

2021 Women, Minorities, and Persons with Disabilities in Science and Engineering



National Center for Science and Engineering Statistics
Directorate for Social, Behavioral and Economic Sciences
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About this report

Women, Minorities, and Persons with Disabilities in Science and Engineering provides statistical information about the participation of these three groups in science and engineering education and employment. Its primary purpose is to serve as a statistical abstract with no endorsement of or recommendations about policies or programs. National Science Foundation reporting on this topic is mandated by the Science and Engineering Equal Opportunities Act (Public Law 96-516).

This report highlights key statistics drawn from a variety of data sources. Data and figures in this report are organized into the following topical areas: enrollment, field of degree, employment status, occupation, including academic careers, and disability status. Online, the reader is invited to explore trends in greater depth through detailed data tables and interactive graphics (<https://nces.nsf.gov/wmpd/>). Technical notes and related resources are provided to aid in interpreting the data, and report content is available for downloading.

Surveys conducted by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation provide a large portion of the data used in this report. NCSES has a central role in the collection, interpretation, analysis, and dissemination of objective data on the science and engineering enterprise. (See Note about COVID-19.)

Note about COVID-19

All data in this report were collected pre-pandemic. The next *Women, Minorities and Persons with Disabilities in Science and Engineering* report will be released in 2023. The 2023 report will reflect data collected during the pandemic and will include questions about its impact on scientists and engineers and their work.

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Executive summary

Women, Minorities, and Persons with Disabilities in Science and Engineering provides statistical information about the participation of these three groups in science and engineering (S&E) education and employment. Its primary purpose is to serve as a statistical abstract with no endorsement of or recommendations about policies or programs. The findings of this report are relevant to policymakers and program managers interested in the representation of these groups in the U.S. S&E enterprise.

Key takeaways

- In 2018, more women than men were enrolled in college, both in 2-year and 4-year institutions. The share of undergraduate students who were Hispanic or Latino increased from 2016 to 2018 but the share of Blacks or African Americans declined during that time.
- Although the overall number of S&E graduate students declined between 2016 and 2018, the share of Hispanic or Latino students increased. However, the shares of both American Indian or Alaska Native students and Black or African American students remained the same.
- Of all S&E degrees awarded in 2018, women earned about half of bachelor's degrees, 44.7% of master's degrees, and 41.2% of doctorate degrees. However, the proportion of degrees awarded to women varied by field—female S&E degree holders were most prevalent in psychology, biological sciences, and agricultural sciences and the least prevalent in computer sciences and engineering.
- Both the share and number of S&E degrees awarded to underrepresented minorities—Hispanics or Latinos, Blacks or African Americans, and American Indians or Alaska Natives—increased over the past decade.
- Historically Black colleges and universities (HBCUs) have an important role in preparing Black or African American students for S&E doctoral programs. Indeed, 23.2% of graduates who earned an S&E doctorate degree between 2015 and 2019 earned their bachelor's degree from an HBCU.
- In 2018, women from underrepresented minority groups—Blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives—earned more than half of the S&E degrees awarded to their respective racial and ethnic groups at the bachelor's, master's, and doctorate levels.
- The unemployment rate is lower overall for scientists and engineers than for the U.S. labor force. Scientists and engineers are individuals with at least a bachelor's degree and an S&E or S&E-related degree or occupation. However, scientists and engineers with one or more disabilities had an unemployment rate greater than that of the U.S. labor force.
- Scientists and engineers generally have higher salaries when working in S&E occupations than in other occupations. However, female scientists and engineers have lower median salaries than do their male counterparts in most broad occupational groups.
- The share of academic doctoral positions held by women with science, engineering, and health doctoral degrees increased from 26.4% in 1999 to 38.5% in 2019. Underrepresented minorities also hold a larger share of academic positions than they did in 1999, although their share remains small (8.9%) and is considerably lower than their share of the population.
- A larger share of S&E doctorate recipients with disability than those without disability reported that their primary graduate school funding was personal or family funds, in particular, loans. In addition, a smaller share of those with disability received research assistantships, traineeships, or internships, or had fellowships, scholarships, or grants than did those without disability.

Introduction

Women, persons with disabilities, and some minority groups—Blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives—are underrepresented in science and engineering (S&E). That is, their representation in S&E education and S&E employment is smaller than their representation in the U.S. population.

Although women have reached parity with men among S&E bachelor's degree recipients—half of S&E bachelor's degrees were awarded to women in 2018—women's representation varies greatly by field and women are still underrepresented in S&E occupations. Hispanics or Latinos have gradually increased their share of S&E degrees, while Blacks or African Americans and American Indians or Alaska Natives have seen slight declines. These three minority groups remain underrepresented in S&E educational attainment and in the S&E workforce. In contrast, Whites and Asians tend to have shares of S&E degree holders and employed scientists and engineers that are similar to or greater than their share of the population and of the labor force.

Underrepresentation and overrepresentation of women and racial or ethnic groups vary by field of study and occupation. Variations in the representation of these groups may be rooted in differences in precollege course taking, participation in S&E higher education, overall educational attainment, and other reasons.

Women and underrepresented minorities constituted a substantial portion of the U.S. population ages 18–64 years old in 2019. Women were 50.1% of the population; Hispanics or Latinos, 18.5%; Blacks or African Americans, 13.0%; Asians, 6.3%; and other racial and ethnic groups combined, 2.8% (figure 1). According to the latest Census Bureau projections,¹ minorities will account for 56% of the U.S. population by 2060. The largest growth is projected in the numbers of Hispanics, Asians, and persons of multiple races.

Although women were just over half the population ages 18–64 years old in 2019, they constituted 47.1% of the labor force—individuals who were employed or unemployed (not employed and actively looking for a job). This difference is due to women in each racial and ethnic category making up a slightly smaller share of the labor force than in the population. In contrast, White men and Hispanic or Latino men make up larger shares of the labor force than of the population, and Black or African American men make up a slightly smaller share.

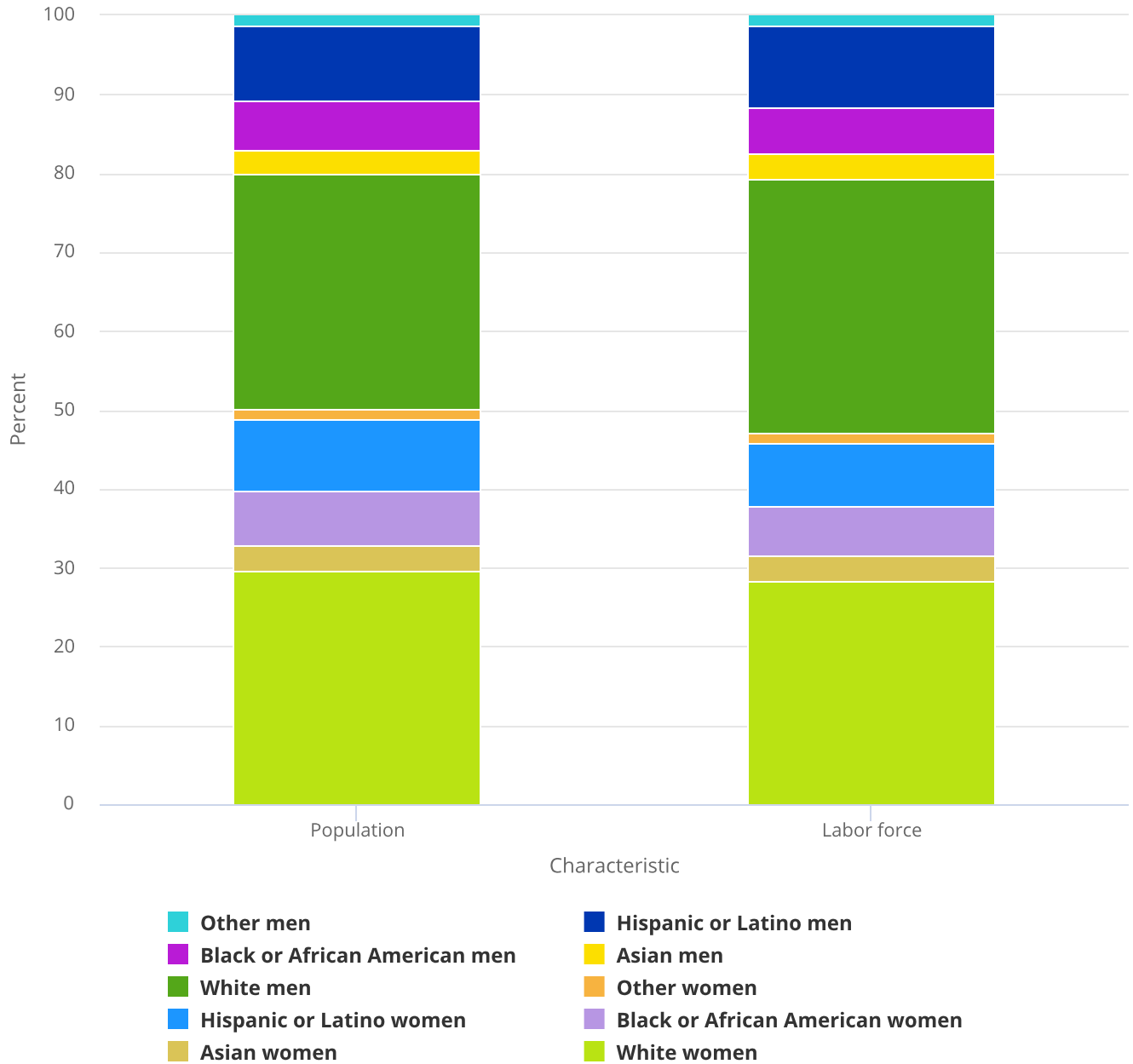
In terms of the underrepresentation of women in S&E fields, the share of S&E research doctorates awarded to women in 2019 was 42.2% versus women making up 50.1% of the population and 47.1% of the labor force. Underrepresented minorities were awarded 11.7% of S&E research doctorates, while making up about a third of both the population and the labor force. Conversely, Asians were awarded 30.9% of S&E research doctorates while making up 6.3% of the population and 6.3% of the labor force. These trends will be examined in more detail in this report.

Estimates of the proportion of the population with one or more disabilities vary depending on the criteria used to define “disability.” Also, trends in the prevalence of disability may be affected by subtle changes in wording and criteria of disability survey questions over time, leading to changes in the reporting and measurement of disability. Currently, according to the Census Bureau's American Community Survey, 10.5% of the working-age population reported some type of disability in 2019, with men and women reporting similar percentages for having any disability and for each type of disability. The most frequently reported disabilities are ambulatory difficulty and cognitive difficulty, each 4.8% of the working-age population (figure 2).

Disabilities do not necessarily limit a person's ability to participate in educational experiences or be productive in an occupation. Persons with one or more disabilities may or may not require special accommodation to enable them to succeed in school or at work.

Figure 1

Noninstitutionalized resident population of the United States and civilian labor force of the United States, ages 18–64, by ethnicity, race, and sex: 2019



Note(s):

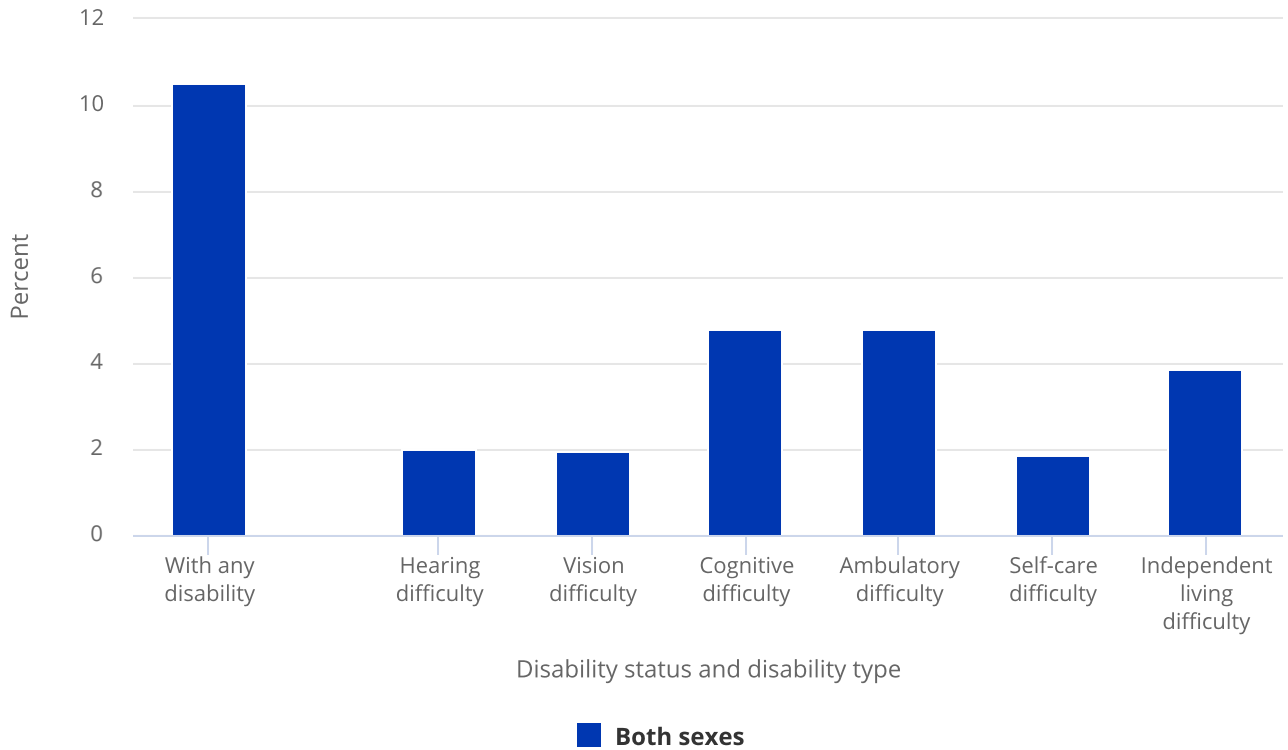
Hispanic or Latino may be any race; race categories exclude Hispanic origin. Other includes individuals not of Hispanic ethnicity who reported more than one race or a race not listed separately.

Source(s):

Census Bureau, Annual Estimates of the Resident Population, 2019; Bureau of Labor Statistics, Current Population Survey, 2019. Related detailed data: WMPD table 1-2 and table 9-3.

Figure 2

U.S. population ages 18–64 with a disability, by type of disability: 2019



Note(s):

Respondents can report more than one disability. Those who reported difficulty with one or more functionalities were classified as with disability.

Source(s):

Census Bureau, American Community Survey, 2019, Public Use Microdata Sample, accessed 25 October 2020. Related detail data: WMPD table 1-3.

Enrollment

Recent trends in undergraduate and graduate enrollment reflect the increasing diversity of the U.S. college and graduate-school populations. For example, Hispanics or Latinos have increased their share of undergraduate students, from 18.9% in 2016 to 20.2% in 2018. However, the share of enrolled undergraduate students for some groups has decreased. For example, the share of Blacks or African Americans decreased from 12.4% in 2016 to 12.1% in 2018. Among all racial and ethnic groups, more women than men enroll in college. In graduate school, the overall number of science and engineering (S&E) students declined between 2016 and 2018, but the share of Hispanic or Latino students increased during this period, from 6.4% to 7.0%. However, the shares of both American Indian or Alaska Native students and Black or African American students remained the same.²

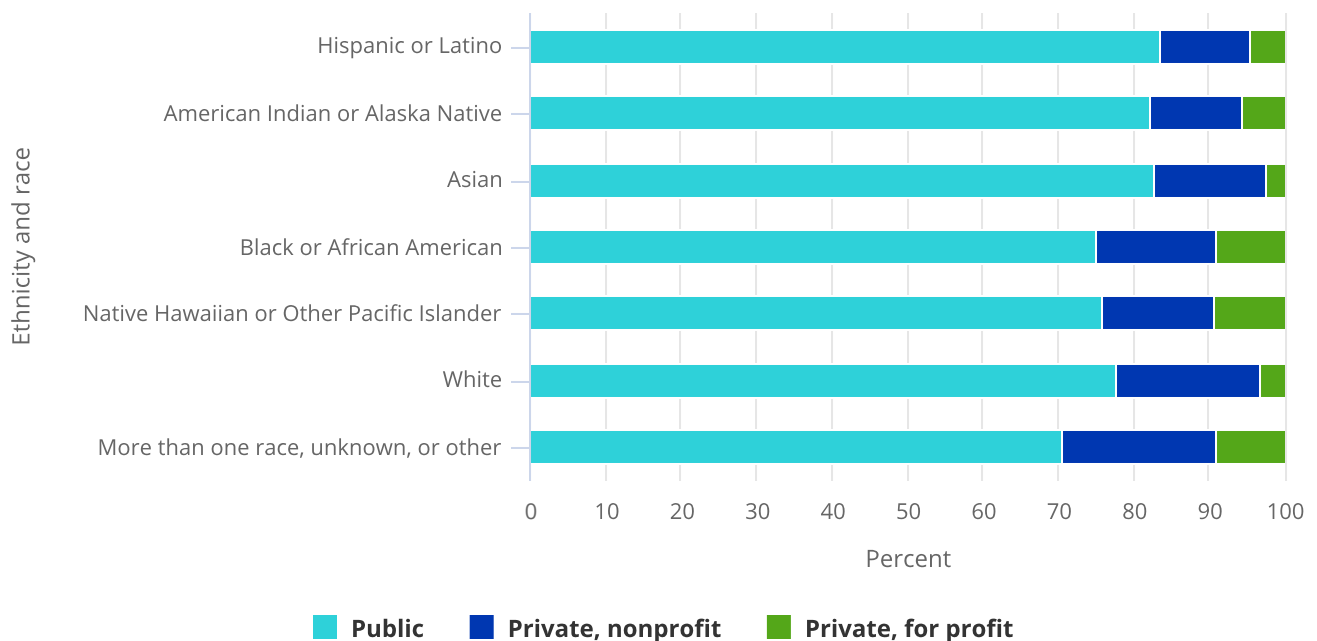
Undergraduate enrollment

Type of school

In 2018, more than three-quarters of undergraduate U.S. citizens and permanent residents were enrolled in public colleges. However, this proportion varies across racial and ethnic groups. Students who are Native Hawaiian or Other Pacific Islander, are Black or African American, or are more than one race, unknown race or ethnicity, or some other designation had the largest share enrolled in private for-profit institutions. Hispanic or Latino, Asian, and American Indian or Alaska Native students had the largest share of enrollees in public institutions. White enrollees and those reporting more than one race, unknown, or other had the largest share of students in private nonprofit institutions (figure 3).

Figure 3

Undergraduate enrollment (2 and 4 year, full and part time), by type of school, ethnicity, and race: 2018



Note(s):

Hispanic or Latino may be any race; race categories exclude Hispanic origin. Race and ethnicity breakouts and percentage calculations are for U.S. citizens and permanent residents only. Data are based on degree-granting institutions eligible to participate in Title IV federal financial aid programs.

Source(s):

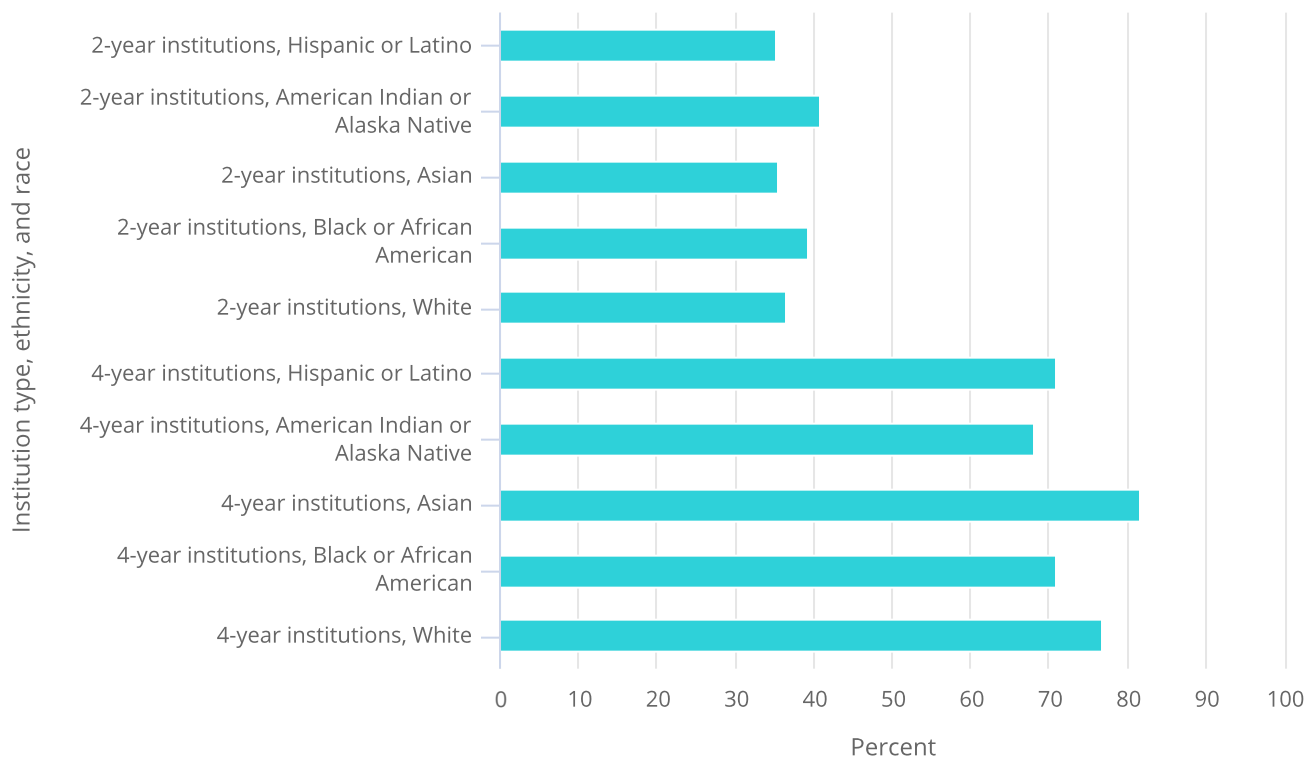
Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment Survey, 2018, unrevised provisional release data, accessed 14 February 2020. Related detailed data: WMPD table 2-5.

Full-time study

Full-time enrollment is more prevalent in 4-year institutions than in 2-year institutions for all racial and ethnic groups. However, enrollment patterns differ somewhat among these groups. At 2-year institutions, only American Indian or Alaska Native students had more than 40% enrolled as full-time students. At 4-year institutions, all groups but American Indian or Alaska Native had more than 70% enrolled full time, and Asian and White students had the highest full-time rate (81.6% and 76.8%, respectively) (figure 4).

Figure 4

Full-time undergraduate enrollment, by institution type, ethnicity, and race: 2018



Note(s):

Hispanic or Latino may be any race; race categories exclude Hispanic origin. Race and ethnicity breakouts and percentage calculations are for U.S. citizens and permanent residents only. Data are based on degree-granting institutions eligible to participate in Title IV federal financial aid programs.

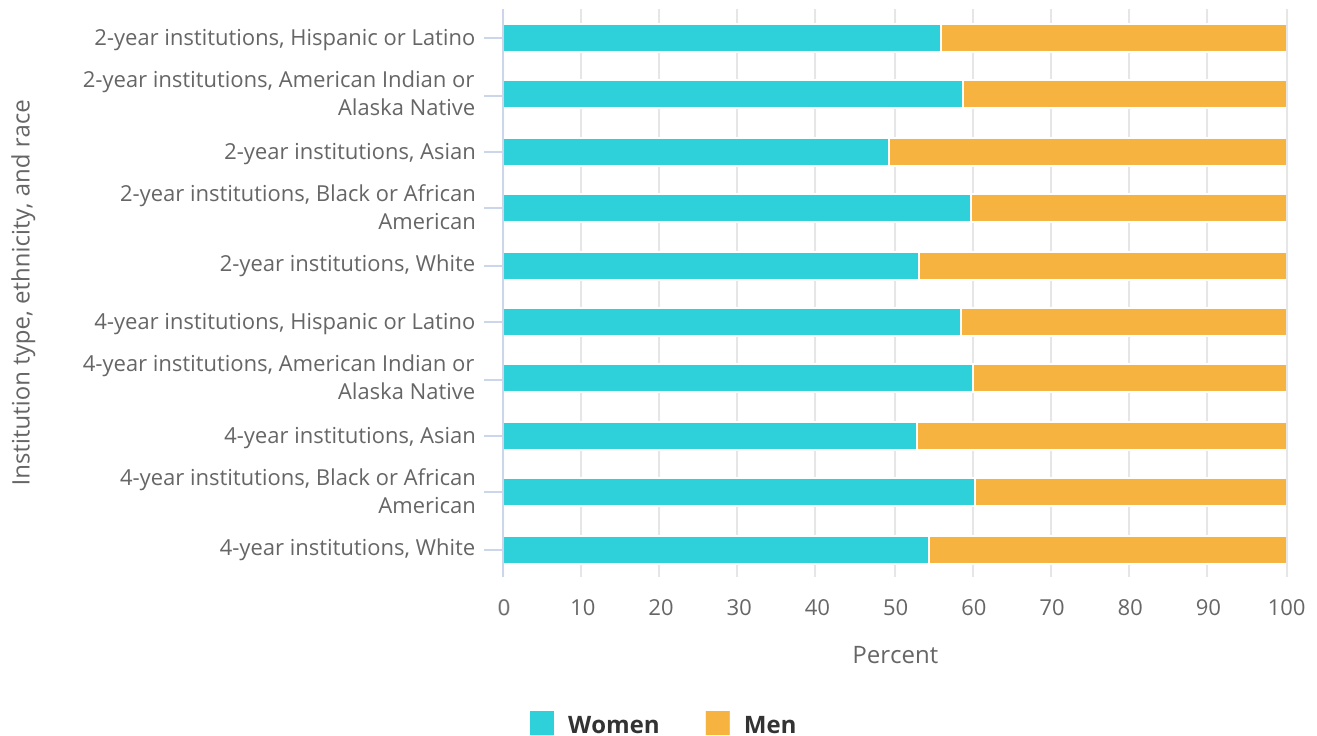
Source(s):

Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment Survey, 2018, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 2-3 and table 2-4.

Among those enrolled full time in undergraduate institutions, more women than men reported being full-time students across most racial and ethnic groups, both in 2-year and in 4-year institutions. The one exception is for Asian women, who made up slightly less than half of Asians enrolled full time in 2-year institutions (figure 5).

Figure 5

Full-time undergraduate enrollment, by institution type, ethnicity, race, and sex: 2018



Note(s):

Hispanic or Latino may be any race; race categories exclude Hispanic origin. Race and ethnicity breakouts and percentage calculations are for U.S. citizens and permanent residents only.

Source(s):

Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment Survey, 2018, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 2-3 and table 2-4.

Graduate enrollment

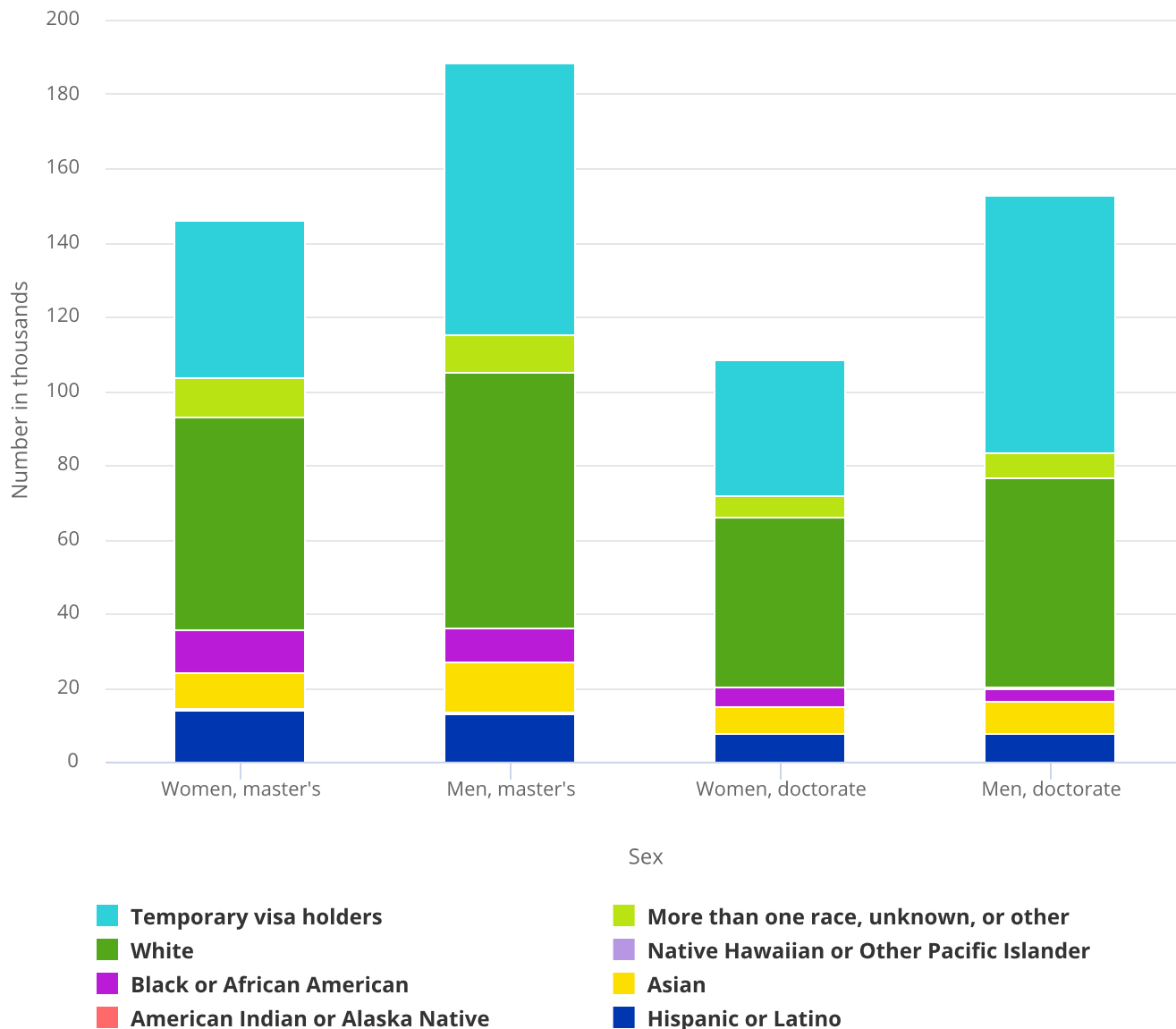
Among students enrolled in graduate school in S&E fields in 2018, White U.S. citizens and permanent residents were the largest group (38.3%), followed by those with temporary visas (37.2%). In S&E master's programs, Black or African American women made up 7.7% of all women enrolled, a larger share than that found for Black or African American men (4.7% of all men in S&E master's program). In addition, among Blacks or African Americans, women outnumber men at this level (11,290 versus 8,888 enrolled in S&E master's programs). Likewise, among S&E doctoral students, 4.6% of female students are Black or African American, a larger share than that found for Black or African American men (2.4% of all male S&E doctoral students). Hispanics or Latinos comprised 7.0% of all S&E graduate students, with Hispanic or Latino women making up 9.4% of women in S&E master's programs and 7.0% of women in S&E doctoral programs; Hispanic or Latino men enrolled in graduate school represented 6.8% of men in S&E master's programs and 5.0% of men in S&E doctoral programs.

About 222,000 graduate students (37.2%) enrolled in S&E fields in 2018 were temporary visa holders. Temporary visa holders made up 30.9% of women and 41.9% of men enrolled in graduate school in S&E fields (figure 6).

Women and men reported similar primary sources of support among the S&E full-time graduate students enrolled in 2018, although the patterns were quite different for master's students compared with the doctoral students. For master's students, the main source of support was self-support (including loans). For doctoral students, the main source of support was from their institution (figure 7).

Figure 6

Graduate students in science and engineering, by ethnicity, race, citizenship, and sex: 2018

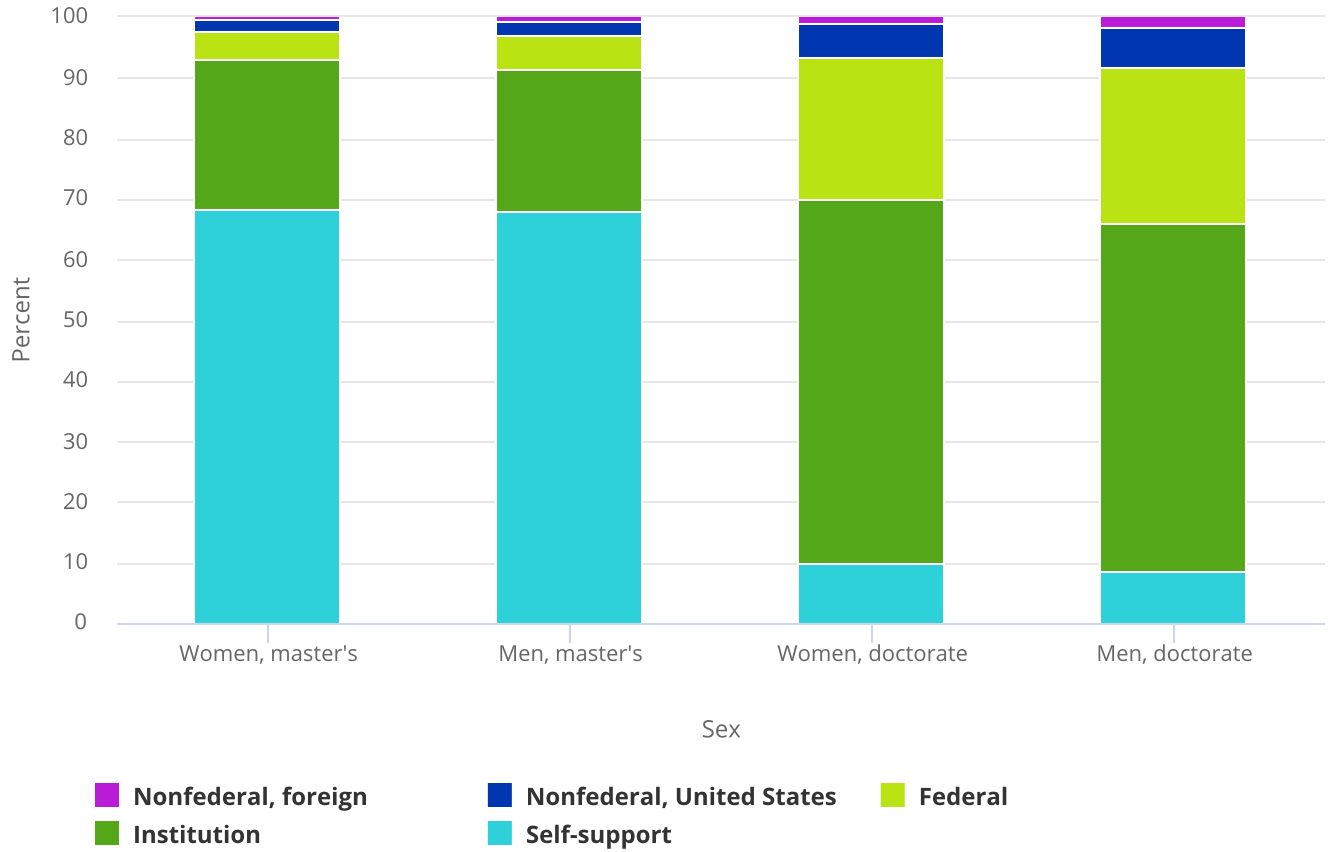


Note(s): Hispanic or Latino may be any race; race categories exclude Hispanic origin. Race and ethnicity breakouts are for U.S. citizens and permanent residents only.

Source(s): National Center for Science and Engineering Statistics, Survey of Graduate Students and Postdoctorates in Science and Engineering, 2018. Related detailed data: WMPD table 3-1.

Figure 7

Primary source of support for full-time science and engineering graduate students, by sex: 2018



Note(s):
Graduate students includes both master's and doctoral students.

Source(s):
National Center for Science and Engineering Statistics, Survey of Graduate Students and Postdoctorates in Science and Engineering, 2018. Related detailed data: WMPD table 3-6.

Field of degree: Women

Of all science and engineering (S&E) degrees awarded in 2018, women earned about half of bachelor's degrees, 44.7% of master's degrees, and 41.2% of doctoral degrees. The shares of women earning S&E bachelor's degrees and master's degrees both decreased slightly from 2008. However, the share of women earning S&E doctoral degrees increased slightly during this period. Although the share of women earning S&E degrees has been fairly stable over the past 10 years, the proportion of degrees awarded to women in S&E fields varies across and within broad fields of study. Women's highest degree shares across all three degree levels (bachelor's, master's, and doctorate) were in psychology and biological sciences. Agricultural sciences had high shares of women earning bachelor's and master's degrees. Computer sciences and engineering had the lowest degree shares of women.³

Overview

Women held a majority of the degrees in several S&E fields in 2018. They held a majority of the degrees in psychology, biological sciences, and agricultural sciences at all degree levels—bachelor's, master's, and doctoral degrees. In psychology, women received at least 70% of degrees at each level. In biological sciences, women received over 60% of bachelor's and master's degrees, and over half of doctoral degrees. In agricultural sciences, women earned over half of bachelor's and master's degrees and 47.5% of doctorates. These were the highest rates among the S&E fields. Despite these high rates, there are S&E fields with low female representation, and they are the focus of this theme.

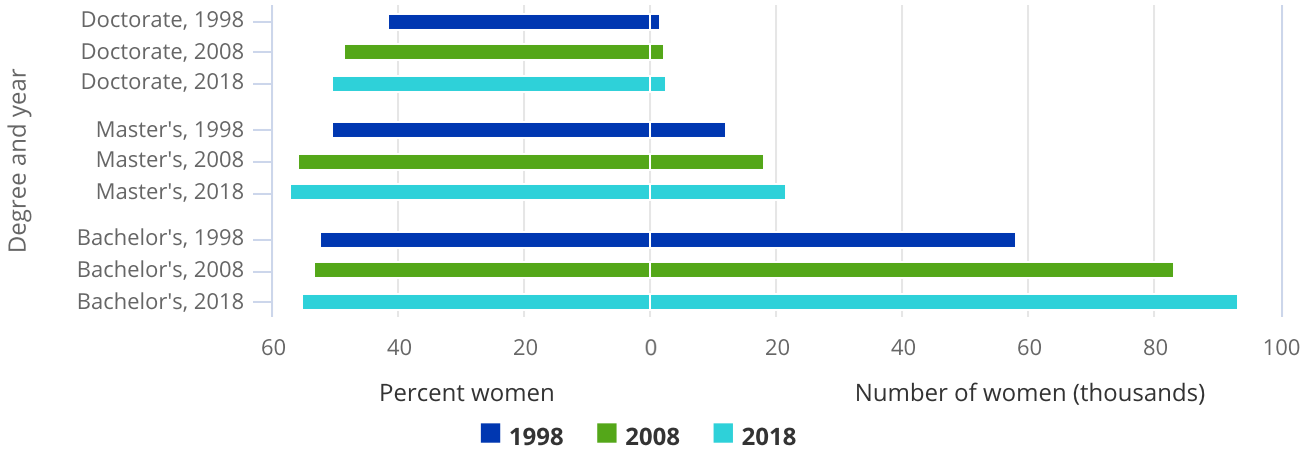
Social sciences

Overall

In the field of social sciences, women earned a majority of bachelor's degrees (55.2%) and master's degrees (57.0%), and they earned slightly more than half of doctorates. The number of female graduates in social sciences and their share in this field increased over time at all three degree levels ([figure 8](#)).

Figure 8

Degrees awarded to women: Social sciences, 1998, 2008, 2018



Source(s):

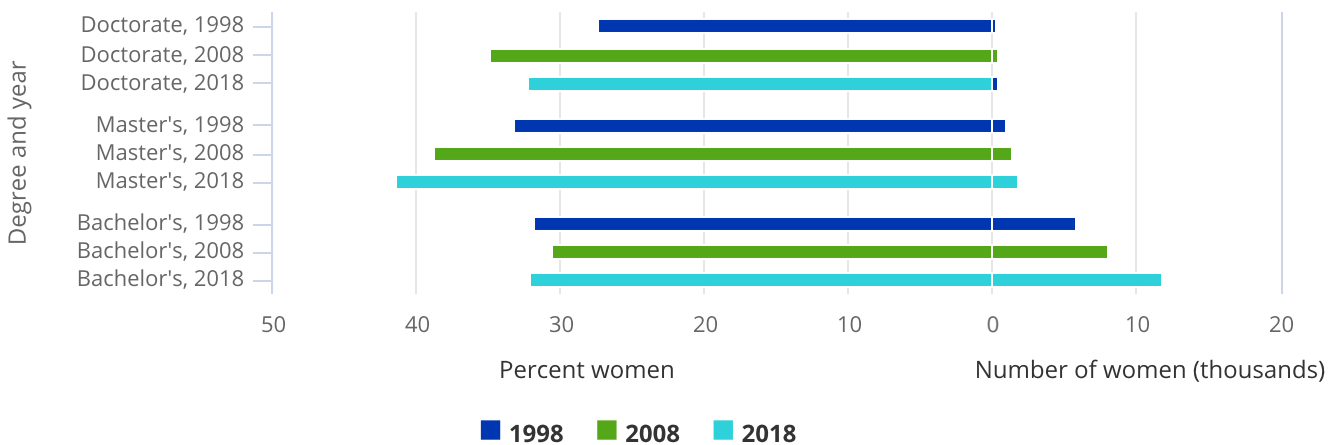
Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-2, table 6-1, and table 7-1.

Economics

Although women earned near or over half of all degrees in social sciences in 2018, their share of economics degrees at all degree levels continues to be the lowest within the social sciences, with little change in the share at the bachelor's degree level over the past 2 decades. The lack of movement at the bachelor's level may constrain future increases at the master's and doctoral levels. In addition, despite a small increase in the number of women receiving doctoral degrees in economics, women's share of these degrees has declined over the past 10 years (figure 9).

Figure 9

Degrees awarded to women: Economics, 1998, 2008, 2018



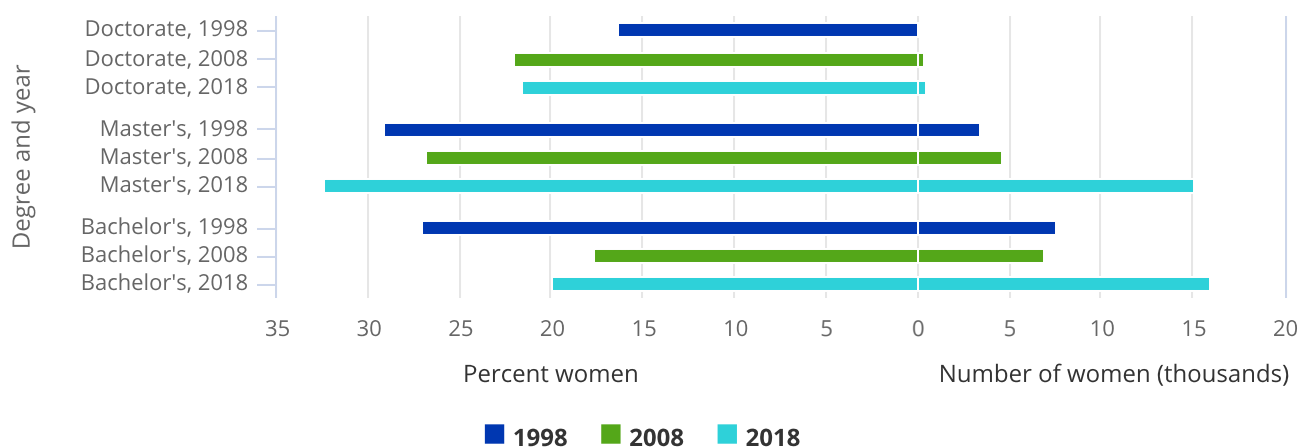
Source(s):

Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-2, table 6-1, and table 7-1.

Computer sciences

Computer sciences has one of the lowest shares of female degree recipients among the broad fields of S&E, despite an increase in the number of women receiving computer sciences degrees over the past 2 decades—the number of women with bachelor’s and doctoral degrees more than doubled, and the number with master’s degrees more than quadrupled. Although the share of women receiving master’s and doctoral degrees increased, the share receiving bachelor’s degrees declined, from 27.0% in 1998 to 19.9% in 2018. The academic pipeline for women earning advanced degrees in computer sciences may be affected, to the extent that graduate enrollment will be affected by a smaller proportion of women receiving a bachelor’s in computer sciences (figure 10).

Figure 10
Degrees awarded to women: Computer sciences, 1998, 2008, 2018

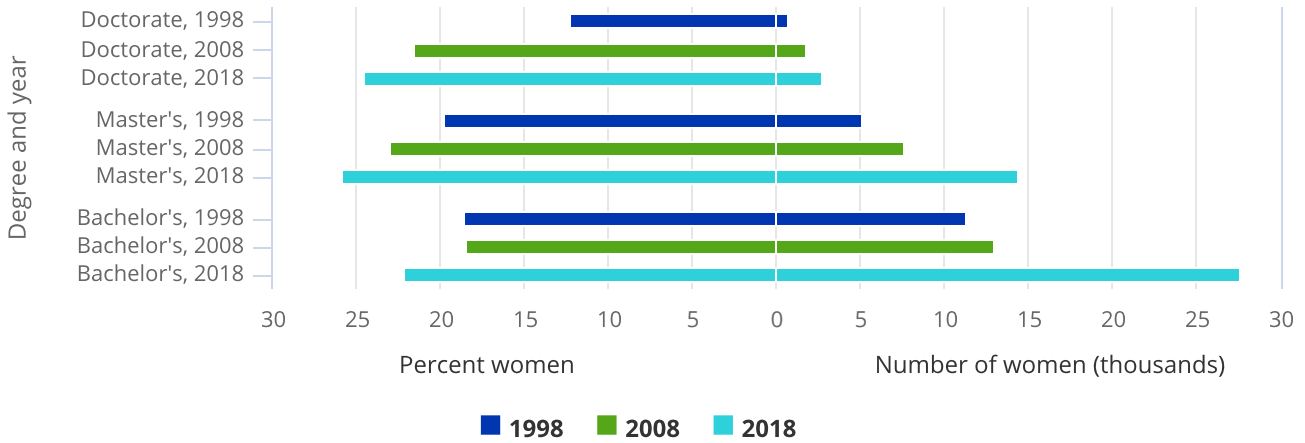


Source(s): Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-2, table 6-1, and table 7-1.

Engineering

Engineering is another S&E field with one of the lowest shares of female degree recipients. However, both the number and share of women receiving engineering degrees increased at all levels over the past 2 decades. The number of women receiving engineering doctoral degrees is small, about 2,700 in 2018, yet the share of degrees earned by women in this field doubled, from 12.3% to 24.5% since 1998 (figure 11).

Figure 11
Degrees awarded to women: Engineering, 1998, 2008, 2018

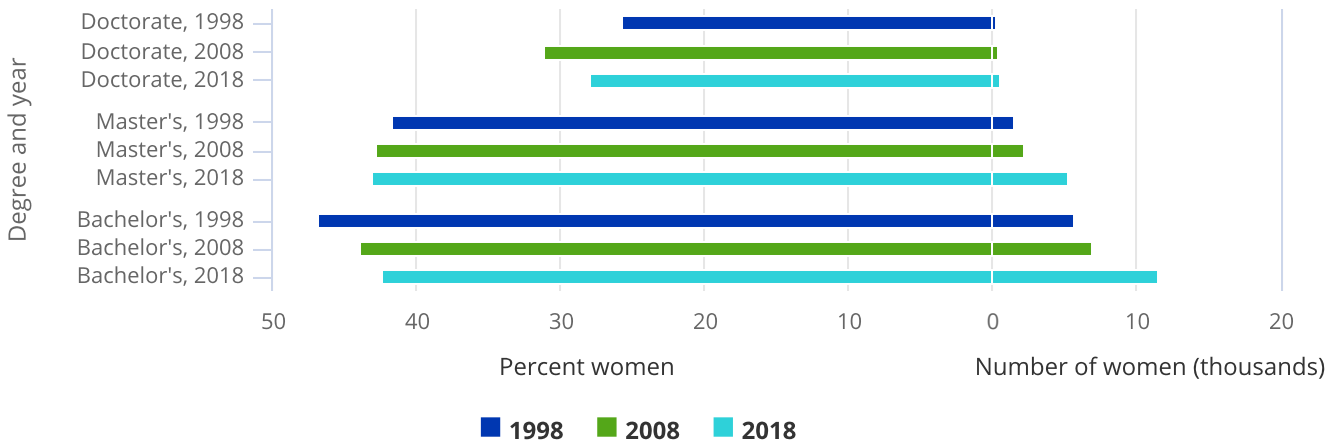


Source(s): Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-2, table 6-1, and table 7-1.

Mathematics and statistics

Women earned less than half of mathematics and statistics degrees: their share was over 40% at both the bachelor's and master's levels but under 30% at the doctoral level. Over the past 2 decades, the share of women receiving bachelor's degrees in mathematics and statistics declined and the share of women receiving master's degrees was stagnant. At the doctoral level, women's share increased between 1998 and 2008, from 25.7% to 31.1%. The share then declined to 28.0% in 2018, even though there was an increase in the number of women receiving doctoral degrees (figure 12).

Figure 12
Degrees awarded to women: Mathematics and statistics, 1998, 2008, 2018



Source(s):

Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-2, table 6-1, and table 7-1.

Earth and physical sciences

Overall

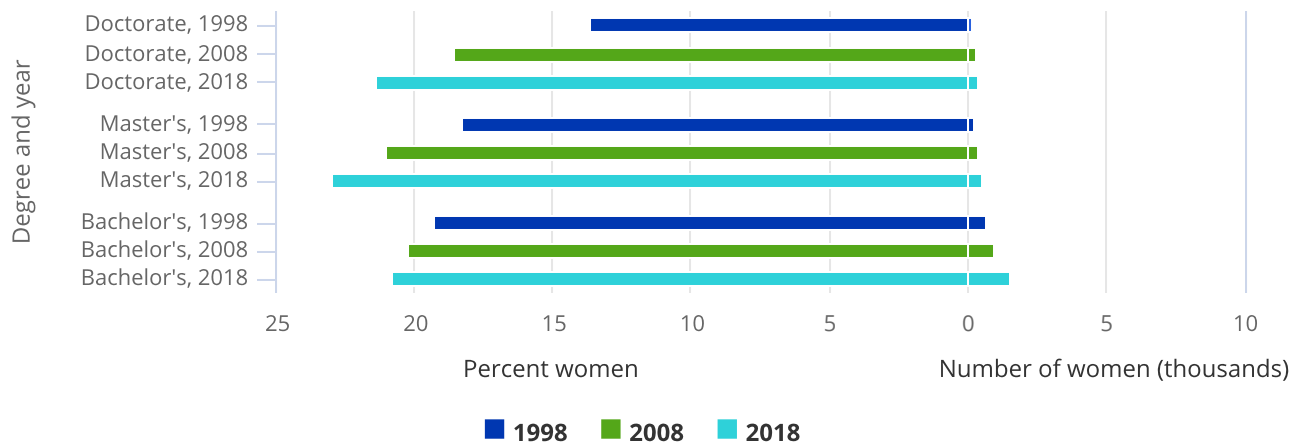
Women earned fewer than half of the degrees in the broad fields of physical and earth sciences. In 2018, women’s shares of bachelor’s, master’s, and doctoral degrees were 40.6%, 35.6%, and 32.5%, respectively, in physical sciences and 38.4%, 42.6%, and 44.1% in earth sciences. At the bachelor’s level, the share of female degree holders decreased slightly between 2008 and 2018, whereas the master’s share held fairly steady. During the same period, the share of doctoral degrees awarded to women increased, from 30.2% in 2008 to 34.3% in 2018. Among the earth and physical sciences, chemistry had the highest shares of degrees awarded to women: 50.8% at the bachelor’s level, 45.4% at the master’s level, and 39.0% at the doctoral level in 2018. Astronomy’s share of women receiving doctoral degrees in 2018 (38.9%) was just behind chemistry’s share. However, the number of female doctorate recipients in astronomy was small (82 women).

Physics

Physics has the lowest share of female degree recipients within the broad field of physical sciences. Although both the number and share of physics degrees awarded to women increased over the past 2 decades for all three degree levels, the number and share of women in this field remained very small ([figure 13](#)).

Figure 13

Degrees awarded to women: Physics, 1998, 2008, 2018



Source(s):

Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-2, table 6-1, and table 7-1.

Field of degree: Minorities

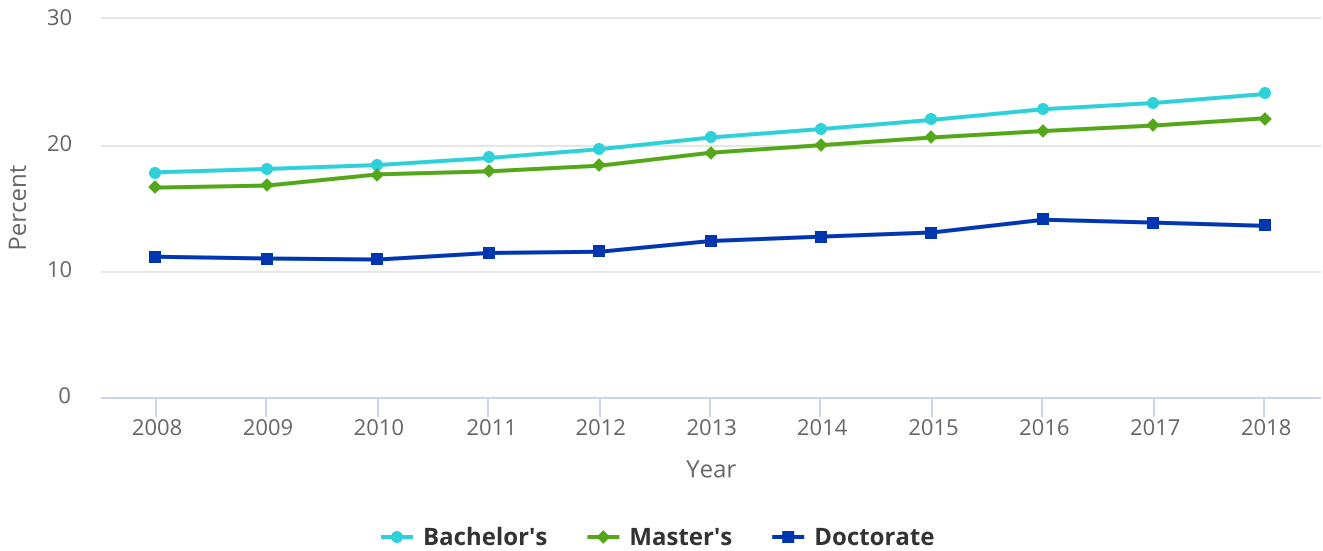
The share of science and engineering (S&E) degrees awarded to underrepresented minorities—Hispanics or Latinos, Blacks or African Americans, and American Indians or Alaska Natives—has increased over the past decade. Minority-serving institutions—historically Black colleges or universities (HBCUs) and high-Hispanic-enrollment institutions (HHEs)—have played an important role in awarding bachelor’s degrees to students who later earn doctorates in S&E fields, helping to advance representation in these fields by minorities. Despite this progress, these groups continue to be underrepresented among S&E degree recipients relative to their representation in the overall population.

Degrees earned by underrepresented minorities

Overall

In 2018, underrepresented minority students received 24.0% of all S&E bachelor’s degrees awarded to U.S. citizens and permanent residents, 22.1% of S&E master’s degrees, and 13.6% of all S&E doctoral degrees. Underrepresented minorities have earned an increasing share of degrees at all three degree levels over the past 10 years, the only exception being a slight decline in doctorates since 2016. Even with the slight dip in the share of doctoral degrees, the number of underrepresented minority doctorate recipients increased nearly 50% over the past 10 years, from 2,247 in 2008 to 3,351 in 2018 (figure 14).

Figure 14
Science and engineering degrees earned by underrepresented minorities, as a percentage of degree type: 2008–18



Note(s): Underrepresented minority groups include Black or African American, Hispanic or Latino, and American Indian or Alaska Native. Hispanic or Latino may be any race; race categories exclude Hispanic origin. Race and ethnicity breakouts and percentage calculations are for U.S. citizens and permanent residents only.

Source(s):

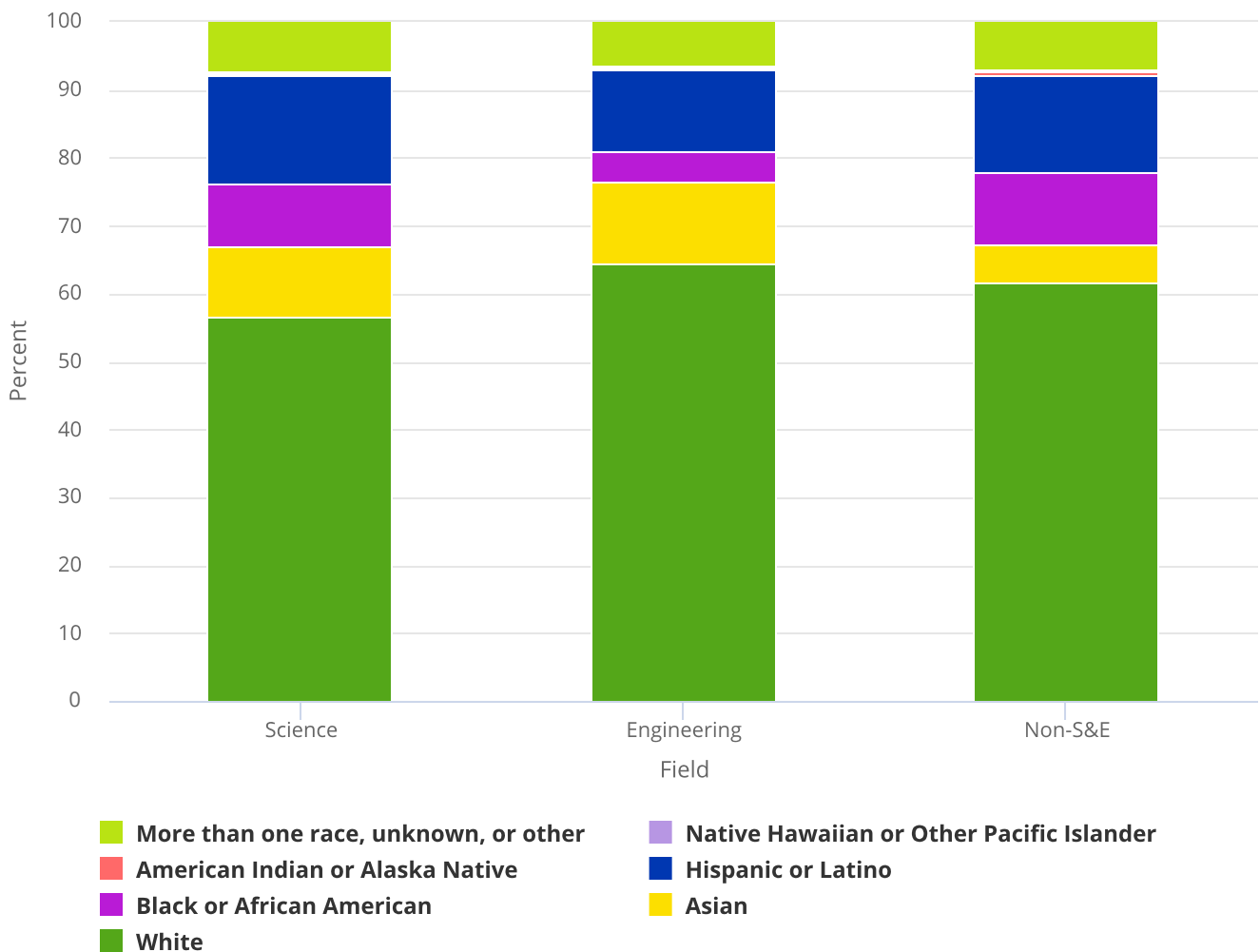
Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-3, table 6-2, and table 7-2.

Bachelor's degrees in science and engineering

In 2018, among U.S. citizens and permanent residents, Whites earned 57.9% of bachelor's degrees in S&E fields and Asians earned 10.7%. Hispanic and Latino graduates were awarded 15.1% of S&E bachelor's degrees; Black or African Americans, 8.5%; and American Indian or Alaska Natives, 0.4%. All three groups of underrepresented minorities earned a larger share of bachelor's degrees in science fields than in engineering fields in 2018 (figure 15).

Figure 15

Bachelor's degrees earned, by ethnicity and race: 2018



S&E = science and engineering.

Note(s):

Hispanic or Latino may be any race; race categories exclude Hispanic origin. Race and ethnicity breakouts and percentage calculations are for U.S. citizens and permanent residents only.

Source(s):

Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, 2018, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-3.

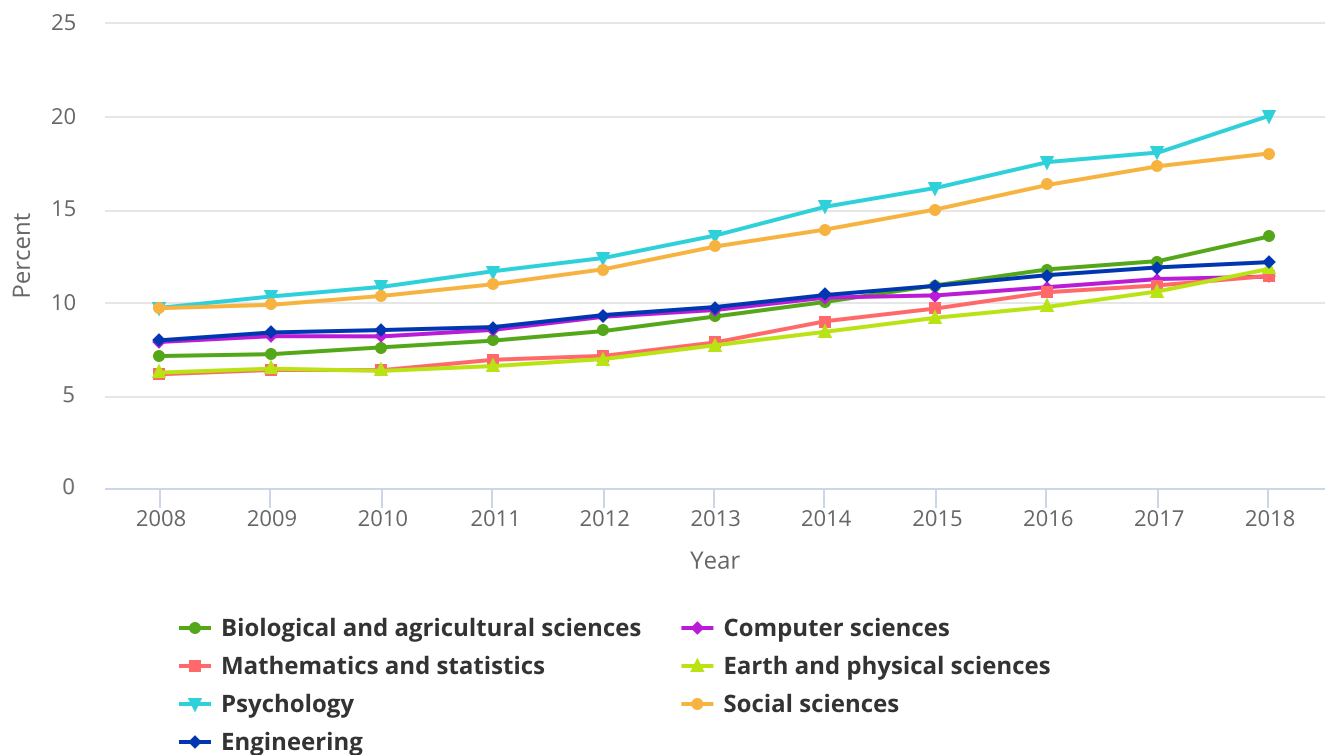
Hispanics or Latinos

Overall

The share of S&E bachelor's degrees awarded to Hispanics or Latinos increased over the past 10 years, from 8.5% of all S&E bachelor's degrees awarded to U.S. citizens and permanent residents in 2008 to 15.1% in 2018. In 2018, the S&E fields with the largest Hispanic or Latino representation were psychology (20.0%), social sciences (18.0%), and biological and agricultural sciences (13.6%) (figure 16).

Figure 16

Science and engineering bachelor's degrees earned by Hispanics or Latinos, as a percentage of degree field, by field: 2008–18

**Note(s):**

Hispanic or Latino may be any race; race categories exclude Hispanic origin. Race and ethnicity breakouts and percentage calculations are for U.S. citizens and permanent residents only.

Source(s):

Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-3.

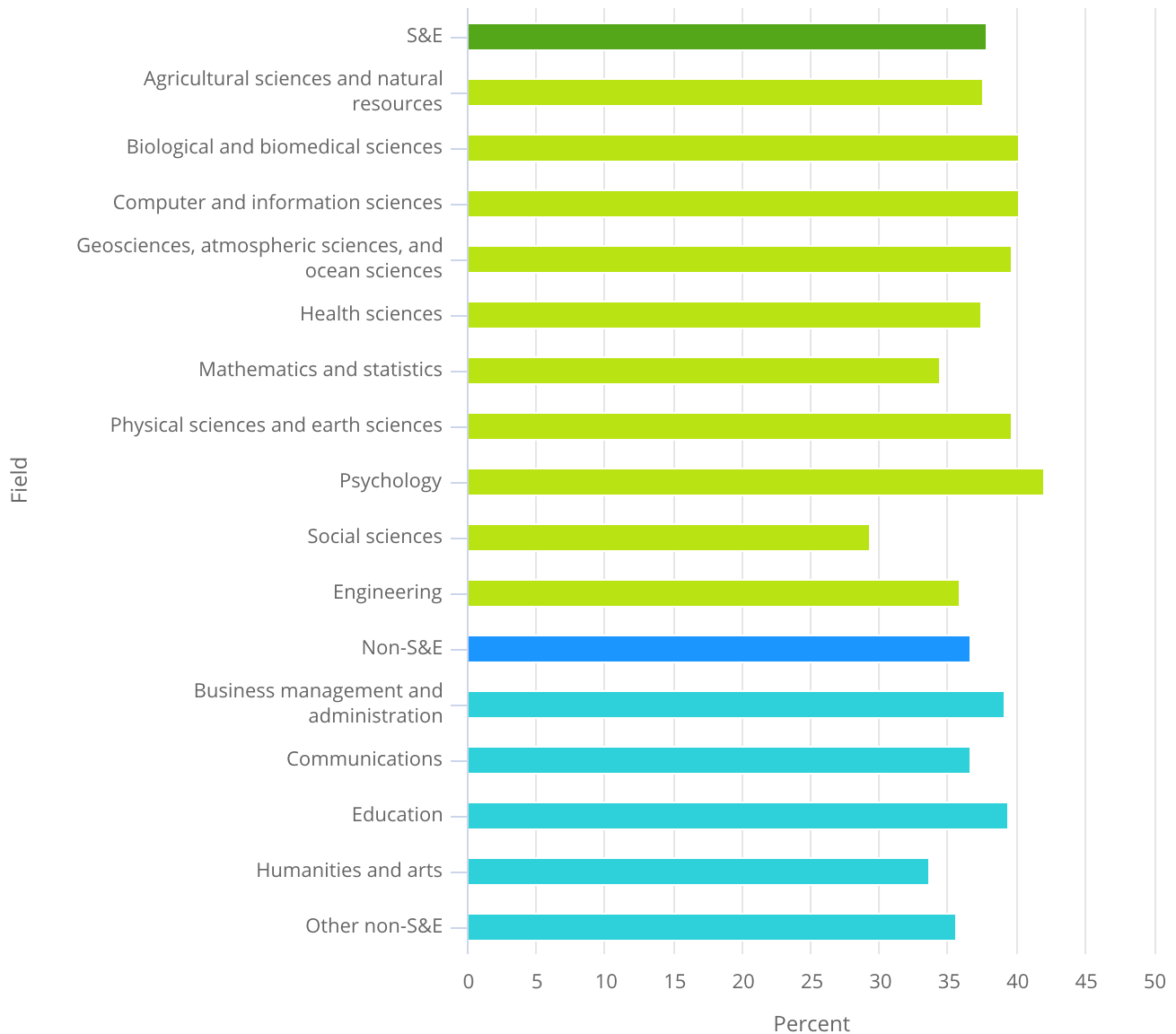
Baccalaureate origins of Hispanic or Latino doctorate recipients

HHEs play an important role in educating Hispanic or Latino students. In 2018, 51.4% of Hispanic or Latino bachelor's degree recipients in all fields earned their degree from HHE institutions, and the share for those in S&E fields was almost

as large (49.2%). Both shares of HHE graduates were slightly higher than they were in 2016. These institutions also are important in training Hispanic students for doctoral studies—37.8% of Hispanics or Latinos who received an S&E research doctorate between 2015 and 2019 received their bachelor’s degree from an HHE institution. These institutions are the baccalaureate origins of an even larger share of Hispanic doctorate recipients in biological and biomedical sciences, computer and information sciences, physical sciences and earth sciences, and psychology (figure 17). (See appendix table A-1 for the top baccalaureate institutions of Hispanic or Latino S&E doctorate recipients.)

Figure 17

Hispanic or Latino doctorate recipients with HHE baccalaureate origins, by broad or major field: 2015–19



HHE = high-Hispanic-enrollment institution; S&E = science and engineering.

Note(s):

In previous years, health sciences was classified as non-S&E. HHEs are public and private nonprofit academic institutions whose undergraduate, full-time equivalent student enrollment is at least 25% Hispanic. Hispanic or Latino may be any race; race categories exclude Hispanic origin.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates. Related detailed data: WMPD table 5-5.

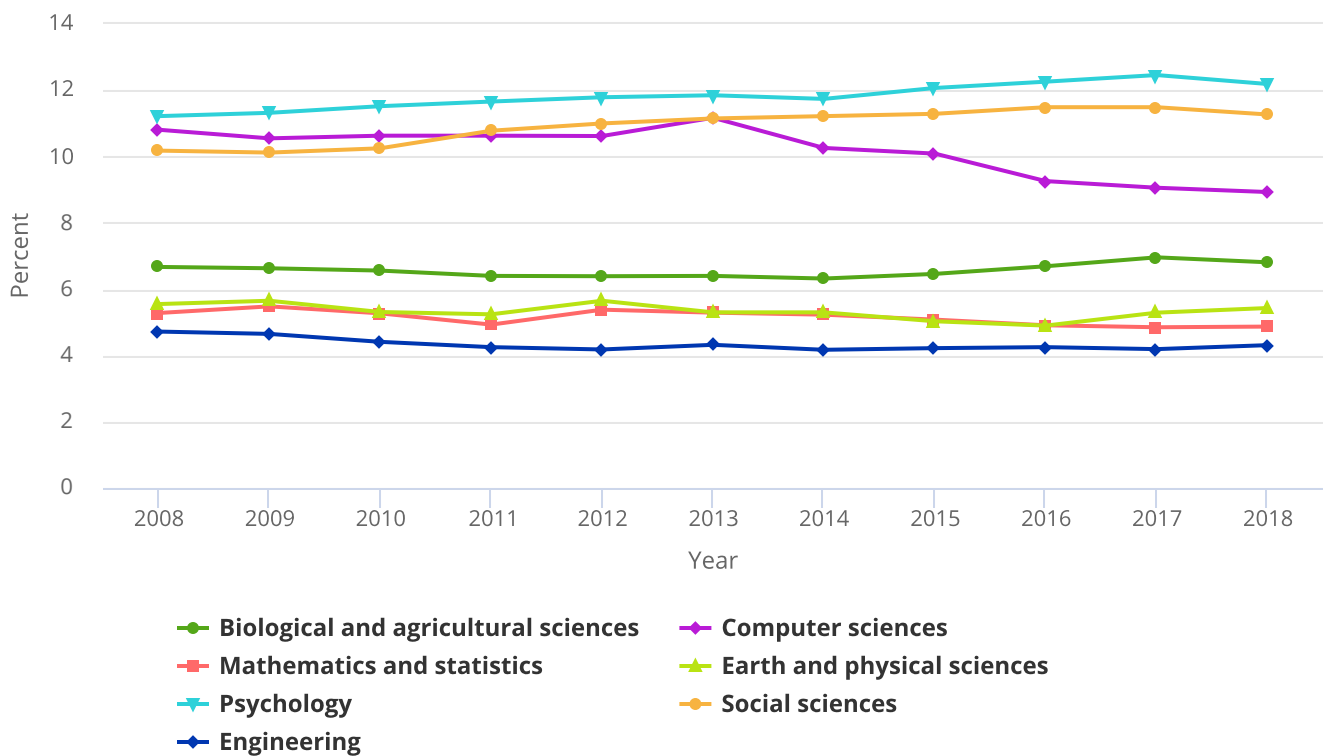
Blacks or African Americans

Overall

Blacks or African Americans, like Hispanics or Latinos, had larger representation in undergraduate fields of psychology (12.2% in 2018) and social sciences (11.3%) than they did in other undergraduate S&E fields. Overall, the shares of Black or African American bachelor's degree recipients in S&E fields held fairly steady, maintaining about 8% over 2008 to 2018. However, the number of S&E bachelor's degrees awarded to Blacks or African Americans increased by 35.9% over the past 10 years, from 41,263 in 2008 to 56,084 in 2018. This increase is roughly close to the growth rate in the number of S&E bachelor's degrees, 37.7% growth over the decade, which resulted in a similar proportion of Blacks or African Americans awarded bachelor's degrees in S&E fields over 2008 to 2018. However, representation in specific S&E fields has changed at different rates, with a relatively large decline in computer sciences and relatively little change in other S&E fields. In computer sciences, the number of Blacks or African Americans receiving bachelor's degrees increased from 4,011 to 6,558 from 2008 to 2018, but their share declined from 10.8% to 8.9% (figure 18).

Figure 18

Science and engineering bachelor's degrees earned by Blacks or African Americans, as a percentage of degree field, by field: 2008–18



Note(s):

Race and ethnicity breakouts and percentage calculations are for U.S. citizens and permanent residents only.

Source(s):

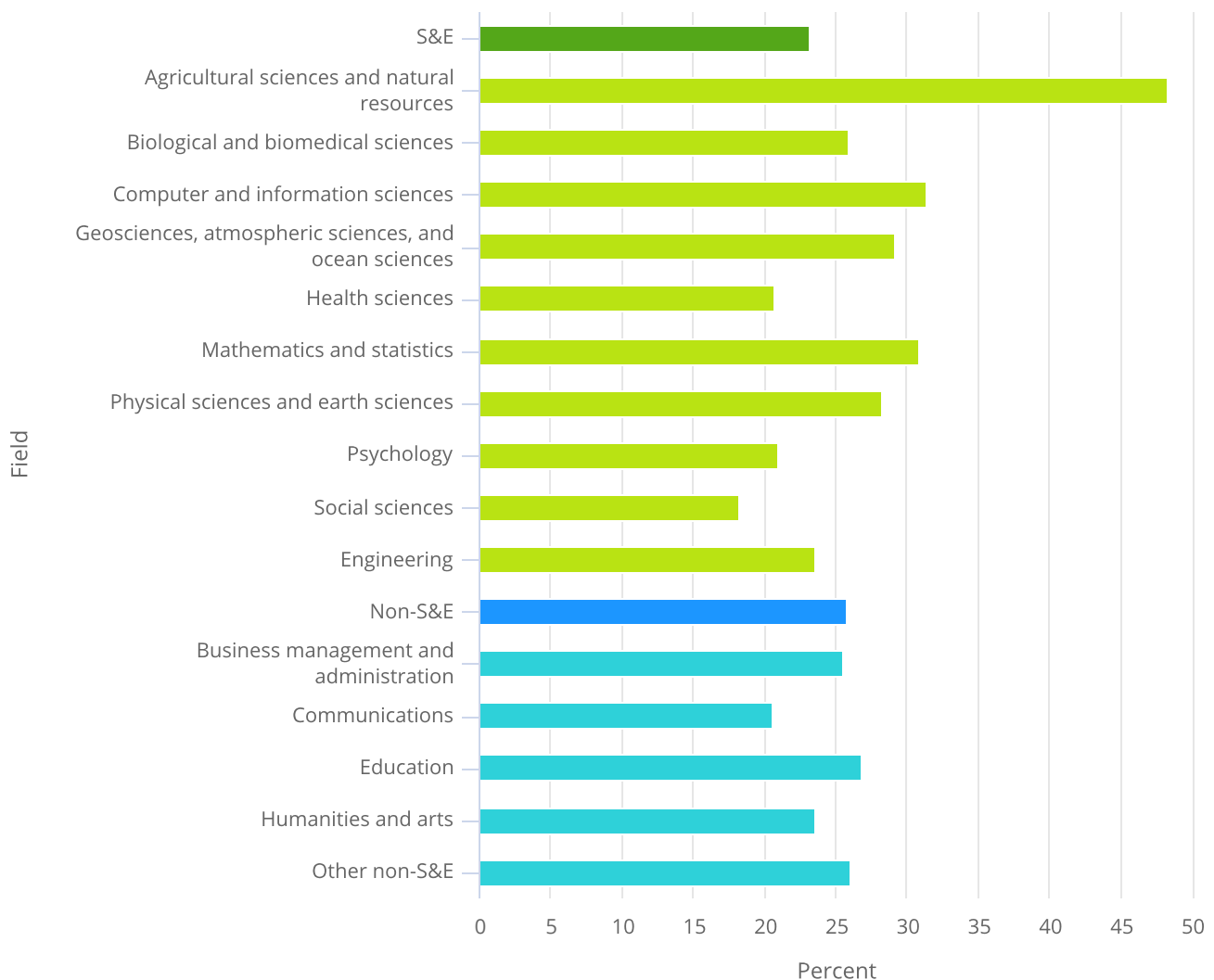
Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-3.

Baccalaureate origins of Black or African American doctorate recipients

HBCUs have an important role in preparing students for S&E doctoral programs. Although 14.9% of Blacks or African Americans who received a bachelor’s degree in S&E fields in 2018 did so from an HBCU, 23.2% of Black or African American graduates who earned an S&E doctorate between 2015 and 2019 earned their bachelor’s degree from an HBCU. Both shares were slightly down over the past few years, yet it is clear that HBCUs continue to have an impact in increasing diversity in the science and engineering fields. HBCUs produced large shares of baccalaureate recipients who later earned doctoral degrees in agricultural sciences and natural resources, computer and information sciences, and mathematics and statistics (figure 19). (See appendix table A-1 for the top baccalaureate institutions of Black or African American S&E doctorate recipients.)

Figure 19

Black or African American doctorate recipients with HBCU baccalaureate origins, by broad or major field: 2015–19



HBCU = historically Black college or university; S&E = science and engineering.

Note(s):

In previous years, health sciences was classified as non-S&E.

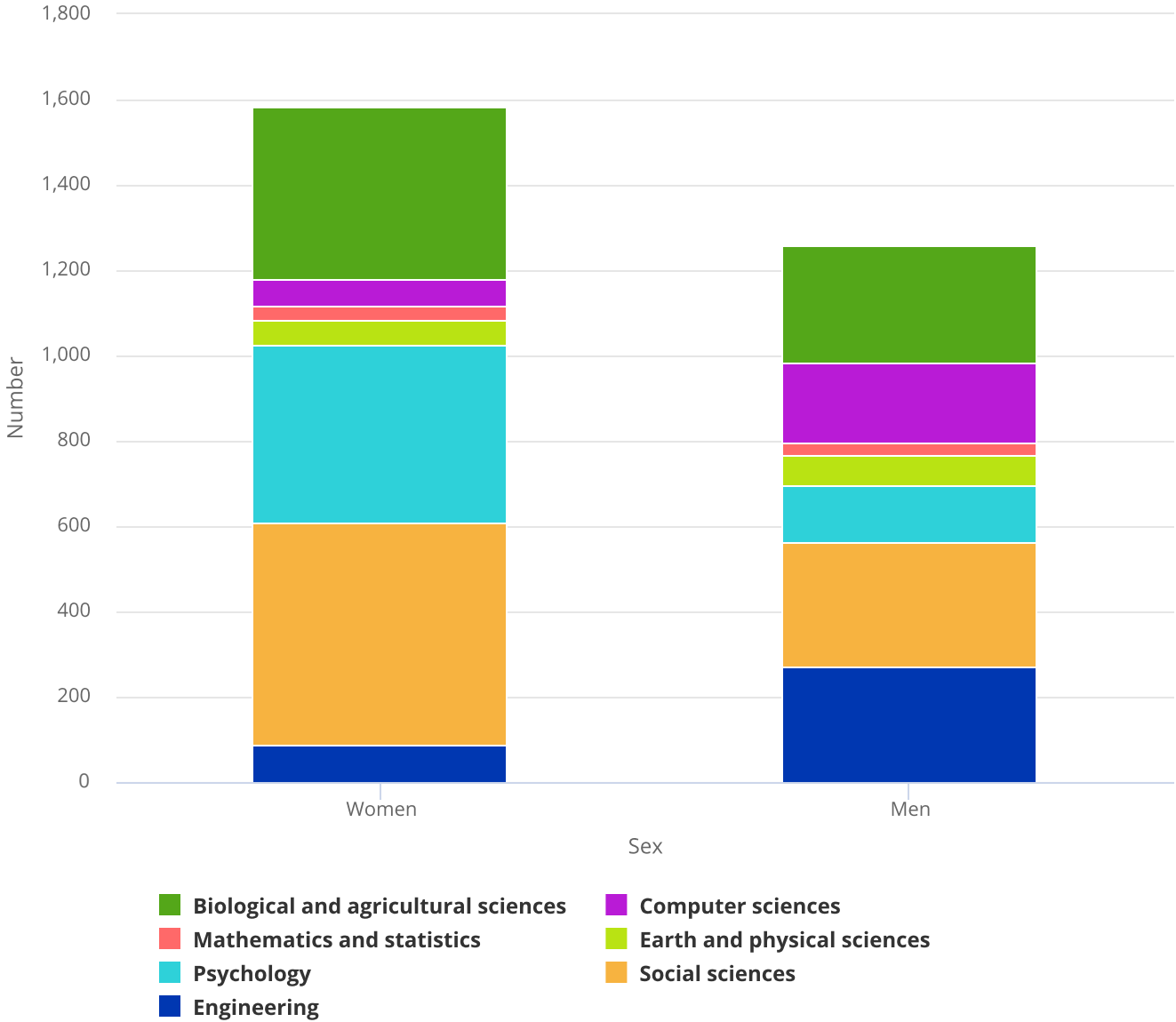
Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates. Related detailed data: WMPD table 5-4.

American Indians or Alaska Natives

The number of American Indians or Alaska Natives who earned bachelor’s degrees in S&E declined from 2,930 to 2,844 between 2016 and 2018. Across S&E fields of study, more American Indian or Alaska Native men than women received bachelor’s degrees in engineering in 2018. However, American Indian or Alaska Native women surpassed their male counterparts in social sciences, psychology, and biological and agricultural sciences (figure 20).

Figure 20
Bachelor's degrees in science and engineering earned by American Indians or Alaska Natives, by sex and field: 2018



Note(s):
Race and ethnicity breakouts are for U.S. citizens and permanent residents only.

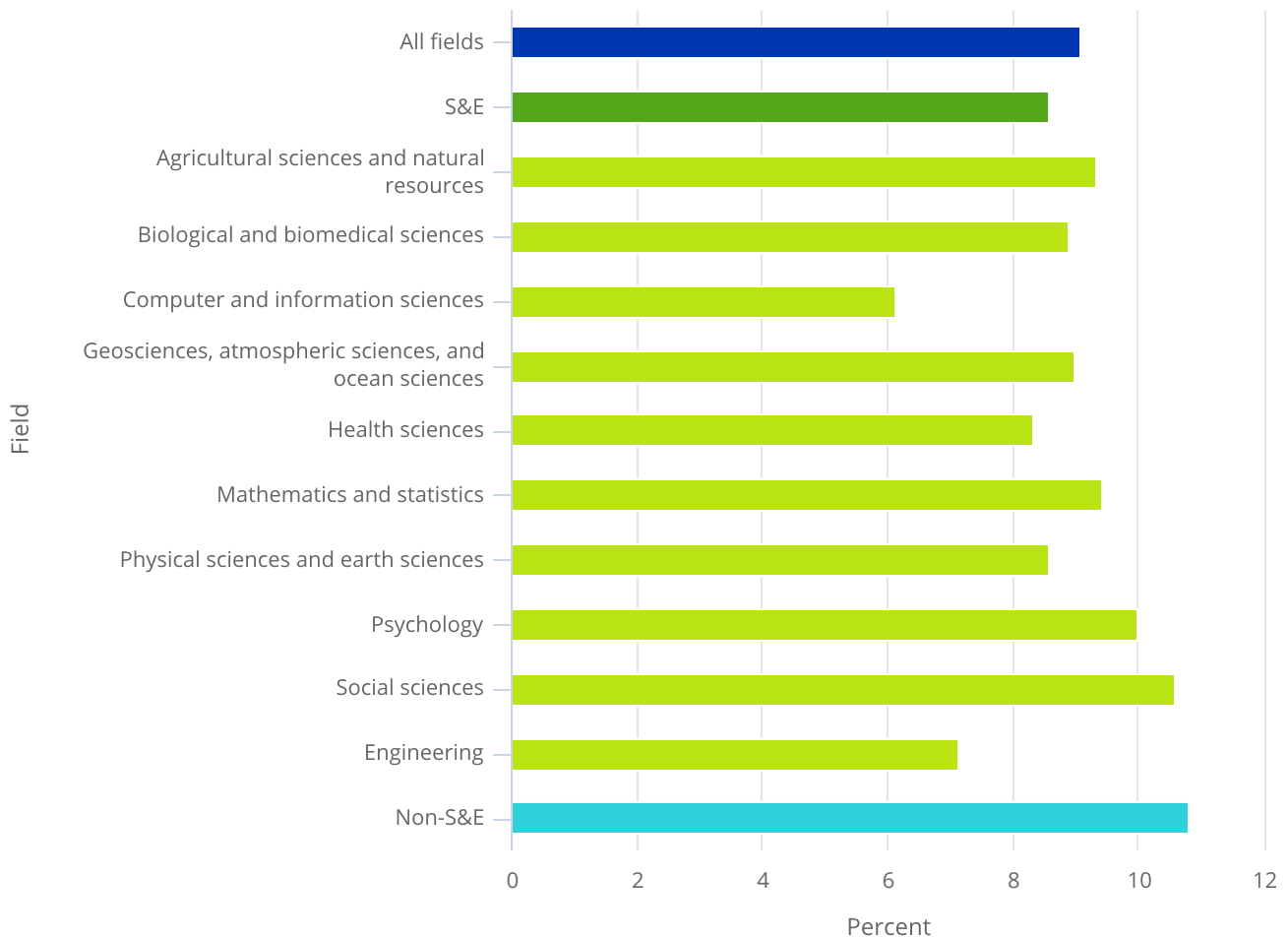
Source(s):
Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, 2018, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-3.

Persons with disability

There is little data on persons with disability by field of study. However, this information is available for doctorate recipients. Of all graduates awarded doctoral degrees in 2019, 9.1% reported having a disability. That is, moderate or greater difficulty of one or more tasks—seeing; hearing; walking; lifting 10 pounds; or concentrating, remembering, or making decisions. Among doctorate recipients, the disability rate in most science fields of study was lower than the overall rate in 2019, with the exceptions of psychology (10.0%) and social sciences (10.6%). Doctorate recipients in engineering had the lowest disability rate (7.1%) (figure 21).

Figure 21

Doctorate recipients with disability, by selected field: 2019



S&E = science and engineering.

Note(s):

In previous years, health sciences was classified as non-S&E. Doctorate recipients could report more than one disability. Survey asks degree of difficulty—none, slight, moderate, severe, or unable to do—an individual has in seeing (with glasses), hearing (with hearing aid), walking without assistance, lifting 10 pounds, or concentrating, remembering, or making decisions. Those respondents who answered "moderate," "severe," or "unable to do" for any activity were classified as having a disability. Data in this table are based on research doctorates only.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2019.

Field of degree: Intersectionality

Intersectionality is a framework for understanding how overlapping social identities can affect individuals, in particular, for helping to understand inequality. For example, a Black or African American woman may face both racial discrimination and sexism, making her experience and the inequality she faces different from both that of White women and that of Black or African American men. Because of this, it is important to analyze differences in science and engineering degree awards by race, ethnicity, and sex.

In 2018, women from underrepresented minority groups—Blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives—earned more than half of the science and engineering (S&E) degrees awarded to their respective racial and ethnic groups at all degree levels—bachelor’s, master’s, and doctorate. Underrepresented minority women have increasing and large shares of bachelor’s degrees in psychology, social sciences, and biological and agricultural sciences. Representation in these fields by underrepresented minority women is increasing, and in some cases, surpasses their representation in the labor force. In addition, they received more than half of the associate’s degrees in the S&E technology fields that prepare students for skilled technical careers.

Differences between women and men

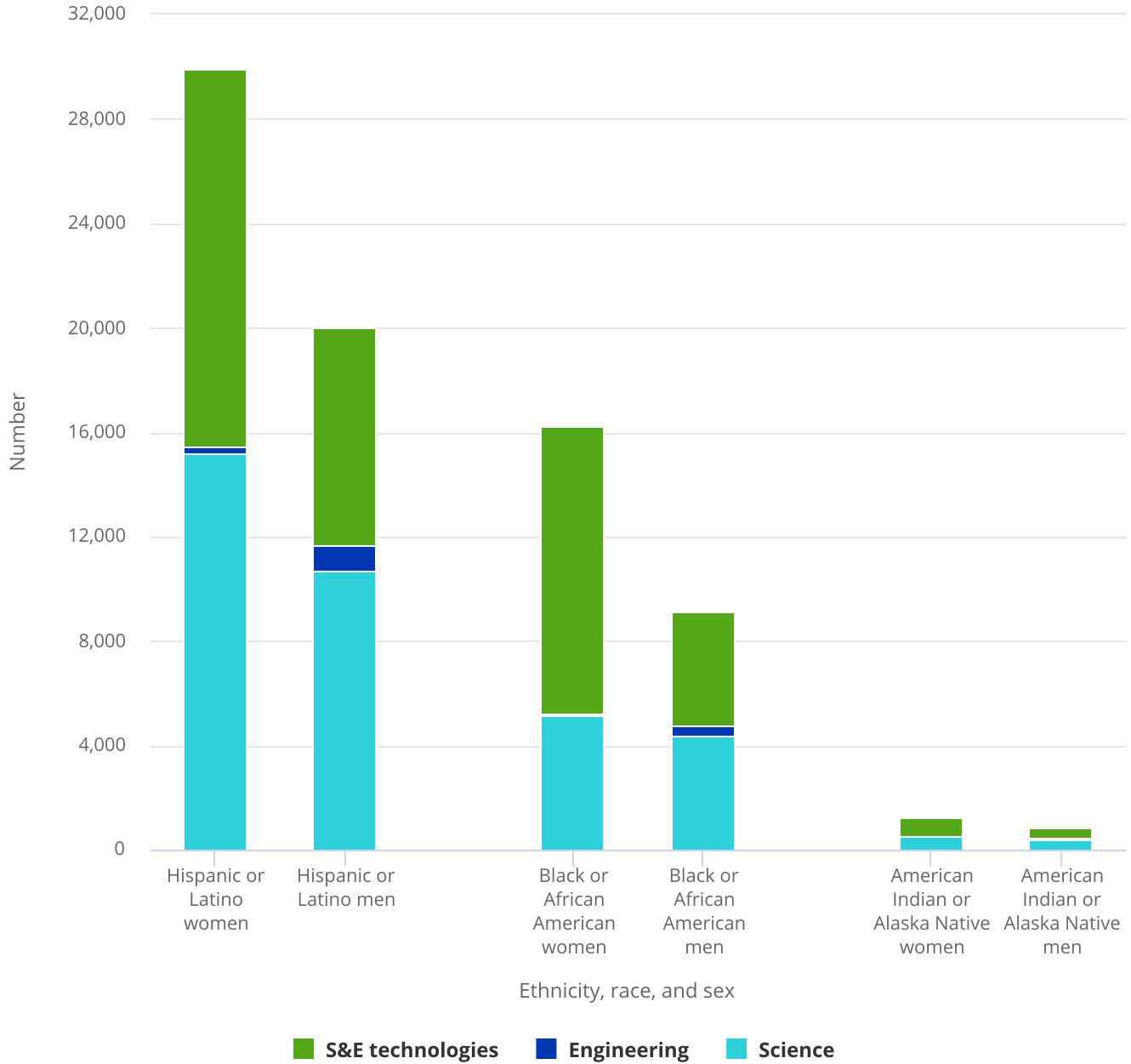
Underrepresented minorities

In 2018, underrepresented minority women received more associate’s degrees in science and in S&E technologies than did their male counterparts. Men from underrepresented groups, however, received more associate’s degrees in engineering than did females from those respective groups. Underrepresented women and men together received almost a third of associate’s degrees in S&E technologies—science, engineering, health, and other technologies that prepare students for skilled technical jobs, which are an important part of the science, technology, engineering, and mathematics (STEM) workforce ([figure 22](#)).

As noted above, at each degree level—bachelor’s, master’s, and doctorate—underrepresented minority women earned a higher share of S&E degrees than did underrepresented minority men. However, in these groups, more men than women earned degrees in engineering at the three degree levels. Over the past decade, the share of both underrepresented minority women and men receiving S&E bachelor’s degrees steadily increased, although there was a slight decline since 2016 in both the shares and number of women and men with doctorates ([figure 23](#)).

Figure 22

Associate's degrees in science, engineering, and S&E technologies, by sex, ethnicity, and selected race: 2018



S&E = science and engineering.

Note(s):

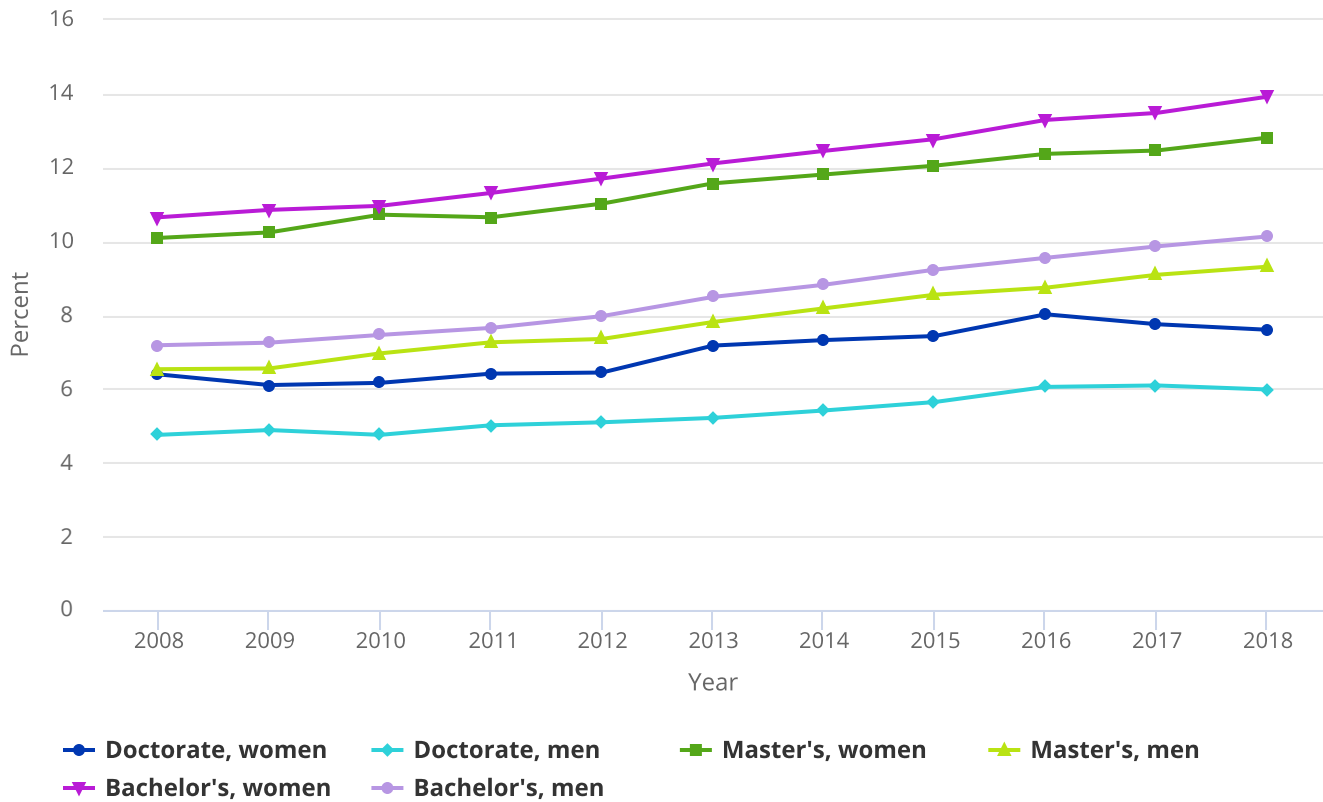
S&E technologies includes science, engineering, health, and other S&E technologies that prepare students for skilled technical jobs. Race and ethnicity breakouts are for U.S. citizens and permanent residents only. Hispanic or Latino may be any race; race categories exclude Hispanic origin. Data are based on degree-granting institutions eligible to participate in Title IV federal financial aid programs.

Source(s):

Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, 2018, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 4-3.

Figure 23

Science and engineering degrees earned by underrepresented minority women and men, as a percentage of all S&E degrees awarded of each degree, by degree type: 2008–18



S&E = science and engineering.

Note(s):

Underrepresented minority groups include Black or African American, Hispanic or Latino, and American Indian or Alaska Native. Hispanic or Latino may be any race; race categories exclude Hispanic origin. Race and ethnicity breakouts and percentage calculations are for U.S. citizens and permanent residents only.

Source(s):

Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-3, table 6-2, and table 7-5.

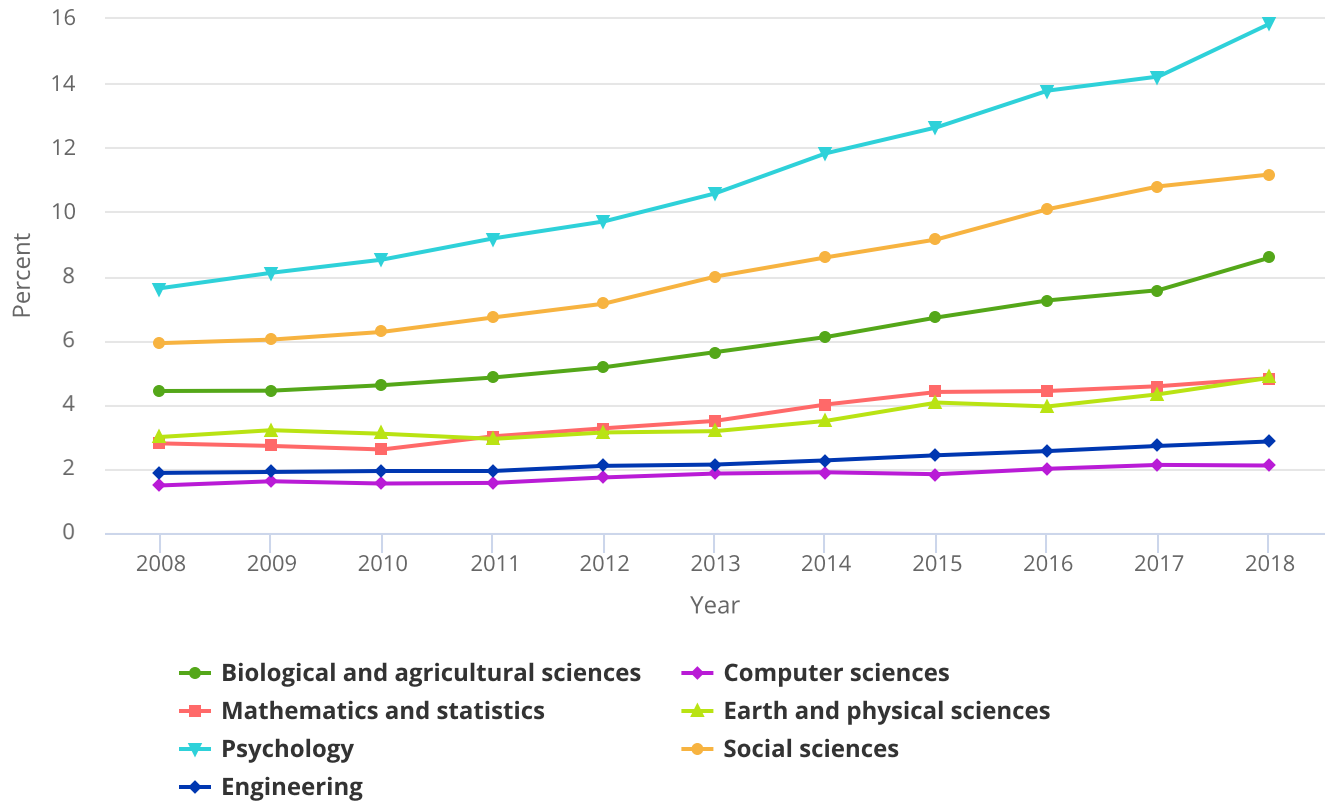
Bachelor's degrees

Hispanic or Latino women

Hispanic or Latino women earned a higher share of bachelor's degrees in psychology, social sciences, and biological and agricultural sciences than in other S&E fields. The share of the bachelor's degrees they earn in these three broad fields increased rapidly since 2008. The share of Hispanic or Latino women receiving bachelor's degrees in engineering and computer sciences increased only slightly over time. Nevertheless, these shares represent about 3,200 Hispanic or Latino women receiving bachelor's degrees in engineering in 2018 and about 1,500 in computer sciences (figure 24).

Figure 24

Science and engineering bachelor's degrees earned by Hispanic or Latino women, as a percentage of degree field, by field: 2008–18



Note(s):

Hispanic or Latino may be any race; race categories exclude Hispanic origin. Race and ethnicity breakouts and percentage calculations are for U.S. citizens and permanent residents only.

Source(s):

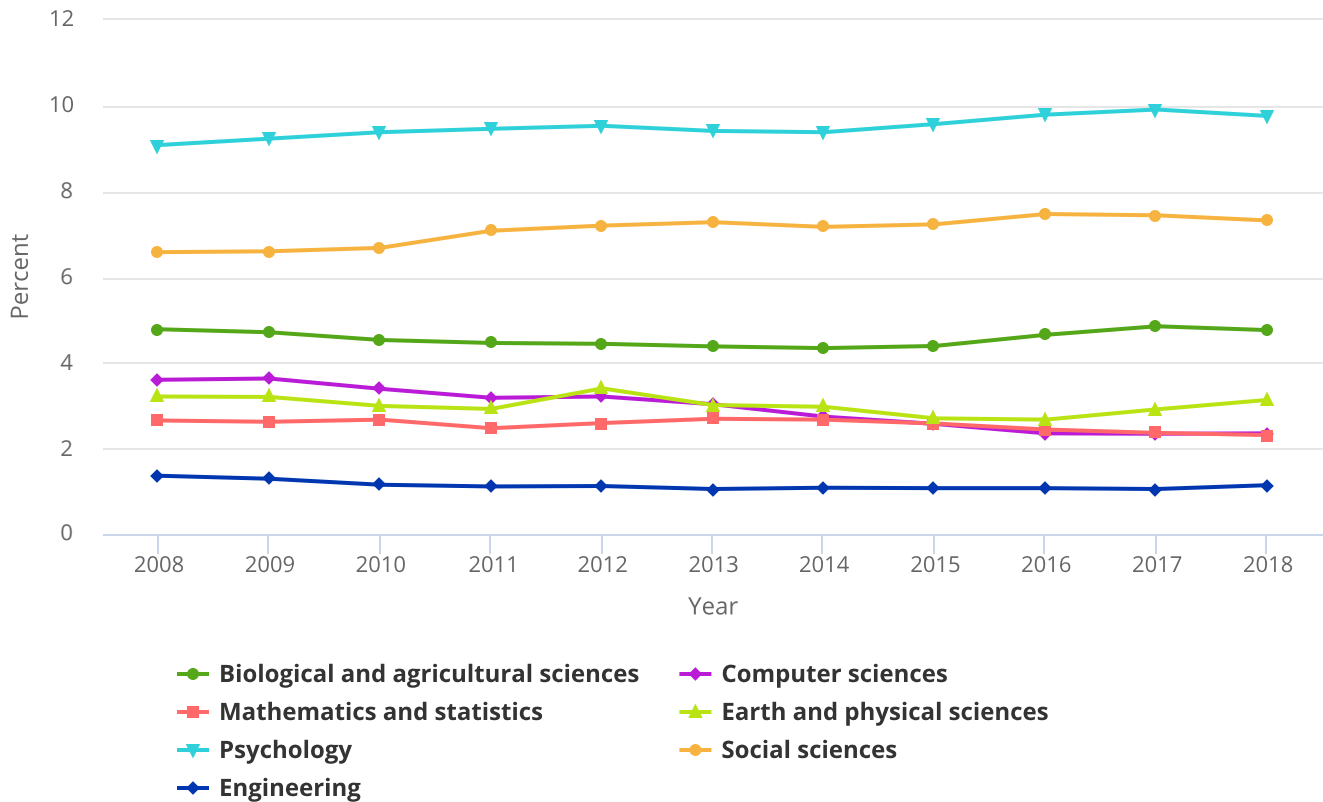
Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-3.

Black or African American women

Black or African American women, similar to Hispanic or Latino women, earned a higher share of bachelor's degrees in psychology, social sciences, and biological and agricultural sciences than they did in any other broad S&E field. Their shares in these fields and other S&E fields were stable despite an increase in their numbers in these fields. The number of Black or African American women who received S&E bachelor's degrees increased from 26,229 in 2008 to 34,359 in 2018, a 31.0% increase, somewhat trailing the 37.7% increase in bachelor's degrees in S&E awarded to U.S. citizens and permanent residents over the same period. In 2018, Black or African American women received over 1,200 bachelor's degrees in engineering, one of the fields with low shares of Black or African American female participation, which was the peak number of recipients over the previous decade (figure 25).

Figure 25

Science and engineering bachelor's degrees earned by Black or African American women, as a percentage of degree field, by field: 2008–18

**Note(s):**

Race and ethnicity breakouts and percentage calculations are for U.S. citizens and permanent residents only.

Source(s):

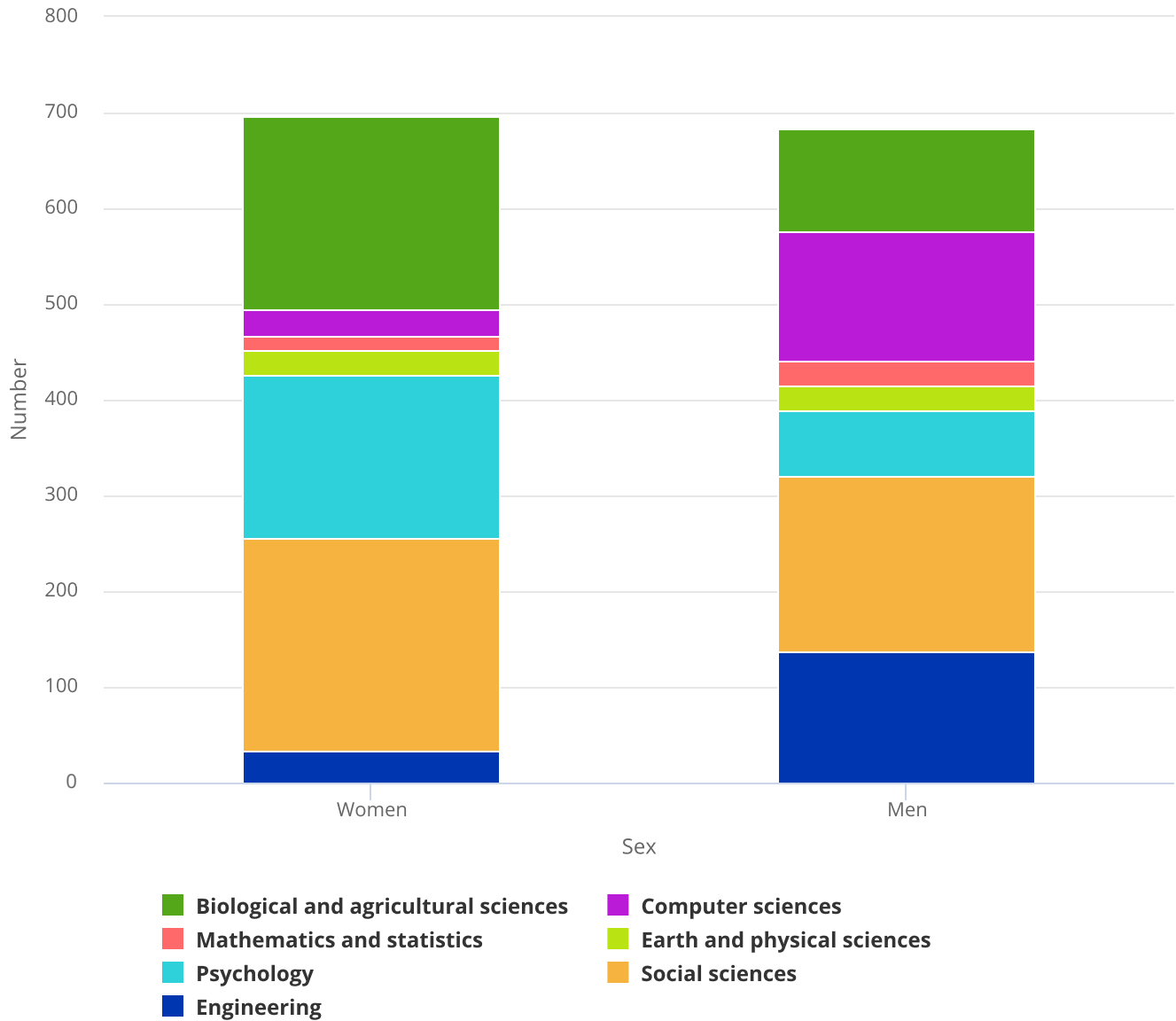
Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-3.

Native Hawaiians or Other Pacific Islanders

A small minority group that is not always presented in detail due to numerical constraints is Native Hawaiians or Other Pacific Islanders. A total of 1,379 bachelor's degrees in S&E fields were awarded to individuals in this group in 2018 (from a total of more than 660,000 S&E bachelor's degrees), down from a peak of 1,611 in 2015. Social sciences, biological and agricultural sciences, and psychology had the most female Native Hawaiians or Other Pacific Islanders bachelor's degree recipients, whereas men most frequently studied social sciences, engineering, and computer sciences. In 2018, slightly more Native Hawaiian or Other Pacific Islander women received bachelor's degrees in S&E than their male counterparts (figure 26).

Figure 26

Bachelor's degrees in science and engineering earned by Native Hawaiians or Other Pacific Islanders, by sex and field: 2018



Note(s):
Race and ethnicity breakouts are for U.S. citizens and permanent residents only.

Source(s):
Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, 2018, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-3.

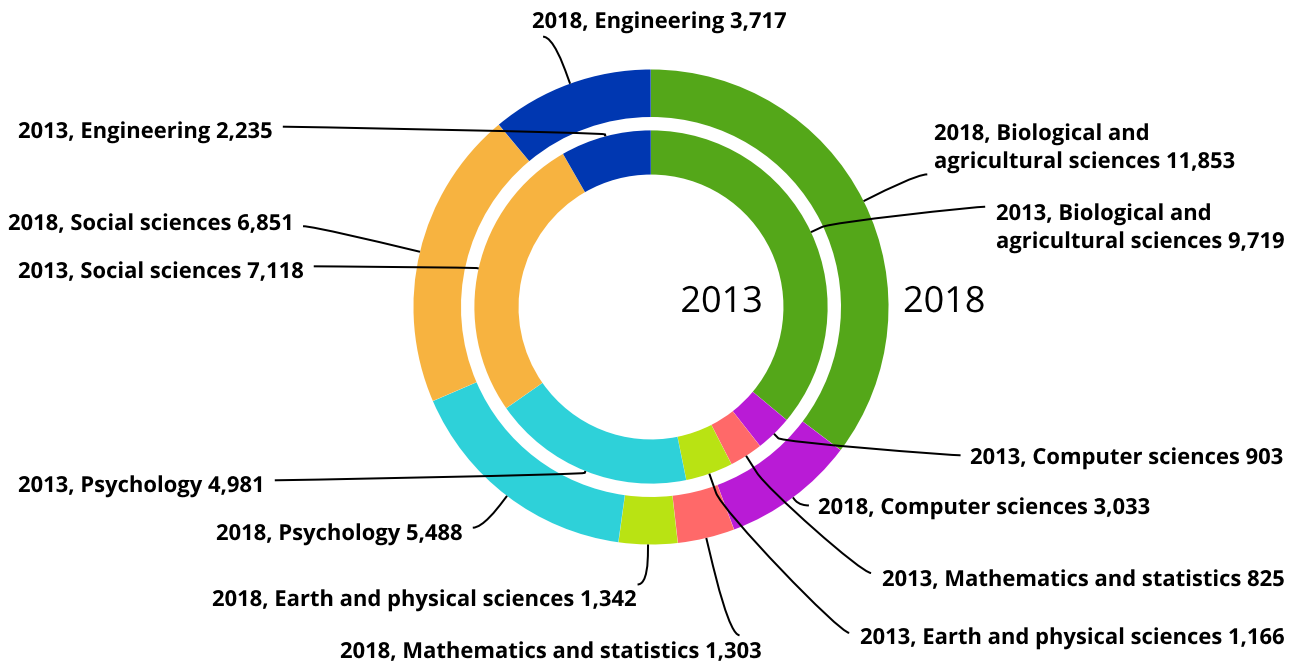
Asian women

Asian women earned their largest number of S&E bachelor's degrees in biological and agricultural sciences (almost 12,000 graduates in 2018, and 7.8% of the field). In most S&E fields, the shares of Asian women have slowly increased over the past few years, with the exception of computer sciences where the number of graduates more than tripled in the past 5 years. Despite relatively small numbers in mathematics and statistics, Asian women received over 1,300 bachelor's

degrees in this field in 2018, 5.8% of the field and almost double the number in 2011. Likewise, in earth and physical sciences, Asian women received over 1,300 bachelor’s degrees, 4.6% of the field in 2018 (figure 27).

Figure 27

Science and engineering bachelor’s degrees earned by Asian women, by field: 2013 and 2018



Note(s):

In 2013, Asian women were 4.7% of bachelor’s degrees in science and engineering, and in 2018 they were 5.1%. Race and ethnicity breakouts are for U.S. citizens and permanent residents only.

Source(s):

Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data, accessed 14 January 2020. Related detailed data: WMPD table 5-3.

Employment

Science and engineering (S&E) education is a large investment of time and resources for both the individual and the economy. Underutilization of this S&E expertise because of unemployment or underemployment affects the U.S. S&E enterprise. The unemployment rate is lower overall for scientists and engineers—those with at least a bachelor’s degree and an S&E or S&E-related degree or occupation—than for the U.S. labor force. However, a larger share of scientists and engineers working part time want a full-time job, compared with the corresponding share of all U.S. part-time workers.⁴

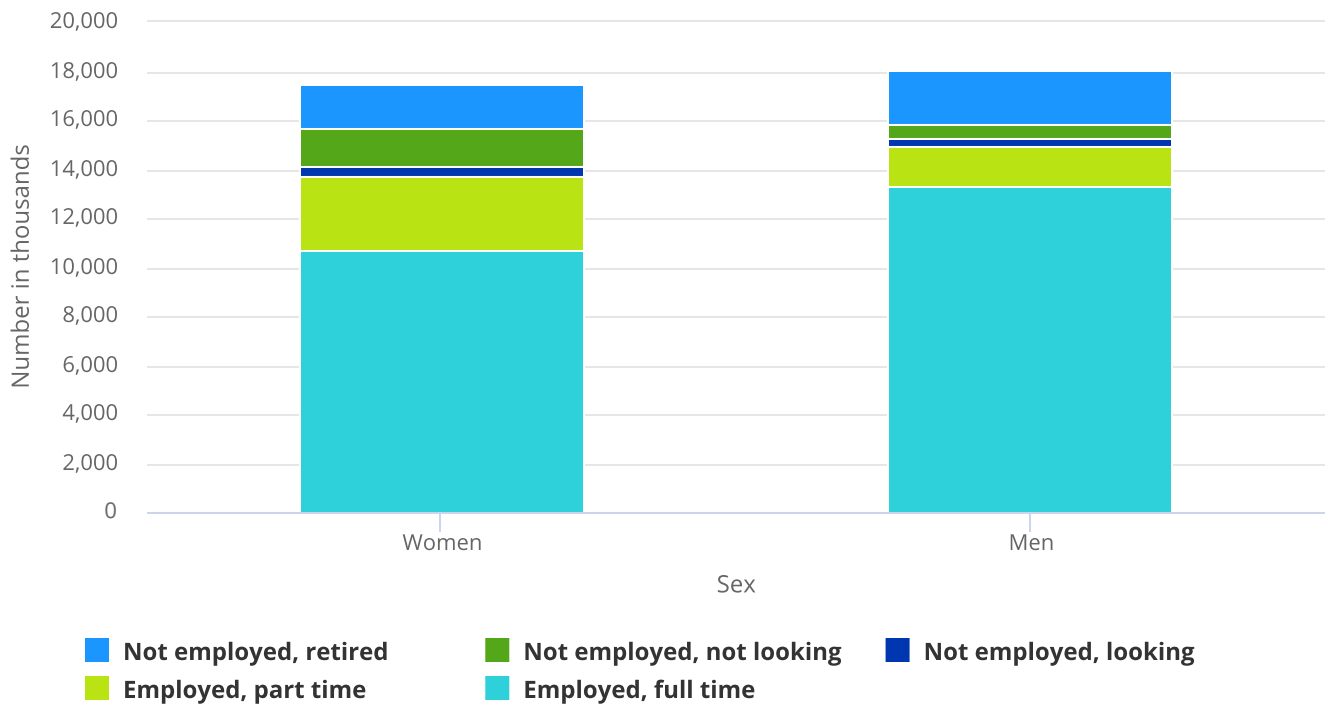
Employment status

Women and men

Among scientists and engineers, more men than women were employed full time in 2019 (13.3 million men versus 10.7 million women) and about twice as many women were employed part time (3.0 million women versus 1.6 million men) (figure 28).

Figure 28

Employment status of scientists and engineers, by sex: 2019



Note(s):

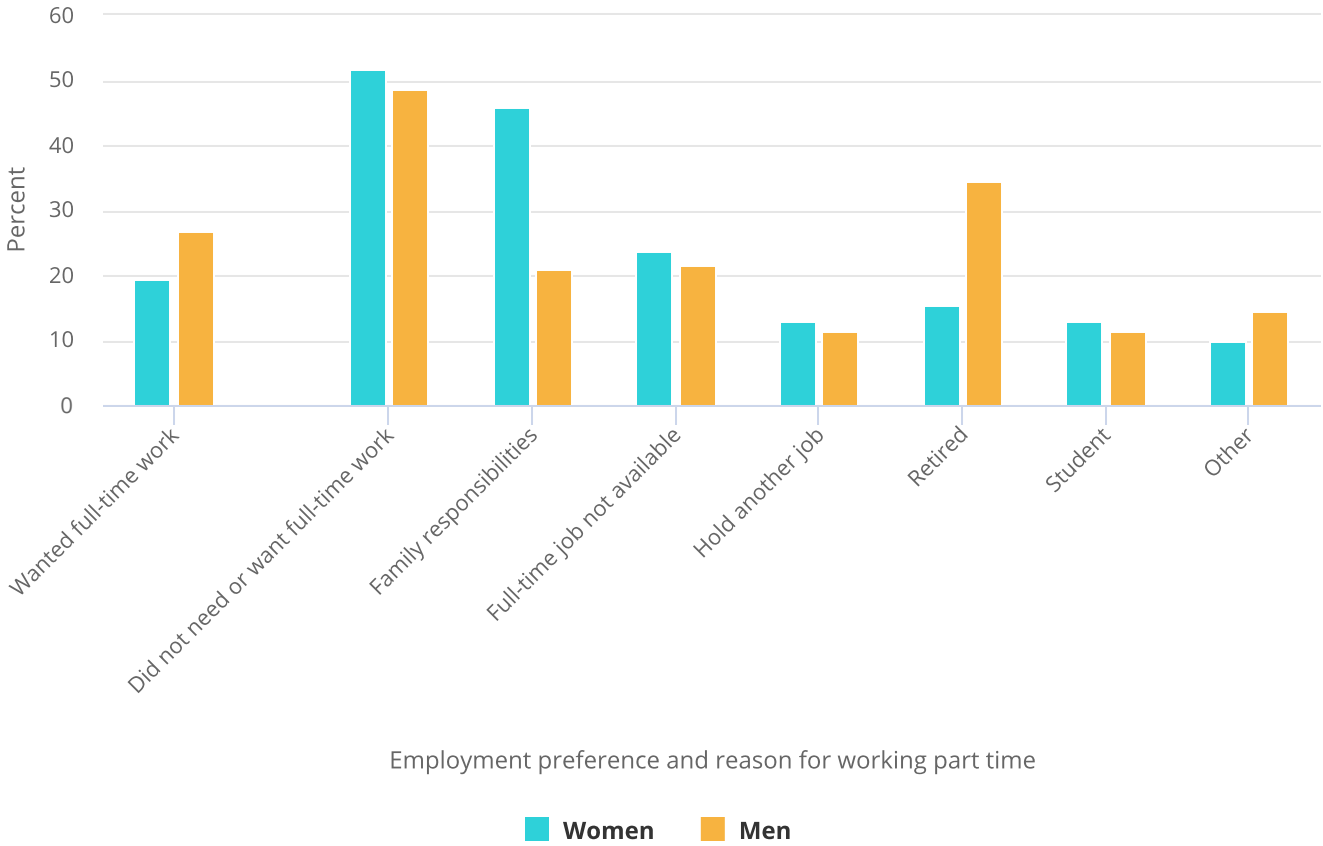
Numbers are rounded to nearest 1,000. Full-time employment is 35 hours or more per week. Part-time employment is less than 35 hours.

Source(s):

National Center for Science and Engineering Statistics, National Survey of College Graduates, 2019. Related detailed data: WMPD table 9-9.

Among those working part time, the share wanting to work full time was slightly higher for men than for women. However, the reasons for working part time varied. A larger share of women than men reported that family responsibilities resulted in their part-time work schedules. Men and women working part time did not differ in their rates of reporting that a full-time job was not available, which may be an indicator of overall economic conditions rather than of an individual’s situation. In 2019, this category of part-time workers, part time for economic reasons, was only 11.9% of the U.S. labor force that was employed part time, whereas among scientists and engineers working part time and who wanted full-time work, 23.6% of women and 21.6% of men reported full-time work was not available among their reasons for working part time (figure 29).

Figure 29
Part-time employed scientists and engineers who want full-time work, and reason for working part time: 2019



Note(s):
Detail may not add to total because of rounding and suppression. Respondents could select more than one reason. Full-time employment is 35 hours or more per week. Part-time employment is less than 35 hours.

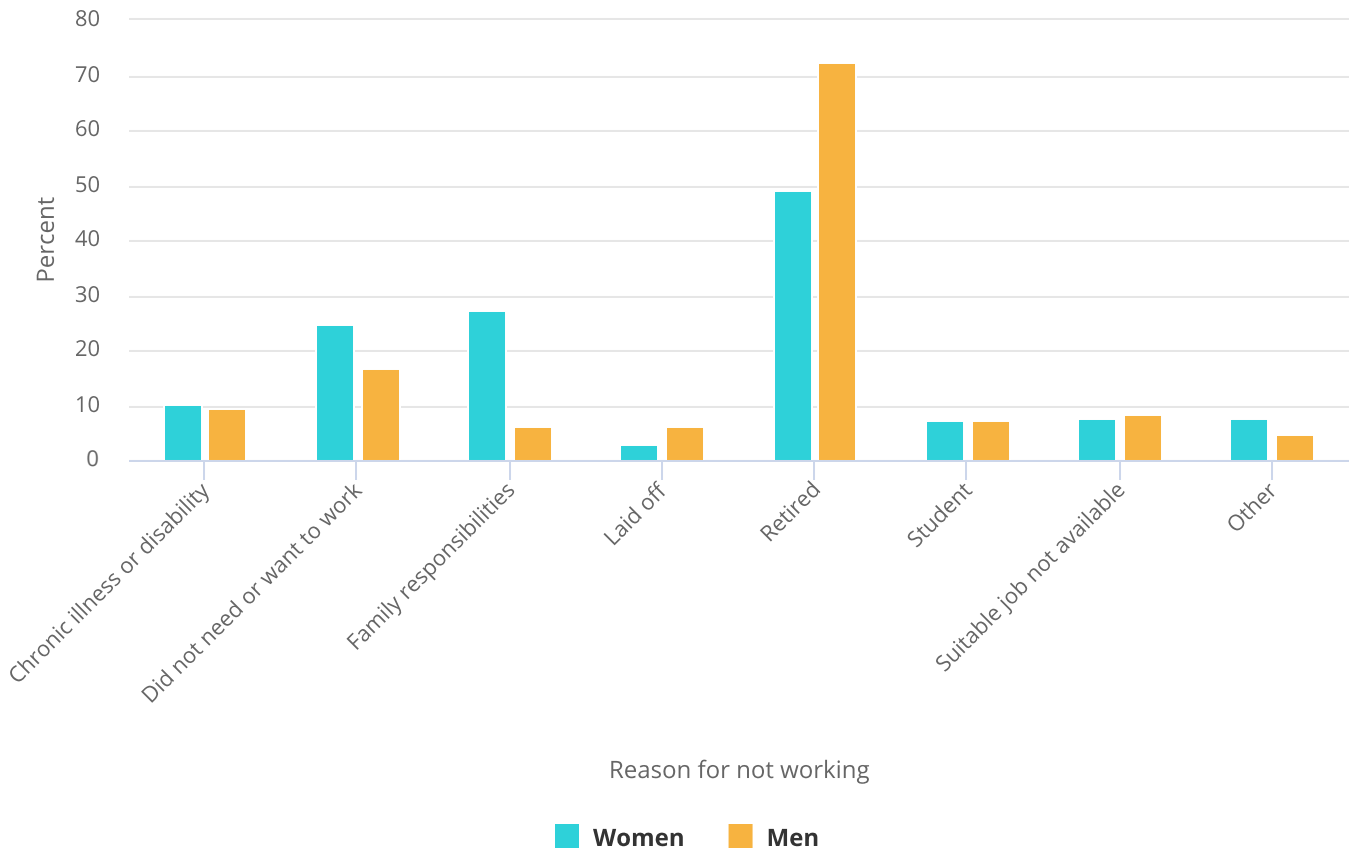
Source(s):
National Center for Science and Engineering Statistics, National Survey of College Graduates, 2019. Related detailed data: WMPD table 9-11.

Among scientists and engineers, the numbers of unemployed men and women—those who are not working but are looking for work—are close, about 400,000 each. Those who are not working but looking for work are considered part of the U.S. labor force, along with employed scientists and engineers. Almost three times as many female scientists and engineers as their male counterparts reported that they are not employed, not looking for work, and not retired. Although scientists and engineers who are not working and not looking are not considered part of the U.S. labor force, they are considered part of the science and engineering workforce.

In reporting reasons for not working among scientists and engineers, a larger share of women than men cited family responsibilities (27.2% versus 6.1%). However, the share of women who reported that a suitable job was not available was similar to that of men. A larger proportion of men than women reported being retired. Some of these differences may be attributed to the differences in the age distributions of scientists and engineers who are men compared with the distributions of those who are women (figure 30).

Figure 30

Scientists and engineers' reasons for being unemployed or not in the labor force, by sex: 2019



Note(s):
 Respondents could select more than one reason for not working.

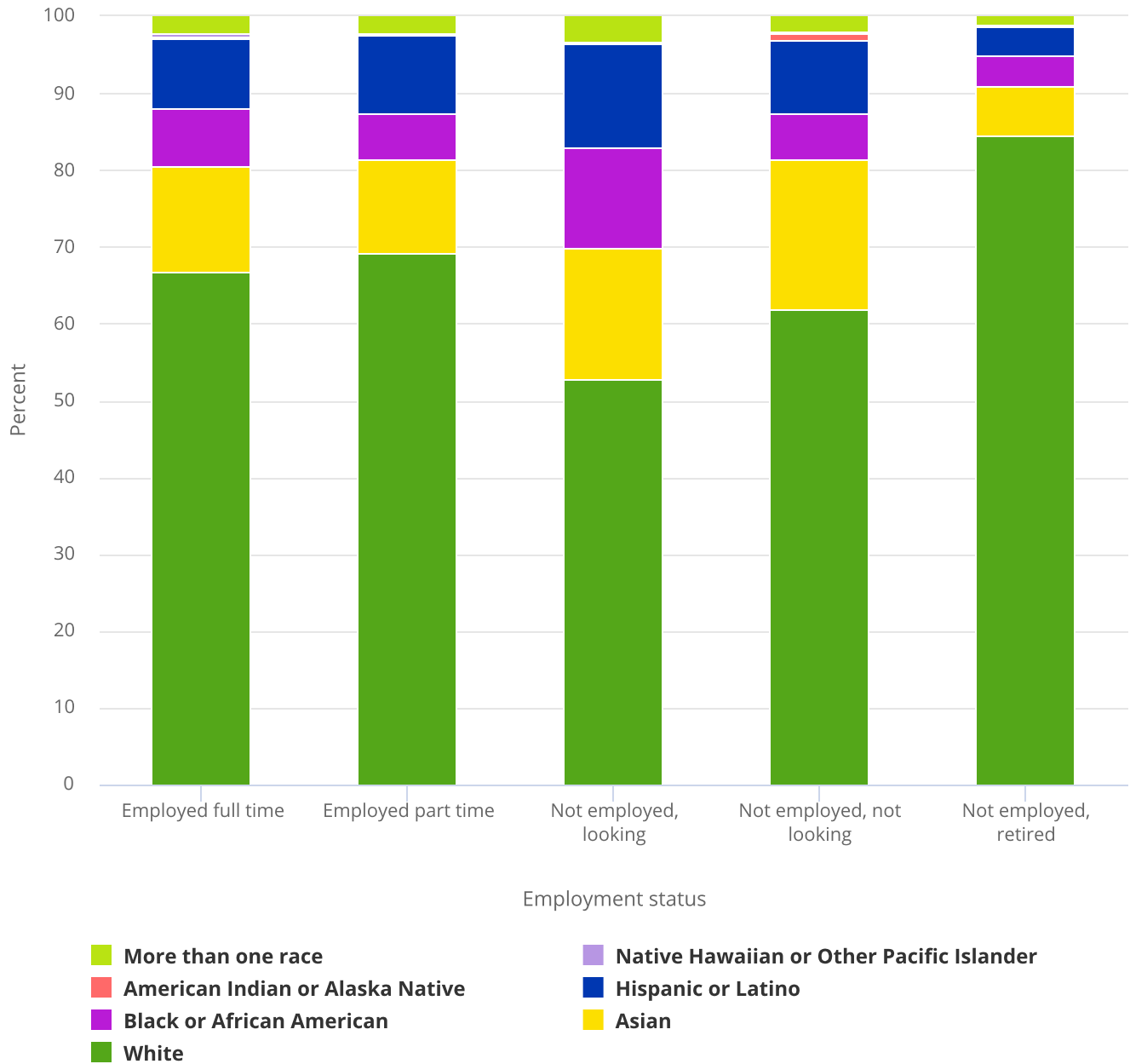
Source(s):
 National Center for Science and Engineering Statistics, National Survey of College Graduates, 2019. Related detailed data: WMPD table 9-12.

Race and ethnicity

Two-thirds of scientists and engineers employed full time are White. White scientists and engineers represent a larger share of those not in the labor force because of retirement (84.3%) than do those from other racial or ethnic groups (figure 31). Some of these differences in employment by race and ethnicity may be attributed to the differences in the age distributions within each group. For example, a larger share of older cohorts of scientists and engineers are employed and have a higher representation of White individuals, compared with recent waves of graduates.

Figure 31

Employment status of scientists and engineers, by ethnicity and race: 2019



Note(s):

Hispanic or Latino may be any race; race categories exclude Hispanic origin. For reasons of confidentiality or reliability, data for Native Hawaiian or Other Pacific Islander has been suppressed in the categories Not employed, looking and Not employed, retired. Suppression is indicated with an "S." Detail may not add to total because of rounding and suppression. Full-time employment is 35 hours or more per week. Part-time employment is less than 35 hours.

Source(s):

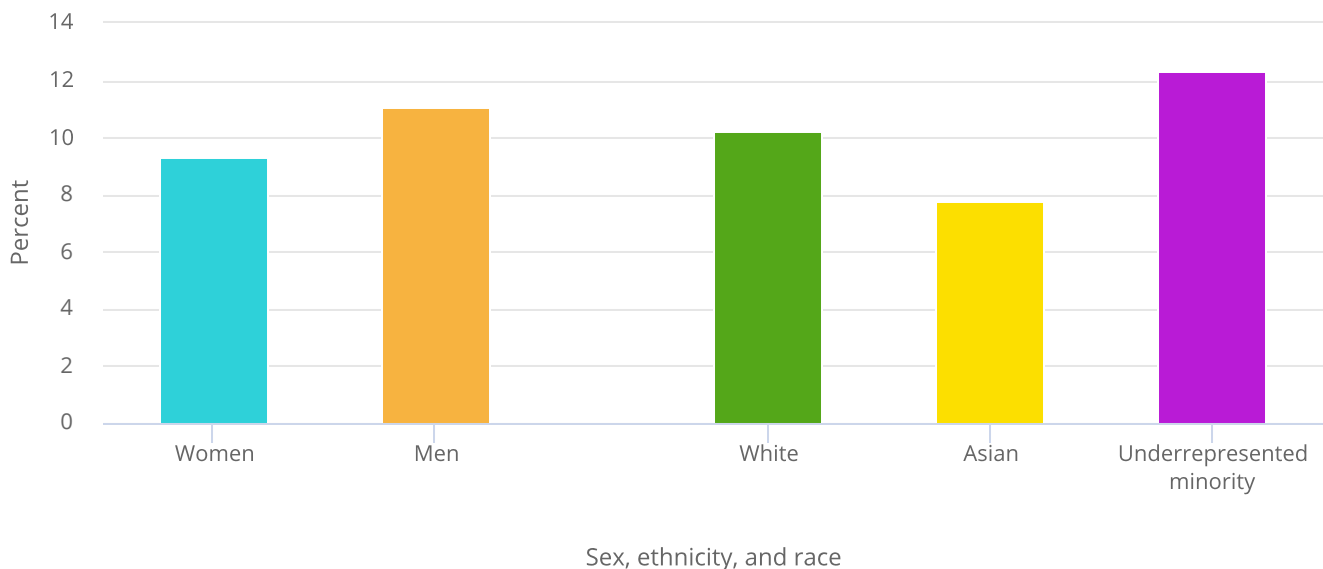
National Center for Science and Engineering Statistics, National Survey of College Graduates, 2019. Related detailed data: WMPD table 9-9.

Disability status

About 10% of employed scientists and engineers reported having one or more disabilities, that is, difficulties in seeing (with glasses); hearing (with hearing aid); walking without assistance; lifting 10 pounds; or concentrating, remembering, or making decisions. Men had a higher disability rate than did women (11.1% versus 9.3%). This is because reported disabilities increase with age and because men made up a larger share of scientists and engineers ages 50 and over than did women (36.9% versus 30.3%). Asians had a lower disability rate (7.7%), and underrepresented minorities had a higher rate (12.3%), compared with the overall disability rate for employed scientists and engineers ([figure 32](#)).

Figure 32

Employed scientists and engineers with disability, by sex, ethnicity, and race: 2019



Note(s):

The National Survey of College Graduates asks the degree of difficulty—none, slight, moderate, severe, or unable to do—an individual has in seeing (with glasses), hearing (with hearing aid), walking without assistance, lifting 10 pounds, or concentrating, remembering, or making decisions. Respondents who answered "moderate," "severe," or "unable to do" for any activity were classified as having a disability. Underrepresented minority groups include black or African American, Hispanic or Latino, and American Indian or Alaska Native. Hispanic or Latino may be any race; race categories exclude Hispanic origin.

Source(s):

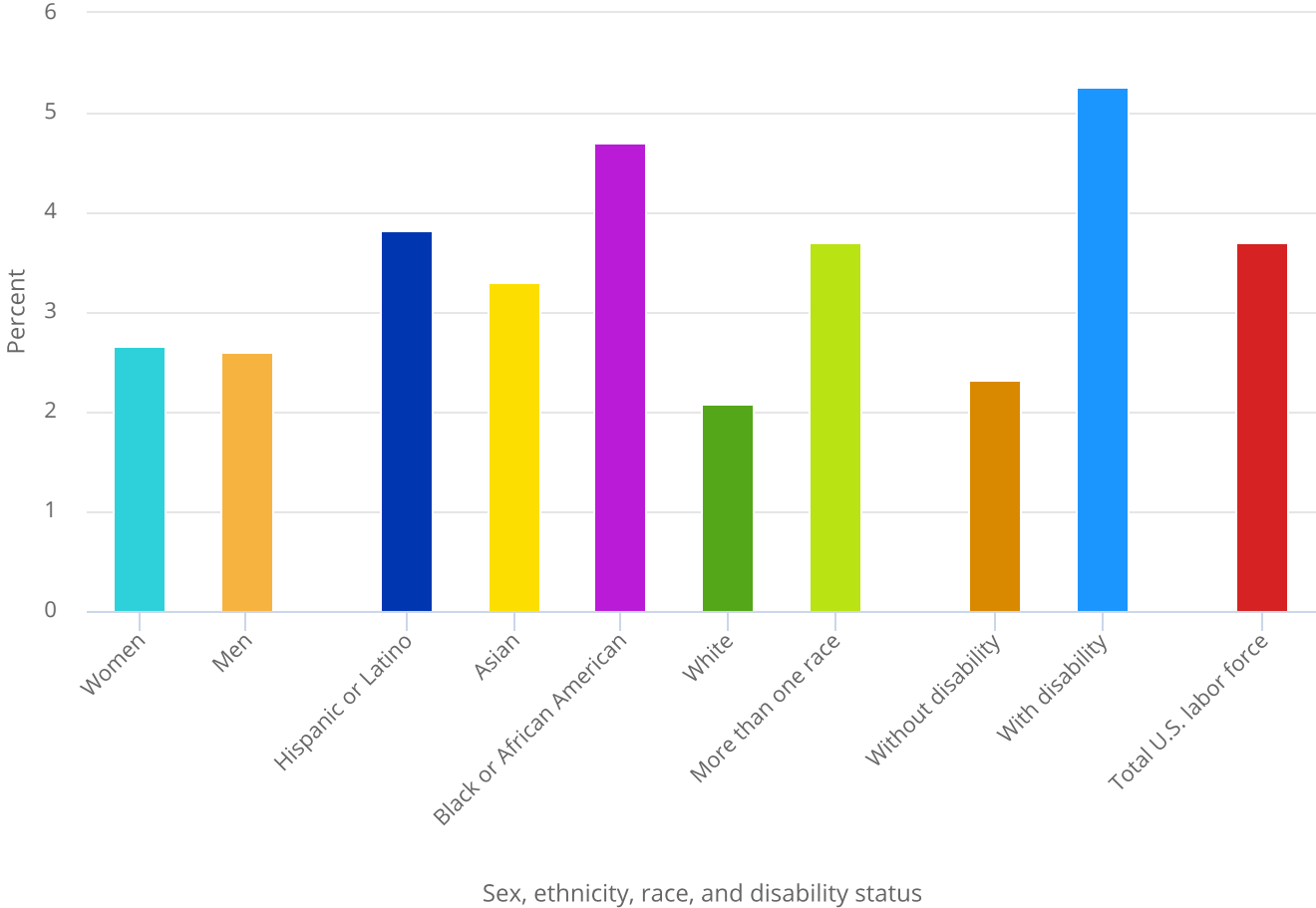
National Center for Science and Engineering Statistics, National Survey of College Graduates, 2019. Related detailed data: WMPD table 9-42 and table 9-43.

Unemployment rate

Looking at the unemployment rates of scientists and engineers in 2019, the rates for both women (2.7%) and men (2.6%) were lower than that of the U.S. labor force (3.7%), indicating a strong demand for those with S&E expertise. Among scientists and engineers, Hispanics or Latinos had an unemployment rate of 3.8%, which is greater than the unemployment rate of Whites (2.1%) but similar to that of the U.S. labor force (3.7%); Blacks or African Americans had an unemployment rate of 4.7%, greater than the rate for Whites. Scientists and engineers with one or more disabilities had an unemployment rate of 5.3%, greater than that of the U.S. labor force ([figure 33](#)).

Figure 33

Unemployment rates of scientists and engineers, by sex, ethnicity, race, and disability status, and of the U.S. civilian labor force: 2019



Note(s): Hispanic or Latino may be any race; race categories exclude Hispanic origin. The National Survey of College Graduates asks the degree of difficulty—none, slight, moderate, severe, or unable to do—an individual has in seeing (with glasses), hearing (with hearing aid), walking without assistance, lifting 10 pounds, or concentrating, remembering, or making decisions. Respondents who answered "moderate," "severe," or "unable to do" for any activity were classified as having a disability. Unemployment rate calculated as the percentage of the labor force not working and looking for work. Total U.S. labor force unemployment rate covers the labor force ages 16 and over.

Source(s): National Center for Science and Engineering Statistics, National Survey of College Graduates, 2019, and Bureau of Labor Statistics Current Population Survey, 2019. Related detailed data: WMPD table 9-9.

Occupation

Scientists and engineers—those with at least a bachelor’s degree and a science or engineering (S&E) or S&E-related degree or occupation—generally have higher salaries when working in S&E occupations than in other occupations. However, female scientists and engineers have lower median salaries than do their male counterparts in most occupations.⁵

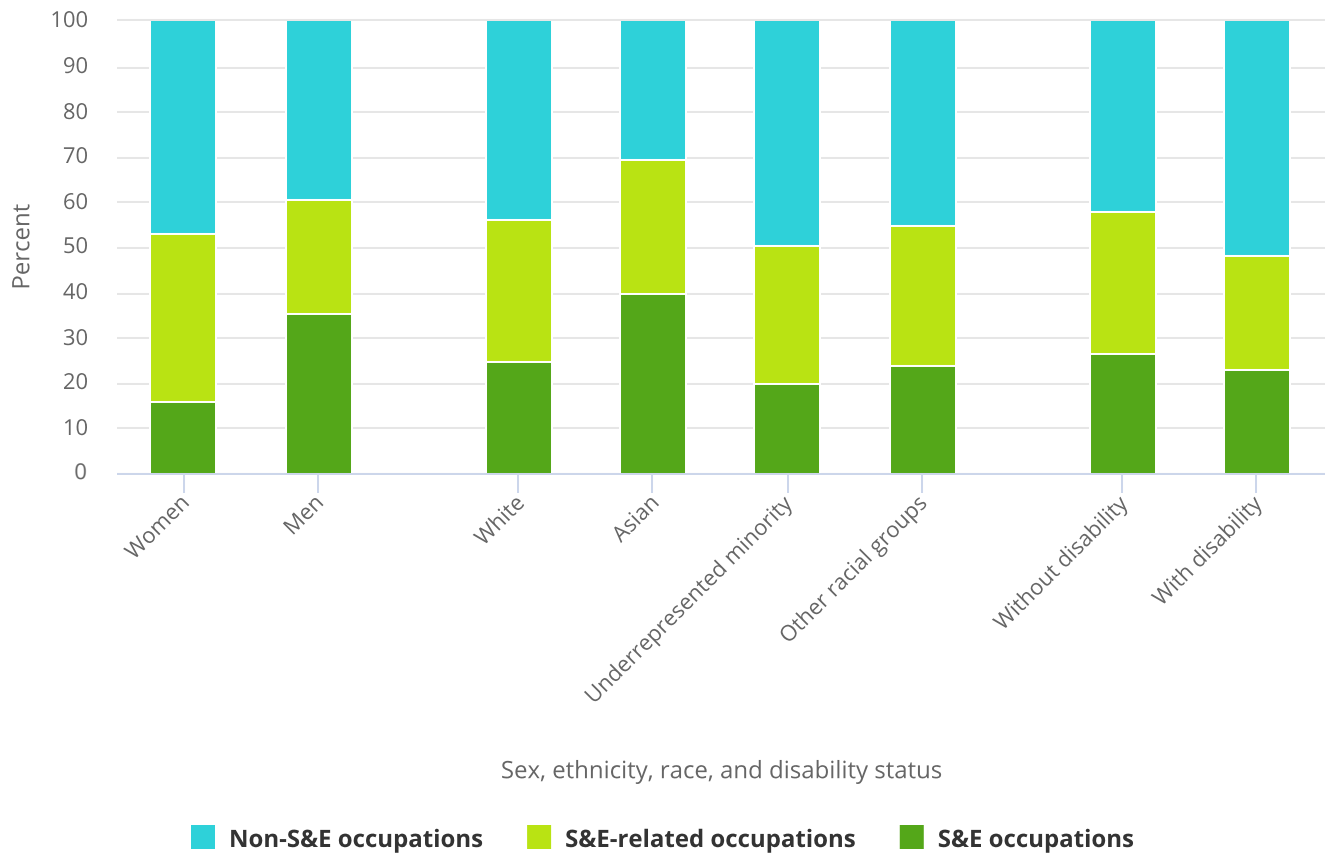
Science and engineering occupations

Among scientists and engineers, a larger share of men than women worked in S&E occupations in 2019. However, a larger share of female than male scientists and engineers worked in S&E-related occupations, which include health occupations, and in non-S&E-occupations.

Underrepresented minorities—Hispanics or Latinos, Blacks or African Americans, and American Indians or Alaska Natives—had a lower share of employed workers in S&E occupations than did Whites, Asians, and other racial groups. In contrast, their share of employed workers in S&E-related occupations was similar to that of the other groups. Scientists and engineers with disability had a lower share of employed workers in S&E or S&E-related occupations than did those without disability and a larger share in non-S&E occupations ([figure 34](#)).

Figure 34

Employed scientists and engineers, by occupational group, sex, ethnicity, race, and disability status: 2019



S&E = science and engineering.

Note(s):

S&E occupations include S&E postsecondary teachers. S&E-related occupations include health occupations. Underrepresented minority groups include Black or African American, Hispanic or Latino, and American Indian or Alaska Native. Hispanic or Latino may be any race; race categories exclude Hispanic origin. The National Survey of College Graduates asks the degree of difficulty—none, slight, moderate, severe, or unable to do—an individual has in seeing (with glasses), hearing (with hearing aid), walking without assistance, lifting 10 pounds, or concentrating, remembering, or making decisions. Respondents who answered "moderate," "severe," or "unable to do" for any activity were classified as having a disability.

Source(s):

National Center for Science and Engineering Statistics, National Survey of College Graduates, 2019. Related detailed data: WMPD table 9-7 and table 9-8.

Median salary

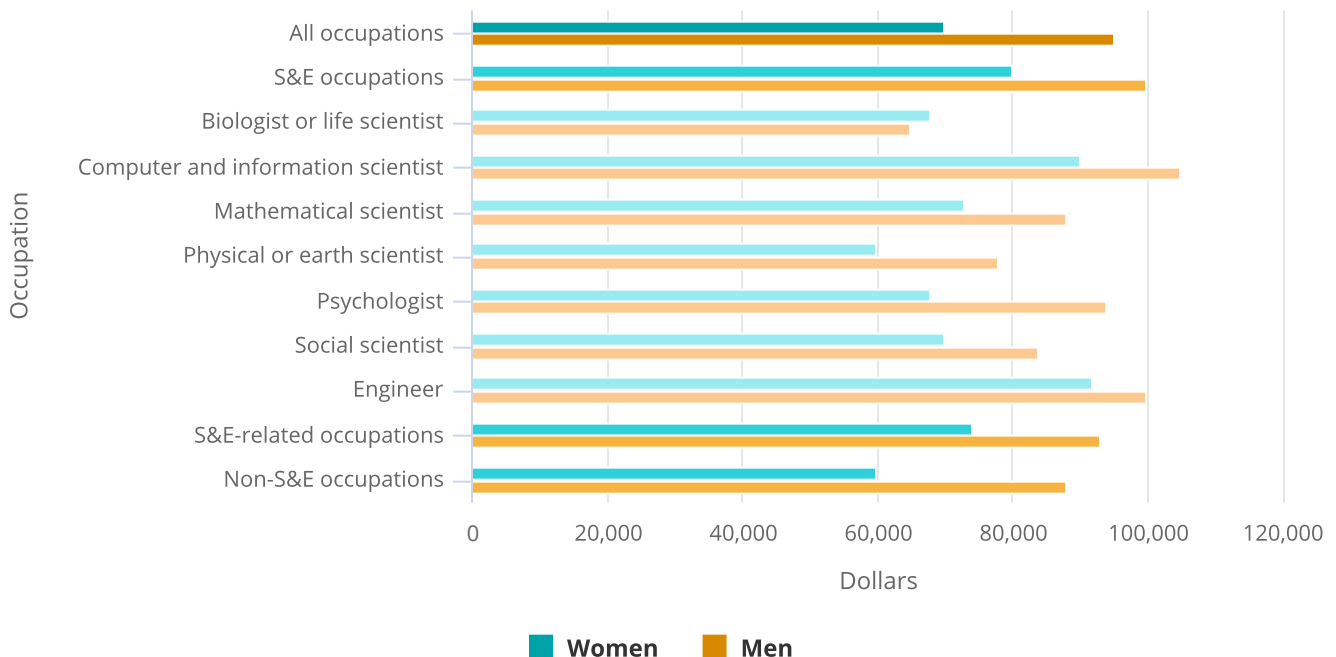
Salary level can be a useful indicator of the benefits of a degree. Median salaries for scientists and engineers vary across many factors, including sex, race and ethnicity, highest degree, field of degree, employment sector, and experience. Some of these factors are not captured in the analysis presented here. However, looking at salary differences can point to possible topics of further research.

Women and men

Among scientists and engineers working full time in 2019, women had lower annual salaries than did men in most broad occupational groups. Overall, women’s median annual salary was \$70,000, whereas the median salary for men was \$95,000. Even for those employed in the relatively high-paying computer and information scientist occupations, women’s median salary was considerably lower than that of their male counterparts. In addition, female psychologists’ median salary was less than that of male psychologists, even though a majority of the field is female. However, for biological and life science occupations, the median salaries for women and for men were similar (figure 35).

Figure 35

Median annual salary of scientists and engineers employed full time, by broad occupation and sex: 2019



S&E = science and engineering.

Note(s):

Salaries are rounded to nearest \$1,000. S&E occupations include S&E postsecondary teachers. S&E-related occupations include health occupations.

Source(s):

National Center for Science and Engineering Statistics, National Survey of College Graduates, 2019. Related detailed data: WMPD table 9-16 and table 9-17.

Race and ethnicity

Salaries of scientists and engineers vary considerably across racial and ethnic groups and also across occupations. Asian scientists and engineers had the highest median salary in S&E occupations (\$104,000), whereas Whites (\$95,000) and other racial groups (\$90,000) had similar median salaries and underrepresented minorities had the lowest median salary (\$80,000). A factor in lower median salaries in S&E occupations for underrepresented minorities may be that Hispanics or Latinos and Black or African Americans have large shares of degrees in psychology, social sciences, and biological and agricultural sciences, which all have lower median salaries than do occupations in computer or information science or in engineering, both of which had higher representation of Asians ([figure 36](#)).

Figure 36

Median annual salary of scientist and engineers employed full time, by ethnicity, race, and broad occupation: 2019



S&E = science and engineering.

Note(s):

Salaries are rounded to nearest \$1,000. S&E occupations include S&E postsecondary teachers. S&E-related occupations include health occupations. Underrepresented minority groups include Black or African American, Hispanic or Latino, and American Indian or Alaska Native. Hispanic or Latino may be any race; race categories exclude Hispanic origin.

Source(s):

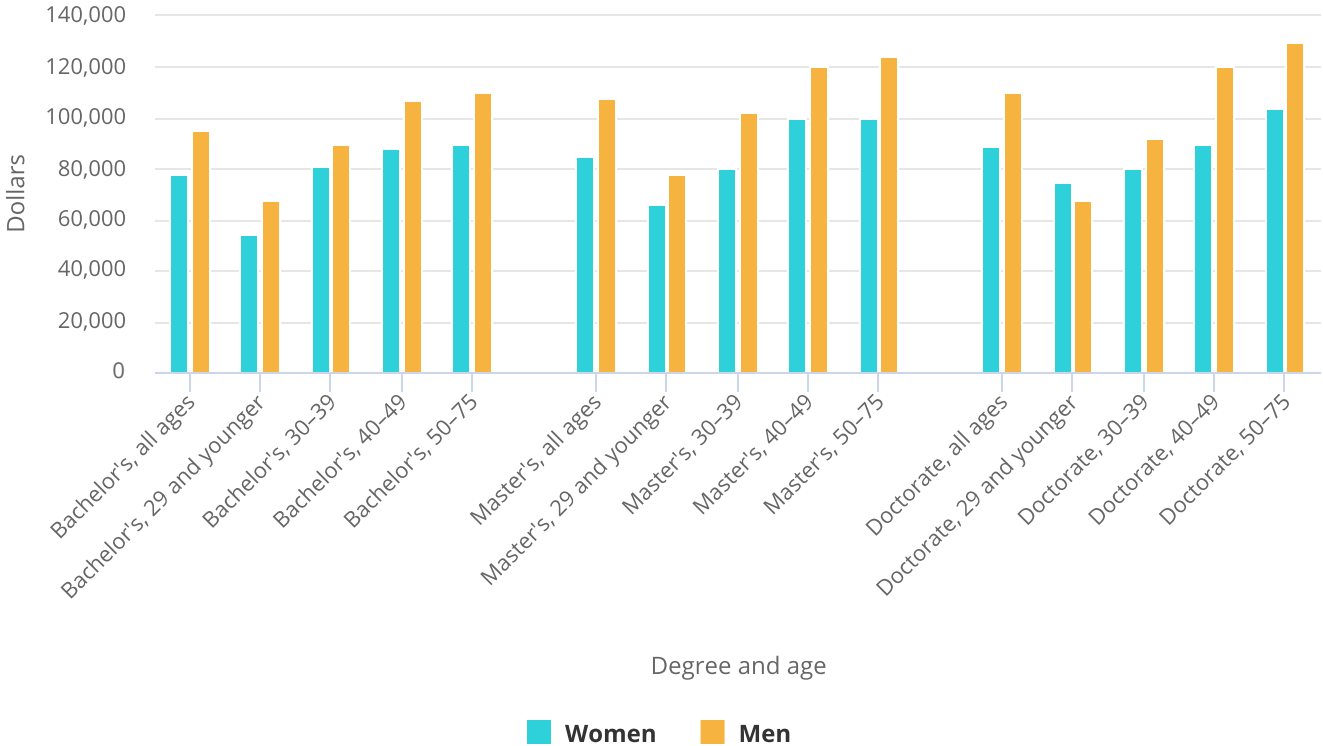
National Center for Science and Engineering Statistics, National Survey of College Graduates, 2019. Related detailed data: WMPD table 9-17.

Age groups

Looking at scientists and engineers working full time in S&E occupations in 2019, median salaries generally increased with degree level and with age, and men generally had higher median salaries than women. However, there are some differences. For those with bachelor’s degrees, men had a higher median salary than did women for all age groups except for ages 30–39 where the median salaries were similar. For those with master’s degrees, men had higher median salaries at all age groups. For those with doctorate degrees, men’s median salaries were greater for those ages 40–49 and those ages 50–75; for those age groups under age 40, the median salaries were similar (figure 37). Research is needed to determine whether this difference in salary between men and women is due to the different environment the older cohorts faced with possibly more equal conditions for younger cohorts, whether women’s career paths for the younger cohorts will still result in salary differentials when they attain more tenure in their careers, or whether other factors cause or contribute to the salary differential.

Figure 37

Median annual salary of scientists and engineers employed full time in S&E occupations, by age, highest degree level, and sex: 2019



S&E = science and engineering.

Note(s):

S&E occupations include S&E postsecondary teachers. Salaries are rounded to nearest \$1,000. Here only S&E occupations are included; S&E-related and non-S&E occupations are excluded.

Source(s):

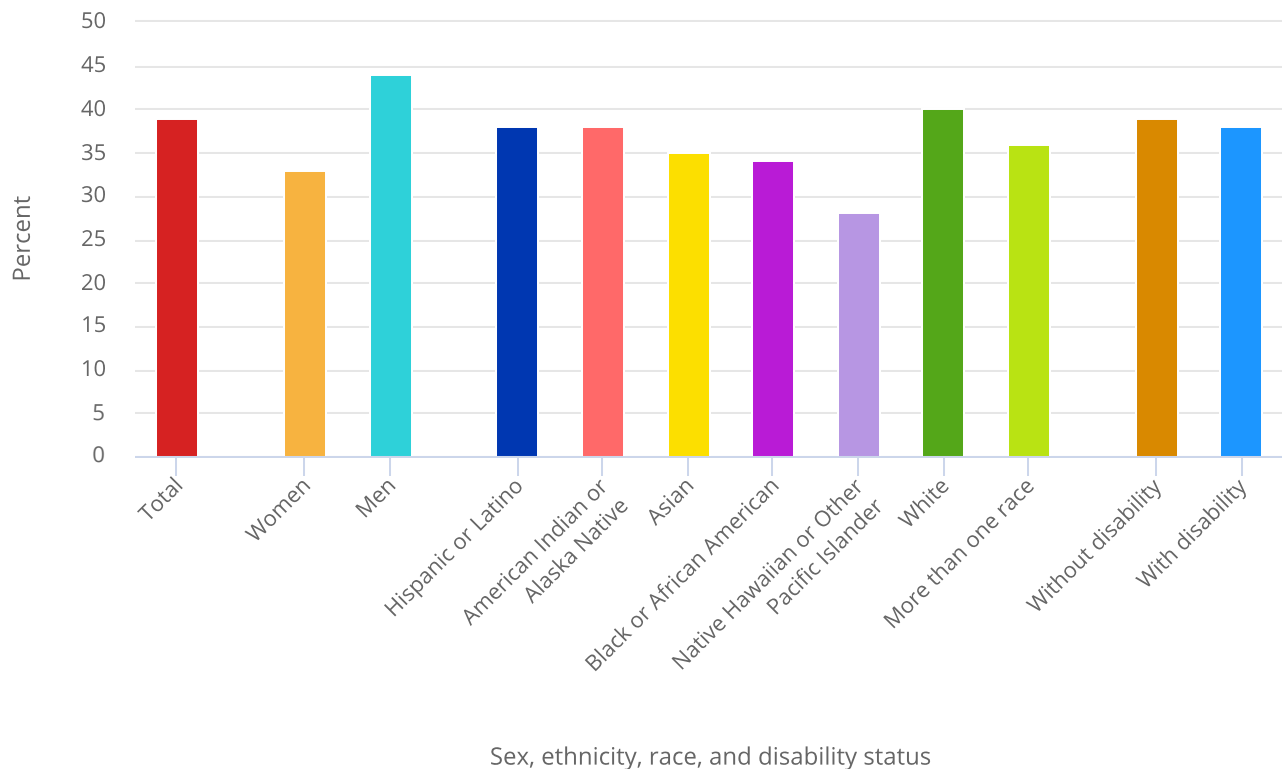
National Center for Science and Engineering Statistics, National Survey of College Graduates, 2019. Related detailed data: WMPD table 9-16.

Supervisory status

One characteristic of a career that factors into salary is whether a scientist or engineer holds a supervisory role in their occupation. The share of scientists and engineers who are supervisors in their jobs, regardless of occupational group, differs for various groups. Men reported holding a supervisory role more frequently than did women (44.4% versus 32.7%), and scientists and engineers who are White reported holding a supervisory role more frequently than did other races and ethnicities. However, those with disabilities and those without disabilities have similar shares of scientists and engineers who are supervisors (figure 38).

Figure 38

Supervisor status of employed scientists and engineers, by sex, ethnicity, race, and disability status: 2019



Note(s):

Hispanic or Latino may be any race; race categories exclude Hispanic origin. The National Survey of College Graduates asks the degree of difficulty—none, slight, moderate, severe, or unable to do—an individual has in seeing (with glasses), hearing (with hearing aid), walking without assistance, lifting 10 pounds, or concentrating, remembering, or making decisions. Respondents who answered "moderate," "severe," or "unable to do" for any activity were classified as having a disability.

Source(s):

National Center for Science and Engineering Statistics, National Survey of College Graduates, 2019. Related detail data: WMPD table 9-36.

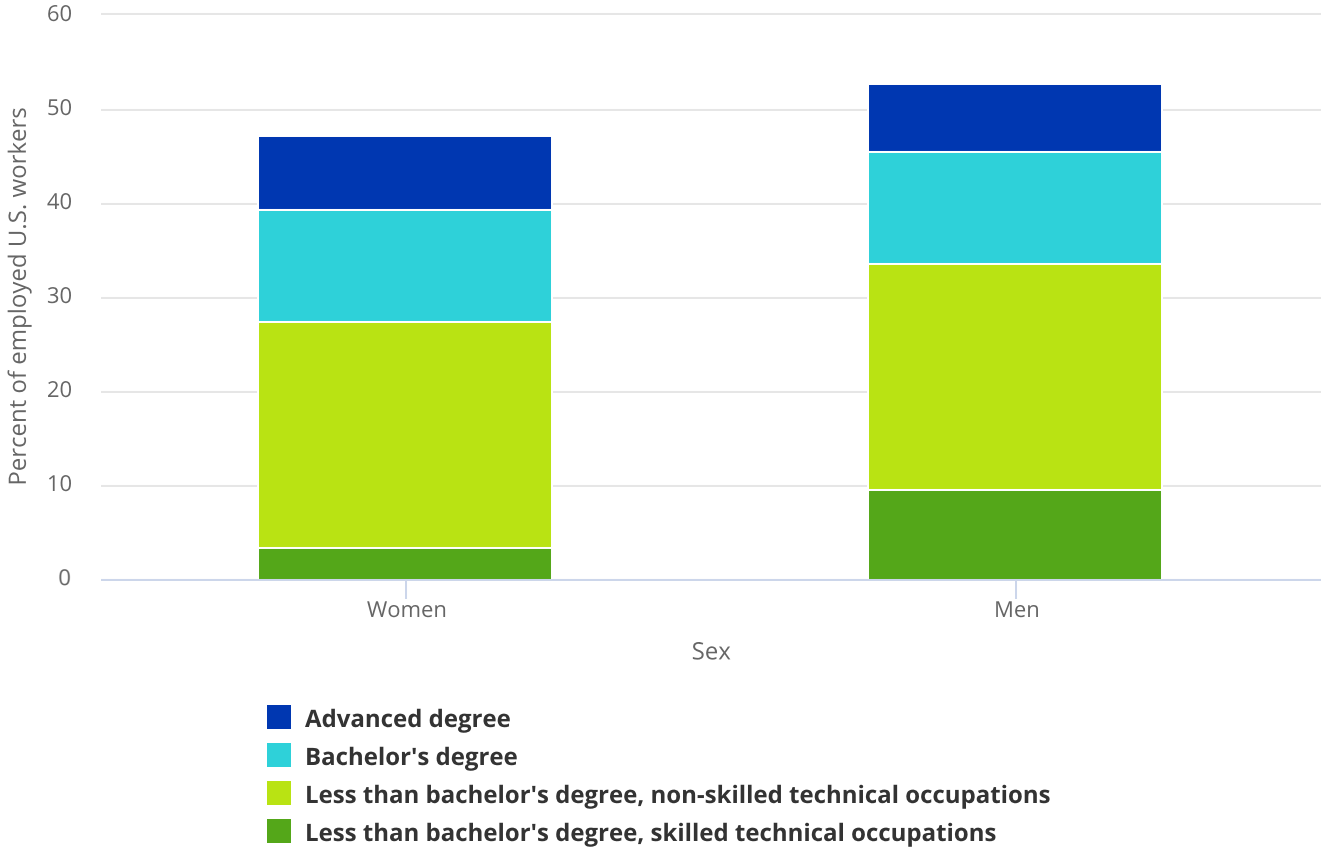
Skilled technical workforce

An emerging area of interest is highly skilled workers in STEM (science, technology, engineering, and mathematics) occupations that do not require a bachelor’s degree or above—the skilled technical workforce (STW). The STW includes those in occupations such as construction and extraction; installation, maintenance, and repair; health care; production; and computer and mathematics. A better understanding of skilled technical workers is needed for policymakers and others in order to build a STEM-capable workforce.⁶

In 2019, the STW numbered about 18 million workers. Women made up about a quarter of the STW, which was 3.4% of those employed in the United States in 2019 (figure 39). Skilled technical workers with disability made up 6.7% of the STW, and 13.9% of all workers with disability were employed in skilled technical jobs (figure 40). Looking within the STW by racial and ethnic groups, Hispanics or Latinos have a similar share (19.0%) of the STW as their share of the working-age population (18.5%). Although Blacks or African Americans make up the third largest share of the STW (9.8%), their representation still lags behind their share of the working-age population (13.0%) (figure 41).

Figure 39

Employed workers ages 25 and older, by educational attainment, occupational group, and sex: 2019



Note(s):

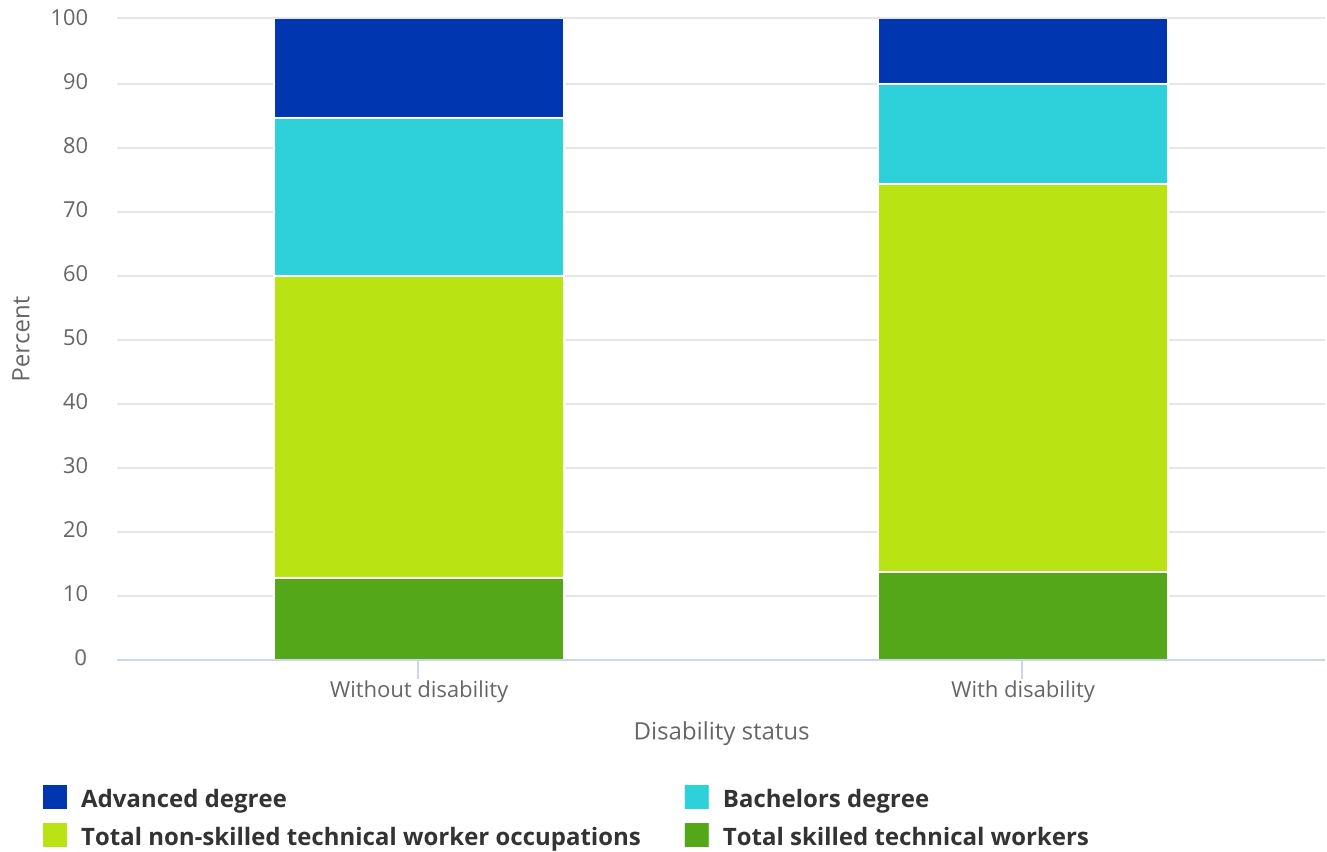
The American Community Survey does not cover employment among self-employed workers and employment in private households. Values do not include those employed in military occupations. Values includes those ages 25 and older.

Source(s):

Census Bureau, American Community Survey, 2019, Public Use Microdata, Sample, accessed 25 October 2020. Related detailed data: WMPD table 9-21.

Figure 40

Employed workers ages 25 and older, by disability status, occupational group, and educational attainment: 2019



Note(s):

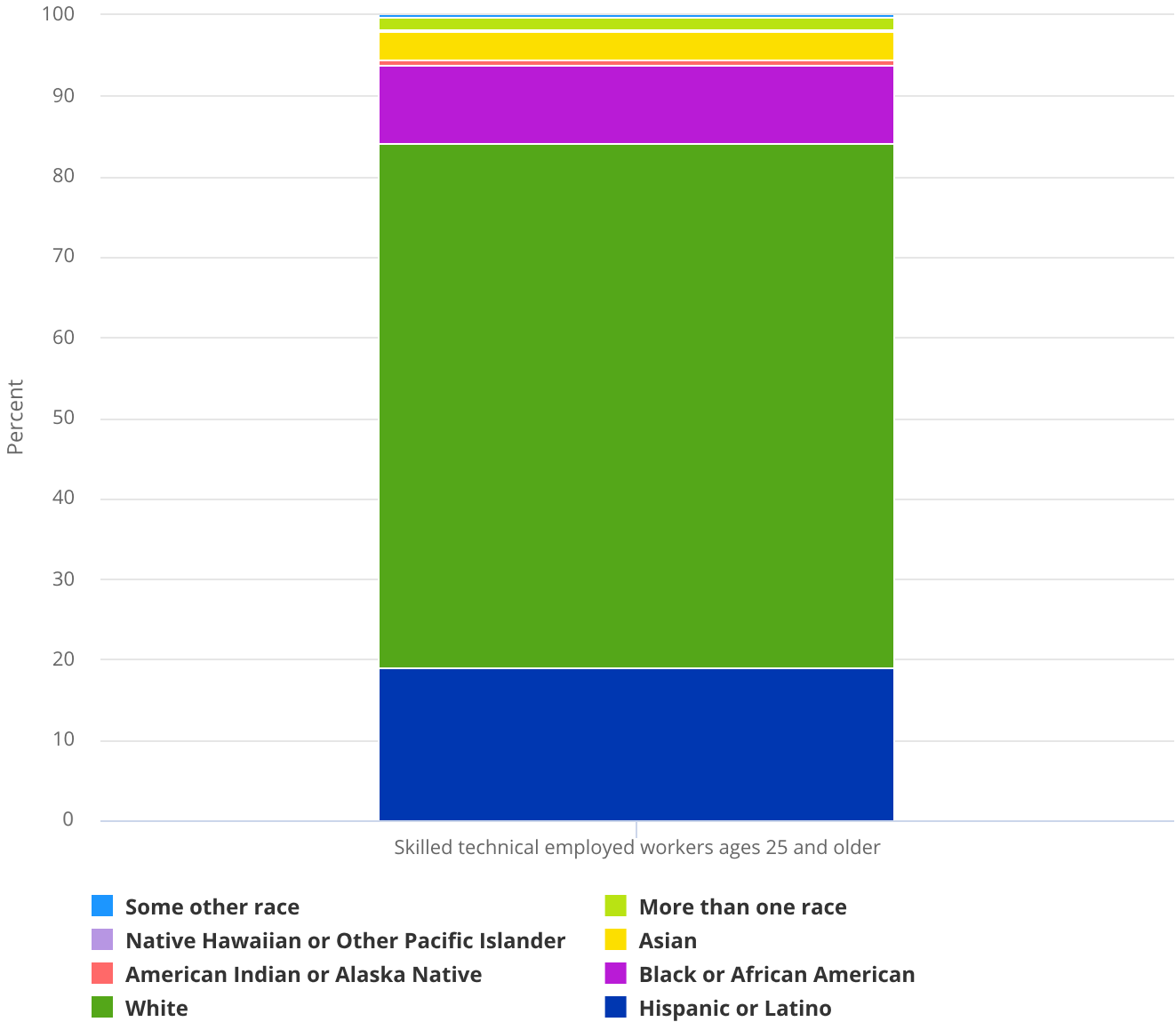
The American Community Survey does not cover employment among self-employed workers and employment in private households. Values do not include those employed in military occupations. Values includes those ages 25 and older. Those who reported difficulty with one or more functionalities were classified as with disability.

Source(s):

Census Bureau, American Community Survey, 2019, Public Use Microdata Sample, accessed 25 October 2020. Related detailed data: WMPD table 9-23.

Figure 41

Skilled technical employed workers ages 25 and older, by race and ethnicity: 2019



Note(s):

The American Community Survey does not cover employment among self-employed workers and employment in private households. Values do not include those employed in military occupations. Values includes those ages 25 and older. Hispanic or Latino may be any race; race categories exclude Hispanic origin.

Source(s):

Census Bureau, American Community Survey, 2019, Public Use Microdata Sample, accessed 25 October 2020. Related detailed data: WMPD table 9-22.

Academic careers

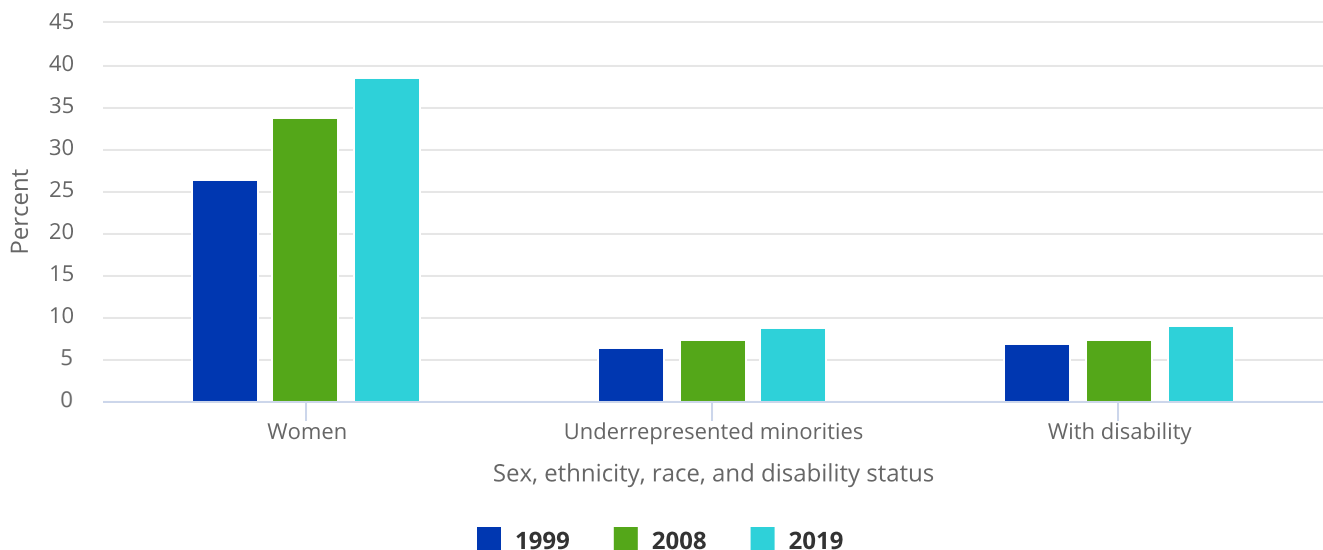
Universities play a key role in the nation's science and engineering (S&E) enterprise by educating and training students in research practices and by performing a large share of the nation's basic research. The structure of academic employment of science, engineering, and health (SEH) doctorate holders has changed substantially over the past several decades as universities and 4-year colleges have increased their share of part-time faculty.⁷ Academic full-time faculty positions are less available today than they were a generation ago. However, the academic workforce is now much more diverse.⁸

Representation

The share of academic doctoral positions held by women with SEH doctoral degrees increased from 26.4% in 1999 to 38.5% in 2019. Underrepresented minorities also hold a larger share of these positions than they did in 1999, although their share remains small (8.9%) and is considerably less than their share of the population, which is about a third of the U.S. population ages 18–64. The share of those in academic doctoral positions with one or more disabilities increased to 9.1%, slightly less than their share in the population (10.5%) (figure 42).

Figure 42

Women, underrepresented minorities, and those with disability as a percentage of the academic doctoral workforce: 1999, 2008, 2019



Note(s):

Underrepresented minority groups include Black or African American, Hispanic or Latino, and American Indian or Alaska Native. Hispanic or Latino may be any race; race categories exclude Hispanic origin. Survey of Doctorate Recipients asks the degree of difficulty—none, slight, moderate, severe, or unable to do—an individual has in seeing (with glasses); hearing (with hearing aid); walking without assistance; lifting 10 pounds; or concentrating, remembering, or making decisions. Respondents who answered "moderate," "severe," or "unable to do" for any activity were classified as having a disability. Academic doctoral workforce consists of doctoral science, engineering, or health doctorate holders who are working at a university or 4-year college.

Source(s):

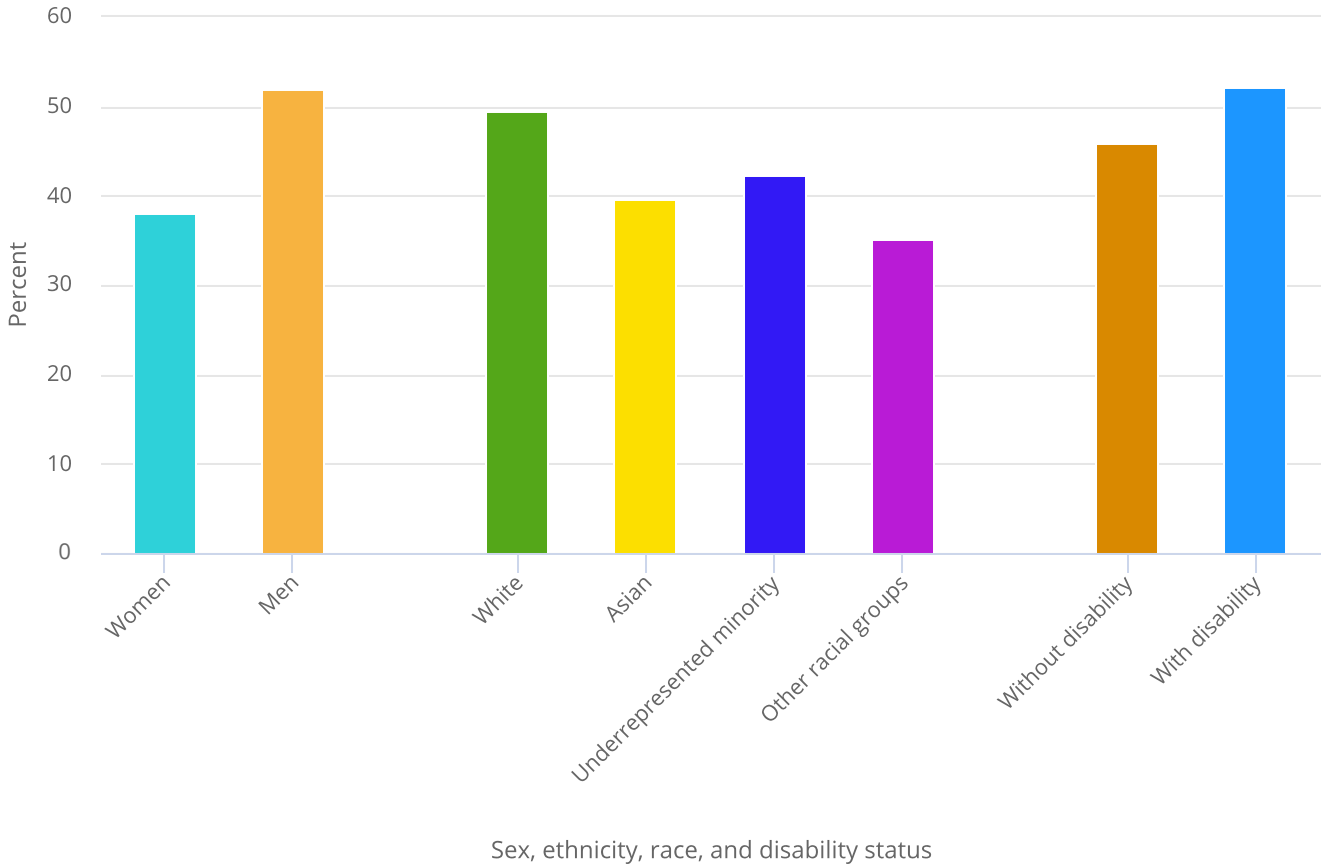
National Center for Science and Engineering Statistics, Survey of Doctorate Recipients. Related detailed data: WMPD table 9-25.

Tenure and academic positions

One goal of an academic career is to achieve tenure. Of all SEH doctorate holders employed in either universities or 4-year colleges in 2019, 46.6% were tenured, with an additional 14.8% in tenure-track positions.

Among SEH doctorate holders in academia, a larger share of men than women had tenure in 2019. Whites had the highest rates of tenure, followed by underrepresented minorities and Asians, who had similar tenure rates. Employed SEH doctorate holders who reported at least one disability were tenured at a higher rate than those without disability (figure 43). This is at least in part due to tenured faculty who are older reporting an aging-related disability, such as reduced sight or hearing, more frequently. Also, a larger proportion of older academics are tenured.

Figure 43
Tenured doctoral scientists and engineers employed in universities and 4-year colleges: 2019



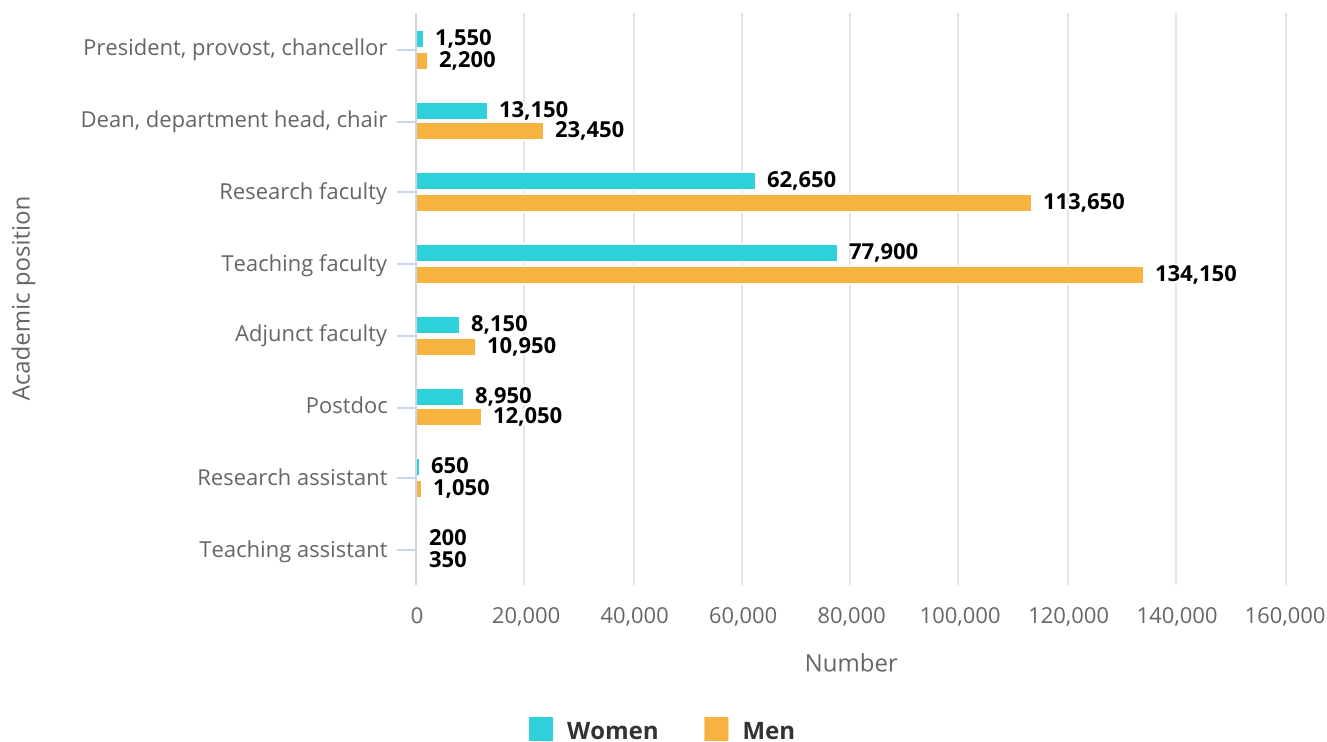
Note(s): Underrepresented minority groups include Black or African American, Hispanic or Latino, and American Indian or Alaska Native. Survey of Doctorate Recipients asks the degree of difficulty—none, slight, moderate, severe, or unable to do—an individual has in seeing (with glasses); hearing (with hearing aid); walking without assistance; lifting 10 pounds; or concentrating, remembering, or making decisions. Respondents who answered "moderate," "severe," or "unable to do" for any activity were classified as having a disability. Doctoral scientists and engineers includes those who received research doctorates in science, engineering, and health fields.

Source(s): National Center for Science and Engineering Statistics, Survey of Doctorate Recipients, 2019. Related detailed data: WMPD table 9-29 and table 9-31.

Looking at types of academic positions, SEH male doctorate holders outnumbered their female counterparts across all major positions in 2019. In particular, women made up about 36% of both research faculty and teaching faculty. Research and teaching assistant numbers were small for men and women (figure 44).

Figure 44

Doctoral scientists and engineers employed in universities and 4-year colleges, by type of academic position and sex: 2019



Note(s):

Numbers rounded to nearest 50. Detail may not add to total because of rounding and suppression. Doctoral scientists and engineers includes those who received research doctorates in science, engineering, and health fields from U.S. higher education institutions. Respondents could report more than one academic position type.

Source(s):

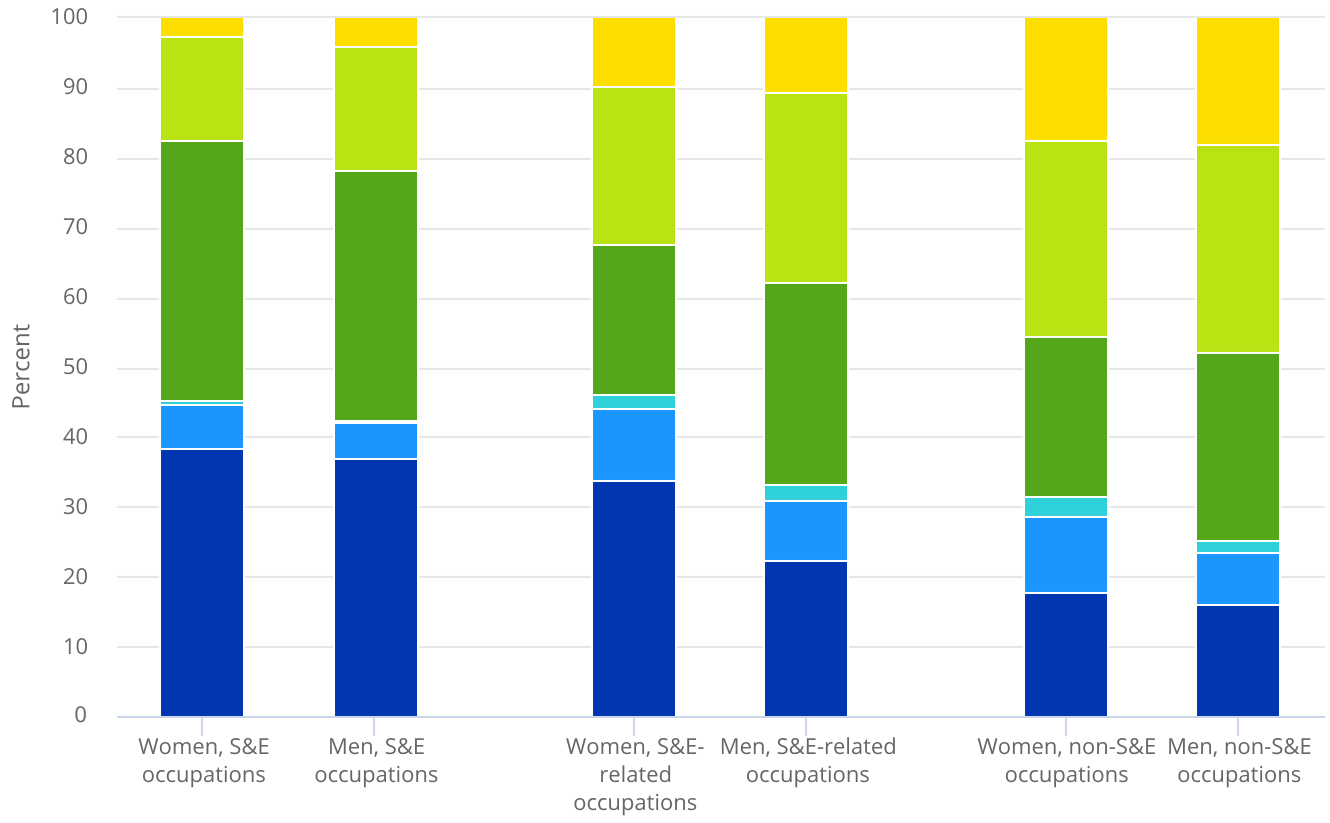
National Center for Science and Engineering Statistics, Survey of Doctorate Recipients, 2019. Related detailed data: WMPD table 9-25 and table 9-28.

Work related to degree

When SEH doctorate holders were asked how related their work was to their doctoral degree, a larger share of women than men who had S&E positions at 4-year educational institutions said that their work was closely related to their degree (38.5% versus 36.9%). In addition, over a third of both women and men were able to find S&E jobs in other sectors that were closely related to their degree, although the share of women was larger than that of men (37.3% versus 35.7%). How closely related SEH doctorate holders' work was to their degree generally declined going from S&E positions to S&E-related positions to non-S&E positions (figure 45).

Figure 45

Employed science, engineering, and health doctorate holders, by sex, broad occupation, sector of employment, and the extent work on principal job is related to doctoral degree: 2019



Sex and broad occupation

- Other sectors, work not related
- Other sectors, work somewhat related
- Other sectors, work closely related
- 4-yr educational institution, work not related
- 4-year educational institution, work somewhat related
- 4-year educational institution, work closely related

S&E = science and engineering.

Note(s):

Four-year educational institutions includes 4-year colleges or universities, medical schools (including university-affiliated hospitals or medical centers), and university-affiliated research institutes. Detail may not add to total because of rounding and suppression. Estimates include those employed and living in the United States during the reference week.

Source(s):

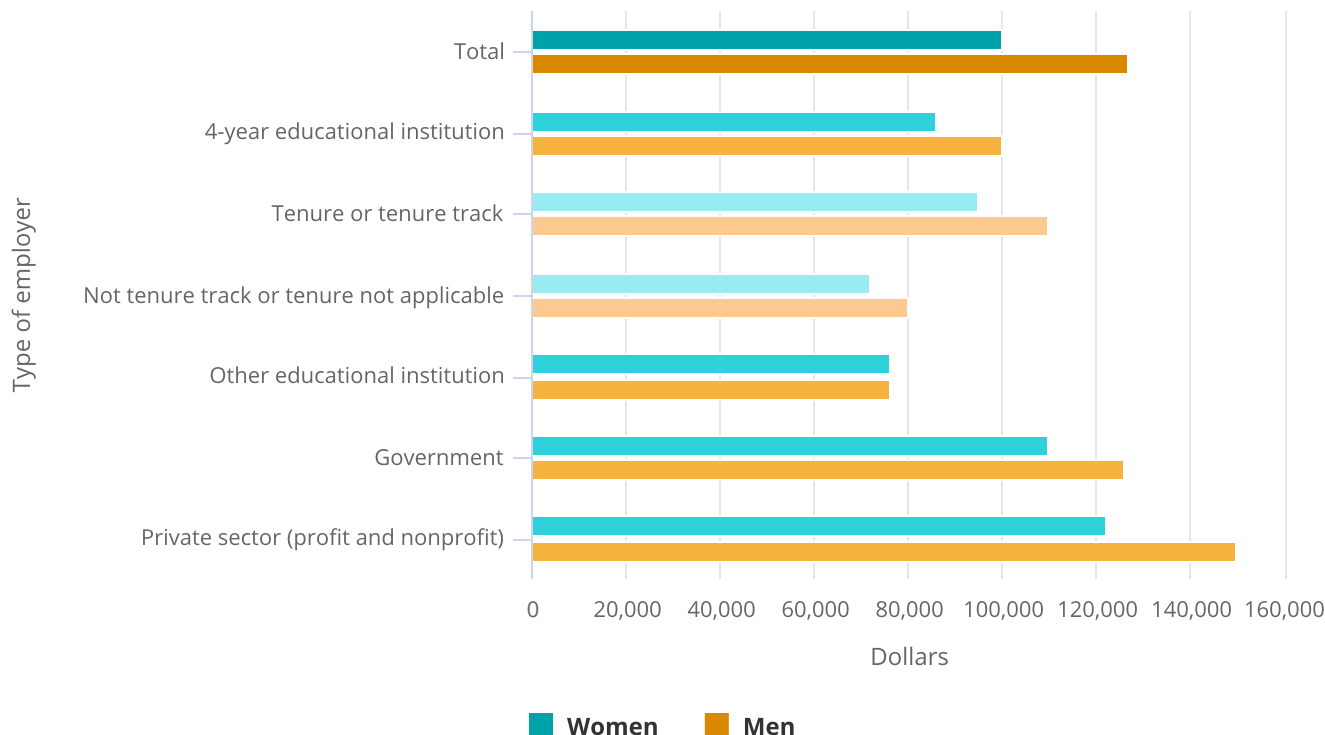
National Center for Science and Engineering Statistics, Survey of Doctorate Recipients, 2019. Related detailed data: WMPD table 9-34.

Salary

Overall, SEH doctorate holders who were employed full-time had a median salary of \$119,000 in 2019. Among those who held positions at 4-year educational institutions and were tenured or on tenure track, the median salary was \$110,000 for men and \$95,000 for women. Those in the private sector had the highest median salaries (\$150,000 for men and \$122,000 for women) (figure 46).

Figure 46

Median annual salary of employed science, engineering, and health doctorate holders, by type of employer and sex: 2019



Note(s):

Four-year educational institutions includes 4-year colleges or universities, medical schools, and university-affiliated research institutes. Other educational institutions includes 2-year colleges, community colleges, or technical institutes, and other precollege institutions. Salaries are rounded to nearest \$1,000. Salary data are for those employed full-time at their principal jobs only.

Source(s):

National Center for Science and Engineering Statistics, Survey of Doctorate Recipients, 2019. Related detailed data: WMPD table 9-35.

Early career

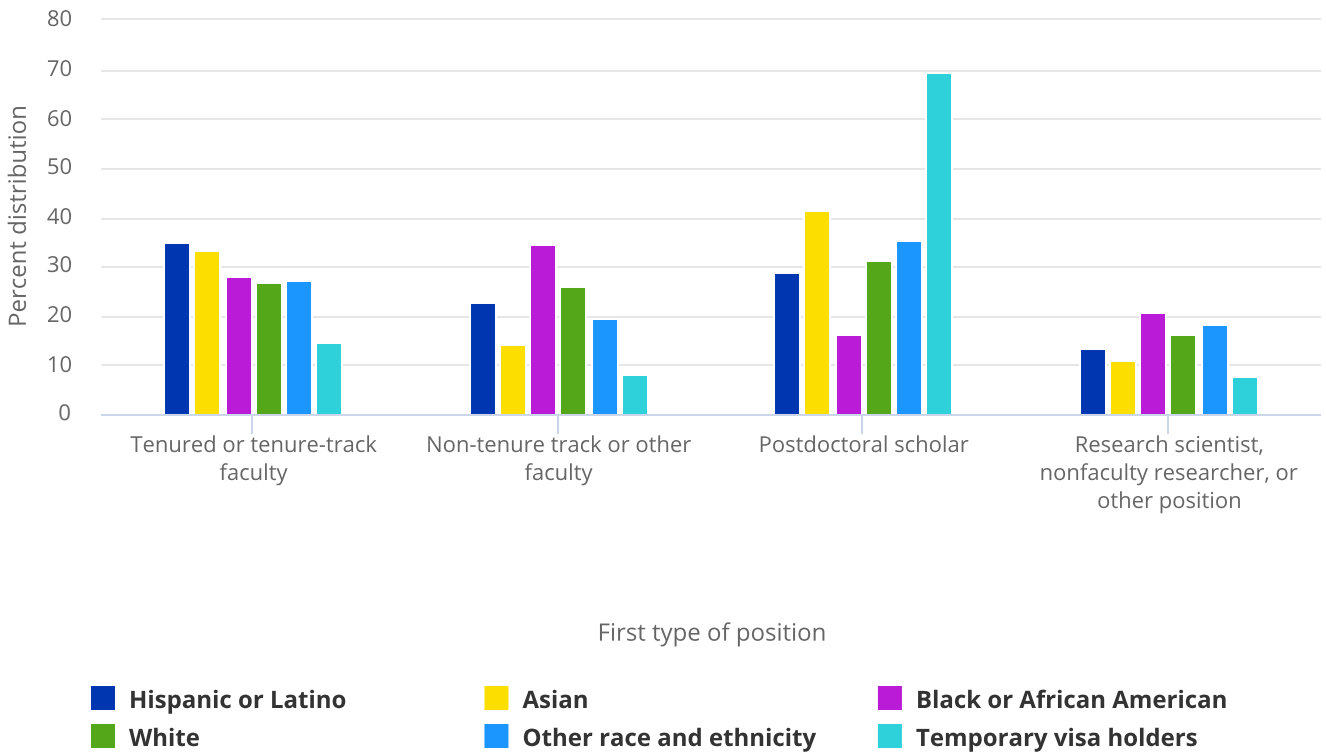
Of particular interest are early career doctorate holders, who are transitioning into their careers after graduate school. Of the 73,850 SEH doctorate holders—those who earned a PhD, MD, or equivalent—who graduated in 2016 or 2017, about 2% were unemployed (not employed and looking for work) in 2019 and about 2% more were not in the labor force (not employed and not seeking work).

Looking at early career doctorate holders within 10 years of receiving their degree is useful in understanding career paths. The first position a new SEH doctorate recipient holds can serve to launch or stall a career, so it is of interest to look at differences across various demographic groups. Twenty-six percent of all early career doctorate holders employed in federally funded research and development centers (FFRDCs) or U.S. master’s- and doctorate-granting academic

institutions, excluding affiliated medical schools and centers, held a tenure or tenure-track position as their first type of position, with similar shares across racial and ethnic groups. Blacks or African Americans had the lowest share of those whose first position was a postdoctoral (postdoc) position (16.4%). In contrast, about 29%–41% of other four racial and ethnic groups held a postdoc position as their first position after receiving their doctorate. Temporary visa degree recipients had the highest incidence of holding a postdoc position as their first position (69.3%) (figure 47).

Figure 47

First type of position for early career doctorate holders, by ethnicity and race: 2017



Note(s):

Hispanic or Latino may be any race; race categories exclude Hispanic origin. Percentages are rounded to the nearest 10th of a percent. Details may not add to totals because of rounding. Early career doctorate holders are individuals employed in federally funded research and development centers (FFRDCs) and U.S. master’s- and doctorate-granting academic institutions, excluding affiliated medical schools and centers who earned their first doctoral degree (PhD, MD, or equivalent) in the previous 10 years.

Source(s):

National Center for Science and Engineering Statistics, Early Career Doctorates Survey, 2017. Related detailed data: WMPD table 8-5.

Persons with disability

Persons with disability may face barriers to education and employment. Discrimination can include being treated less favorably or lack of reasonable accommodation in school or in the labor market. Of interest here is measuring the representation of persons with disability in science and engineering.

Overview

Scientists and engineers with disability⁹ who are in the early stage of their career are of special interest. Incidence of disability increases with age. For example, of all employed science, engineering, and health doctorate holders, 5.0% of those under age 40 have a disability, whereas 9.4% of those ages 40 and over have one. Older scientists and engineers experiencing aging-related disabilities, such as deterioration of sight or hearing, who are already employed, and perhaps already tenured, are less likely to face career barriers.¹⁰

Summary of findings

Findings for persons with disability are reported throughout this report and are also included below.

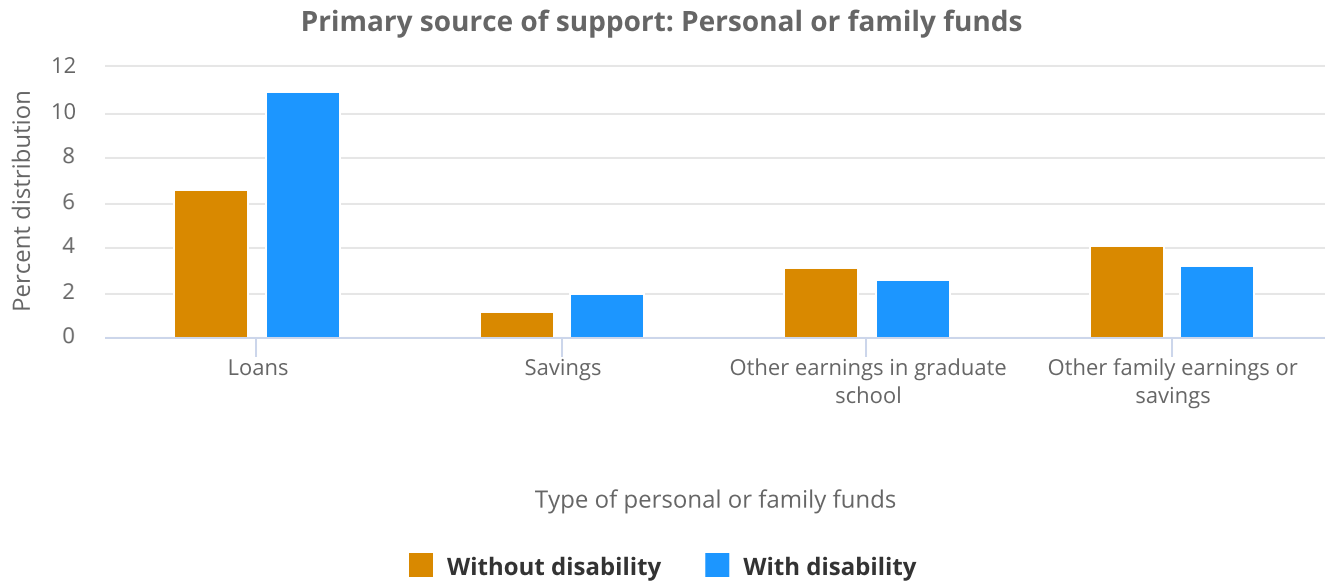
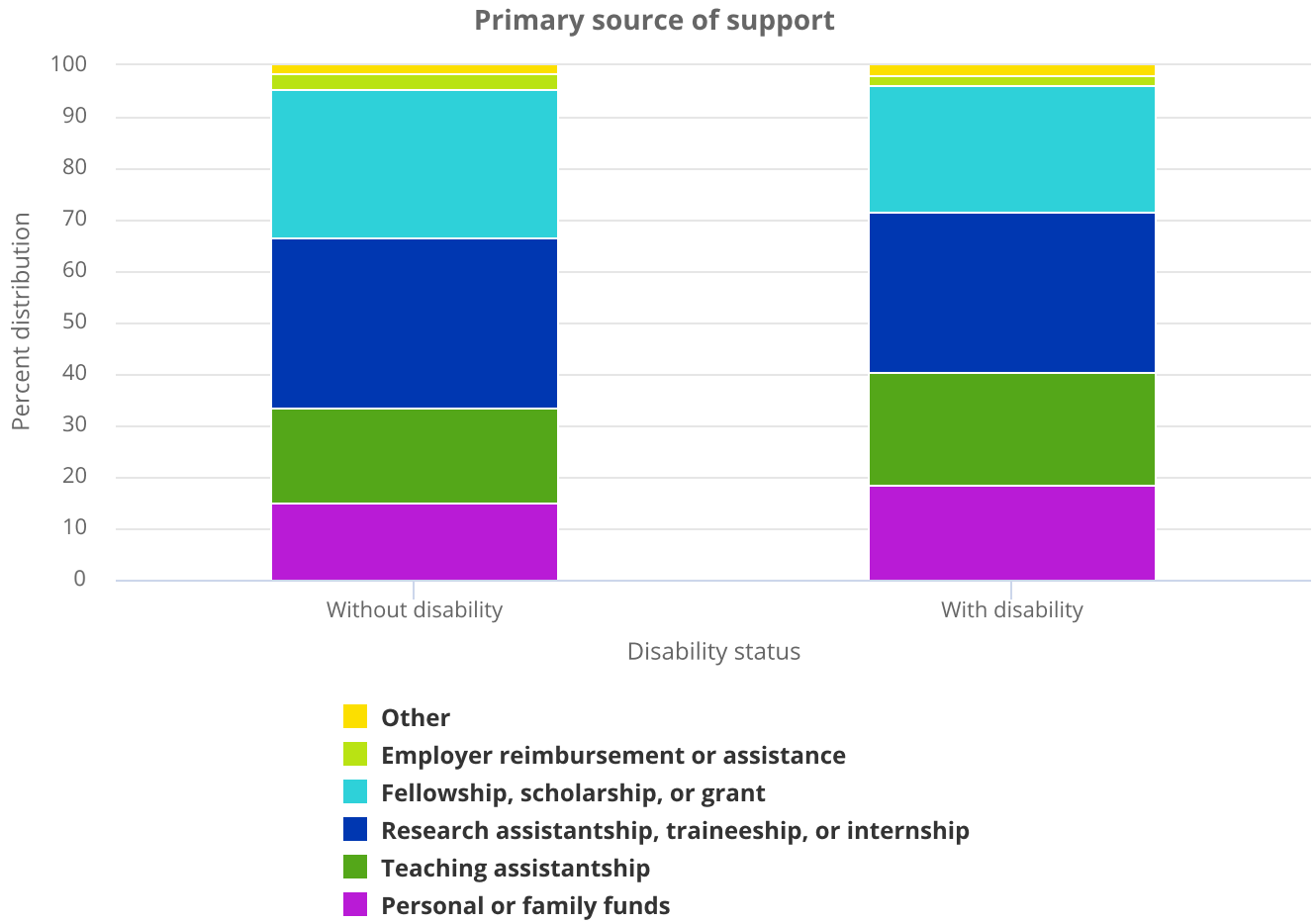
- About 10% of women and about 9% of men who are scientists and engineers with at least a bachelor's degree reported that they are not working due to chronic illness or disability ([figure 30](#)). In addition, scientists and engineers with disability have a higher unemployment rate than do those without disability and a higher unemployment rate than the overall U.S. unemployment rate in 2019 ([figure 33](#)).
- Among employed scientists and engineers with at least a bachelor's degree, men had a higher disability rate than did women and underrepresented minorities had a higher rate than did Whites or Asians ([figure 32](#)).
- Among employed scientists and engineers with disability, a smaller share worked in science and engineering (S&E) or S&E-related occupations and a larger share worked in non-S&E occupations than those without disability ([figure 34](#)).
- The share of employed scientists and engineers with disability who had supervisory status was similar to that of those without disability ([figure 38](#)).

In addition, doctorate recipients in S&E fields in 2019 had a lower disability rate than those in non-S&E fields. However, among doctorate recipients in S&E fields, a larger proportion of those with disability than those without reported that their primary support of their graduate program was personal or family funds, in particular, loans. In addition, a smaller proportion of those with disability reported receiving research assistantships, traineeships, or internships or having fellowships, scholarships, or grants than did their counterparts without disability ([figure 48](#)).

These findings indicate that scientists and engineers with disability differ from those without disability across a range of measures. For example, those with disability have a higher rate of unemployment. Further investigation is planned into the educational attainment and employment of those with disability and their career paths to better understand their representation in the U.S. S&E enterprise.

Figure 48

Primary source of support for U.S. citizen and permanent resident S&E doctorate recipients, by disability status: 2019



S&E = science and engineering.

Note(s):

American Indian or Alaska Native doctorate recipients with unknown or refused citizenship status are counted as U.S. citizens and thus are included. Other source of support includes foreign and unknown source of support. Data in this table refer to research doctorates only and differ from doctoral degree data in this report that are based on the Integrated Postsecondary Education Data System Completions Survey. The greatest differences are in psychology, education, and medical or health sciences. Doctorate recipients could report more than one disability. Survey asks degree of difficulty—none, slight, moderate, severe, or unable to do—an individual has in seeing (with glasses), hearing (with hearing aid), walking without assistance, lifting 10 pounds, or concentrating, remembering, or making decisions. Those respondents who answered "moderate," "severe," or "unable to do" for any activity were classified as having a disability.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2019. Related detailed table: WMPD table 7-24.

Appendix

Table A-1

Top U.S. baccalaureate institutions of science and engineering doctorate recipients from various groups: 2015–19

(Number)

Group and institution	Doctorate recipients	Historically Black college or university	High-Hispanic-enrollment institution
Women			
U. California, Berkeley	971	No	No
Cornell U.	654	No	No
U. Michigan, Ann Arbor	618	No	No
Black or African American			
Howard U.	132	Yes	No
Spelman C.	116	Yes	No
U. Maryland, Baltimore County	105	No	No
Hispanic or Latino			
U. Puerto Rico, Mayaguez	342	No	Yes
U. Puerto Rico, Rio Piedras	288	No	Yes
U. Texas, El Paso	190	No	Yes
American Indian or Alaska Native			
U. New Mexico, Albuquerque	15	No	No
U. Oklahoma, Norman	14	No	No
Oklahoma State U., Stillwater	10	No	No
Asian			
U. California, Berkeley	783	No	No
U. California, Los Angeles	391	No	No
Cornell U.	340	No	No
Persons with disabilities			
U. California, Los Angeles	29	No	No
U. California, Berkeley	28	No	No
U. California, San Diego	25	No	No

Note(s):

Hispanic or Latino may be any race; race categories exclude Hispanic origin. Includes all doctorate recipients except those who reported that they did not receive a baccalaureate degree. Data in this table refer to research doctorates only. None of the institutions listed is a tribal college or university.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates. Related detailed data: WMPD table 7-9 through table 7-20.

Glossary and key to acronyms

Glossary

High-Hispanic-enrollment institutions. HHEs are public and private nonprofit academic institutions whose undergraduate, full-time equivalent student enrollment is at least 25% Hispanic. The list of HHEs included in this report is based on data from the Integrated Postsecondary Education Data System Fall 2018 Enrollment Survey conducted by the National Center for Education Statistics.

Historically Black colleges or universities. HBCUs are academic institutions on a list maintained by the White House Initiative on Historically Black Colleges or Universities. The Higher Education Act of 1965, as amended, defines an HBCU as “...any historically Black college or university that was established prior to 1964, whose principal mission was, and is, the education of Black Americans, and that is accredited by a nationally recognized accrediting agency or association determined by the Secretary [of Education] to be a reliable authority as to the quality of training offered or is, according to such an agency or association, making reasonable progress toward accreditation.” See <https://sites.ed.gov/whhbcu/one-hundred-and-five-historically-black-colleges-and-universities/>.

Minority. A minority is a racial or ethnic group that is a small percentage of the U.S. population. Blacks or African Americans, Hispanics or Latinos, American Indians or Alaska Natives, Native Hawaiians or Other Pacific Islanders, Asians, and persons reporting more than one race are minority groups.

S&E technologies. A group of fields that includes science, engineering, health, and other technologies that prepare students for skilled technical jobs.

Scientists and engineers. In this report, persons classified as scientists and engineers are residents of the United States who have a baccalaureate degree or higher and an S&E or S&E-related degree or occupation. A baccalaureate or higher degree is a bachelor's, master's, doctoral, or professional degree.

Skilled technical workforce: The STW consists of individuals ages 25 years and older who do not possess a bachelor's degree and work in highly technical fields, such as construction and extraction; installation, maintenance, and repair; health care; production; and computer and mathematics.

Tribal college. Tribal colleges are fully accredited academic institutions on a list maintained by the White House Initiative on Tribal Colleges and Universities. See <https://sites.ed.gov/whiaiane/tribes-tcus/tribal-colleges-and-universities/>.

Underrepresented minority. This category comprises three racial or ethnic minority groups (Blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives) whose representation in S&E education or employment is smaller than their representation in the U.S. population.

Key to acronyms

HBCU: Historically Black college or university

HHE: High-Hispanic-enrollment institution

S&E: Science and engineering

SEH: Science, engineering, and health

STEM: Science, technology, engineering, and mathematics

STW: Skilled technical workforce

Data sources

The data in this report come from surveys conducted by the National Center for Science and Engineering Statistics (NCSES), National Science Foundation; National Center for Education Statistics (NCES), Department of Education; Census Bureau, Department of Commerce; and Bureau of Labor Statistics, Department of Labor. In addition, administrative data come from the Office of Personal Management. The technical notes for this report provide detailed information on specific data sources.

The degree award data from NCES cover degrees in the following science and engineering fields: astronomy, chemistry, physics, atmospheric sciences, earth sciences, ocean sciences, mathematics and statistics, computer sciences, agricultural sciences, biological sciences, psychology, social sciences, and engineering. To present data in a condensed form for this report, in some cases fields were aggregated in figures and in the text. Data on degree awards include associate's, bachelor's, master's, and doctoral degrees and do not include professional degrees, such as the MD or JD. The exception is data from the Early Career Doctorates Survey which does include holders of MD degrees.

Data on population projections are from the Census Bureau, 2017 National Population Projections Tables (<https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html>). U.S. labor force statistics are from the Bureau of Labor Statistics Current Population Survey, monthly microdata files. Information on the Current Population Survey is at <https://www.bls.gov/cps/>, and the monthly microdata files are at <https://www.census.gov/data/datasets/time-series/demo/cps/cps-basic.html>. Statistics on part-time workers and annual unemployment rate are from the Bureau of Labor Statistics, Current Population Survey, 2019, table 8, cpsaat08 (<https://www.bls.gov/cps/cpsaat08.htm>).

Racial and ethnic categories reported are those mandated by the Office of Management and Budget (OMB) effective 1 January 2003. OMB specified the following categories of racial and ethnic groups: Black or African American; American Indian or Alaska Native; Asian; Native Hawaiian or Other Pacific Islander; White; Hispanic or Latino regardless of race; and more than one race. In earlier volumes, racial and ethnic groups were identified as White, Black, Hispanic, Asian or Pacific Islander, and American Indian or Alaska Native (for more details, see the technical notes for this report). Because of insufficient sample size in some surveys, not all racial or ethnic groups are reported in all tables or figures.

Information on race and ethnicity is presented only for U.S. citizens and permanent residents in NCSES's Survey of Graduate Students and Postdoctorates in Science and Engineering enrollment data and in NCES's enrollment and degree award data. However, the proportions of students by race and ethnicity are calculated based on the total number of students enrolled or earning degrees, including those who have temporary visas in themes 1 (Enrollment) and 2 (Field of degree: Women). Elsewhere the total number of degrees received is based on U.S. citizens and permanent residents.

Notes

- 1** Census Bureau. 2017 National Population Projections Tables: Main Series. Available at <https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html>. Vespa J, Armstrong DM, and Medina L. 2020. *Demographic Turning Points for the United States: Population Projections for 2020 to 2060*. Report P25-1144. Washington, DC: Census Bureau. Available at <https://www.census.gov/library/publications/2020/demo/p25-1144.html>.
- 2** In this theme, race or ethnicity breakouts are for U.S. citizens and permanent residents only, but totals include students with a temporary visa.
- 3** In this theme, totals include students with a temporary visa.
- 4** Data in the employment theme are sample data, and the statistics presented are estimates of the population. Differences described are significant at the 90% confidence level; a characterization of “similar” or “similar to” indicates that the estimates are not statistically different.
- 5** Data in the occupation theme are sample data, and the statistics presented are estimates of the population. Differences described are significant at the 90% confidence level; a characterization of “similar” or “similar to” indicates that the estimates are not statistically different.
- 6** For more information on the skilled technical workforce, see <https://www.nsf.gov/statistics/stw/skilled-technical-workforce.cfm>.
- 7** See American Association of University Professors. 2017. *Campus Equity Week Highlights Contingent Faculty Working Conditions*. AAUP News Update. Available at <https://www.aaup.org/news/campus-equity-week-highlights-contingent-faculty-working-conditions#>.
- 8** Data in the academic careers theme are sample data, and the statistics presented are estimates of the population. Differences described are significant at the 90% confidence level; a characterization of “similar” or “similar to” indicates that the estimates are not statistically different.
- 9** Data on people with disabilities have limitations. Most data on disability are self-reported. Surveys from the National Center for Science and Engineering Statistics include a series of questions where the respondent is asked, “What is the USUAL degree of difficulty you have with” seeing; hearing; walking; lifting 10 pounds; and concentrating, remembering, or making decisions. The response choices are none, slight, moderate, severe, and unable to do. Respondents who report “moderate,” “severe,” or “unable to do” for any activity were classified as having a disability. See the online technical notes for a full discussion of the data limitations.
- 10** See Mann DR, Wittenburg DC. 2015. Starting Behind. *Journal of Disability Policy Studies* 26(2)89–99. doi: 10.1177/1044207315583898.

Acknowledgments and citation

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