

Women in STEM

Conducted on behalf of the Royal Society
by Jisc

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Jisc data analytics

Contents

Introduction	3
Female STEM academic staff	4
Chart 1 Percentage of academic STEM staff 2007/08-2022/23 by sex.....	4
Chart 3 Percentage of academic STEM female staff 07/08-22/23 by disability marker	6
Chart 4 Percentage of academic STEM female staff 2007/08-2022/23 by grouped age	7
Chart 5 Percentage of academic STEM female staff 2007/08-2022/23 by mode of employment	8
Chart 6 Percentage of academic STEM female staff 2007/08-2022/23 by contract levels	9
Chart 7 Percentage of academic STEM female staff 2019/20-2022/23 by academic discipline	10
Chart 8 Percentage of academic STEM female staff 07/08-22/23 by terms of employment	11
Female STEM students	12
Chart 9 Percentage of STEM students 2015/16-2022/23 by sex and level of study	12
Chart 10 Percentage of female STEM students 2015/16-2022/23 by subject of study.....	13
Chart 12 Percentage of female STEM students 2015/16-2022/23 by disability marker.....	15
Chart 13 Percentage of female STEM students 2015/16-2022/23 by grouped age.....	16
Chart 14 Percentage of female STEM undergraduate students with UK permanent address 2015/16- by parental education	17
Chart 15 Percentage of female STEM UK undergraduate students with UK permanent address 2015/16- 2022/23 by socio economic status	18
Chart 16 Percentage of female STEM undergraduate students with a permanent address in the UK 2015/16- 2022/23 by low participation marker	19
Annex.....	20
Annex 1 Ethnicity definition 2022/23.....	20

Introduction

The first part of this report focuses on analysis of female academic staff¹ working in STEM² at UK higher education providers from 2007/08 to 2022/23. Data is sourced from the HESA Staff record. The second part of this report focusses on analysis of female students studying STEM³ subjects at UK higher education providers from 2015/16 to 2022/23. Data is sourced from the HESA Student Record, the HESA Legacy Student Record and the HESA Legacy Student Alternative Record. The report uses descriptive statistics to compare cohorts and not all differences have been statistically validated.

- From 2007/08 to 2011/12 data was collected on what academic subject the member of staff studied. Each member of staff could have up to 2 subjects. From 2012/13 onwards data was collected on their current academic discipline. Each member of staff could have up to two subjects from 2012/13 to 2013/14, and three subjects from 2014/15 onwards.
- Each member of staff has been assigned to the working in STEM category if their first academic discipline or current academic discipline is a STEM subject. Further analysis was carried out to determine whether including academic discipline 2, and current academic disciplines 2 and 3 affected the analysis. It did not, so for simplicity and ease of reporting it was restricted to the first discipline returned in the data.
- Analysis is restricted to academic staff and excludes atypical staff⁴.
- 'Students' refers to students irrespective of which year of study they are participating in.
- All numbers are rounded to the nearest 5. Percentages are based on unrounded figures to 0 decimal places. Percentage point differences between figures are calculated based on unrounded percentages. All percentages are based on a denominator of 22.5 or more.
- The number of HE Providers in the Staff Record has gone up from 166 in 2018/19 to 214 in 2022/23. The number of HE providers in the Student Record has gone up from 261 in 2015/16 to 304 in 2022/23. Data for several HE providers were not included as they did not opt-in to the **Category 3 Permitted Purpose**.

¹ Those staff with an academic contract that is either research only, teaching only, both teaching and research, or neither teaching nor research

² STEM relates to Medicine & dentistry; Subjects allied to medicine; Biological sciences; Veterinary science; Agriculture & related subjects; Physical sciences; Mathematical sciences; Computer science; Engineering & technology; Architecture, building & planning subjects.

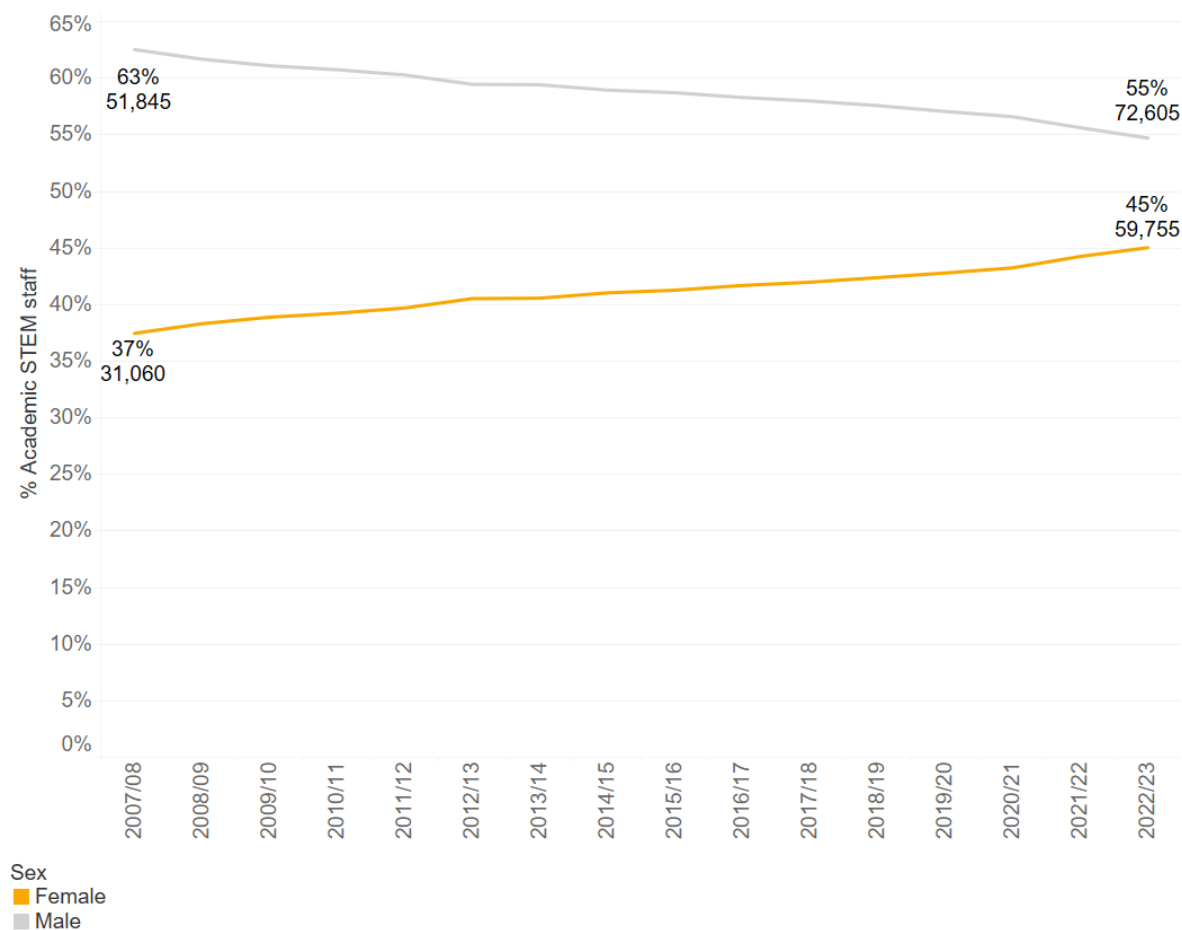
³ STEM subjects relate to Medicine & dentistry; Subjects allied to medicine; Biological and sport sciences; Psychology, Veterinary sciences; Agriculture food and related studies; Physical sciences; Mathematical sciences; Computing; Engineering & technology; Architecture, building & planning subjects; Geography, earth and environmental studies (natural sciences).

⁴ Atypical staff are those members of staff whose contracts involve working arrangements that are not permanent, involve complex employment relationships and/or involve work away from the supervision of the normal work provider.

Female STEM academic staff

Chart 1 shows that the percentage of female STEM academic staff increased from 37 per cent in 2007/08 (31,060) to 45 per cent in 2022/23 (59,755). For male STEM staff the percentage decreased for the same period from 63 per cent (51,845) to 55% (72,605) showing a narrowing gap for numbers of academic STEM staff.

Chart 1 Percentage of academic STEM staff 2007/08-2022/23 by sex⁵



⁵ Staff can return Other Sex or Unknown Sex (2022/23 only). Due to small numbers, these have been excluded from the chart but included in any percentage calculations.

Chart 2 shows the proportion of academic STEM female staff from ethnic minority groups has increased from 12 per cent (42,575) to 21 per cent (11,515) from 2007/08 to 2022/23.

Chart 2 Percentage of academic STEM female staff 2007/08-2022/23 by ethnicity

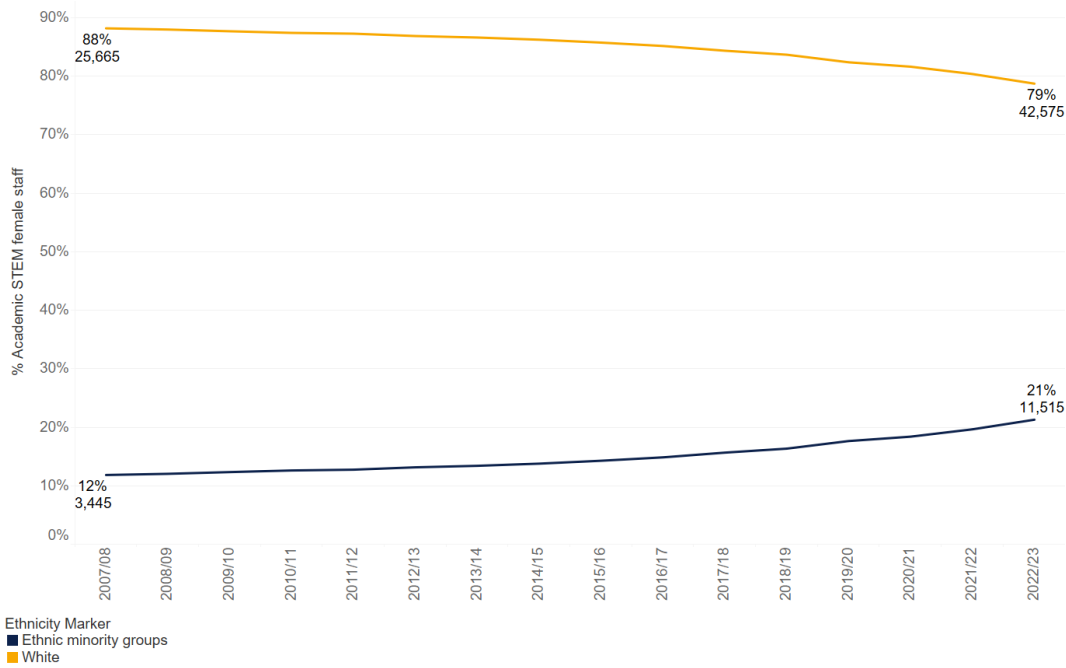


Chart 3 shows that the proportion of female staff with a known disability rose from 2 per cent (690) in 2007/08 to 7 per cent (4,030) in 2022/23.

Chart 3 Percentage of academic STEM female staff 07/08-22/23 by disability marker

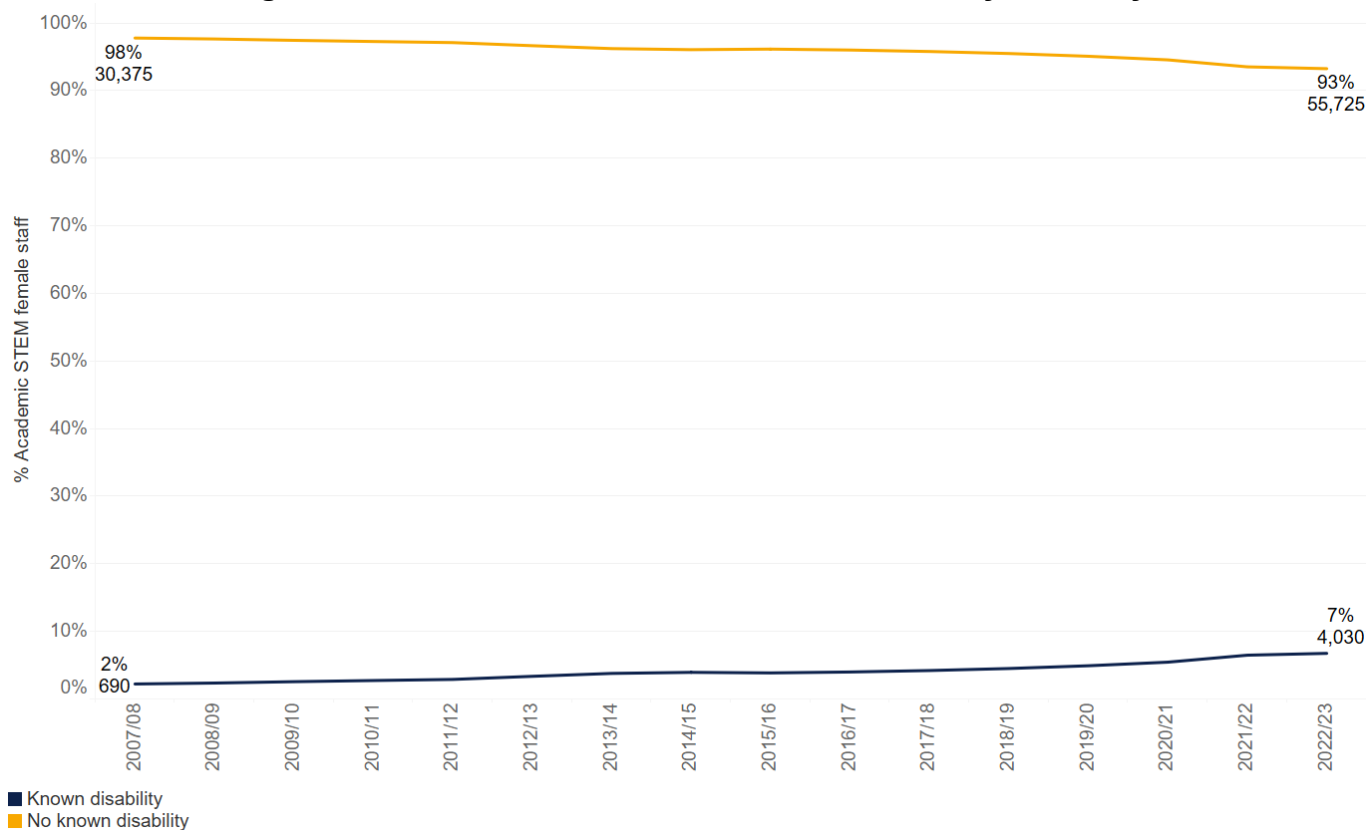


Chart 4 shows the proportion of each age group among female STEM staff. Female STEM staff ages 50-65 saw the largest percentage point increase, from 21 per cent (6,540) in 2007/08 to 24 per cent (14,145) in 2022/23. The proportion of STEM female staff aged 34 and under saw the largest percentage point decrease, from 35 per cent in 2007/08 to 32 per cent in 2022/23, though the numbers rose from 10,890 to 18,925 across the same time period.

Chart 4 Percentage of academic STEM female staff 2007/08-2022/23 by grouped age

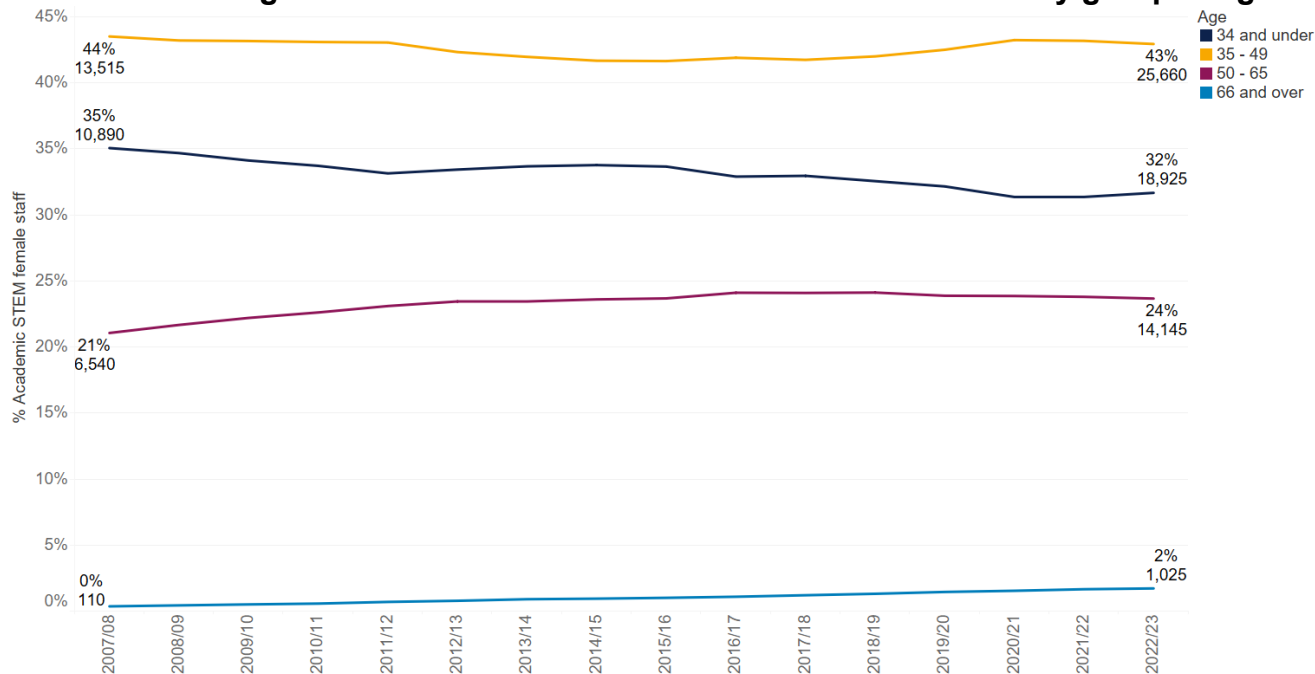


Chart 5 shows the majority of academic STEM female staff work full-time. The proportion of those working part-time increased from 30 per cent (9,330) to 37 per cent (22,250) from 2007/08-2022/23.

Chart 5 Percentage of academic STEM female staff 2007/08-2022/23 by mode of employment

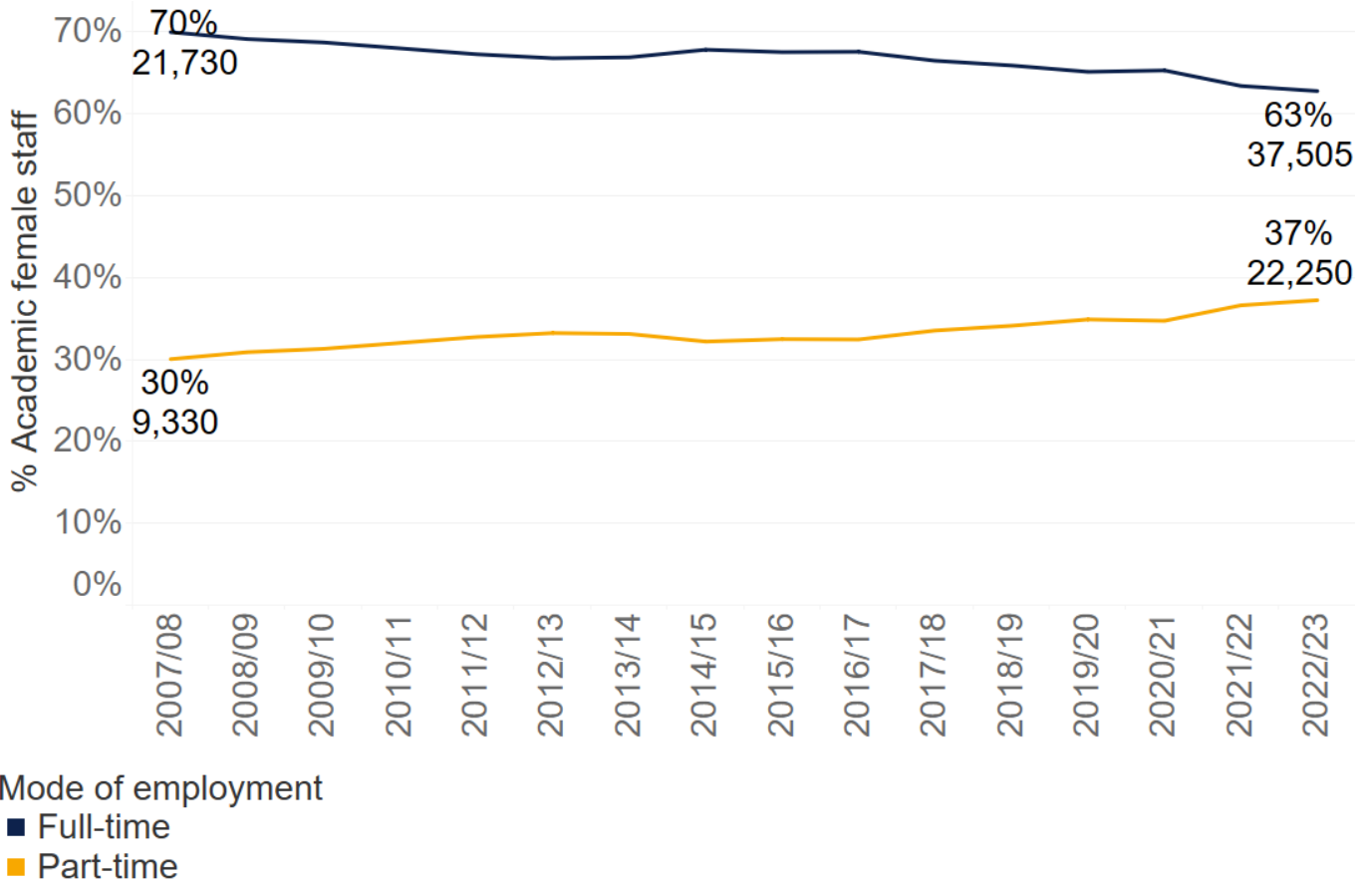


Chart 6 shows the proportion of academic STEM staff in each contract level who are female. Academic STEM female staff were the most represented at assistant professional staff/administrative staff level, in which they made up 52 per cent (1,495) of academic STEM staff. Academic STEM female staff are the least represented at professor level, although there was an increase from 17 per cent (1,790) in 2013/14 to 26 per cent (3,840) in 2022/23.

Chart 6 Percentage of academic STEM female staff 2007/08-2022/23 by contract levels

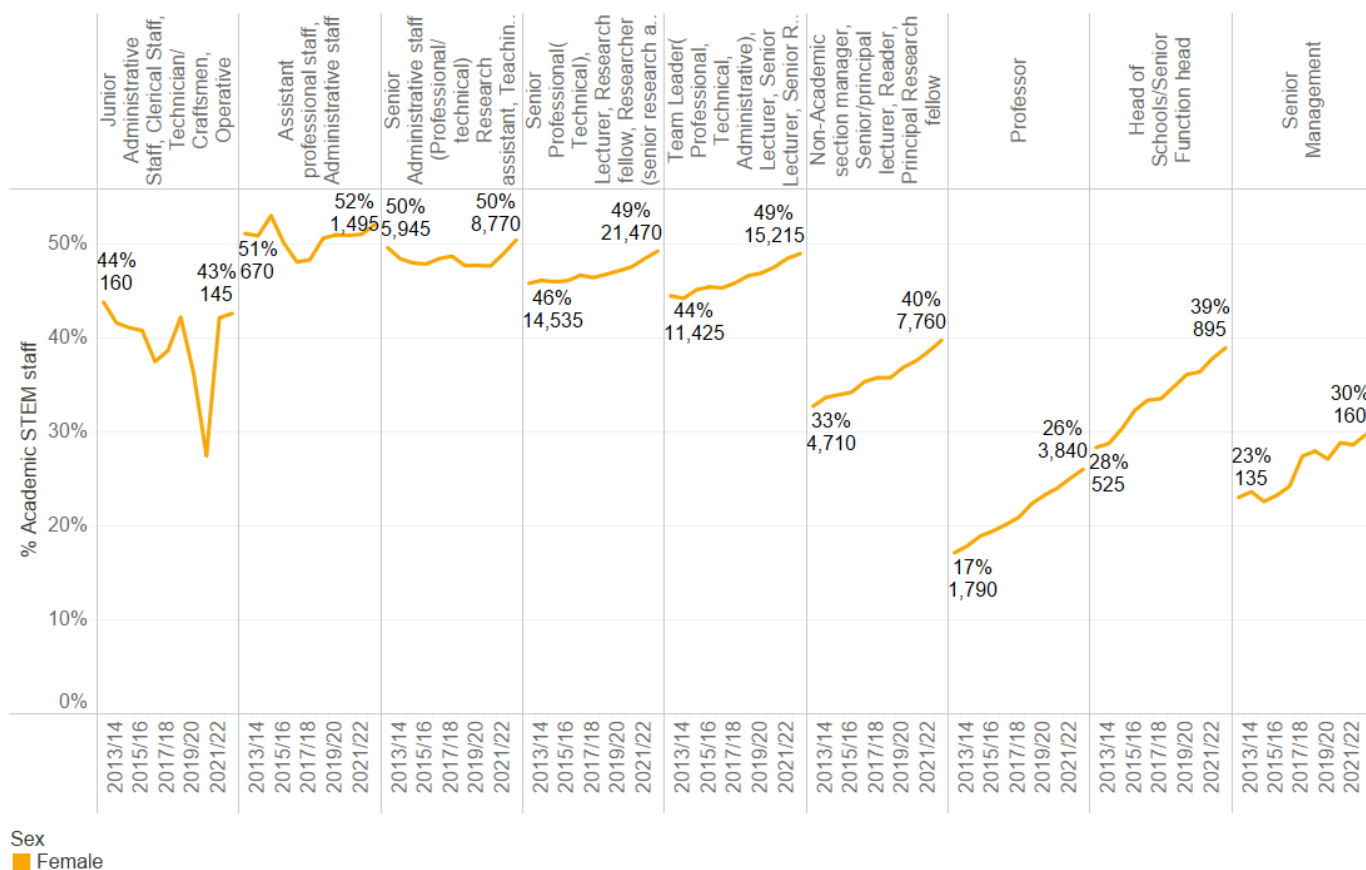


Chart 7 shows the proportion of academic STEM female staff in each academic discipline. In 2022/23, academic STEM female staff made up 67 per cent of staff in Subjects allied to medicine (15,980) and Psychology (7,190), whereas they made up only 23 per cent in Engineering and technology. Across all subject areas females have seen a growth in representation from 2019/20-2022/23, except for Veterinary sciences, where the proportion decreased from 64 per cent (595) in 2019/20 to 63 per cent (715) in 2022/23, though overall numbers of females did rise.

Chart 7 Percentage of academic STEM female staff 2019/20-2022/23 by academic discipline

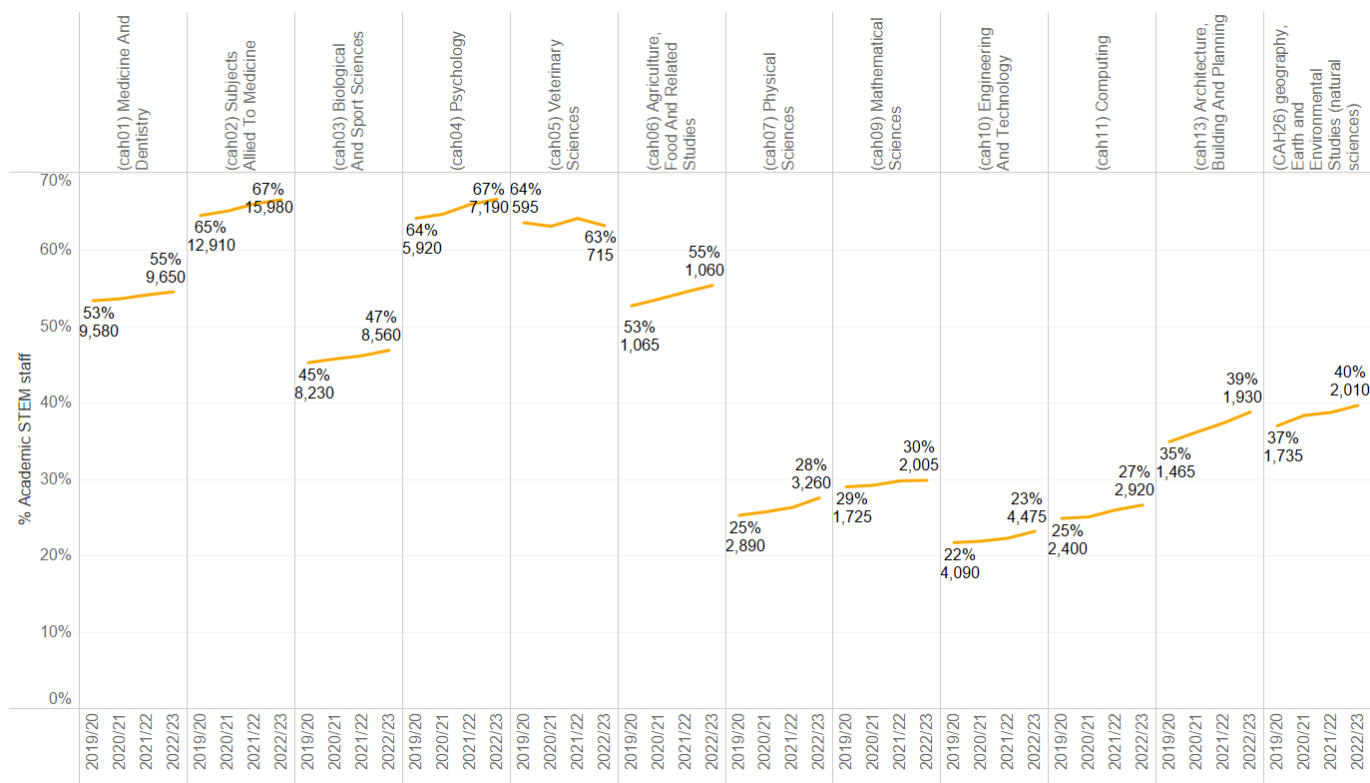
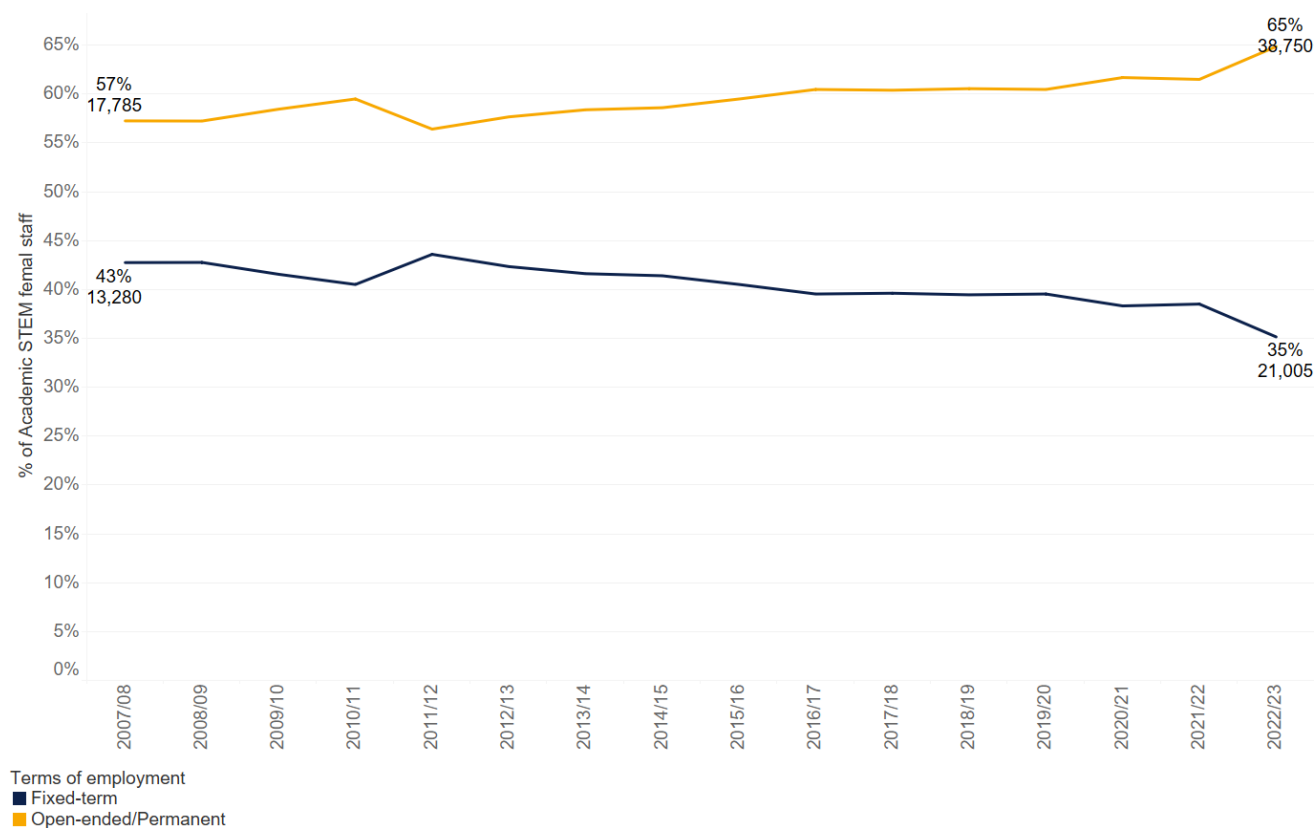


Chart 8 shows the proportion of female STEM staff who are on fixed term or open-ended/permanent contracts. The number of female STEM staff on fixed-term contracts rose from 13,280 to 21,005 from 2007/08 to 2022/23 but the proportion decreased by 8 percentage points from 43 per cent to 35 per cent. This corresponds to a rise in the proportion of female STEM staff on open-ended/permanent contracts across the same time period from 57 per cent (17,785) to 65 per cent (38,750).

Chart 8 Percentage of academic STEM female staff 07/08-22/23 by terms of employment



Female STEM students

Chart 9 shows female STEM students made up over 50 per cent of both undergraduate and postgraduate students. For postgraduate STEM students, the proportion of females increased from 53 per cent (118,690) in 2015/16 to 55 per cent (203,775) in 2022/23. For undergraduate STEM students, the proportion of females increased from 51 per cent (414,510) in 2015/16 to 54 per cent (504,255) in 2022/23.

Chart 9 Percentage of STEM students 2015/16-2022/23 by sex and level of study

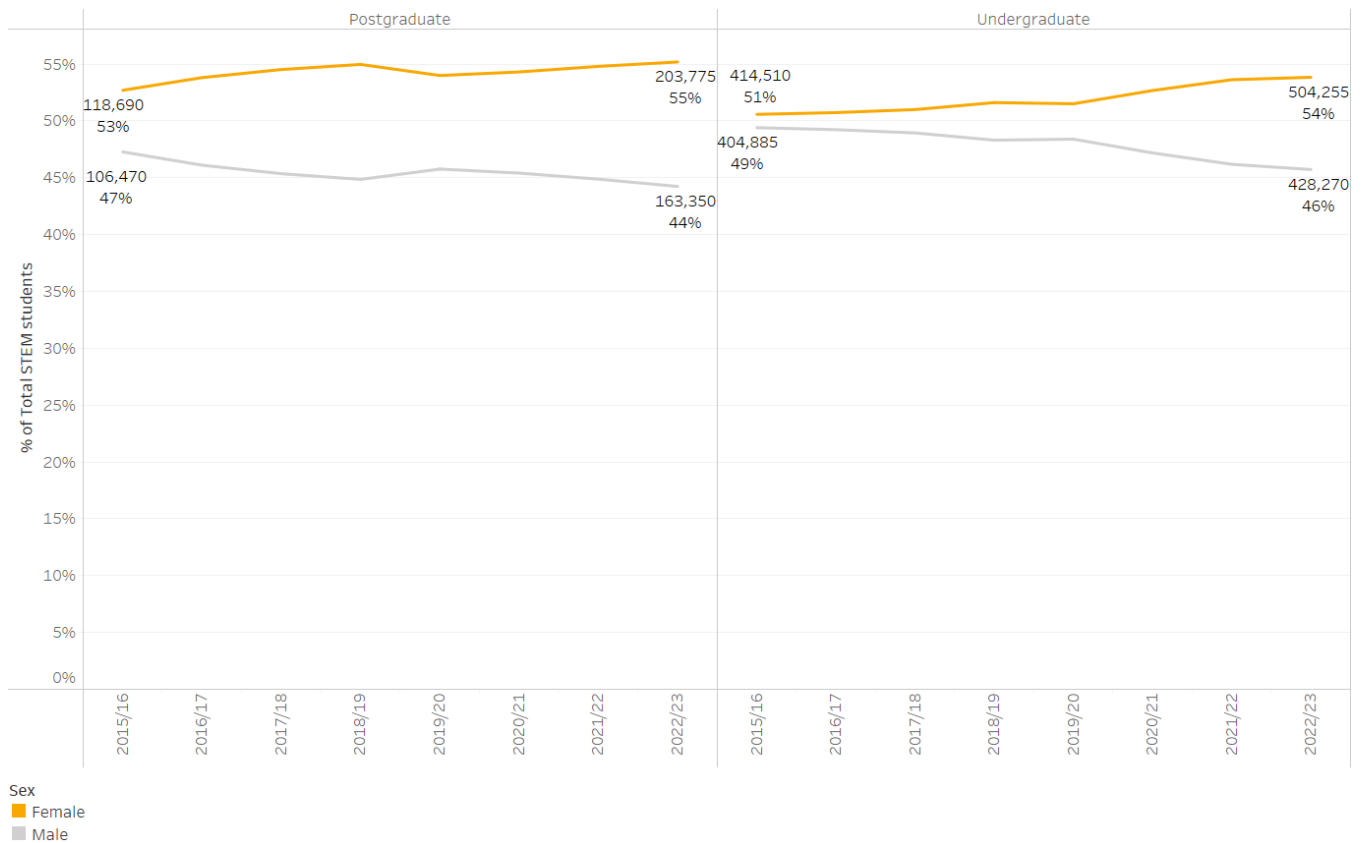
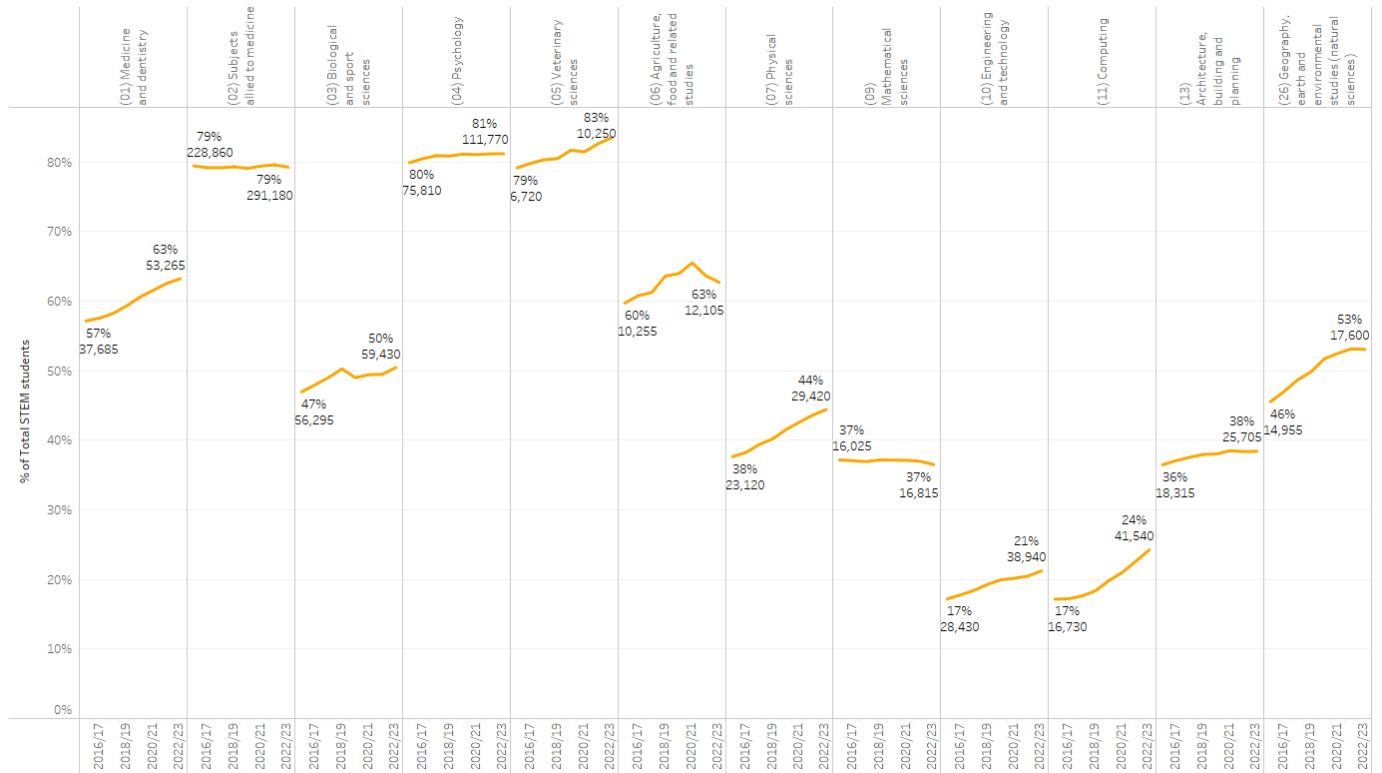


Chart 10 shows the proportion of female students within each STEM subject area. In 2022/23, female students had the highest representation in Veterinary Sciences (83 per cent); with the lowest representation in Engineering and Technology (21 per cent). The largest percentage point increases from 2015/16-2022/23 were in Computing (17 per cent to 24 per cent) and Geography, Earth and Environmental Sciences (46 per cent to 53 per cent). No subjects saw a decrease in the representation of female students, but Mathematical sciences (37 per cent) and Subjects allied to Medicine (79 per cent) remained the same across the time series, though the underlying number of students has increased.

Chart 10 Percentage of female STEM students 2015/16-2022/23 by subject of study



Ethnicity information is only collected for students whose permanent address is in the UK. Chart 11 shows the proportion of female STEM students from ethnic minority groups increased from 22 per cent (101,220) in 2015/16 to 29 per cent (163,490) in 2022/23 with an increase of 1 per centage point per year across the time series.

Chart 11 Female STEM students with UK permanent address 2015/16-2022/23 by ethnicity marker

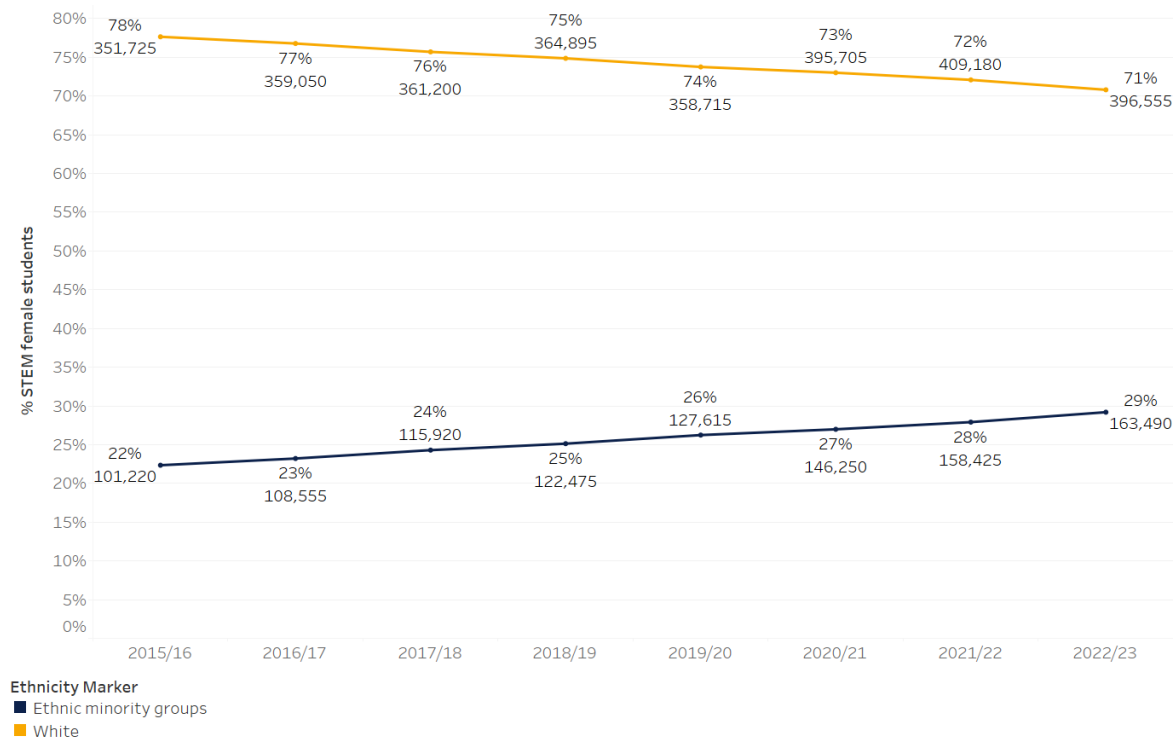


Chart 12 shows the proportion of female STEM students with a known disability increased from 12 per cent (61,900) to 20 per cent (143,360) from 2015/16 to 2022/23.

Chart 12 Percentage of female STEM students 2015/16-2022/23 by disability marker

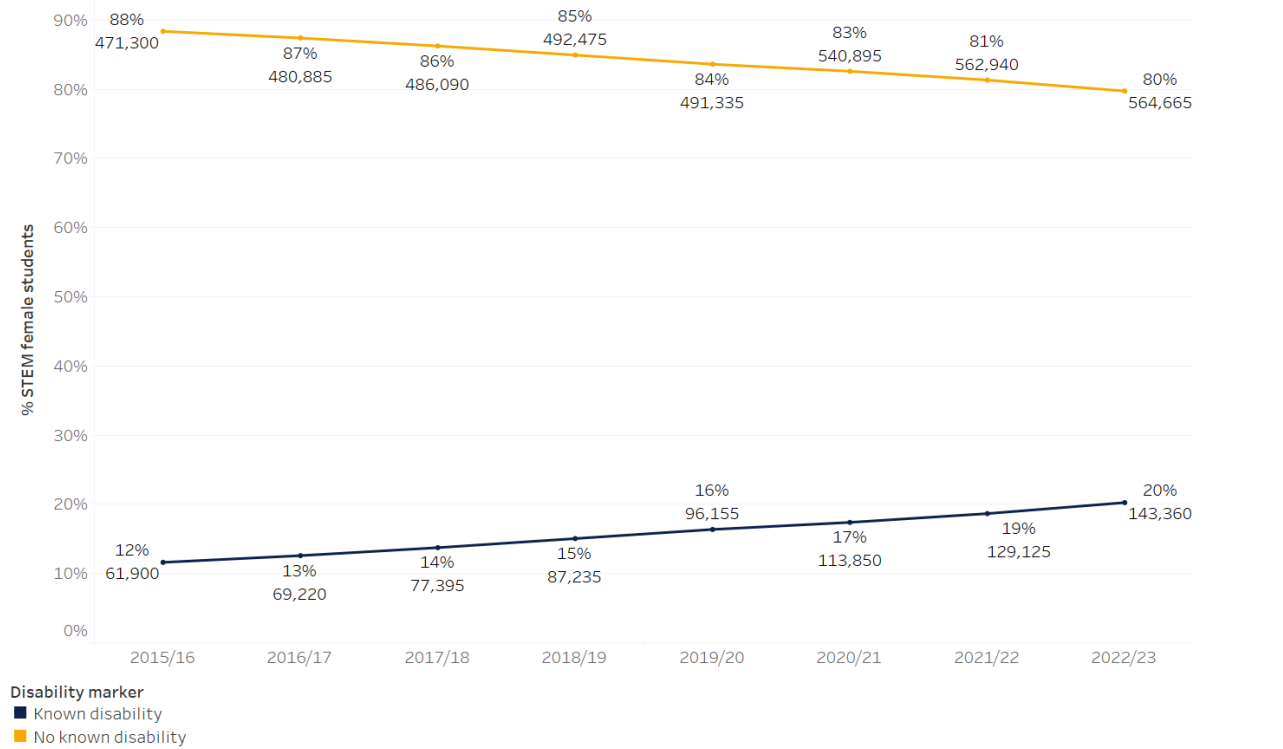


Chart 13 shows the proportion of female STEM students in each age bracket. This did not show much change from 2015/16-2022/23, with percentages staying the same for female STEM students aged 30 years and over (26 per cent) which rose from 139,240 to 184,285 and for female STEM students aged 25-29 years (14 per cent) which rose from 72,835 to 100,255. The proportion of female STEM students aged 20 and under decreased for the same time series by one percentage point (36 to 35 per cent) and increased for those aged 21-24 years by one percentage point (24 to 25 per cent).

Chart 13 Percentage of female STEM students 2015/16-2022/23 by grouped age

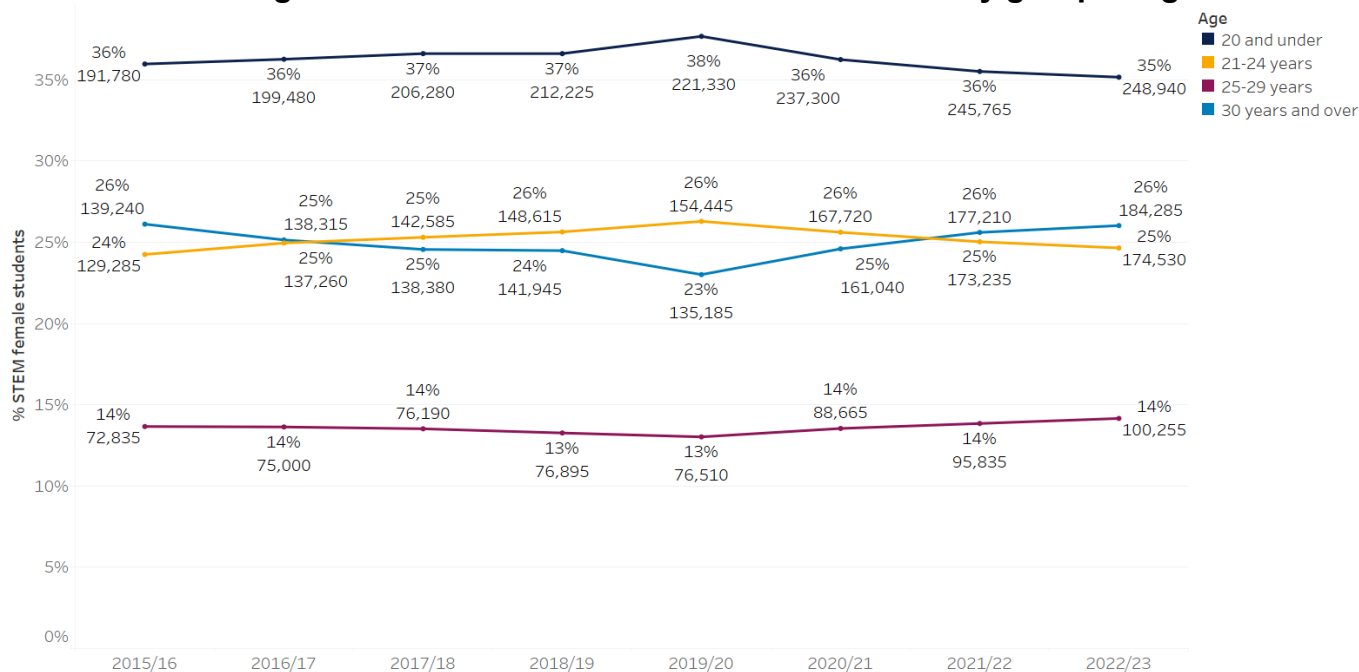
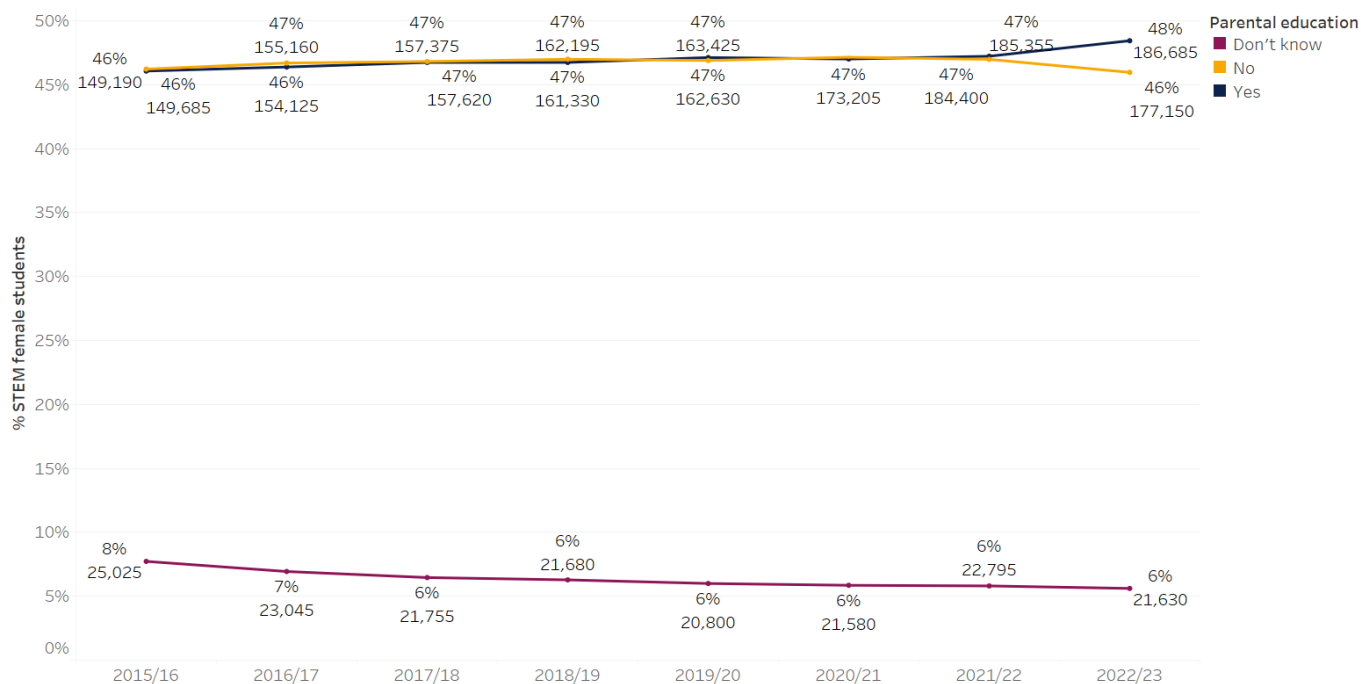


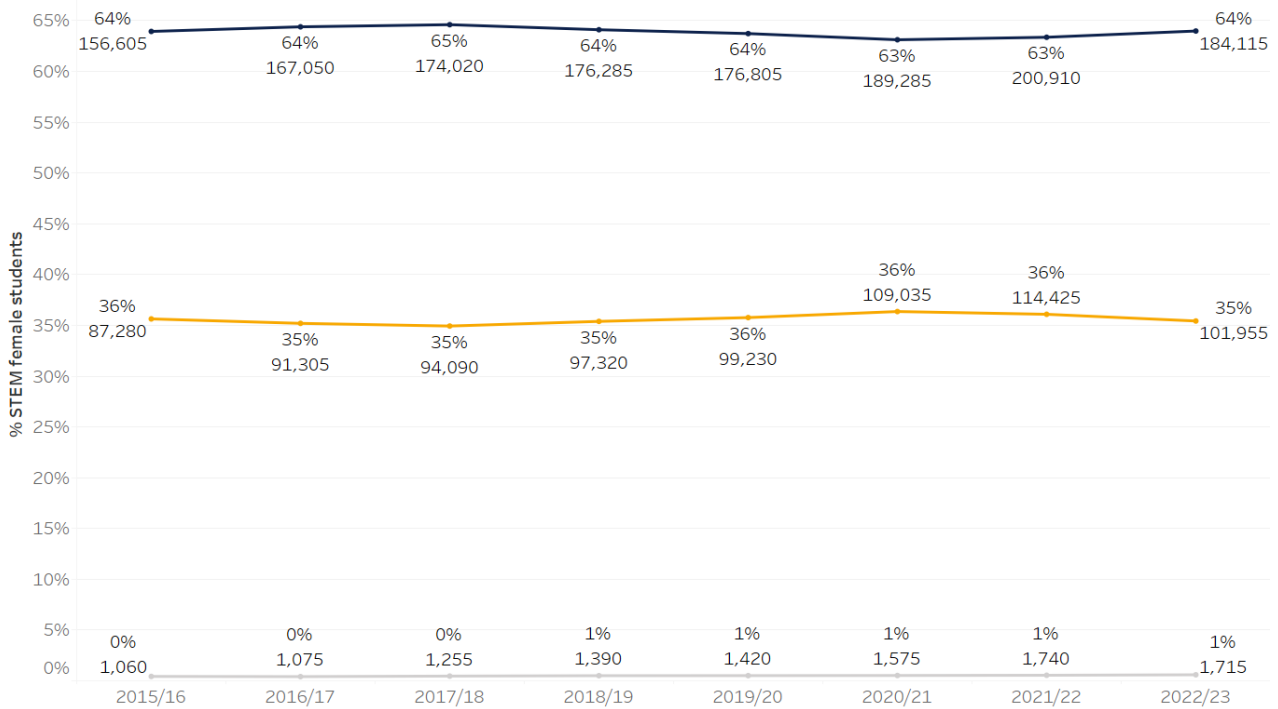
Chart 14 shows the proportions of female STEM undergraduate students by parental education status. The number of students with known parental education status was similar for 2015/16-2022/23 with 0-1 percentage points difference, but in 2022/23 the percentage of female STEM undergraduate students with parental education (186,685) is two percentage points higher than those whose parents did not have higher education qualifications (177,150). The percentage of female STEM undergraduate students with unknown parental education status decreased from 8 per cent to 6 per cent across the same time series.

Chart 14 Percentage of female STEM undergraduate students with UK permanent address 2015/16-2022/23 by parental education



Socio-economic information is typically collected for students who had a permanent address in the UK. Chart 15 shows the majority of female STEM undergraduate students with a UK permanent address came from a SEC 1-3 background (64 per cent, 184,115). This percentage was the same in 2015/16 as 2022/23.

Chart 15 Percentage of female STEM UK undergraduate students with UK permanent address 2015/16-2022/23 by socio economic status

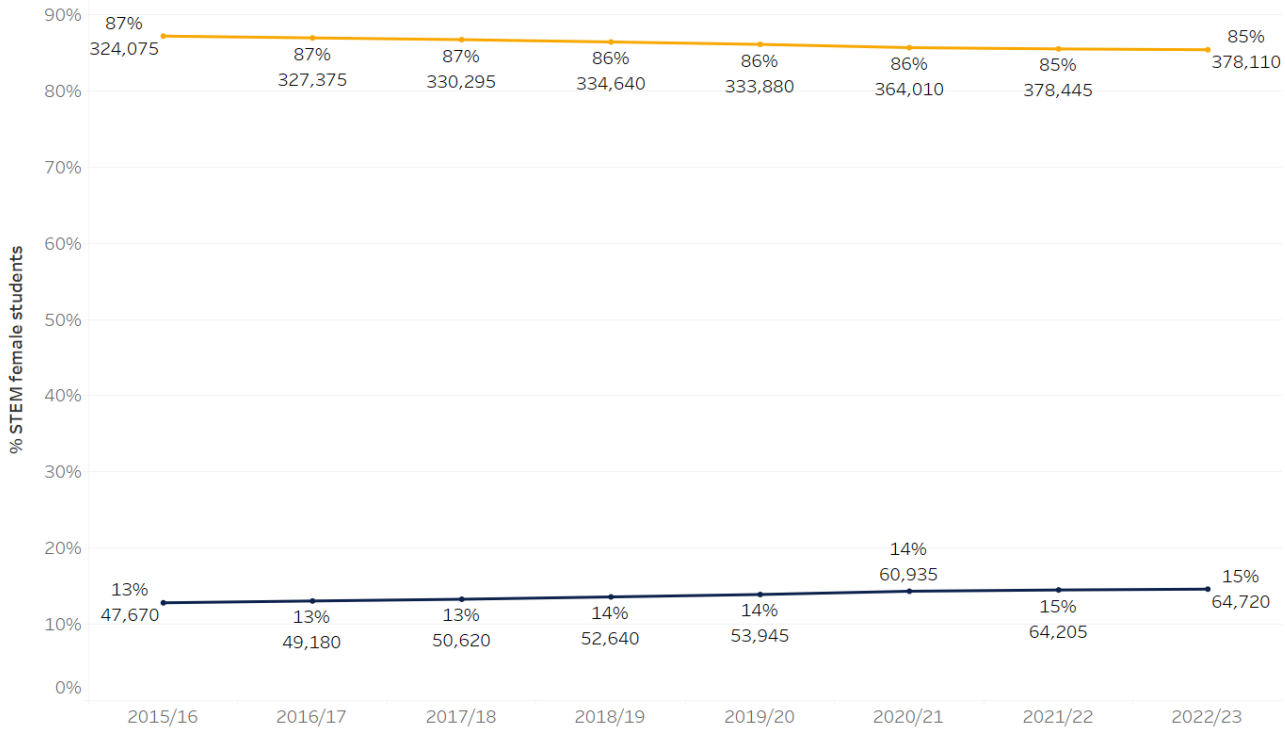


Socio-economic classification grouped

- SEC 1-3
- SEC 4-7
- Never worked & long-term unemployed

Chart 16 shows that 85 per cent (378,110) of female STEM undergraduate students with a permanent address in the UK were not from low participation neighbourhoods (POLAR 4) in 2022/23 compared to 15 per cent (64,720) of female STEM undergraduate students with a permanent address in the UK who were. The percentage of female STEM undergraduate students with a permanent address in the UK from low participation neighbourhoods rose from 13 per cent (47,670) in 2015/16 to 15 per cent (64,720) in 2022/23.

Chart 16 Percentage of female STEM undergraduate students with a permanent address in the UK 2015/16-2022/23 by low participation marker



Low participation neighbourhood marker (POLAR 4)
 ■ Low participation neighbourhood (POLAR4)
 ■ Other neighbourhood (POLAR4)

Annex

Annex 1 Ethnicity definition 2022/23

White - English, Scottish, Welsh, Northern Irish or British, White - English, Welsh, Northern Irish or British, White - British, Irish, Northern Irish, English, Scottish or Welsh, White - Gypsy or Irish Traveller, White - Gypsy or Traveller, White - Irish Traveller, White - Irish, White - Polish, White - Roma, White - Scottish, White - Showman / Showwoman, plus Any other White background

Black includes Black - African or African British, Black - Caribbean or Caribbean British, plus Any other Black background

Asian includes Asian - Bangladeshi or Bangladeshi British, Asian - Chinese or Chinese British, Asian - Filipino, Asian - Indian or Indian British, Asian - Pakistani or Pakistani British plus Any other Asian background

Other includes Arab, plus other ethnic background. Mixed includes mixed - White and Black Caribbean, mixed - White and Black African, mixed - White and Asian, other mixed background

Not known includes not known and information refused. Ethnic minority groups include all non-white categories excluding not known