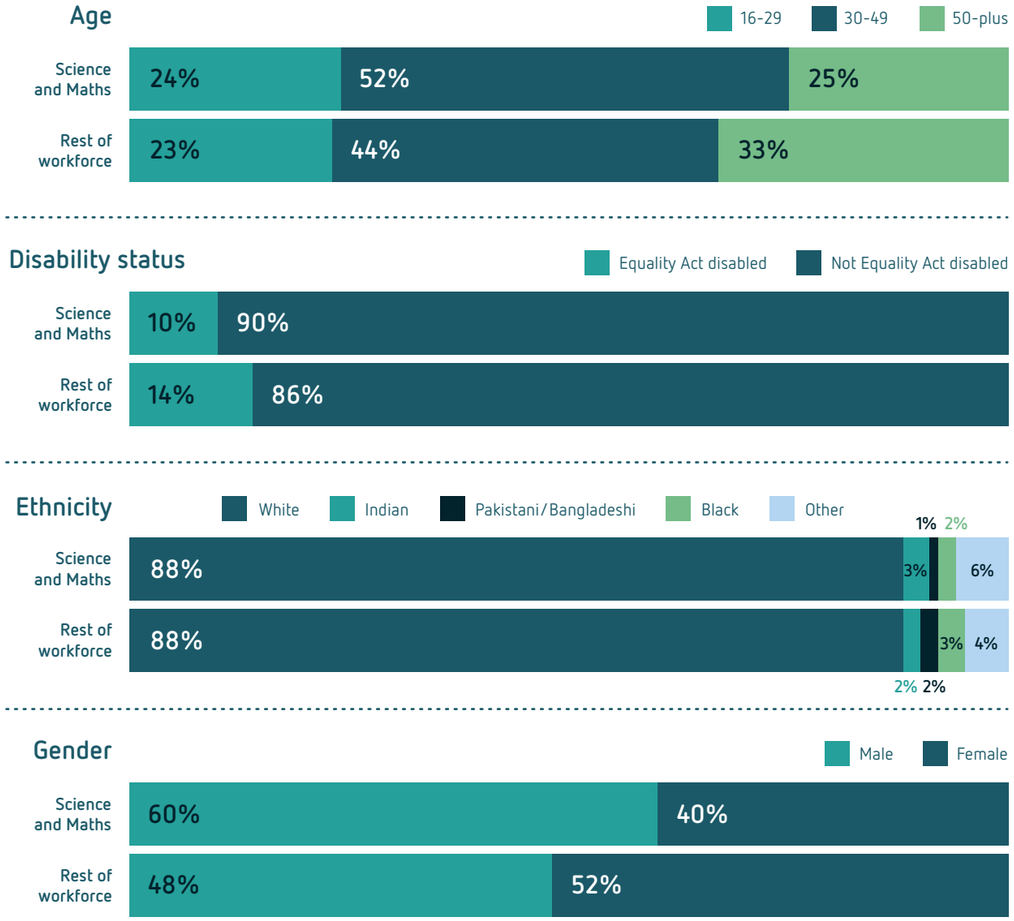


Figure 5: *The composition of the science and maths STEM workforce in terms of age, disability status, ethnicity and gender, UK, 2019*

Source: Analysis of ONS, Labour Force Survey

Science and maths is however one of the worst performers in terms of employment of disabled people, with just 10% of the discipline's workers recording that they have a disability, compared to 14% of those in work and 19% of the whole working-age population. Lack of diversity on this metric is a problem across the whole STEM workforce, but it is in science and maths (along with engineering) that the difference between the employment mix within the discipline and the rest of the workforce is most stark.

The technology workforce is predominantly male and middle-aged, but has more ethnic diversity than other parts of the STEM workforce

Just one-in-five workers in the technology workforce are female, and disabled workers are also underrepresented in this part of the STEM workforce. But, as Figure 6 shows, people from ethnic minorities make up a larger share of the technology workforce than in the rest of the labour market (16% compared to 12%). This is driven by an over-representation (relative to the rest of the workforce) of Indian workers in this part of STEM: 7% of workers in technology are of Indian ethnicity, compared to 2% in the rest of the workforce.

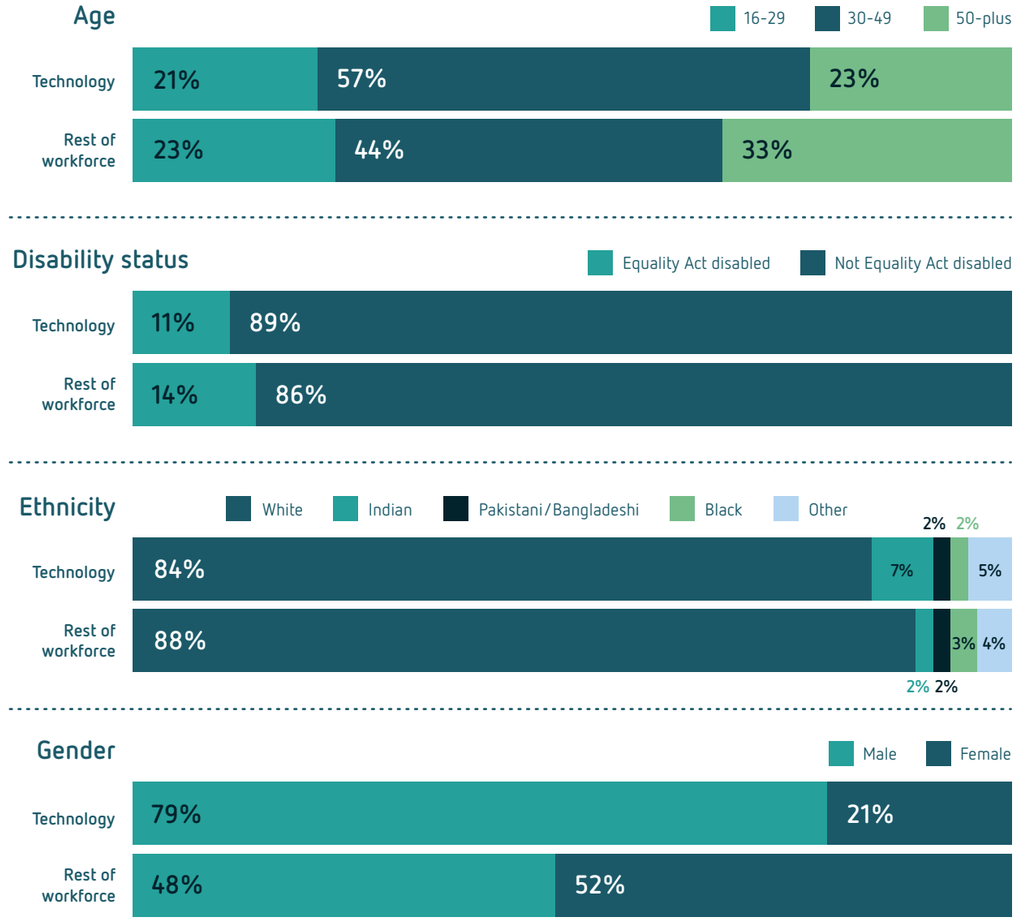


Figure 6: *The composition of the technology STEM workforce in terms of age, disability status, ethnicity and gender, UK, 2019*

Source: Analysis of ONS, Labour Force Survey

The technology workforce also stands out for its relatively 'middle working-aged' workforce, with 57% of technology workers aged in their 30s and 40s compared to 44% of those in the rest of the workforce. In other words, technology workers are 30% more likely to be aged 30-49 than the mix of ages in the wider economy would imply.

Diversity across multiple characteristics in STEM

Diversity and representation in the workforce do not only matter in terms of single characteristics: combinations of characteristics must be considered too. It is important not only to strive towards gender balance, for example, but also for a workforce to include people of each gender from a representative diversity of ethnicities. This section therefore looks at the overlaps between different pairs of protected characteristics within the STEM workforce.

Disabled workers of all ethnicities are less likely to be STEM workers

We begin by looking at the intersection of ethnicity and disability. Sample size limitations in the latest data mean that it is not able to draw robust conclusions as to the interaction of individual ethnicity groups (e.g. Bangladeshi, Black etc.), so this analysis focusses on comparing people of White ethnicity with people from all ethnic minority groups together.

This first intersectional comparison finds that there is relatively little difference in likelihood of disabled people from an ethnic minority to be working in STEM (1%), compared to the rest of the workforce (1%). The same is true of those who are disabled and White (10% in STEM, 13% in the rest of the workforce). As outlined in the previous section, the underrepresentation of disabled workers in STEM is common across all disciplines and (details in Figure 7 below) that this is also the case when viewed by ethnicity.

Figure 7: *Composition of STEM workforce by disabled status (in line with the Equality Act definition) and ethnicity, UK, 2019*

Source: Analysis of ONS, Labour Force Survey

Disabled people working in STEM are likely to be male, whereas a majority of non-STEM disabled workers are female

Combining gender and disability together, the over-representation of males in the STEM workforce is mirrored among the part of the workforce who are disabled. 14% of the non-STEM workforce are disabled (the combination of the lower green and black bars in Figure 8 below), and the majority (59%) of this group is female. Yet only one-third of the STEM workforce who are disabled is female. This 'double underrepresentation' means that just 4% of the STEM workforce is female and disabled, compared to 8% of the rest of the workforce.

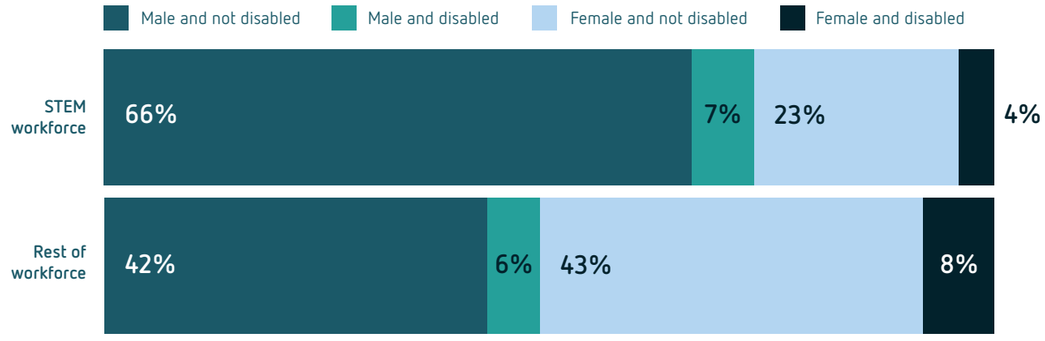


Figure 8: *Composition of STEM workforce by disabled status (in line with the Equality Act definition) and gender, UK, 2019*

Source: Analysis of ONS, Labour Force Survey

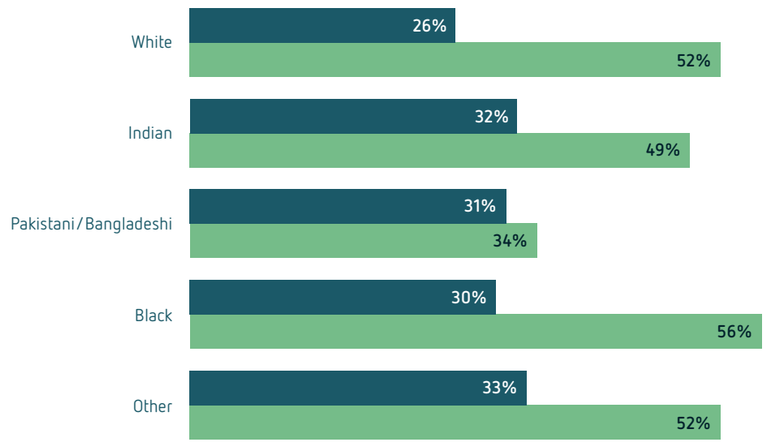
White women are less likely to be STEM workers than ethnic minority women

Across all ethnicities, women are underrepresented in the STEM workforce (27%) and White men dominate the employment mix (65%). Figure 9 shows that 23% of the STEM workforce are White women (equivalent to 10% of the entire White female workforce) and ethnic minority women make up 4% of the STEM workforce (equivalent to 13% of the entire ethnic minority female workforce). Therefore, proportionally, ethnic minority women are more likely to work in STEM than White women. This picture is the same if the health discipline is excluded from the analysis.

Alongside the over-representation of White men in the STEM workforce, ethnic minority men account for 9% of the STEM workforce, compared to 6% of the non-STEM workforce.

Figure 9: *Composition of STEM workforce by ethnicity and gender, UK, 2019* Source: Analysis of ONS, Labour Force Survey

Figure 9 shows that while the STEM workforce is male-dominated in all ethnic groups, this is to a lesser extent among ethnic minority groups than among White workers. Among White STEM workers, one-in-four are female, while among ethnic minority STEM workers, almost one-in-three is female. Figure 10 provides an in-depth look at the breakdown of gender by detailed ethnicity, reinforcing the finding that women of all ethnic minorities captured, were proportionally more likely to work in STEM than White women.



Note: Numbers describe the proportion of the STEM or non-STEM workforce of a particular ethnicity that is female; for example, the top bar says that 26% of White workers in the STEM workforce are female. It must also acknowledge that the data sample size for these figures are smaller than other sets due to the nature of this data.

Figure 10: *Proportion of workforce grouping that are female, by ethnicity, UK, 2019* Source: Analysis of ONS, Labour Force Survey

There is very little difference in the gender balance of the STEM workforce at younger ages

The STEM workforce is slightly more gender-balanced at younger ages, though it remains significantly more gender unequal than the rest of the workforce, as shown in Figure 11. Among over-50s, only 23% of STEM workers are female, while this figure rises to 28% among those aged 30-49 and to 29% among those aged 16-29. In younger cohorts, there is a marginally higher female representation, but not one that is commensurate with the scale of the underrepresentation of women in STEM as a whole – 52% of the non-STEM workforce are female. Proportionally higher representation in younger age groups would usually indicate of improvements in sector recruitment and accessibility, this is not demonstrably the case in the STEM workforce.

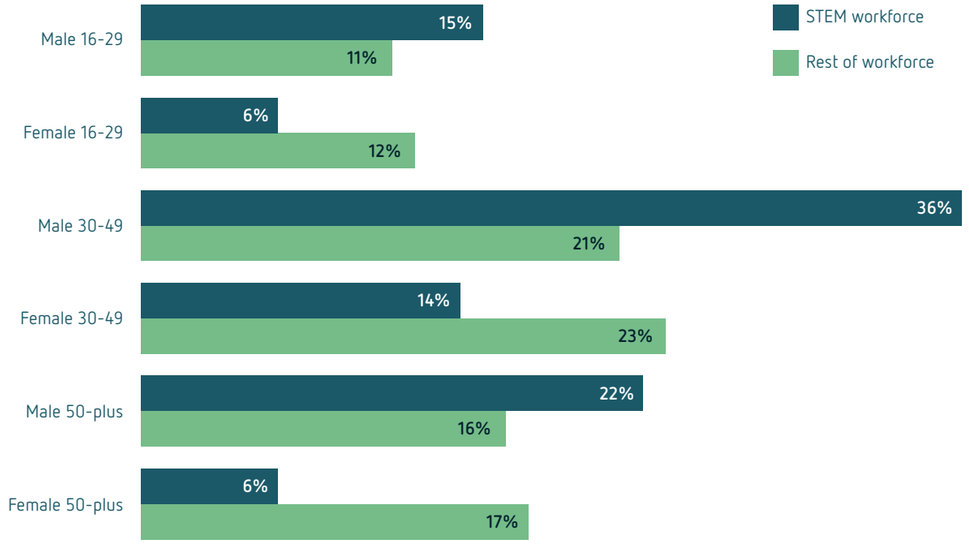


Figure 11: *Composition of STEM workforce by age band and gender, UK, 2019* Source: Analysis of ONS, Labour Force Survey

Regional differences in size and diversity of the STEM workforce

Regional STEM workforces tend to reflect the diversity of the population in different regions and nations relatively well, although the sector's overall dispersion across the UK is uneven, with STEM workers (particularly those in technology) over-represented in London and the South East above all, as Figure 12 shows.

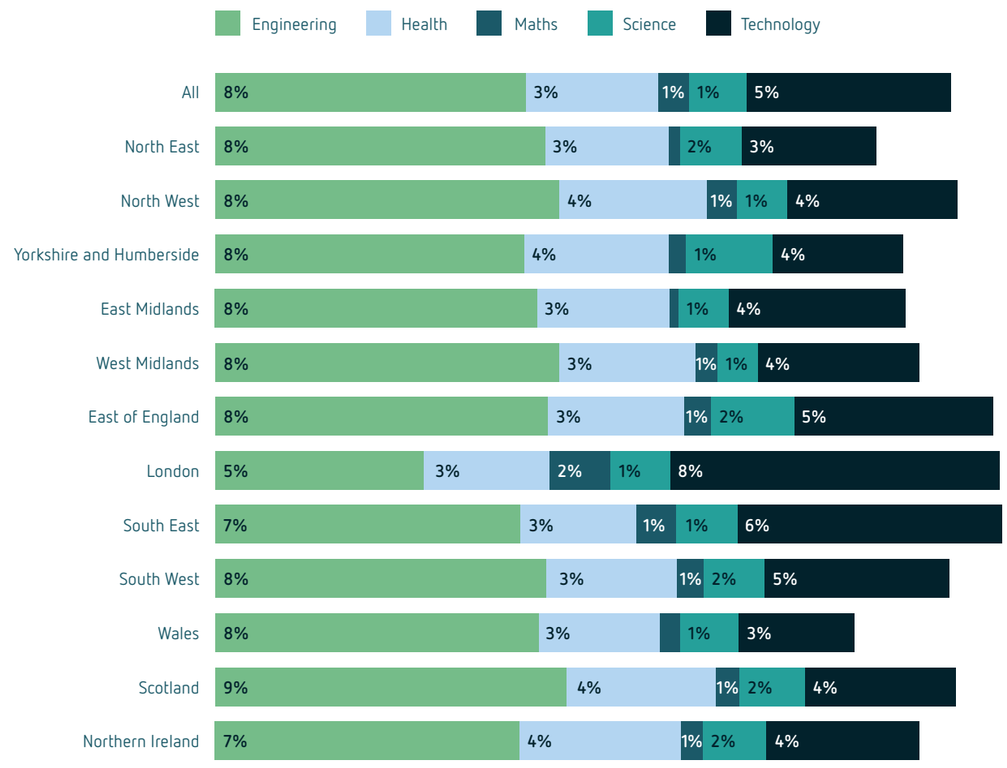


Figure 12: *Proportion of employment in STEM, by discipline and region, UK, 2019*

Source: Analysis of ONS, Labour Force Survey

The composition of the STEM workforce is relatively representative of the diversity of different regions and nations in terms of gender and ethnicity, as Figure 13 and Figure 14 show. The most notable difference is that workers from ethnic minorities are slightly underrepresented in London's STEM workforce compared to its whole workforce.

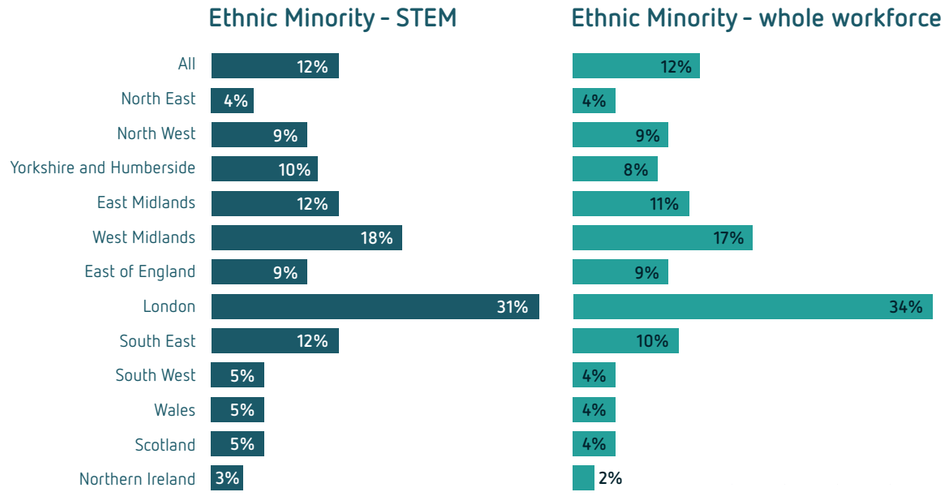


Figure 13: *Proportion of workforce that are from an ethnic minority background, STEM and whole workforce, UK, 2019*

Source: Analysis of ONS, Labour Force Survey

Looking at differences in gender diversity in different regions and nations, Figure 14 shows that there is greater geographical variation in women's representation in the workforce among STEM workers than among the whole workforce. Women's representation in STEM is not clearly correlated, however, with their representation in the whole workforce in different areas.

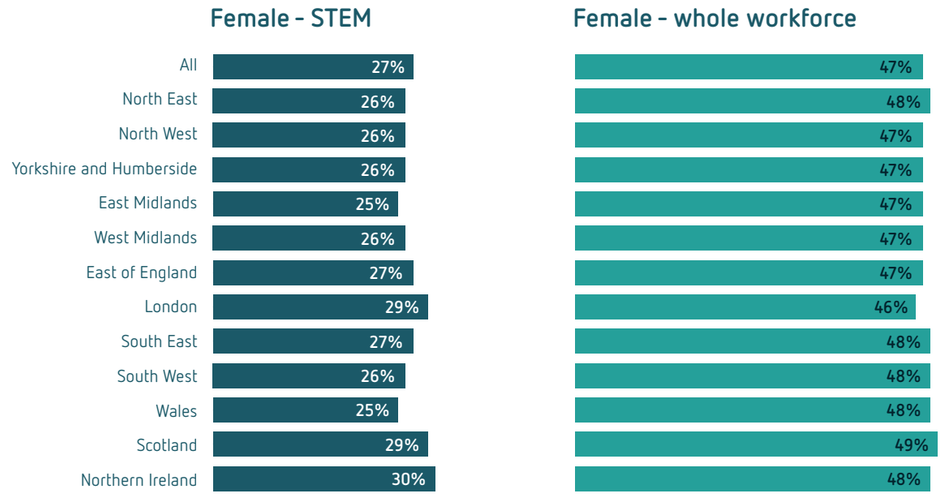


Figure 14: *Proportion of workforce that is female, STEM and whole workforce, UK, 2019*

Source: Analysis of ONS, Labour Force Survey

Diversity and the STEM 'career ladder'

A further dimension by which the diversity of the STEM workforce can be examined is in its distribution in different levels of seniority within industry. One way to look at this is using the National Statistics Socio-Economic Classification (NS-SEC), which divides the adult population in to eight groups according to their type of employment. It is not intended to define an explicit hierarchy of occupations, but gives an idea of the different roles and status that workers have within their industries and within the employment relationship, as routine or non-routine employees, middle managers or senior managers.

Figure 15 shows the level of representation in the workforce of women, people from ethnic minorities and disabled people, in seven of the eight NS-SEC groups (the eighth group, people in unemployment or who have never worked, is excluded). It shows that women are a minority of the workforce at all levels, and that they are least represented among lower supervisory workers and small employers.

People from ethnic minorities are hardly represented at all among routine and semi-routine STEM occupations (such as 'welding trades' and 'animal care services'), and make up a larger proportion of workers at higher points in the STEM career ladder. This can be explained by the fact that they are much more likely (76%, versus 55% for White people) to work in STEM disciplines outside engineering, which all have a much greater proportion of people working in management. In the engineering discipline 51% of STEM workers are in a managerial role, compared to 79% of STEM workers in health, 80% in mathematics, 86% in technology and 97% in science.

Disabled people working in STEM are less likely to be in managerial or higher managerial positions, than those in non-STEM occupations. However, a higher percentage of STEM disabled workers are in routine occupations, than in the non-STEM workforce.

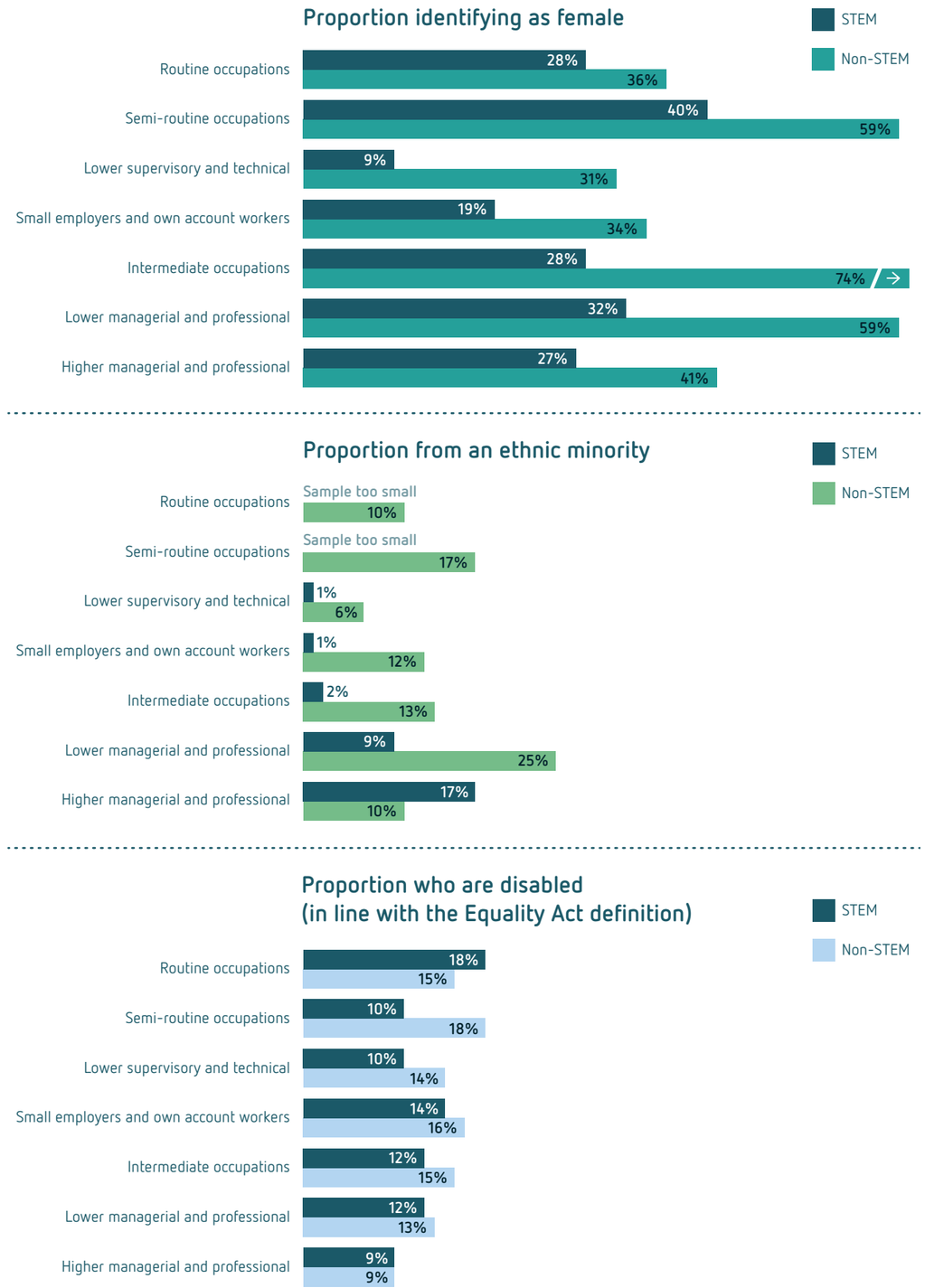


Figure 15: *Proportion of STEM workers with particular characteristic, by NS-SEC group, UK, 2019*

Note: the eighth NS-SEC group, 'Unemployed and never worked', is omitted.

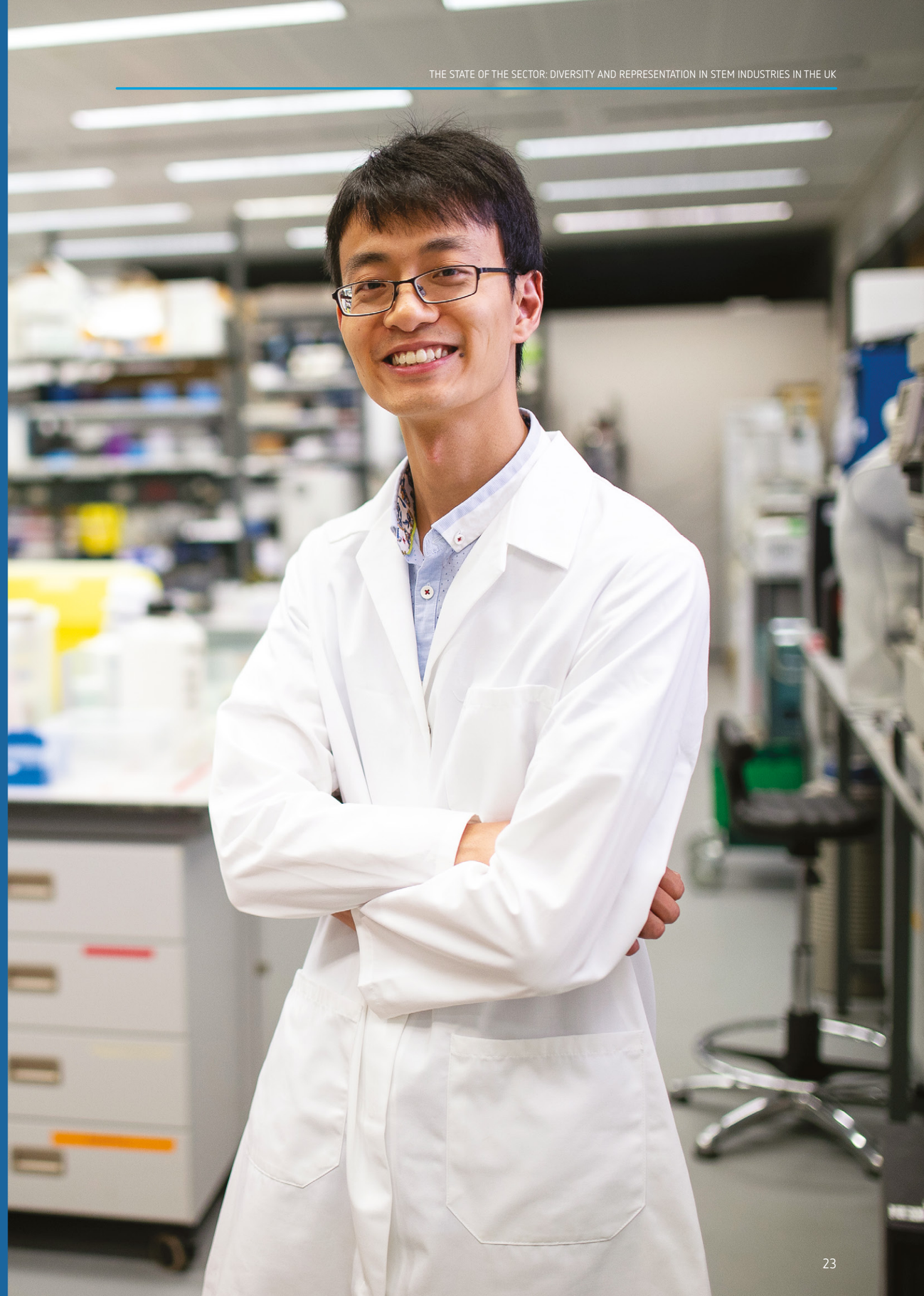
Source: Analysis of ONS, Labour Force Survey

Conclusion

The STEM workforce is an integral part of the UK's labour market and economy, accounting for almost one-in-five of all jobs. This data analysis brief has shown that despite tentative signs on some metrics, diversity and representation is slightly more balanced among younger age cohorts. However, the STEM workforce remains very different from the wider labour force in terms of gender and ethnic diversity in particular. The evidence presented will hopefully be a useful building block for efforts to improve the diversity of the STEM workforce, whether by tackling the vast underrepresentation of women within engineering, or the across-the-board underrepresentation of disabled people.

There is clearly more work to be done. First, in terms of research into other key dimensions of diversity within the STEM workforce, for example, sexual orientation. Secondly, while diversity and representation in STEM is necessary, it alone is not sufficient to ensuring the field is inclusive to all. Evidence shows that further efforts are needed to identify and address structural barriers as well as removing bias towards people with certain characteristics once they have joined the STEM workforce (Begeny,2020). The next step in the inquiry process will be to collect evidence on inclusivity practice within the sector, exploring further than representation to recruitment and retention, with the goal of presenting recommendations to enact real change within the STEM workforce.

For more information on the APPG into Diversity and Inclusion in STEM inquiry into Equity in the STEM workforce, please visit: **https://www.britishscienceassociation.org/appg**.



Glossary

The following terms used in this report are defined as follows.

Ethnic minority	The Equality Act prohibits discrimination against someone on the grounds of their race. Someone is defined as being from an ethnic minority if they define their ethnicity as a category other than White.
Equality Act disabled	The Equality Act 2010 changed the definition of a disability from the previous ones established by the Disability Discrimination Act. In the current definition, a person has a disability if they have 'a physical or mental impairment which has a substantial and long-term adverse effect on that person's ability to carry out normal day-to-day activities'. It is important to note that this definition does not include some mild or intermittent conditions.
Gender	The data in this report is compiled from ONS Labour Force Survey statistics. This survey asks participants for their gender in a binary question with response options "Male" or "Female".
Intersectionality	Coined by Kimberlé Crenshaw (1989) to describe the complex, cumulative way in which the effects of multiple forms of discrimination (such as racism and sexism) combine, overlap, or intersect especially in the experiences of marginalized individuals or groups (Merriam-Webster, 2020).
NS-SEC	National Statistics Socio-Economic Classification.
Protected characteristic	The Equality Act 2010 sets out nine 'protected characteristics'.(EHRC, 2020) It is illegal to discriminate against someone on these grounds, except in the case of specific exemptions such as religious tradition.
STEM	Throughout this report this acronym is used to refer to the science, technology, engineering, maths and health workforce.
SOC	Standard Occupational Classification.

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Annex: Diversity among detailed sub-sections of the STEM workforce

This table shows the mix of the workforce at the most detailed occupational level. This is not the full list of STEM occupations because data is only shown where sample sizes were above a minimum threshold of 20. Occupations are listed in order of size, in descending order.

Table 1: *Proportion of STEM workers in detailed occupational groups with specific personal characteristic*

Occupational groups	Discipline	Workers	Male %	Female %	16-29 %	30-49 %	50 & over	Disabled %	Not disabled %	White %	Ethnic minorities %
All workers	**n/a**	**32,80,000**	**53**	**47**	**23**	**45**	**32**	**14**	**86**	**88**	**12**
All STEM	**All**	**5,900,000**	**73**	**27**	**22**	**50**	**28**	**11**	**89**	**87**	**13**
Programmers and software development professionals	Technology	380,000	86	14	28	55	17	10	90	79	21
Medical practitioners	Health	280,000	53	47	16	59	25	7	93	66	34
Electricians and electrical fitters	Engineering	270,000	98	2	29	44	27	10	90	95	5
Metal working production and maintenance fitters	Engineering	220,000	98	2	30	37	33	11	89	95	5
Production managers and directors in construction	Engineering	220,000	89	11	6	50	44	11	89	96	4
IT specialist managers	Technology	220,000	82	18	9	64	26	9	91	89	11
IT and telecommunications professionals	Technology	190,000	82	18	18	56	26	11	89	76	24
IT business analysts, architects and systems designers	Technology	150,000	84	16	16	59	25	8	92	75	25
Engineering professionals n.e.c.	Engineering	130,000	87	13	23	48	29	9	91	92	8
IT and telecommunications directors	Technology	120,000	86	14	6	64	30	7	93	91	9
IT operations technicians	Technology	110,000	69	31	26	50	24	14	86	81	19
Engineering technicians	Engineering	100,000	95	5	24	45	31	8	92	95	5
IT user support technicians	Technology	100,000	78	22	29	48	22	15	85	83	17
Graphic designers	Technology	90,000	70	30	21	65	14	13	87	91	9
Civil engineers	Engineering	89,000	89	11	23	46	31	7	93	89	11
Animal care services occupations n.e.c.	Health	84,000	13	87	30	42	29	17	83		
Design and development engineers	Engineering	82,000	94	6	25	49	26	7	93	90	10
Construction project managers and related professionals	Engineering	79,000	90	10	17	50	33	11	89	93	7
Mechanical engineers	Engineering	79,000	91	9	16	49	35	8	92	90	10
Product, clothing and related designers	Technology	78,000	41	59	19	46	34	11	89	93	7
Photographers, AV and broadcasting equipment operators	Technology	77,000	80	20	27	46	27	9	91		
Laboratory technicians	Science	76,000	47	53	37	41	22	13	87	86	14
Physiotherapists	Health	73,000	26	74	25	53	22	10	90		
Biological scientists and biochemists	Science	72,000	44	56	14	56	30	8	92	88	12
Pharmacists	Health	69,000	37	63	27	50	24	7	93	65	35
Research and development managers	Science	67,000	59	41	9	62	30	10	90	87	13
Health professionals n.e.c.	Health	67,000	18	82	16	52	32	17	83	84	16
Web design and development professionals	Technology	66,000	77	23	33	58	9	12	88	92	8
Actuaries, economists and statisticians	Maths	63,000	67	33	31	56	12	5	95	83	17
Natural and social science professionals n.e.c.	Science	63,000	47	53	26	60	15	12	88	84	16
Therapy professionals n.e.c.	Health	63,000	27	73	12	42	46	21	79	90	10
IT project and programme managers	Technology	58,000	78	22	12	62	26	15	85	85	15
Architects	Engineering	57,000	69	31	11	58	30				
Quantity surveyors	Engineering	56,000	86	14	25	49	27	7	93	91	9
Chartered surveyors	Engineering	56,000	84	16	21	42	37	8	92		
Production and process engineers	Engineering	54,000	92	8	21	45	34	9	91	92	8
Occupational therapists	Health	49,000	12	88	14	54	31	15	85		
Environment professionals	Science	48,000	62	38	22	53	25	12	88		
Science, engineering and production technicians n.e.c.	Science	45,000	71	29	18	40	42	12	88		
Quality control and planning engineers	Engineering	43,000	81	19	20	42	38			88	12
Dental practitioners	Health	43,000	44	56	21	52	26			64	36
Medical and dental technicians	Health	40,000	45	55	21	55	24	10	90	78	22
Inspectors of standards and regulations	Engineering	40,000	65	35				14	86		
Financial managers and directors	Maths	36,000	71	29							
Psychologists	Health	36,000	17	83	16	52	32	17	83		
Medical radiographers	Health	35,000	22	78	23	52	24	15	85	80	20
Draughtspersons	Engineering	35,000	88	12	23	44	33	12	88		
Quality assurance technicians	Engineering	32,000	59	41	26	48	26				
Pharmaceutical technicians	Health	30,000	17	83	18	54	27	16	84		
Finance and investment analysts and advisers	Maths	30,000	79	21	26	52	22			73	27
Paramedics	Health	29,000	60	40	24	61	15				
Physical scientists	Science	29,000	77	23	22	61	18	14	86		
Planning, process and production technicians	Engineering	29,000	69	31	21	39	39				
Chartered and certified accountants	Maths	26,000	63	37	29	44	27				
Chemical scientists	Science	25,000	77	23	25	45	31				
Book-keepers, payroll managers and wages clerks	Maths	25,000	45	55	32	41	27				
Architectural and town planning technicians	Engineering	23,000	70	30	41	39	20				
Veterinarians	Health	22,000	35	65							
Financial accounts managers	Maths	18,000	68	32							
Conservation professionals	Science	17,000	48	52							
Business and related research professionals	Technology	15,000	52	48							
Opticians	Health	14,000	58	42							
Environmental health professionals	Engineering	12,000	41	59							

The British Science Association provides the Secretariat for the All-Party Parliamentary Group on Diversity & Inclusion in STEM

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