

# 2020

## Doctorate Recipients from U.S. Universities

National Center for Science and Engineering Statistics  
Directorate for Social, Behavioral and Economic Sciences  
National Science Foundation





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November 2021  
NSF 22-300



NATIONAL  
ENDOWMENT  
FOR THE  
HUMANITIES

## ABOUT THIS REPORT

The Survey of Earned Doctorates (SED), the data source for this report, is an annual census of individuals who earn research doctoral degrees from accredited U.S. academic institutions. The survey is sponsored by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation and by three other federal agencies: the National Institutes of Health, the Department of Education, and the National Endowment for the Humanities.

Monitoring the number of degrees awarded in science and engineering fields is an important part of the mission of NCSES, the nation's leading provider of statistical data on the U.S. science and engineering enterprise. The data from the SED are reported in several publications. The most

comprehensive and widely cited publication is this report, *Doctorate Recipients from U.S. Universities*. This annual report calls attention to major trends in doctoral education and is organized into four recurring themes and a special focus area that highlight important questions about doctorate recipients. Online, the reader is invited to explore trends in greater depth through detailed data tables and interactive graphics (<https://nces.nsf.gov/sed/>). Technical notes and related resources are provided to aid in interpreting the data, and report content is available for downloading. An interactive data tool with data from the SED and other NCSES surveys is also available at <https://ncesdata.nsf.gov/>.

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# EXECUTIVE SUMMARY

Doctoral education trains scientists, engineers, researchers, and scholars, all of whom are critical to the nation's progress. These individuals create and share new knowledge and new ways of thinking that lead, directly and indirectly, to new products, services, and works of art. Annual counts of doctorate recipients from U.S. universities are measures of the incremental investment in human resources devoted to science, engineering, research, and scholarship, and these counts can serve as leading indicators of the capacity for knowledge creation and innovation in various domains.

Changes in the characteristics of this population over time reflect political, economic, social, technological, and demographic trends. These include the following:

- Increased representation of women, minorities, and temporary visa holders
- Emergence of new fields and changes in the relative popularity of other fields
- Changes in completion time for doctoral study
- Expansion of the postdoctoral pool
- Shifting academic employment opportunities after graduation
- Different pathways to the doctoral degree

Understanding these connections is necessary to make informed improvements in this country's doctoral education system.

The data in this report cover the 2020 academic year (1 July 2019 to 30 June 2020) and are collected from doctorate students who complete the Survey of Earned Doctorates as they approach graduation. The latter part of this survey period coincided with the beginning of the COVID-19 pandemic. Next academic year, the questionnaire includes specific questions about the impact of the pandemic.

Key takeaways from the 2020 data include the following:

- In 2020, the number of doctorate recipients declined to 55,283 (from 55,614 in 2019); this is the first drop since 2017.
- The number of U.S. citizens and permanent resident doctorate recipients declined in 2020 to 34,492 (from 35,232 in 2019), and the number of temporary visa holders was similar to the number in 2019 (18,482 in 2020 and 18,324 in 2019).
- Between 2019 and 2020, the number of doctorate recipients who were U.S. citizens and permanent residents declined in all races and ethnicities except for Hispanics and Latinos and those reporting more than one race—numbers in both of these groups increased slightly. The proportion of doctorate recipients who were underrepresented minorities (Black or African American, Hispanic or Latino, and American Indian or Alaska Native) among U.S. citizens and permanent residents remained stable compared to 2019 (16%). However, there was a slight decline in the proportion of Asian doctorate recipients among U.S. citizens and permanent residents.

- Women earn 49% or more of doctorates in life sciences, psychology and social sciences, education, humanities and arts, and other non-science and engineering (non-S&E) fields. They constitute about a third of those in physical sciences and earth sciences and a quarter of those in engineering and in mathematics and computer sciences.
- The pattern of rising parental educational attainment is visible among all races and ethnicities among U.S. citizens and permanent residents. However, the proportion of doctorate recipients who are from an underrepresented minority group with at least one parent with a bachelor's degree is lower than the proportion corresponding to their Asian or White counterparts.
- Definite commitments for employment after graduation have continued to increase in 2020 across many of the broad S&E fields, following low points in 2014–16. However, the percentage of doctorate recipients in the life sciences and in mathematics and computer sciences who reported definite employment commitments was flat or nearly flat between 2019 and 2020. In 2020, 70% of doctorate recipients reported having definite commitments for employment or postdoctoral study.
- In 2020, in every broad field of study, median expected salaries for doctorate recipients committing to jobs in industry or business were higher than the salaries for those committing to postdoctoral positions or jobs in academe.
- In 2020, large majorities (71% and above) of doctorate recipients in S&E fields excluding psychology and social sciences reported holding no debt related to their graduate education. In psychology and social sciences, humanities and arts, and other non-S&E fields, the share of doctorate recipients with no debt was about half; in education, it was less than half.
- The number of doctorate recipients who are temporary visa holders is highly concentrated in a few countries. In 2020, those from China, India, and South Korea accounted for 53% of doctoral awards, and those from the top 25 countries of origin accounted for 86%.
- In 2020, nearly three-quarters (73%) of doctorate recipients on temporary visas intended to stay in the United States after graduating; this proportion has increased from 2010 (69%).
- Intentions to stay and definite employment commitments to stay in the United States after graduation are higher among S&E doctorate recipients than among those with degrees in non-S&E fields.
- Among doctorate recipients on temporary visas with definite commitments to stay in the United States after graduation, a greater proportion work in the industry or business sector than in the academic sector. In contrast, a greater proportion of U.S. citizens and permanent residents work in the academic sector than in the industry or business sector.

# U.S. DOCTORATE AWARDS

Each new cohort of doctorate recipients augments the supply of prospective scientists, engineers, researchers, and scholars. Data on the composition of these cohorts reveal changes in the presence of different demographic groups.

## OVERALL TRENDS

The number of research doctorate degrees awarded by U.S. institutions in 2020 decreased to 55,283, down from 55,614 in 2019, according to the Survey of Earned Doctorates (SED) (figure 1). Since the survey's inception in 1957, the number of doctorates awarded shows a strong upward trend—average annual growth of 3.1%—punctuated by periods of slow growth and even decline.

Since the SED began collecting data, the number of research doctorates awarded in science and engineering (S&E) fields has exceeded the number of non-S&E doctorates, and over time the gap has widened. From 1980 to 2020, the number of S&E doctorate recipients has more than doubled, while the number of non-S&E doctorates awarded in 2020 declined to just below the 1980 count. As a result, the proportion of S&E doctorates to all doctorates climbed from 58% in 1979 to 77% in 2020.

## CITIZENSHIP

### Trends in citizenship

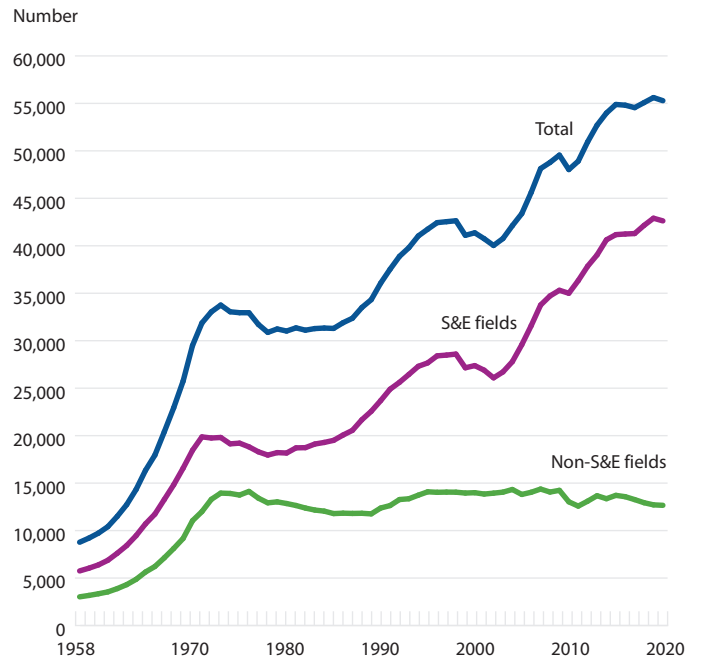
In 2020, the number of doctorates in S&E fields awarded to temporary visa holders was 16,003, up 225 from 2019 (figure 2). Overall, growth of doctorates awarded to temporary visa holders was up 101% since 2000 and up 37% since 2010. Since 2000, the proportion of S&E doctorates awarded to temporary visa holders peaked at 41% in 2007, held steady at about 36% between 2010 and 2017, and increased to 39% in 2020.<sup>1</sup>

In comparison, although starting from a larger base, the number of S&E doctorates awarded to U.S. citizens and permanent residents decreased by 735 doctorates from 2019 to 2020 and experienced a slower relative growth overall (37% since 2000 and 17% since 2010).

### Countries or economies of foreign citizenship

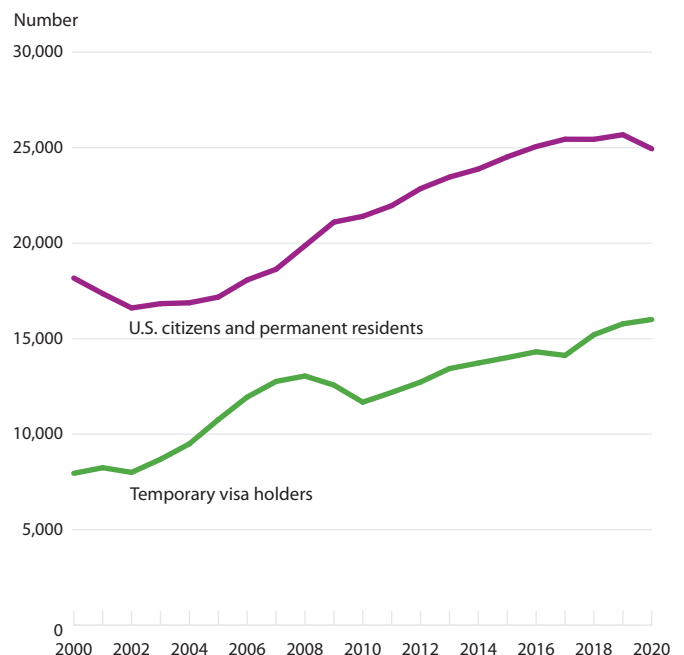
The number of doctorate recipients on temporary visas is highly concentrated in a few places of origin. Between 2010 and 2020, 10 countries accounted for 70% of the 177,454 doctorates awarded to temporary visa holders, and the top three countries—China, India, and South Korea—accounted for over half (53%) (figure 3). Between 70% and 94% of doctorate recipients from these countries earned a doctorate in an S&E field.

Figure 1. Doctorates awarded by U.S. colleges and universities: 1958–2020



SOURCE: NCSES, Survey of Earned Doctorates, 2020.

Figure 2. Doctorates awarded in S&E fields, by citizenship: 2000–20

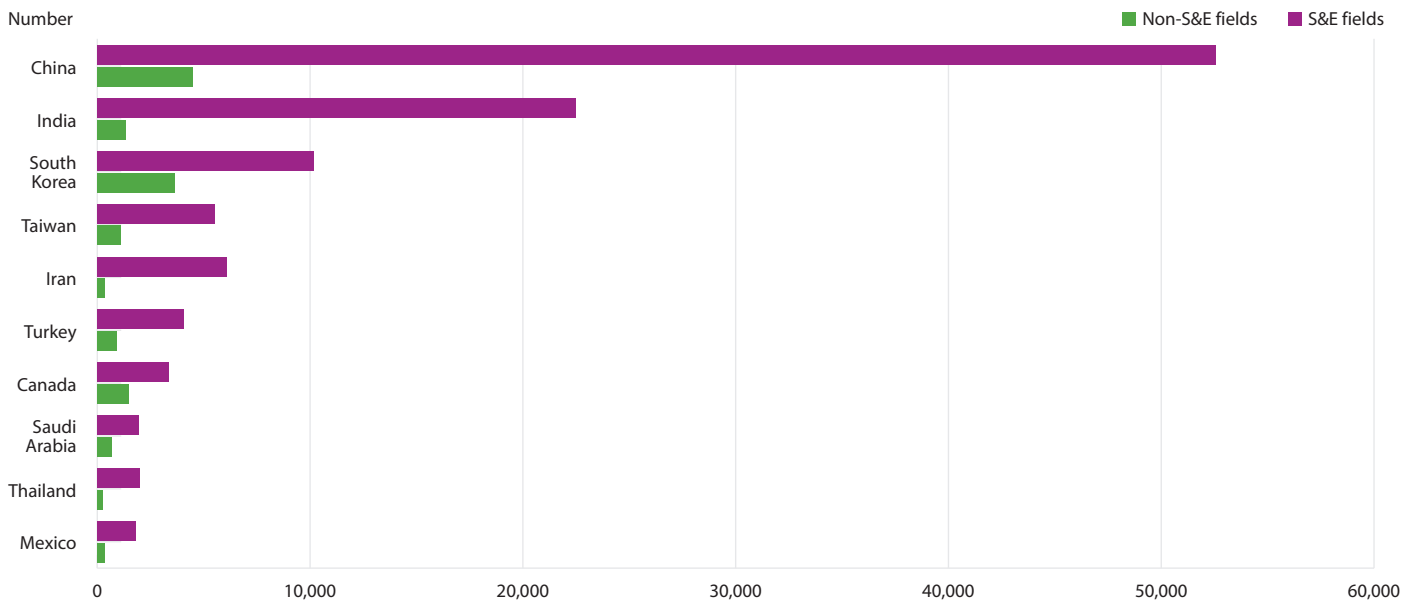


NOTES: Excludes respondents who did not report citizenship. Counts of unreported citizenship fluctuated between 1,750 and 4,144.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.



**Figure 3. Top 10 countries of foreign citizenship for doctorate recipients with temporary visas: 2010–20**



NOTES: China includes Hong Kong. Ranking based on total number of doctorate recipients.  
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

## SEX

### Citizenship

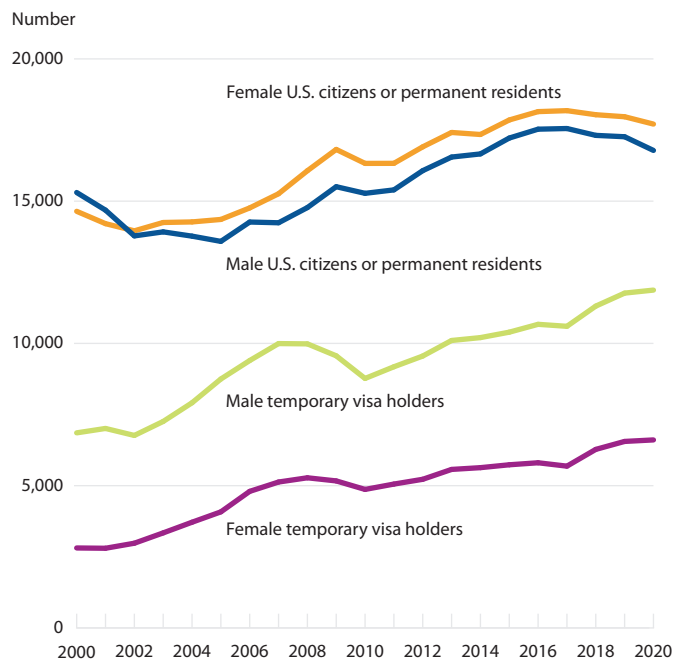
Overall, 46% of all doctorates in 2020 were awarded to women. Since 2002, women have earned just over half of all doctorates awarded to U.S. citizens and permanent residents and more than 30% of doctorates awarded to temporary visa holders (figure 4). From 2000 to 2008, the share of female doctorate recipients grew from 49% to 52% among U.S. citizens and permanent residents and from 29% to 35% among temporary visa holders. Since 2008, the shares of female doctorates in both citizenship categories have changed little.

### Field of study

Most of the growth in the number of doctorates earned by both men and women has been in S&E fields (figure 5). From 2000 to 2020, the number of female doctorate recipients in S&E fields increased by 75%, though starting from a small base, compared with 45% growth in the number of male S&E doctorates. Women’s share of S&E doctorates awarded increased from 38% in 2000 to 42% in 2009, and it has remained stable since then.

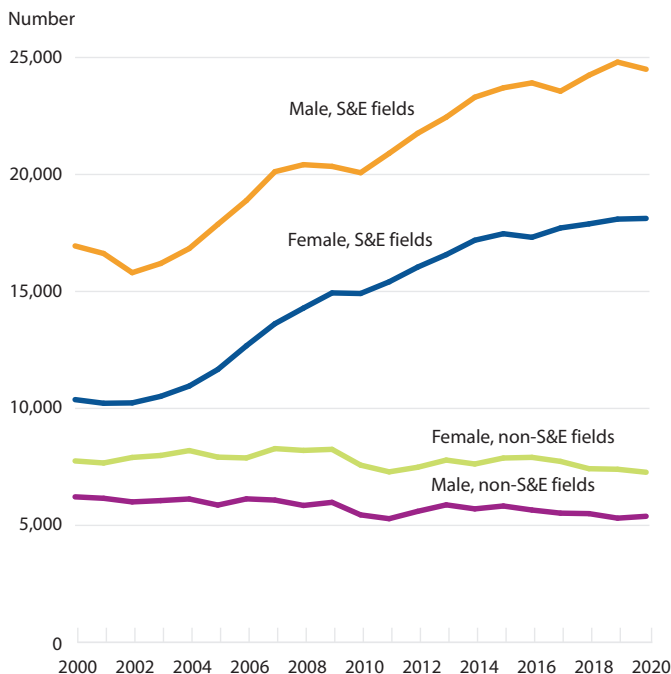
In non-S&E fields, 57% of doctorates were awarded to women in 2020, a share that has changed little since the early 2000s. The number of female non-S&E doctorate recipients declined by 6% between 2000 and 2020, while the number of male doctorate recipients in those fields declined by 13%.

**Figure 4. Sex and citizenship of doctorate recipients: 2000–20**



NOTE: Excludes respondents who did not report sex or citizenship.  
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 5. Sex and field of study of doctorate recipients: 2000–20**



NOTE: Excludes respondents who did not report sex.

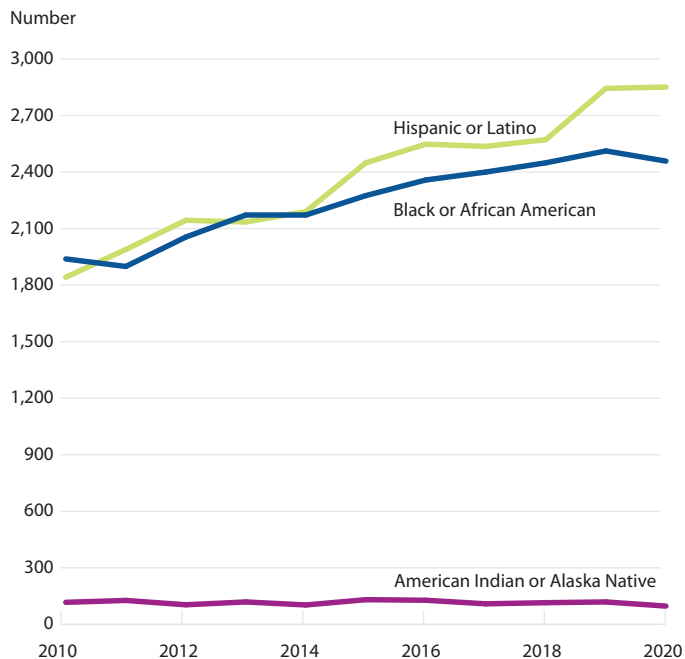
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

## RACE AND ETHNICITY

From 2010 to 2020, participation in doctoral education by Blacks or African Americans or Hispanics or Latinos who are U.S. citizens or permanent residents has been increasing, although starting from a small number.

In the past ten years, the number of Hispanic or Latino doctorate recipients increased from 1,842 to 2,851 (figure 6). As a result, the proportion of doctorates earned by this group relative to U.S. citizens and permanent residents grew from 6% to 8% during this period. The number of Black or African American doctorate recipients increased from 1,939

**Figure 6. Doctorates earned by underrepresented minority U.S. citizens and permanent residents: 2010–20**



NOTES: Excludes U.S. citizen and permanent resident respondents who did not report race or ethnicity. Counts of unreported race or ethnicity fluctuated between 742 and 1,293. Hispanic or Latino may be any race.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

in 2010 to 2,458 in 2020, and the proportion of doctorates they earned increased from 6% to 7% during this period. Between 2019 and 2020, however, the number of doctorates earned by Blacks or African Americans declined by 2%.

Between 2010 and 2019, the number of doctorates earned by American Indian or Alaska Native doctorate recipients has fluctuated between a low of 103 in 2014 and a high of 131 in 2015. In 2020, it declined to 97 (from 119 in 2019), remaining under 1% of doctorate recipients awarded to U.S. citizens and permanent residents.

# FIELDS OF STUDY

As researchers expand their understanding of the world, new fields of study emerge and existing fields change. Observing which fields of study are attracting growing proportions of students can provide early insight into where future research breakthroughs may occur.

## FIELD OF STUDY TRENDS

### S&E

Doctorates in science and engineering (S&E) fields are a growing share of all doctorates awarded. Every broad S&E field except for psychology and social sciences increased both its number and share of all doctorates over the past 2 decades. Psychology and social sciences increased in the number of doctorate recipients, but its share of all doctorates declined.<sup>2</sup> Engineering had the largest growth among S&E fields, from 13% of all doctorates in 2000 to 19% in 2020 (figure 7).

### Non-S&E

Within non-S&E fields, the number of doctorates awarded in education and in humanities and arts declined between 2000 and 2020, leading to a large, steady drop in the relative share of doctorates in those fields.<sup>3</sup> The number of doctorates in other non-S&E fields—such as business

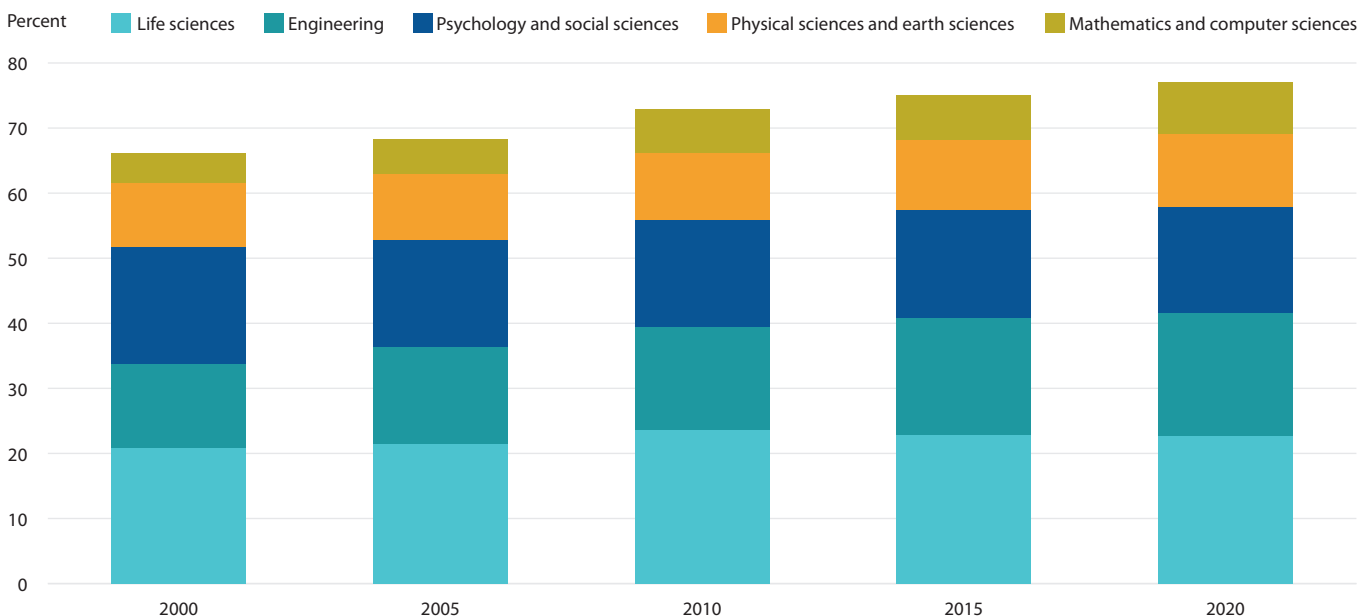
management and communication—increased,<sup>4</sup> but the share of these doctorates remained fairly level (figure 8).

## TEMPORARY VISA HOLDERS

In the past 2 decades, the number of doctorate recipients who are U.S. citizens or permanent residents increased in every broad field of study except in education and in humanities and arts, where numbers declined. During this period, the number of doctorates awarded to temporary visa holders increased in every broad field and at fast rates.<sup>5</sup>

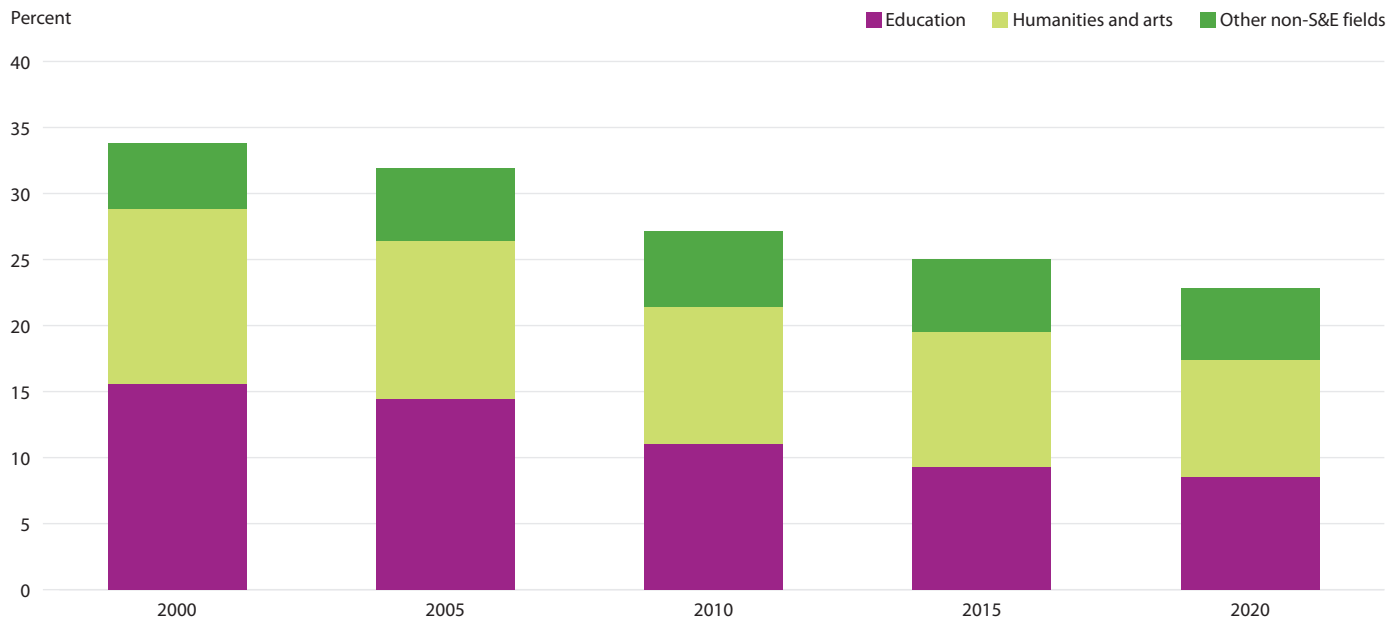
In 2020, temporary visa holders earned the majority of doctorates awarded in engineering (59%) and in mathematics and computer sciences (59%) (figure 9). Since 2000, the proportion of temporary visa holders increased the most in those two broad fields and in the category of other non-S&E fields, which includes business management and administration, communication, and other non-S&E fields not elsewhere classified.

Figure 7. Doctorates awarded in S&E broad fields of study: Selected years, 2000–20



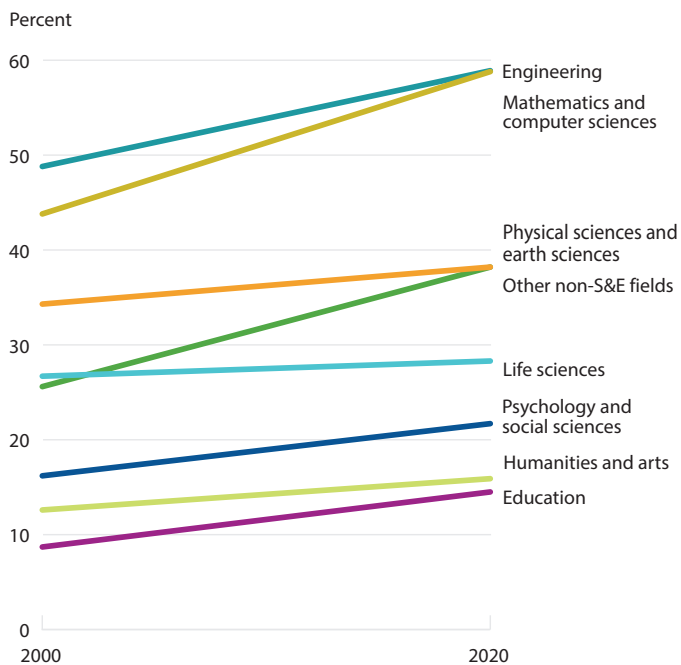
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 8. Doctorates awarded in non-S&E broad fields of study: Selected years, 2000–20**



SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 9. Doctorate recipients on temporary visas: 2000 and 2020**



NOTE: Percentages are based on the number of doctorate recipients who reported citizenship.  
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

## MINORITY U.S. CITIZENS AND PERMANENT RESIDENTS

In 2020, 69% of the 34,492 doctorate recipients who were U.S. citizens or permanent residents were White; 9% were Asian, 8% were Hispanic or Latino, 7% were Black or African American, and 3% identified as more than one race.<sup>6</sup> The remaining doctorate recipients were either American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, or did not report their race or ethnicity. Blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives are considered underrepresented in S&E because they are a larger proportion of the adult U.S. population (12%, 16%, and 0.7%, respectively) than the proportion of S&E doctorates they earn (6%, 8%, 0.2%, respectively) (table A and table B).

Among minority U.S. citizens and permanent residents, doctorate recipients of different racial or ethnic backgrounds are more heavily represented in some fields of study than in others. In 2020, Asians earned a larger share of doctorates than other racial and ethnic minority groups in life sciences, physical sciences and earth sciences, mathematics and computer sciences, and engineering. Black or African American doctorate recipients were the largest minority population in education and in other non-S&E fields, and Hispanics or Latinos were the largest minority population in humanities and arts. Hispanics or Latinos and Blacks or African Americans earned a larger proportion of doctorates in psychology and social sciences and in education than did other minority groups (figure 10).

**Table A. Adult resident population of the United States, by race and ethnicity: 2019**

(Number and percent)

Race and ethnicity	Number	Percent
All race and ethnicities	255,200,373	100.0
Hispanic or Latino <sup>a</sup>	41,884,672	16.4
Not Hispanic or Latino	213,315,701	83.6
American Indian or Alaska Native	1,818,958	0.7
Asian	15,221,807	6.0
Black or African American	31,140,331	12.2
Native Hawaiian or Other Pacific Islander	448,851	0.2
White	160,626,928	62.9
More than one race	4,058,826	1.6

<sup>a</sup> Hispanic or Latino may be any race.

SOURCES: Census Bureau, Population Division, Annual Estimates of the Resident Population by Sex, Age, Race, and Hispanic Origin for the United States and States: April 1, 2010 to July 1, 2019 (NC-EST2019-ASR6H), released June 2020, <https://www.census.gov/data/tables/time-series/demo/popest/2010s-national-detail.html>.

**Table B. S&E doctorate awards to U.S. citizens and permanent residents, by race and ethnicity: 2020**

(Number and percent)

Race and ethnicity	Number	Percent
U.S. citizens and permanent residents	24,493	100.0
Hispanic or Latino <sup>a</sup>	2,000	8.2
Not Hispanic or Latino	22,493	91.8
American Indian or Alaska Native	54	0.2
Asian	2,645	10.8
Black or African American	1,406	5.7
White	17,430	71.2
More than one race	892	3.6
Other race or race not reported	243	1.0
Ethnicity not reported	273	1.1

<sup>a</sup> Hispanic or Latino may be any race.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

## WOMEN

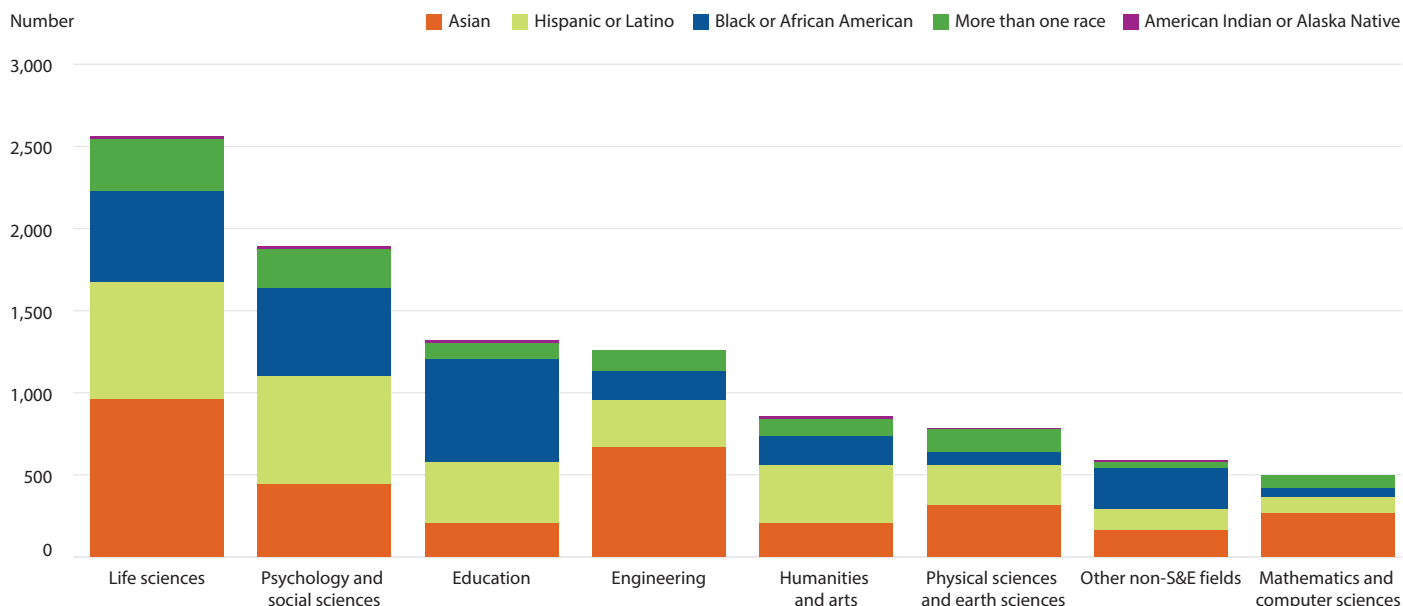
### Overview

Women’s share of doctorates awarded has grown over the past 2 decades in all broad fields of study except for humanities and arts where it remained the same. In 2020, women earned 49% or more of the doctorates awarded in life sciences, psychology and social sciences, education, humanities and arts, and other non-S&E fields.

Women earned only between about a quarter and a third of the doctorates awarded in engineering, in mathematics

and computer sciences, and in physical sciences and earth sciences in 2020. However, women’s shares of doctorates in these fields have grown over the past 20 years. From 2000 to 2020, the proportion of female doctorates grew considerably in life sciences (from 47% to 56%), in engineering (from 16% to 25%), and in physical sciences and earth sciences (from 25% to 33%). In psychology and social sciences and in mathematics and computer sciences, women’s share grew by 4 to 5 percentage points during this period (figure 11).

**Figure 10. Doctorates awarded to minority U.S. citizens and permanent residents, by selected race, ethnicity, and broad field of study: 2020**



NOTE: Hispanic or Latino may be any race.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

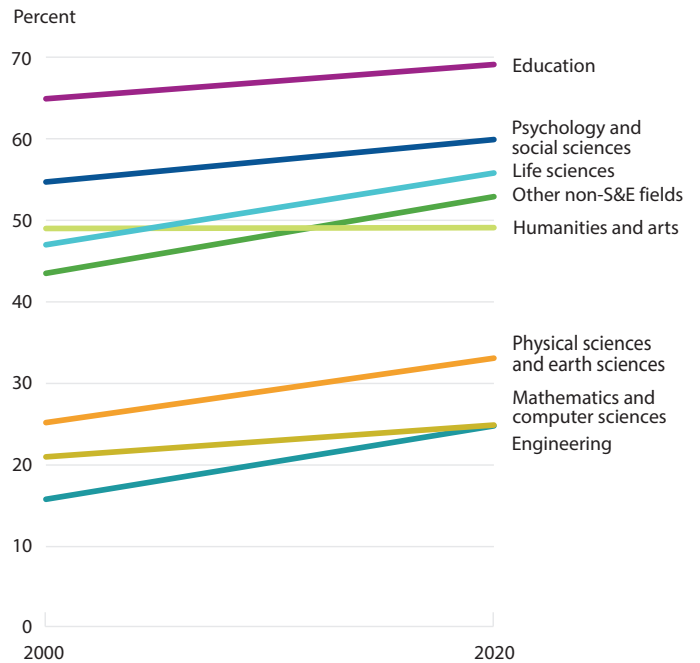
## Growing and declining S&E fields

The growth or decline in the share of women doctorate recipients in different fields does not always track with the overall growth of those fields. Between 2010 and 2020, the number of doctorate recipients in all fields grew by 15% while the share of women declined by nearly 1 percentage point (figure 12).<sup>7</sup>

From 2010 to 2020, the proportion of female doctorate recipients increased between 3 and 6 percentage points in four fields where the overall numbers of doctorates increased: industrial and manufacturing engineering; agricultural science and natural resources; mechanical engineering; and aerospace, aeronautical, and astronautical engineering. Women’s share of doctorates also increased about 7 percentage points in anthropology, a field that declined in the overall number of doctorates awarded.

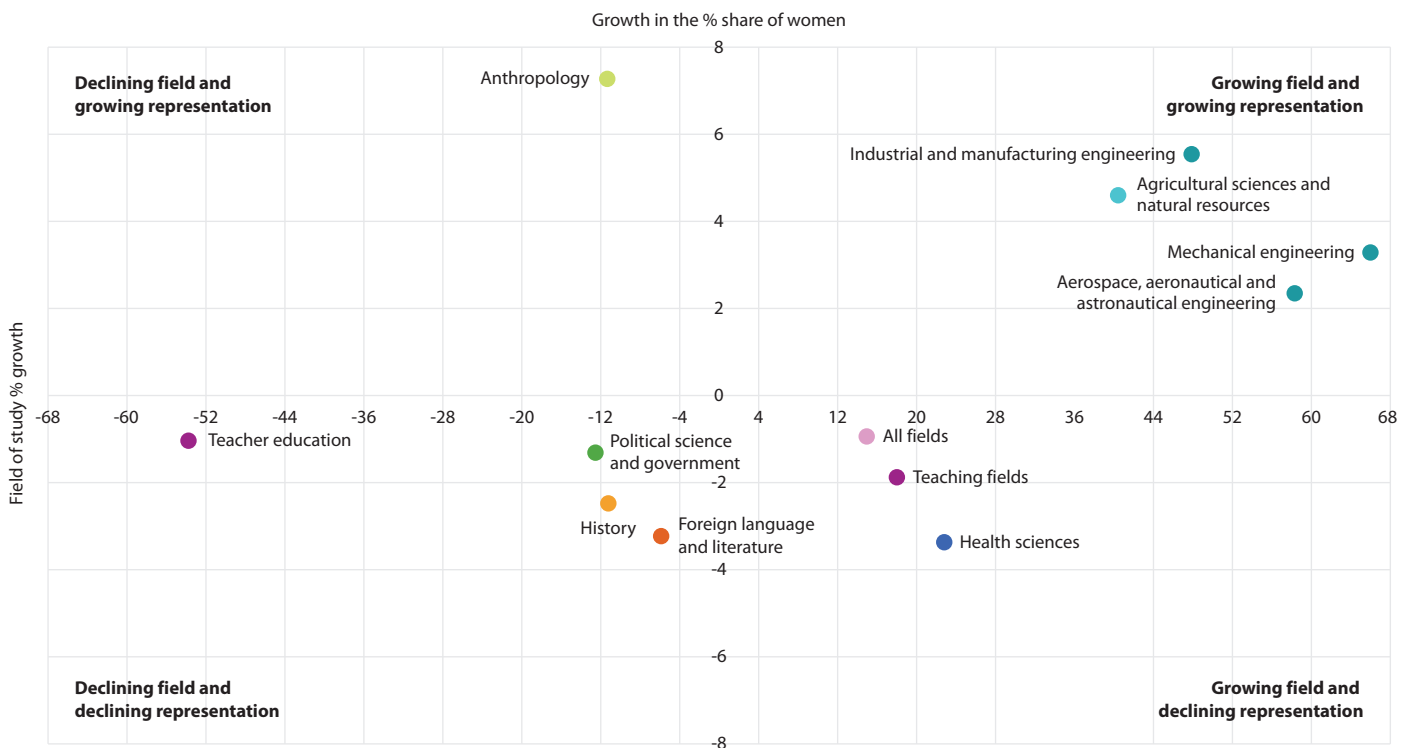
Despite the growth in the number of doctorate recipients in the health sciences and in teaching fields in the past 10 years, women’s shares of doctorates in these fields declined. The proportion of female doctorate recipients also declined in political science and government, history, and foreign languages and literature—fields in which the number of doctorates declined as well.

**Figure 11. Doctorates awarded to women, by broad field of study: 2000 and 2020**



NOTE: Percentages are based on the number of doctorate recipients who reported sex. SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 12. Fastest changing fields of study for female doctorate recipients and rates of change: 2010–20**



NOTES: Growth in the share of women refers to the difference in the percentage of women in a field during this period. Field of study growth is the overall change in the number of doctorate recipients in this period in a field (including both women and men).

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

# PATH TO THE DOCTORATE

Some paths to the doctoral degree are less traveled and some are more difficult to navigate, owing to a variety of influences that shape doctoral study. These paths may lead to different postgraduate destinations.

## PARENTAL EDUCATION

### Overview

The parents of recent doctorate recipients are better educated than the parents of earlier cohorts of doctorate recipients.<sup>8</sup> The share of doctorate recipients from families in which neither parent has earned more than a high school diploma declined in the past 20 years. In contrast, the shares of doctorate recipients from families with at least one parent holding bachelor's degree increased (figure 13).

### Race and ethnicity

The pattern of rising parental educational attainment is visible among all races and ethnicities for doctorate recipients who are U.S. citizens or permanent residents (figure 14).

Nonetheless, a smaller proportion of doctorate recipients who are underrepresented minorities—Black or African American, Hispanic or Latino, and American Indian or Alaska Native—have at least one parent with a bachelor's degree than Asian or White doctorate recipients.

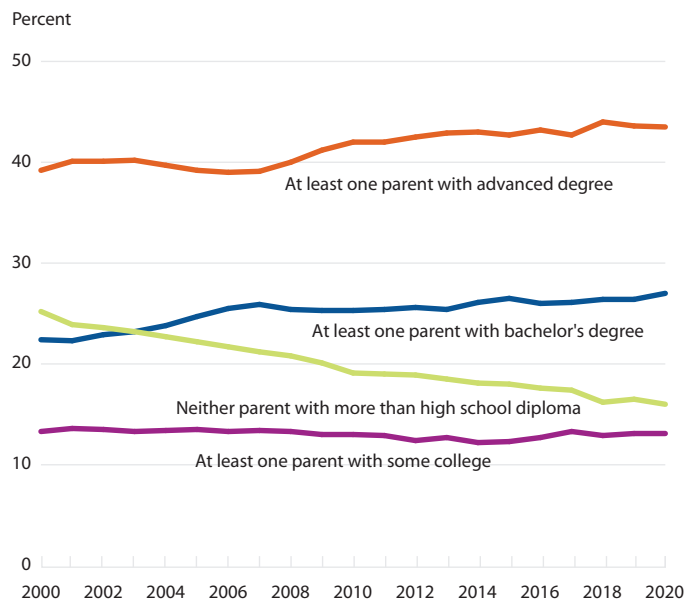
In 2020, about 75% of doctorate recipients who were Asian or who were White came from families having at least one parent who had a bachelor's degree or higher, compared with between 49% and 58% of doctorate recipients who were Black or African American, American Indian or Alaska Native, or Hispanic or Latino.

## SOURCES OF FINANCIAL SUPPORT

### Overview

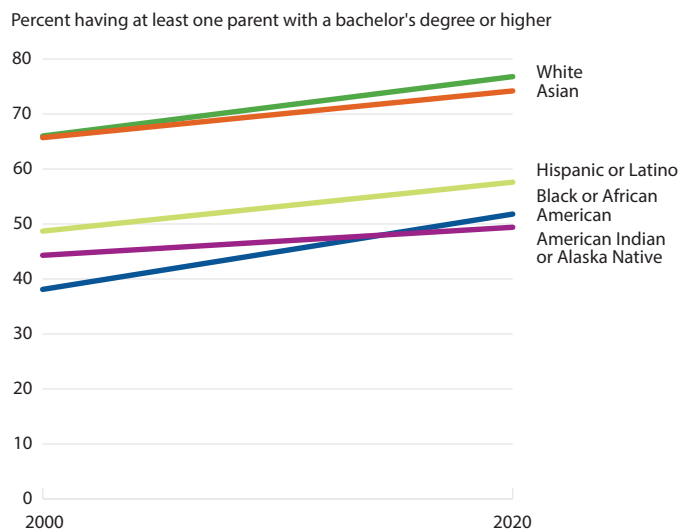
In 2020, about one-third of doctorate recipients were primarily supported by research assistantships or traineeships; 24% by fellowships, scholarships, or dissertation grants; and 22% by teaching assistantships. About 15% of doctorate recipients relied primarily on their own resources—loans, personal savings, personal earnings, and the earnings or savings of their spouse, partner, or family—to finance their graduate studies, and 5% relied on other sources, such as employer reimbursement and foreign support (figure 15).

**Figure 13. Doctorates awarded, by highest parental educational attainment: 2000–20**



NOTES: Percentages are based on the number of doctorate recipients who responded to the item on the highest educational attainment for either parent. Percentages may not sum to 100% because of rounding and because of doctorate recipients who reported “not applicable” for both father’s and mother’s education beginning in 2004.  
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 14. Parental educational attainment of U.S. citizen or permanent resident doctorate recipients, by race and ethnicity: 2000 and 2020**



NOTES: Percentages are based on the number of doctorate recipients who are U.S. citizens or permanent residents. Hispanic or Latino may be any race.  
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

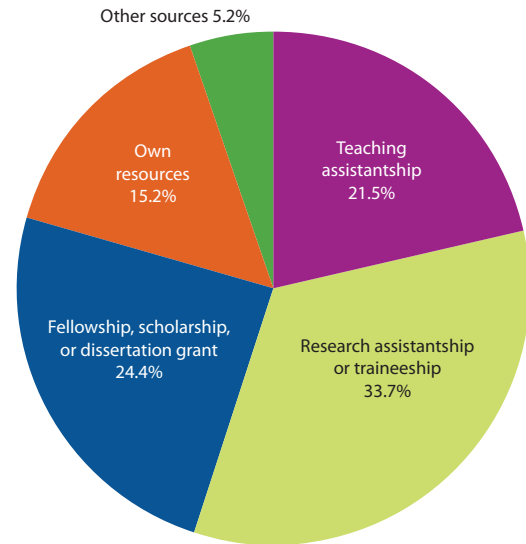
## Field of study

The primary sources of financial support used by doctorate recipients vary by field of study. In 2020, research assistantships were the most common primary source of financial support for doctorate recipients in engineering, in physical sciences and earth sciences, and in life sciences. In mathematics and computer sciences, teaching assistantships were just as frequent as research assistantships. Fellowships, scholarships, or dissertation grants and teaching assistantships were the most common source of primary support for comparable shares of doctoral students in humanities and arts. Nearly half of doctorate recipients in education relied on their own resources as their primary source of support. In psychology and social sciences, between 24% and 29% of doctorate recipients reported that their primary source of financial support was either fellowships, scholarships, or dissertation grants; teaching assistantships; or their own resources (figure 16).

## Graduate debt

The amount of education-related debt<sup>9</sup> incurred by doctorate recipients during graduate school is an indicator of the

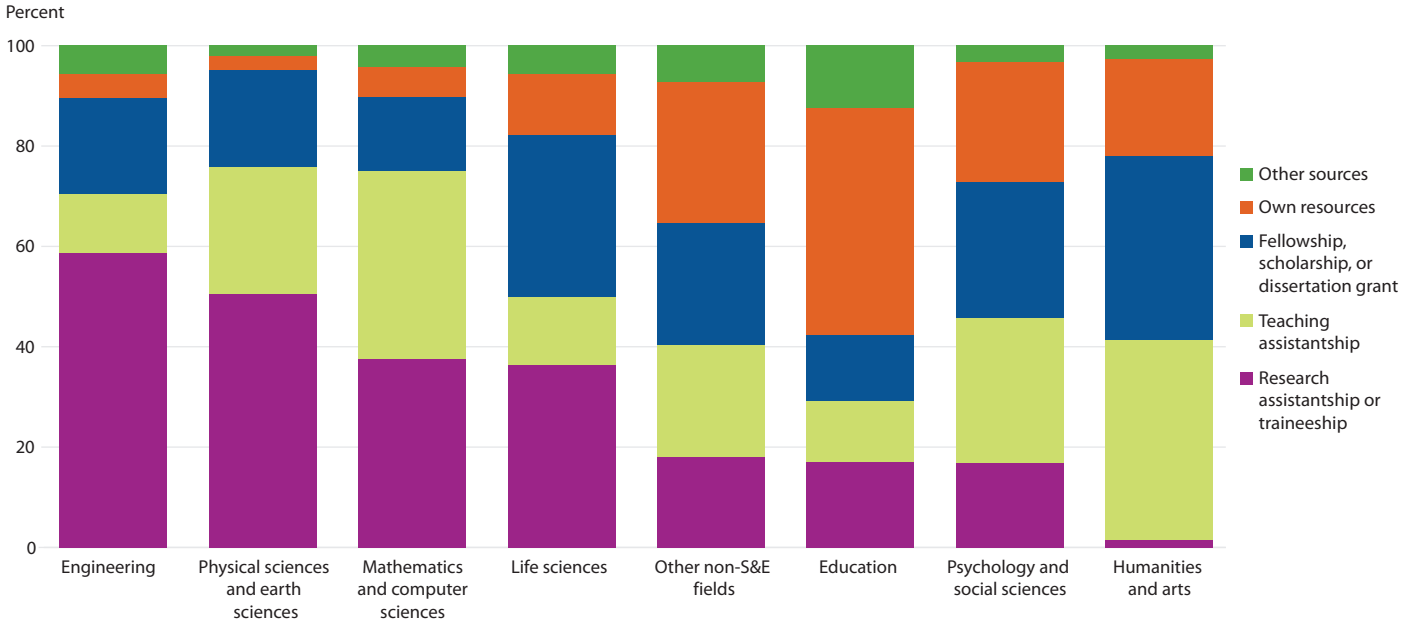
Figure 15. Primary source of financial support for doctorate recipients: 2020



NOTES: Percentages are based on the number of doctorate recipients who responded to the primary source of financial support item. Research assistantship or traineeship includes other assistantships and internships or clinical residencies. Own resources includes loans, personal savings, personal earnings outside the institution sources listed, and earnings or savings of spouse, partner, or family. Other sources includes employer reimbursement or assistance and foreign support.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

Figure 16. Primary source of financial support for doctorate recipients, by broad field of study: 2020



NOTES: Percentages are based on the number of doctorate recipients who responded to the primary source of financial support item. Research assistantship or traineeship includes other assistantships and internships or clinical residencies. Own resources includes loans, personal savings, personal earnings outside the institution sources listed, and earnings or savings of spouse, partner, or family. Other sources includes employer reimbursement or assistance and foreign support.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.



availability of financial support. In 2020, large majorities (72% and above) of doctorate recipients in physical sciences and earth sciences, in mathematics and computer sciences, engineering, and in life sciences reported holding no debt related to their graduate education when they were awarded the doctorate (figure 17). These are also fields that tend to receive the support of federal government and academic institutions in the form of research assistantships or traineeships; fellowships, scholarships, or dissertation grants; or teaching assistantships.<sup>10</sup> In psychology and social sciences, humanities and arts, and other non-S&E fields, the share of doctorate recipients with no debt was about half; in education, it was lower than half.

Within each broad field of study, 5% to 8% of doctorate recipients had incurred low levels (\$10,000 or less) of graduate debt. The shares of doctoral graduates with graduate debt burdens over \$30,000 were greatest in education (36%), psychology and social sciences (28%), other non-S&E fields (27%), and humanities and arts (25%).

In 2020, doctorate recipients in the S&E fields with the lowest median cumulative debt—physical sciences and earth sciences, engineering, and mathematics and computer sciences—had among the highest median expected annual salaries. In these fields, median expected salaries at graduation were more

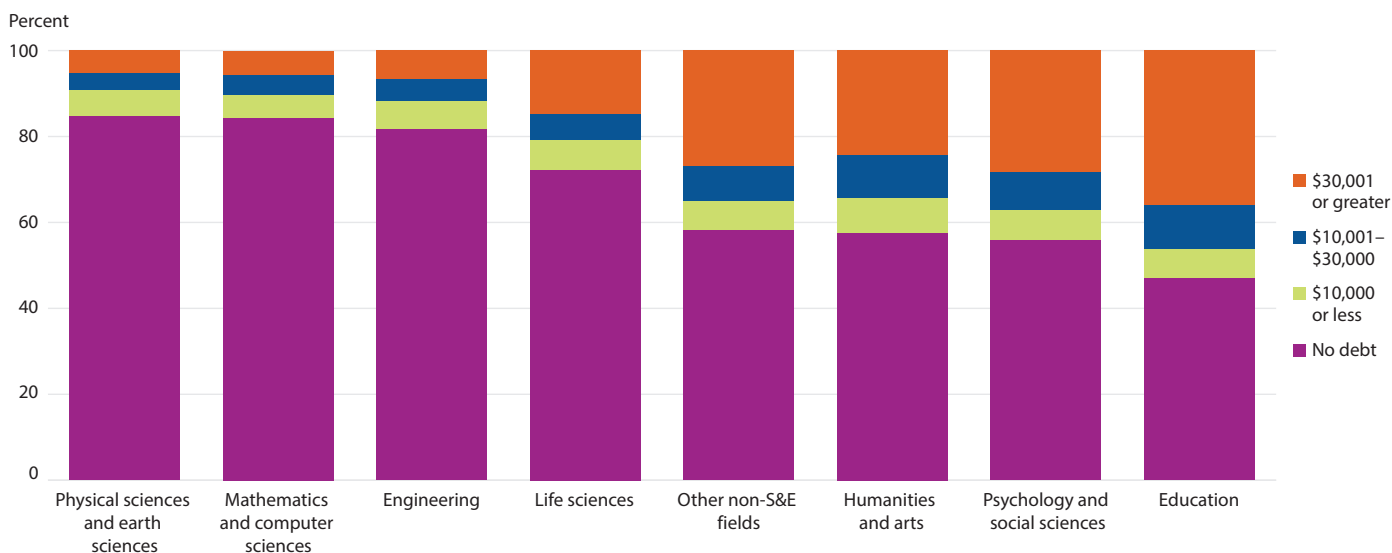
than triple the median cumulative debt. Median debt among those in business management and administration was higher (\$55,000), but their median expected salary was more than double their median debt (figure 18).

In contrast, doctorate recipients in the fields with the highest median cumulative debt (psychology, other non-S&E fields, and education) reported among the lowest median expected annual salaries. In psychology, the median cumulative debt was \$24,000 higher than the median expected salary at graduation. And in other non-S&E fields, the median cumulative debt was \$6,000 higher than expected salary. In the fields of education and communication, doctorate recipients' median expected salary was about the same as their median cumulative debt.

## TIME TO DEGREE

Earning a doctorate in non-S&E fields takes years longer than completing an S&E doctorate. The longest median time to degree from graduate school entry to doctoral award is in education. Over the past 20 years, median time to degree declined slightly or remained level in most S&E fields and in humanities and arts and in other non-S&E fields; it fell from 14.2 to 12.0 years in education (figure 19).

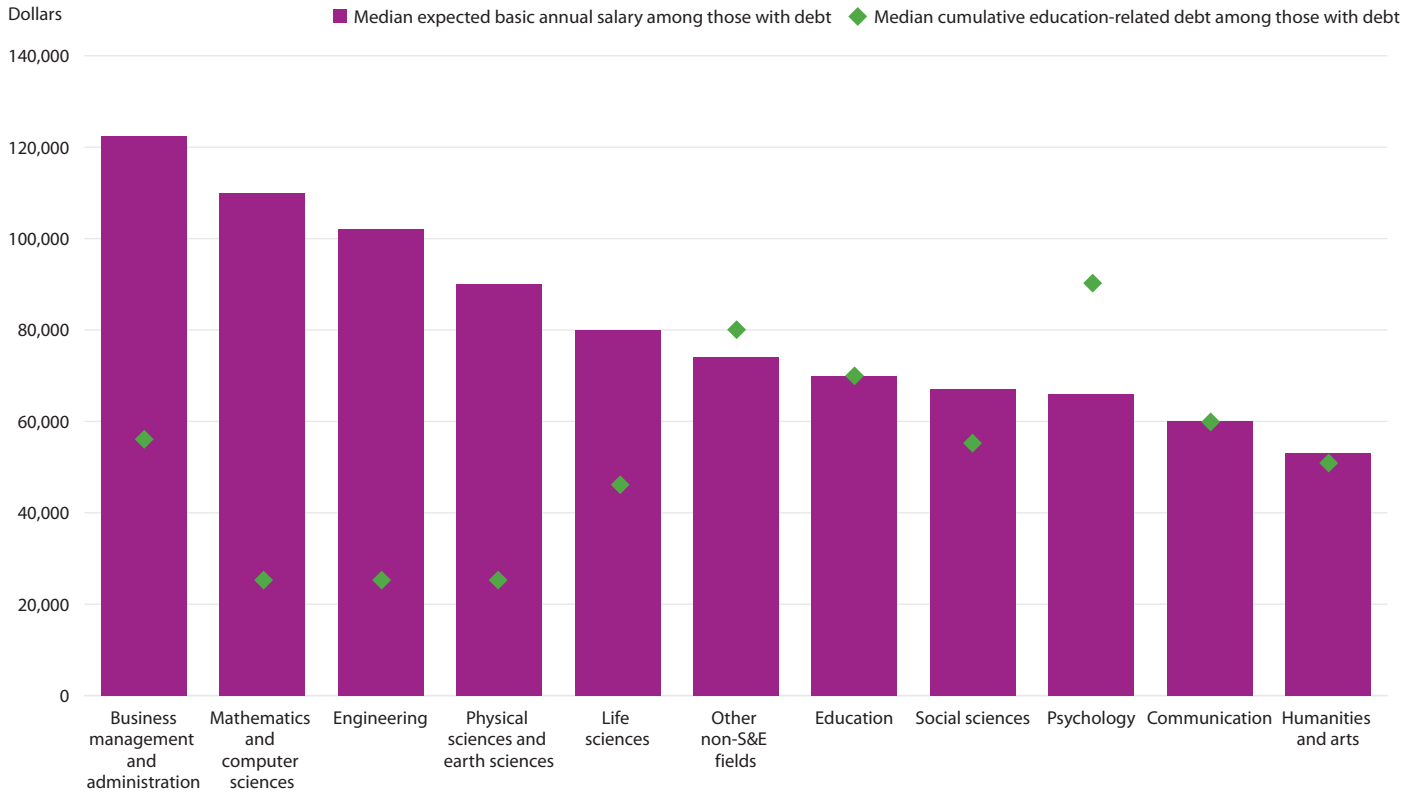
**Figure 17. Graduate debt of doctorate recipients, by broad field of study: 2020**



NOTE: Percentages are based on the number of doctorate recipients who responded to the graduate debt item ( $n = 50,405$ ).

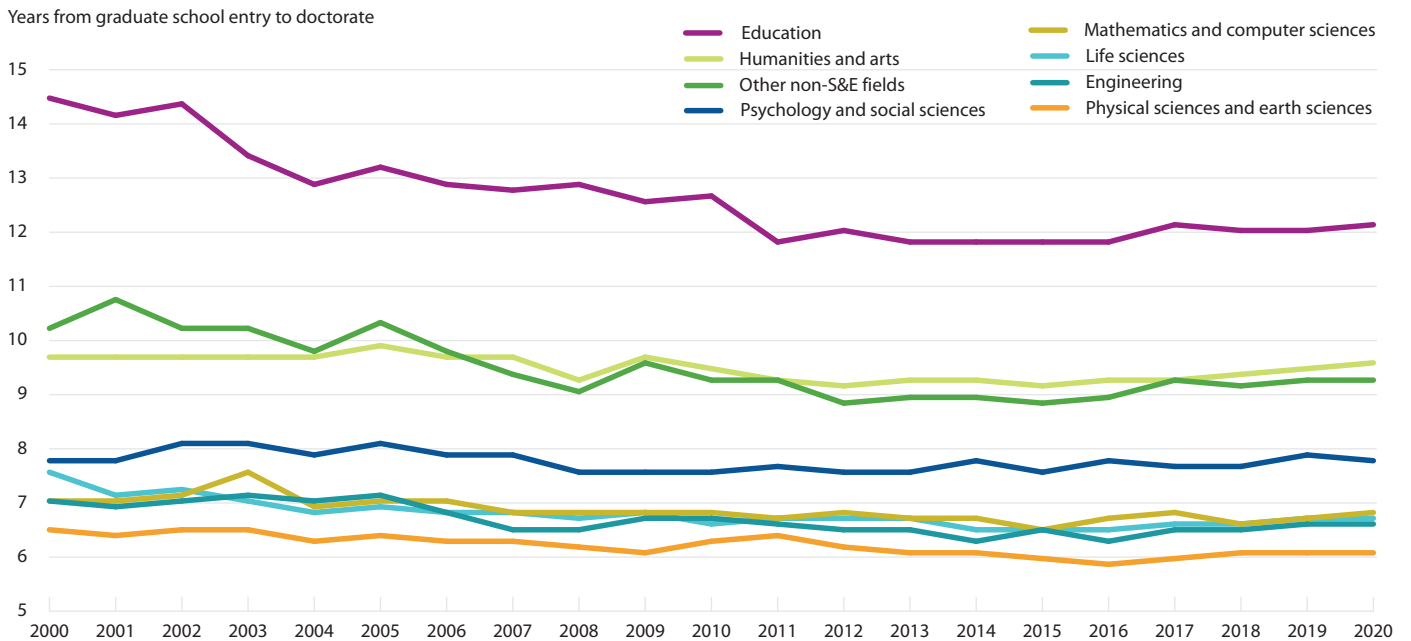
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 18. Median expected basic annual salary and median cumulative education-related debt for debt-holding doctorate recipients with definite employment commitments in the United States, by field of study: 2020**



NOTES: Definite employment commitment excludes postdoctoral study. Calculation of median debt excludes doctorate recipients reporting no debt.  
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 19. Median time to degree of doctorate recipients, by broad field of study: 2000–20**



SOURCE: NCSES, Survey of Earned Doctorates, 2020.

# POSTGRADUATION TRENDS

A graduate's first position after earning the doctoral degree may reflect broad economic conditions and can shape later career opportunities, earnings, and choices. Over the longer term, the early career patterns of doctorate recipients may influence the decisions of future students considering careers as scientists, engineers, scholars, and researchers.

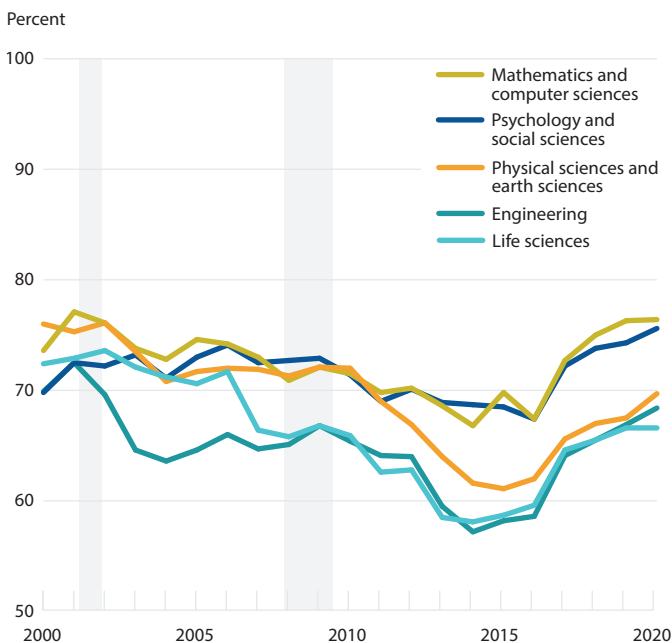
## JOB MARKET

At any given time, the job market for new doctorate recipients will be better in some fields of study than in others. Though all fields tend to follow patterns that generally reflect overall trends in economic conditions, definite commitments at graduation are likely to be influenced by many factors.

In life sciences, physical sciences and earth sciences, and engineering, the proportions of doctorate recipients

reporting definite commitments, including postdoctoral positions (postdocs), have declined since 2000. These fields hit low points from about 2014 to 2016, depending on the field, but have since rebounded. In 2020, the proportion of doctorate recipients in mathematics and computer sciences and in psychology and social sciences who had definite commitments reached their highest points in the past 20 years (76% in each field) (figure 20). Non-science and engineering (non-S&E) fields similarly have recovered from lows in 2014–16 (figure 21).

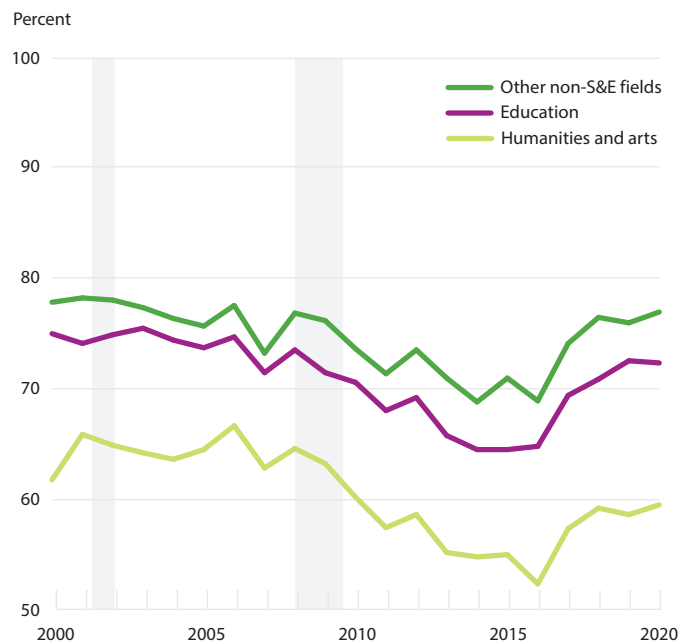
**Figure 20. Definite commitments among doctorate recipients, by S&E broad field of study: 2000–20**



NOTES: Shaded areas in the graphic reflect recessions that occurred between March 2001 and November 2001 and between December 2007 and June 2009. Definite commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment, including postdoctoral study, in the coming year. Percentages are based on the number of doctorate recipients who responded to the postgraduation status item.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 21. Definite commitments among doctorate recipients, by non-S&E broad field of study: 2000–20**



NOTES: Shaded areas in the graphic reflect recessions that occurred between March 2001 and November 2001 and between December 2007 and June 2009. Definite commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment, including postdoctoral study, in the coming year. Percentages are based on the number of doctorate recipients who responded to the postgraduation status item.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

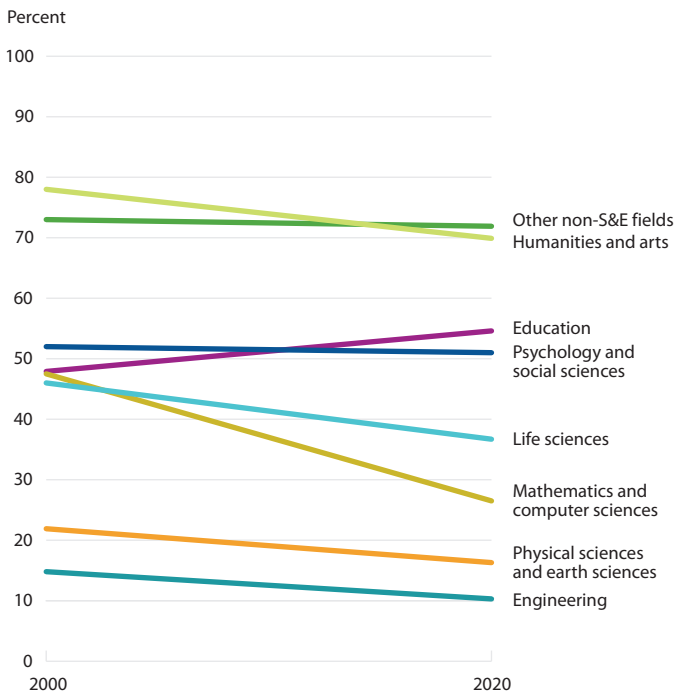
## FIRST POSTGRADUATE POSITION

### Academic employment

In 2020, 40% of all doctorate recipients with definite employment commitments (excluding postdoc positions) in the United States reported that their principal job would be in academe, down from 49% in 2000.

The highest rates of academic employment commitments were reported by doctorate recipients in humanities and arts and in other non-S&E fields (70% and 72%, respectively); the lowest rates were in engineering (10%) and in physical sciences and earth sciences (16%). In the past 20 years, the rate of academic employment commitments declined in all fields except for education, where it increased (figure 22).

**Figure 22. Definite employment commitments in academe in the United States, by broad field of study: 2000 and 2020**



NOTES: Definite employment commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment other than a postdoctoral position in the coming year. Percentages are based on the number of doctorate recipients who reported definite commitments (including those missing employer type) and plans to stay in the United States.

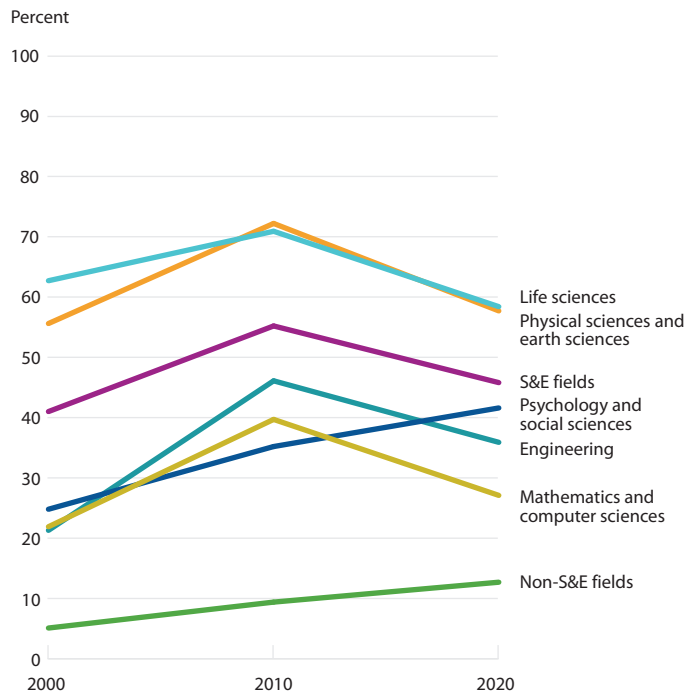
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

### Postdoc positions

Historically, postdoc study positions have been a customary part of the early career paths of doctorate recipients in life sciences and in physical sciences and earth sciences, making up over half of definite commitments. Since 2000, postdocs also have become more prevalent in mathematics and computer sciences, psychology and social sciences, engineering, and non-S&E fields, though their rates in these fields are not as high.

After a decade of growth between 2000 and 2010, the overall proportion of S&E doctorate recipients taking postdoc positions in the United States immediately after graduation declined from 55% to 46%. The proportions of doctorate recipients taking postdoc positions in life sciences, physical sciences and earth sciences, mathematics and computer sciences, and engineering declined during this period, but the proportions in psychology and social sciences and in non-S&E fields increased (figure 23).

**Figure 23. U.S. postdoctorate rate for doctorate recipients, by broad field of study: Selected years, 2000–20**



NOTE: Percentages are based on the number of doctorate recipients who reported definite commitments in the coming year, who reported whether their commitment was for postdoctoral study or other employment, and who plan to live in the United States.

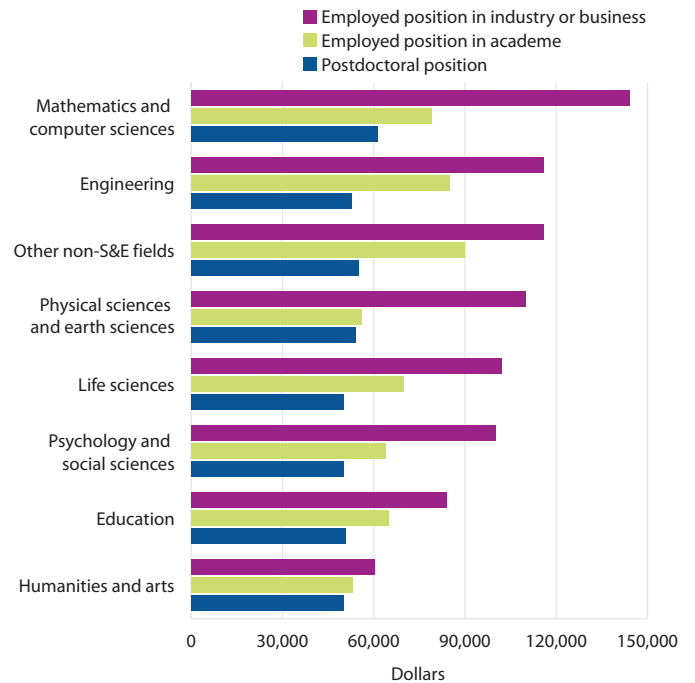
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

## MEDIAN SALARIES

In 2020, doctorate recipients who had definite commitments for a postdoc or other employed position in the United States in the coming year reported basic annual salaries that varied by their field of study and the type of position to which they committed.

In every field, median expected salaries for doctorate recipients committing to jobs in industry or business<sup>11</sup> were higher than those in postdocs and academe (figure 24). The median salaries for postdocs in almost all broad fields were relatively similar, ranging from \$50,000 to \$55,000. Postdocs in mathematics and computer sciences were the exception, with a median salary of \$61,000. Doctorate recipients in engineering and those in other non-S&E fields, such as industry or business, reported the highest median academic salaries (\$85,000 and \$90,000, respectively). Those in mathematics and computer sciences reported the highest median salaries in industry or business positions (\$144,000).

**Figure 24. Median expected basic annual salary of doctorate recipients with definite commitments in the United States, by position type and broad field of study: 2020**



NOTES: Definite commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment, including postdoctoral study, in the coming year and plans to stay in the United States. Industry or business includes all nonacademic sectors, including self-employment, private for-profit and private nonprofit, and government.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

# SPECIAL FOCUS: TEMPORARY VISA HOLDER DOCTORATE RECIPIENTS AND POSTGRADUATION PLANS

In an integrated global economy, knowledge is an increasingly valued national resource. By studying abroad, international students expand their employment opportunities, and many end up choosing between employment opportunities in different countries.

This special focus section examines the top countries of origin and fields of temporary visa holders who earned a doctorate in the United States.

## OVERVIEW

This section reports on how many intend to stay in the United States, where they have jobs lined up, and compares their patterns to those of their U.S. citizen or permanent resident counterparts. International doctoral recipients, led by those from China and India, outnumber American students in many science and engineering (S&E) fields, particularly in the fields of engineering, computer science, mathematics and statistics, and economics. Most of these doctorate recipients want to stay in the United States if they had the opportunity, and they end up working in industry or business at higher rates than their U.S. citizen or permanent resident counterparts.

## TOP FIELDS OF TEMPORARY VISA HOLDER DOCTORATE RECIPIENTS

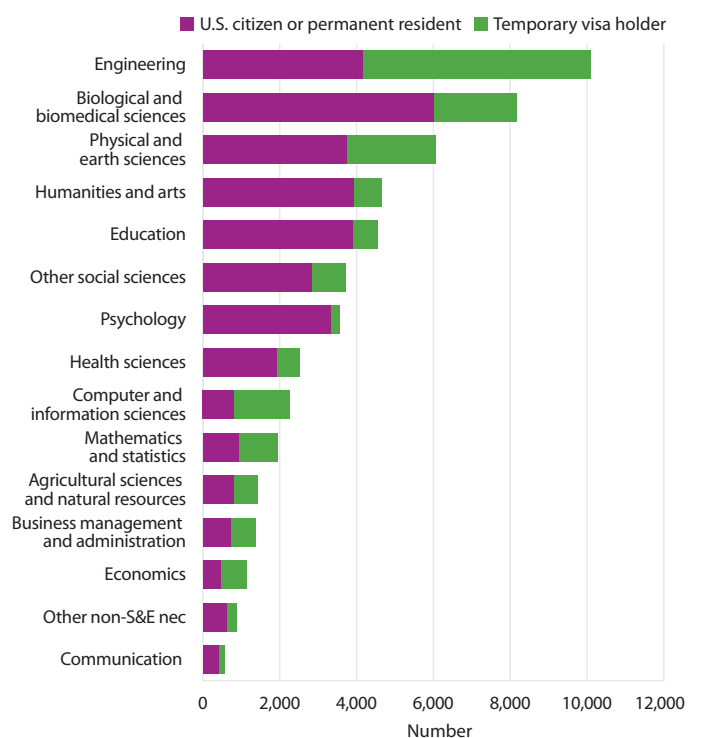
Since 2010, temporary visa holders earned nearly 180,000 out of 585,000 doctorates in the United States and 56% of these doctorates were in science fields and 31% were in engineering fields.<sup>12</sup> In 2020, the number of temporary visa holders earning a doctoral degree exceeded the number of their U.S. citizen and permanent resident counterparts in engineering, computer and information sciences, mathematics and statistics, and economics (figure 25). Within engineering, temporary visa holders accounted for about two thirds of doctorate recipients in electrical, electronics, and communications engineering (68%), industrial and manufacturing engineering (66%), and civil engineering (64%) (table C).

The proportion of temporary visa holder doctorate recipients was lowest in psychology (7%), humanities and arts (16%), and education (15%) (figure 25).

## TOP COUNTRIES OF ORIGIN

In 2020, doctorate recipients from the top 25 countries of origin accounted for 86% of all doctorate recipients awarded to temporary visa holders. The top three countries, China, India, and South Korea, accounted for more than half (figure 26).

**Figure 25. Doctorate recipients, by selected field of study and citizenship status: 2020**



nec = not elsewhere classified.

NOTES: Excludes respondents who did not report citizenship. Other social sciences includes anthropology, political science and government, sociology, and other social sciences.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Table C. Doctorate recipients in engineering, by citizenship status and fine field: 2020**

(Number and percent)

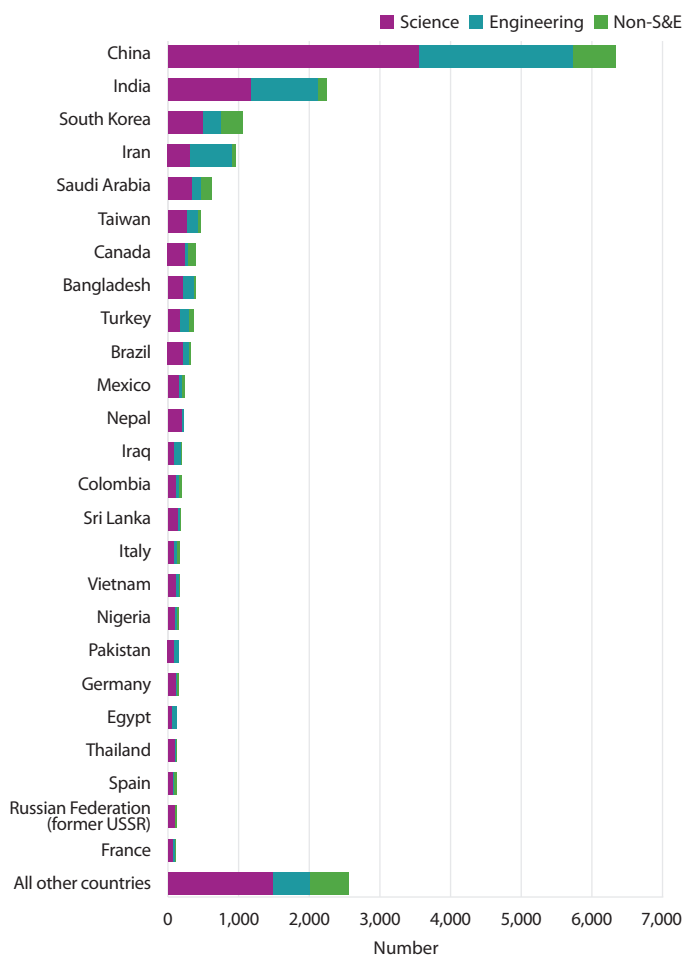
Citizenship status and field	All citizenships	U.S. citizens and permanent residents	Temporary visa holders	% temporary visa holders
All doctorate recipients <sup>a</sup>	55,283	34,492	18,482	33.4
Engineering	10,476	4,154	5,955	56.8
Aerospace, aeronautical, and astronautical engineering	399	221	163	40.9
Bioengineering and biomedical engineering	1,083	689	364	33.6
Chemical engineering	994	465	482	48.5
Civil engineering	796	245	513	64.4
Electrical, electronics, and communications engineering	1,973	552	1,344	68.1
Industrial and manufacturing engineering	304	82	200	65.8
Materials science engineering	880	398	463	52.6
Mechanical engineering	1,634	601	983	60.2
Other engineering	2,413	901	1,443	59.8

<sup>a</sup> Includes respondents who did not report citizenship status.

NOTE: See table A-6 in the Technical Notes for a listing of major fields and their constituent subfields.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 26. Top 25 countries of origin of U.S. doctorate recipients on temporary visas, by doctorate field: 2020**

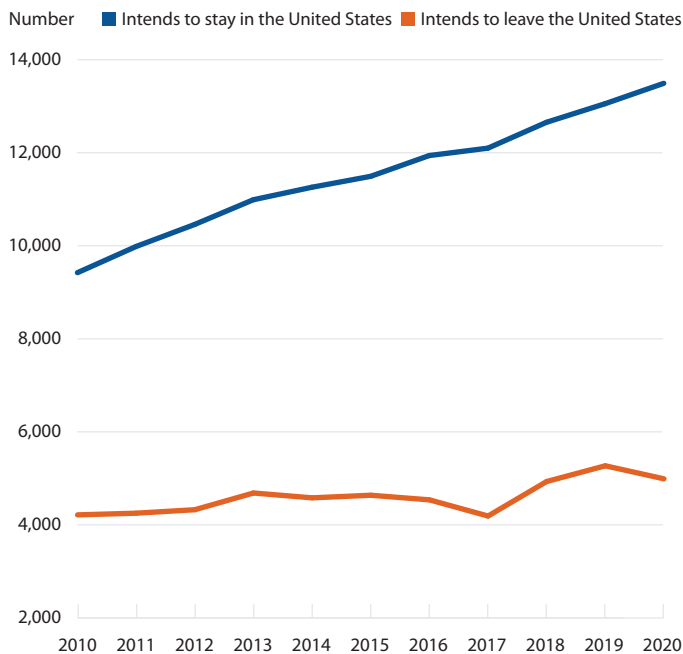


NOTES: Data include temporary residents and non-U.S. citizens with unknown visa status. Rank is based on total number of doctorates. Tied countries are listed alphabetically. China includes Hong Kong. All other countries excludes cases with unknown country of origin.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

The vast majority of the doctorate recipients from China and India (90% and 94%, respectively) earned their degrees in S&E. A larger proportion of doctoral recipients from South Korea (28%) than from China or India earned their degree in a non-S&E field. Over half of the doctorate recipients from Iran, Iraq, and Egypt earned a doctorate in engineering.

**Figure 27. Doctorates awarded to temporary visa holders, by intention to stay in the United States after graduation: 2010–20**



NOTE: Counts based on all doctorate recipients on temporary visas who indicated where they intended to stay after graduation (United States vs. foreign location).

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

## INTENTION TO STAY IN THE UNITED STATES AFTER GRADUATION

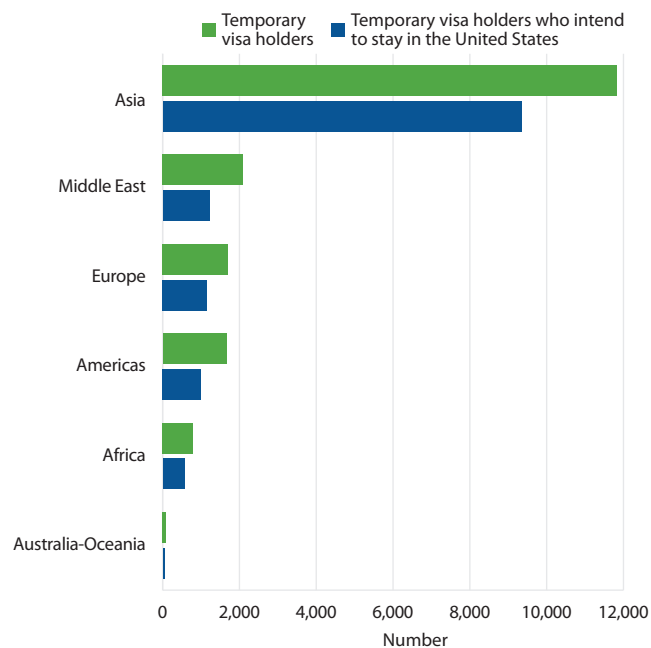
In 2020, 73% of doctorates on temporary visas intended to stay in the United States after graduating (figure 27). This proportion has increased from 69% in 2010, suggesting that the appeal of the United States for highly educated individuals has remained strong.

### Intentions and definite plans to stay in the United States, by country

Intentions to stay were highest among doctorate recipients from Asia (79%), the largest group of temporary visa holders, and those from Africa (73%), a much smaller group. They were lowest among doctorate recipients from the Middle East (figure 28).

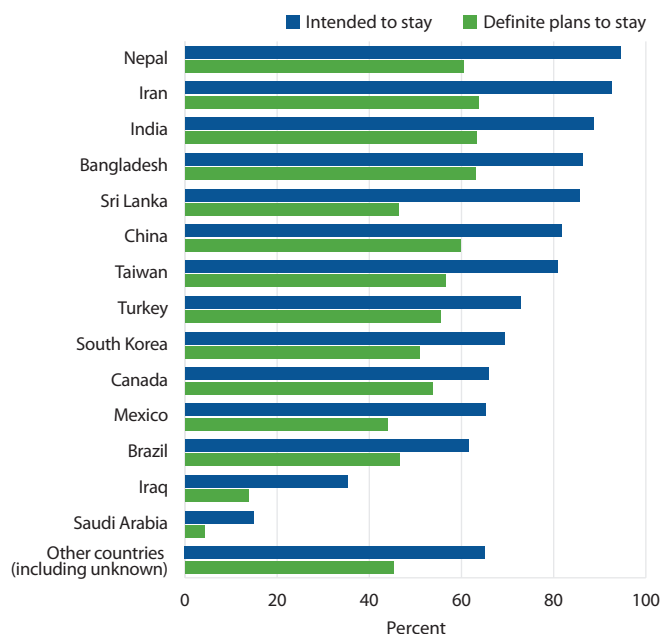
Among S&E doctorate recipients with a temporary visa who are from the top countries of origin and are earning their degree in the United States, more than 80% of those from China, India, Iran, Taiwan, Bangladesh, Sri Lanka, and Nepal indicated they intended to stay in the United States after graduation. More than 56% of the doctorate recipients from these countries (aside from Sri Lanka) had definite employment commitments in the United States after graduating (figure 29).

**Figure 28. Doctorate recipients on temporary visas who intend to stay in the United States after graduation, by region of country of citizenship: 2020**



NOTES: Counts based on all doctorate recipients on temporary visas who indicated where they intended to stay after graduation (United States vs. foreign location). Asia includes Hong Kong.  
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 29. Intentions and definite plans to stay in the United States among S&E temporary visa holder doctorate recipients from top countries of origin, by place of citizenship: 2020**



NOTES: Data include non-U.S. citizen recipients who are on temporary visas and also those whose visa status is unknown. Data for "intended to stay" refer to the doctoral recipients' intentions to stay in the United States within the year after graduation as reported around the graduation date. Doctorate recipients with "definite plans to stay" have a postdoctoral research appointment or a definite employment plan in the United States. Percentages are based on the total number of temporary resident doctorate recipients, including those who did not report their postgraduate location plans or employment plans.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

Among the top ten countries, intention to stay in the United States was lowest among doctorate recipients from Saudi Arabia (15%) and Iraq (35%), with even lower proportions from these countries having definite employment commitments in the United States (4% and 14%, respectively).

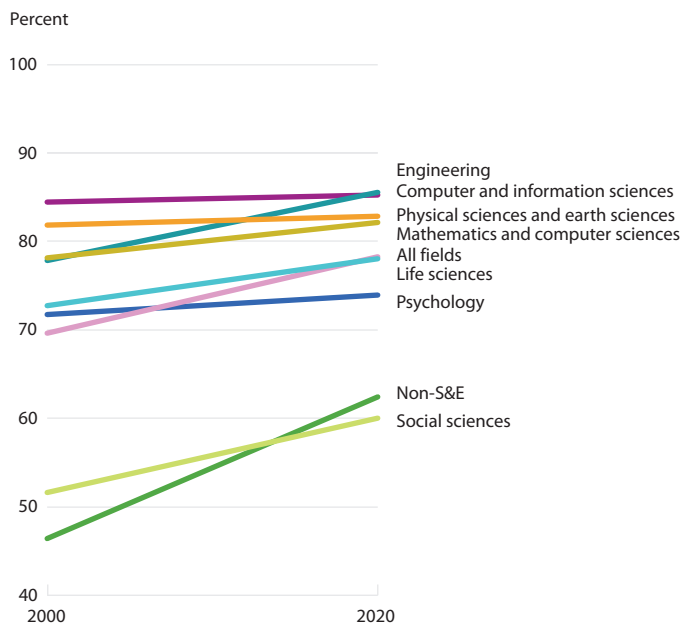
### Intentions and definite plans to stay in the United States, by field

In 2020, intentions to stay in the United States were higher among doctorate recipients in S&E fields (76%) than among those in non-S&E fields (56%). S&E doctorate recipients on temporary visas (54%) reported having definite employment commitments in the United States at higher rates than those in non-S&E fields (39%) (including postdoctoral research appointments).

In 2020, 78% of temporary visa holder doctorate recipients with definite commitments for employment indicated that the location of their postdoc or other employment commitment was in the United States, up from 70% in 2000 (figure 30). These expected stay rates were highest in fields where temporary visa holders were more heavily represented: engineering (86%), computer and information sciences (85%), physical sciences and earth sciences (83%), and mathematics and statistics (82%).



**Figure 30. Temporary visa holder doctorate recipients with definite commitments in the United States, by field of study: 2000 and 2020**



NOTE: Definite postgraduate commitment includes doctorate recipients reporting definite postgraduation commitments for employment or postdoctoral study.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

In the past 2 decades, expected stay rates grew the most among doctorate recipients with temporary visas in the social sciences and in non-S&E fields (e.g., education, humanities and arts, and other non-S&E fields). However, expected rates among doctorate recipients in these fields remain the lowest of all fields.

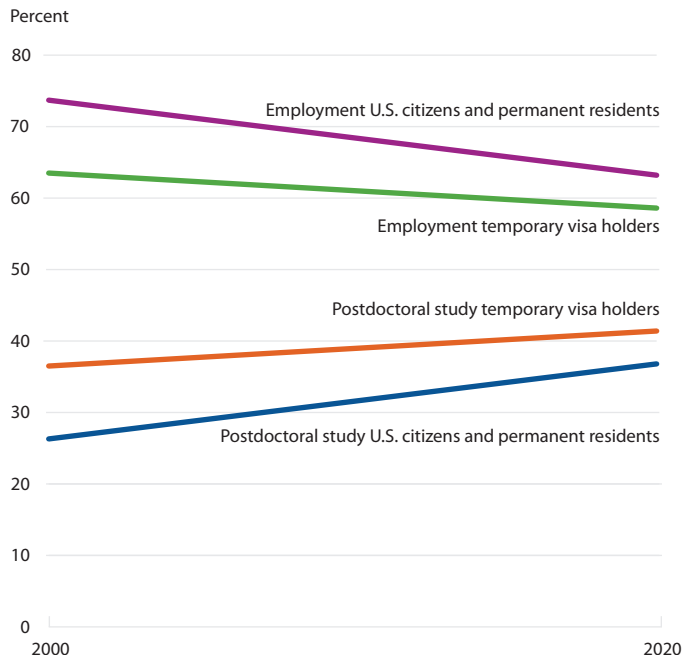
## EMPLOYMENT COMMITMENTS, BY CITIZENSHIP STATUS

In 2020, among doctorate recipients with definite employment commitments who reported the status of their postgraduation plans,<sup>13</sup> equal proportions of temporary visa holders and U.S. citizens or permanent residents had firm employment plans after they earned their degree (70% each).<sup>14</sup> The sections that follow focus on this segment of doctorate recipients who reported having definite employment commitments after graduation and on the differences by citizenship status.

### Plans for employment versus plans for postdoctoral study

Over the past 2 decades, U.S. citizens and permanent residents have had plans for employment in non-postdoc positions at

**Figure 31. Type of postgraduation plans of doctorate recipients with definite commitments, by citizenship status: Selected years, 2000–20**



NOTE: Percentages based on number reporting definite commitments and type of plan (employment or postdoctoral study).

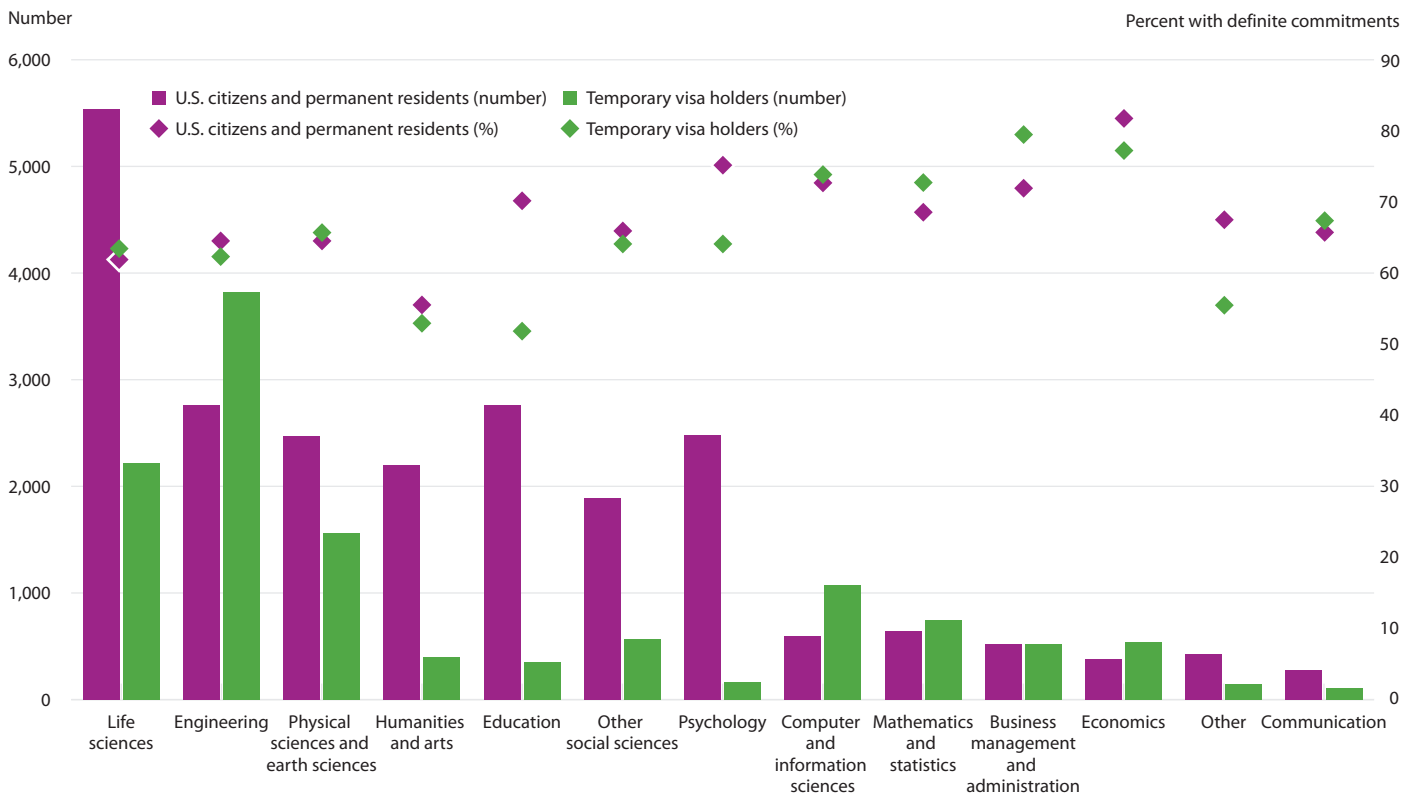
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

higher rates than did those on temporary visas. In contrast, temporary visa holders have had plans for postdoctoral study at higher rates than did U.S. citizens and permanent residents (figure 31). These differences narrowed over the past 20 years. In 2020, 63% of U.S. citizens and permanent residents had definite commitments for employment and 37% for postdoctoral study, compared with 59% and 41%, respectively, for their temporary visa holder counterparts.

### Definite commitments by citizenship status and field

In engineering, computer and information sciences, and mathematics and statistics, larger numbers of temporary visa holders than U.S. citizens and permanent residents had definite postgraduation commitments for employment after graduation (postdoctoral study and non-postdoc positions) (figure 32). In these fields, the proportion of doctorate recipients with definite commitments was similar for both citizenship groups. In the life sciences, physical and earth sciences, psychology, other social sciences, and non-S&E fields, the number of U.S. citizens and permanent residents with definite employment commitments after graduation surpassed that of temporary visa holders.

**Figure 32. Doctorate recipients with definite postgraduation commitments for employment, by field and citizenship status: 2020**



NOTES: Excludes those who didn't report citizenship status. Other social sciences includes Anthropology, Political science and government, Sociology, and Other social sciences. Other includes non-science and engineering fields not elsewhere classified. Definite postgraduate commitment includes doctorate recipients reporting definite postgraduation commitments for employment or postdoctoral study. Excludes respondents who did not report citizenship status.

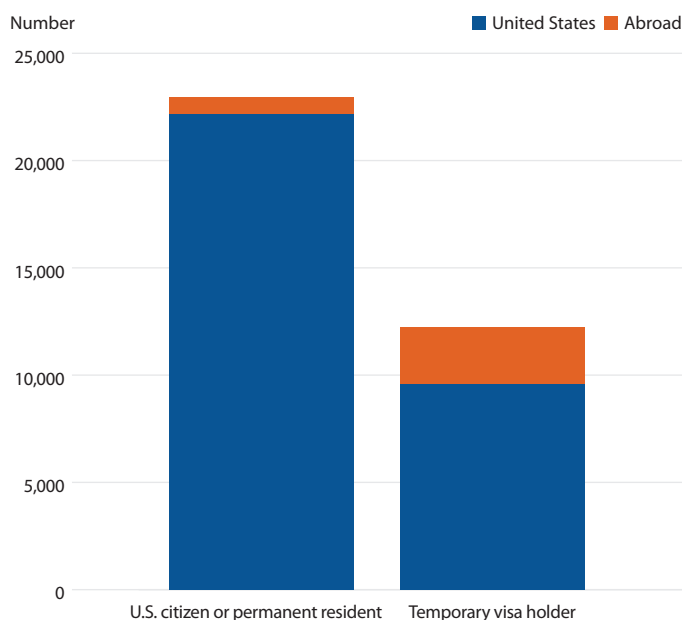
SOURCE: NCSES, Survey of Earned Doctorates, 2020.

### Location and sector of employment commitments by citizenship status

In 2020, the vast majority of U.S. citizens and permanent residents (97%) with definite employment commitments (including postdoctoral study) after graduation indicated that the job location was in the United States, compared with 78% of their temporary visa holder counterparts (figure 33).

The employment sector of doctorate recipients with definite postgraduation commitments varies by their citizenship status as well as by the location of their job commitment (figure 34). In 2020, 44% of doctorate recipients who were U.S. citizens and permanent residents with jobs in the United States, the largest group, had a job lined up in academia compared to 28% of their temporary visa holder counterparts with employment commitments in the United States. In contrast, 67% of temporary visa holders with commitments in the United States had employment commitments in industry or business compared to 30% of

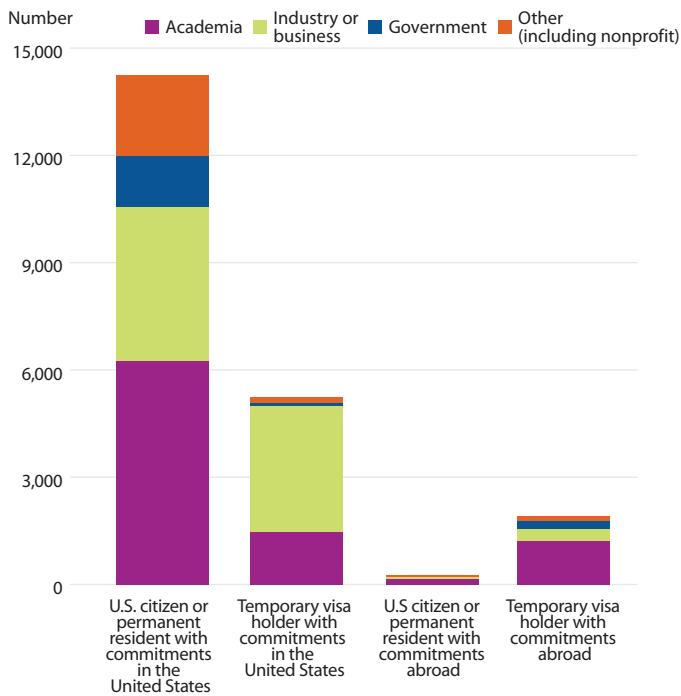
**Figure 33. Location of employment commitments of doctorate recipients with definite employment commitments, by citizenship status: 2020**



NOTES: Definite employment commitment includes doctorate recipients reporting definite postgraduate commitments for employment or postdoctoral study. Data include doctorate recipients with known location of employment commitments.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 34. Employment sector of doctorate recipients with definite postgraduation employment commitments, by citizenship status and location of commitments: 2020**



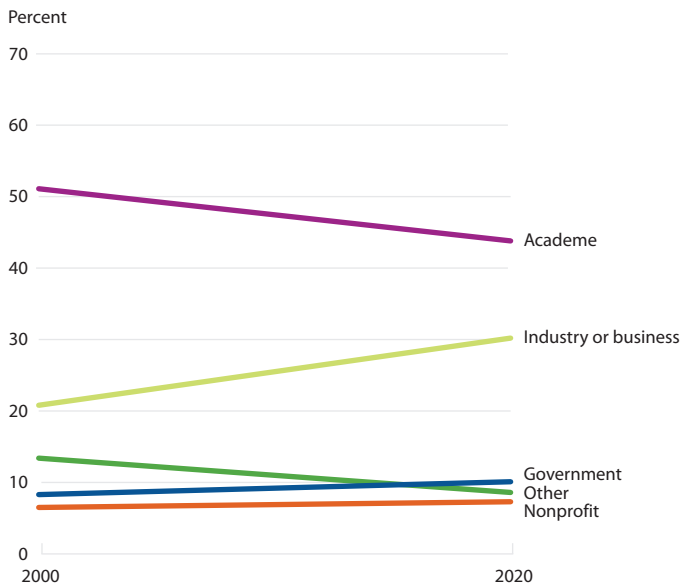
NOTES: Industry or business includes doctorate recipients who indicated self-employment. Other is mainly composed of elementary and secondary schools. Counts based on number reporting definite employment commitments and sector.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

U.S. citizens and permanent residents. A greater proportion of temporary visa holder doctorate recipients with commitments abroad accepted positions in the academic sector (63%) than in the industry or business sector (18%). These patterns have been prevalent since at least 2000 (figures 35 and 36). During the past 2 decades, regardless of citizenship status, the proportion of doctorate recipients with definite postgraduation commitments for employment in academia has declined and those in the industry or business sector has grown.

In 2020, 44% of U.S. citizens and permanent residents with definite postgraduation commitments for employment in the United States had committed to jobs in academia (down from 51% in 2000), and 30% were planning on working in industry or business (up from 21% in 2000) (figure 35). Among their temporary visa holder counterparts, 67% had lined up jobs in industry or business (up from 58% in 2000), and 28% had commitments in academia (down from 34% in 2000) (figure 36).

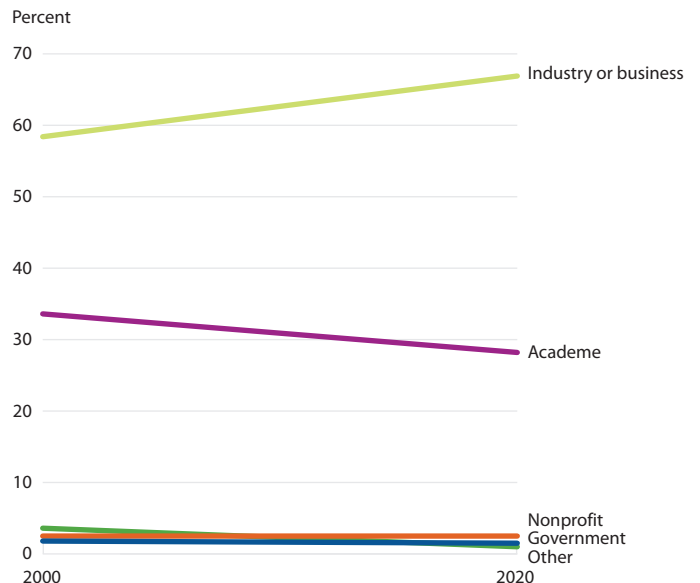
**Figure 35. Employment sector of U.S. citizen and permanent resident doctorate recipients with definite postgraduation commitments for employment in the United States: 2000 and 2020**



NOTES: Definite postgraduate commitment includes doctorate recipients reporting definite postgraduation commitments for employment or postdoctoral study. Percentages based on number reporting definite employment commitments and sector.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

**Figure 36. Employment sector of doctorate recipients on temporary visas with definite postgraduation commitments for employment in the United States: 2000 and 2020**



NOTES: Definite postgraduate commitment includes doctorate recipients reporting definite postgraduation commitments for employment or postdoctoral study. Percentages based on number reporting definite employment commitments and sector.

SOURCE: NCSES, Survey of Earned Doctorates, 2020.

# GLOSSARY

**Area of study.** See *Field of study*.

**Basic annual salary.** Annual salary to be earned from the doctorate recipient's principal job in the next year, not including bonuses or additional compensation for summertime teaching or research.

**Cumulative debt.** The amount of debt, incurred both at the undergraduate level and the graduate level, owed by a doctorate recipient at the time the doctorate is awarded.

**Definite commitment.** A commitment, through a contract or other method, by doctorate recipients to accept employment, including a postdoc study position, in the coming year or to return to predoctoral employment.

**Definite employment commitment.** A definite commitment by doctorate recipients for employment in a non-postdoc position in the coming year.

**Field of study.** The Survey of Earned Doctorates (SED) collects data on 331 fields of doctoral study. For reporting purposes, these fields are typically grouped into 35 major fields and further aggregated into eight broad fields: life sciences; physical sciences and earth sciences; mathematics and computer sciences; psychology and social sciences; engineering; education; humanities and arts; and other non-science and engineering fields. For comparative purposes in the section "Special Focus: Educational Pathways to the Doctorate," this report uses an additional area of study grouping for natural sciences, which includes life sciences, physical sciences and earth sciences, and mathematics and computer sciences.

See technical table A-6 in the online resources of this report for a listing of the major fields within each broad field category. See the survey questionnaire for a full listing of the fine fields of study (<https://nces.nsf.gov/sed/>).

**Graduate debt.** The amount of debt from graduate-level education owed by a doctorate recipient at the time the doctorate is awarded.

**NCSES.** National Center for Science and Engineering Statistics.

**Non-S&E.** Non-science and engineering: A grouping of broad fields of study that includes education, humanities and arts, and other non-S&E fields, such as business management and administration.


**Parental educational attainment.** The highest level of education attained by either parent or guardian of a doctorate recipient.

**Postdoctoral (postdoc) position.** As defined in the questionnaire, a temporary position primarily for gaining additional education and training in research, usually awarded in academe, industry or business, government, or a nonprofit organization.

**Race and ethnicity.** Doctorate recipients who report Hispanic or Latino heritage, regardless of racial designation, are counted as Hispanic or Latino, and as of 2013, those who do not answer the Hispanic or Latino ethnicity question are counted as "ethnicity not reported." Respondents who indicate that they are not Hispanic or Latino and indicate a single race are reported in their respective racial groups, except for those indicating Native Hawaiian or Other Pacific Islander, who are included in "other race or race not reported." Beginning in 2001, respondents who are not Hispanic or Latino and who indicate more than one race are reported in the category "more than one race." Data for this category were not collected before 2001. Before 2001, respondents who are not Hispanic or Latino and who indicate more than one race were categorized as "other or unknown." For 2001 and later data, the "other or unknown" category includes doctorate recipients who indicated that they were not Hispanic or Latino and either did not respond to the race item or reported their race as Native Hawaiian or Other Pacific Islander. For 2000 and earlier data, Native Hawaiians or Other Pacific Islanders are counted in the Asian group.

**Research doctorate.** A doctoral degree that is oriented toward preparing students to make original intellectual contributions in a field of study and that is not primarily intended for the practice of a profession. Research doctorates require the completion of a dissertation or equivalent project. In this report, the terms "doctorate" and "doctoral degree" are used to represent any of the research doctoral degrees covered by the survey. Professional doctoral degrees, such as the MD, DDS, JD, and PsyD, are not covered by the Survey of Earned Doctorates.

**S&E.** Science and engineering: A grouping of broad fields of study that includes science (life sciences, physical sciences and earth sciences, mathematics and computer sciences, psychology and social sciences) and engineering fields.



**Sources of financial support.** Sources of financial support are grouped into the following five categories: fellowships (includes scholarships and dissertation grants); teaching assistantships; research assistantships (includes traineeships, internships, clinical residencies, and other assistantships); own resources (includes loans, personal savings, personal earnings, and earnings or savings of spouse, partner, or family); and other (includes employer reimbursements and support from non-U.S. sources).

**Time to degree.** The time elapsed from the start of any graduate school program to completion of the doctoral degree.

**Underrepresented minority.** Groups that are underrepresented in science and engineering, relative to their numbers in the U.S. population: American Indian or Alaska Native, Black or African American, and Hispanic or Latino.<sup>15</sup>

# DATA SOURCE

The Survey of Earned Doctorates (SED) is the sole data source for *Doctorate Recipients from U.S. Universities: 2020*. The principal elements of the 2020 SED data collection are described in the sections that follow. More detailed information and related technical tables are available at <https://nces.nsf.gov/sed/>.

**Survey eligibility.** The SED collects information on research doctorate recipients only. Research doctorates require the completion of a dissertation or equivalent project, are oriented toward preparing students to make original intellectual contributions in a field of study, and are not primarily intended for the practice of a profession. The 2020 SED recognized 18 distinct types of research doctorates. In 2020, 98% of research doctorate recipients earned the PhD.

The population eligible for the 2020 survey consisted of all individuals who received a research doctorate from an accredited U.S. academic institution in the 12-month period from 1 July 2019 to 30 June 2020.

**Survey universe.** The total universe consisted of 55,283 persons in 449 institutions that conferred research doctorates in academic year 2020.

**Data collection.** Institutional coordinators at each doctorate awarding institution distributed the SED Web survey link to individuals receiving a research doctorate. In 2020, for the first time, the SED data collection did not use the self-administered paper questionnaire. Nonresponding graduates were contacted by e-mail and mail, with the URL of the SED Web survey. If a series of follow-up e-mails and mailings is unsuccessful, the survey contractor attempts to reach nonrespondents to complete an abbreviated

survey by computer-assisted telephone interviewing. RTI International served as the 2020 SED data collection contractor on behalf of NCSES.

**Survey response rates.** In 2020, 92.1% of research doctorate recipients completed the survey. Limited records (field of study, doctoral institution, and sex) are constructed for nonrespondents from administrative records of the university—commencement programs, graduation lists, and other public records—and are included in the reported total of doctorate recipients. The survey response rates for 1980–2020 and the item response rates for 2010–20 are provided in the technical tables.

**Time series data changes.** After a multiyear review of Doctor of Education (EdD) degree programs participating in the SED, 143 programs were reclassified from research doctorate to professional doctorate over the 2010–11 period. No additional reclassifications of EdD degree programs are planned. SED data are no longer being collected from graduates earning degrees from the reclassified EdD programs, and this has affected the reporting of the number of doctorates awarded by sex, citizenship, race, and ethnicity. Several figures in this report show the impact of the decline in number of doctoral degrees awarded in education from 2009 to 2011 (see figure 8 and figure 12 in the section “Fields of study,” and figure 22 in the section “Postgraduation trends”). Readers should note that the declines from 2009 to 2010 and from 2010 to 2011 are at least partly attributable to the EdD reclassification.<sup>16</sup>

**Data license.** Microdata from the SED may be obtained through a restricted-use data license (see <https://nces.nsf.gov/statistics/license/index.cfm>).

# NOTES

- 1 For more details on doctorate recipients who are temporary visa holders, see the Special Focus section.
- 2 For details on the number of doctorate recipients by field, please see detailed table 12 at <https://nces.nsf.gov/pubs/nsf22300/data-tables>.
- 3 Regarding the decline in the field of education, see details in the “Time series data changes” in the section Data Source.
- 4 For details on the number of doctorate recipients by field, see detailed table 12 at <https://nces.nsf.gov/pubs/nsf22300/data-tables>.
- 5 For more details, see detailed table 17 at <https://nces.nsf.gov/pubs/nsf22300/data-tables>.
- 6 For more details, see detailed table 19 at <https://nces.nsf.gov/pubs/nsf22300/data-tables>.
- 7 For more details, see detailed table 15 at <https://nces.nsf.gov/pubs/nsf22300/data-tables>.
- 8 In the United States, educational attainment has risen over time (see <https://www.census.gov/data/tables/time-series/demo/educational-attainment/cps-historical-time-series.html>, accessed 30 June 2021).
- 9 For a detailed discussion on other aspects of education-related debt, see National Center for Science and Engineering Statistics (NCSES). 2020. *Doctorate Recipients from U.S. Universities 2018*, Education-Related Debt. NSF 20-301. Available at <https://nces.nsf.gov/pubs/nsf20301/report>.
- 10 For more data on the primary sources of financial support of doctorate recipients by field, see related figure 16 in this report and detailed table 35 at <https://nces.nsf.gov/pubs/nsf22300/data-tables>.
- 11 Industry or business includes all nonacademic sectors, including self-employment, private for-profit and private nonprofit, and government.
- 12 For more details, see detailed table 18 at <https://nces.nsf.gov/pubs/nsf22300/data-tables>.
- 13 In 2020, 95% of doctorate recipients who reported citizenship status responded to the question on postgraduation commitments (95% of U.S. citizens and permanent residents and 94% of temporary visa holders). See detailed table 43 at <https://nces.nsf.gov/pubs/nsf22300/data-tables>.
- 14 For more details, see detailed table 43 at <https://nces.nsf.gov/pubs/nsf22300/data-tables>.
- 15 For detailed data on underrepresented minorities, see National Center for Science and Engineering Statistics (NCSES). 2020. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2020*. NSF 19-304. Alexandria, VA: National Science Foundation.
- 16 For more details on these declines, see detailed table 13 at <https://nces.nsf.gov/pubs/nsf22300/data-tables>.

# ACKNOWLEDGMENTS

The Survey of Earned Doctorates (SED) is conducted and sponsored by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF) and co-sponsored by the National Institutes of Health (NIH), Department of Education (ED), and National Endowment for the Humanities (NEH). These federal agencies gratefully acknowledge the support and assistance of graduate deans and their staff, registrars, dissertation officers, and other administrators who participate in the SED effort and contribute to its success. Appreciation is also extended to the new research doctorate recipients who completed the 2020 survey.

NCSES's Jaquelina Falkenheim authored and oversaw preparation of this report, and Kelly Kang (NCSES) oversaw the preparation of all data tables, under the leadership of Emilda B. Rivers, NCSES Director; Vipin Arora, NCSES Deputy Director; Matthew Williams, Acting NCSES Chief Statistician; and Rebecca Morrison, Acting NCSES Human Resources

Statistics Program Director. Wan-Ying Chang (NCSES) advised on statistical issues. Other NCSES staff who contributed to this report include Elizabeth Grieco, Karen Hamrick, Abigail Okrent, and Josh Trapani. Jock Black (NCSES) reviewed this report.

Under NCSES contract, staff at RTI International conducted the 2020 survey and played a valuable role in the resulting publications. The following staff provided especially notable contributions: Patricia Green, Jamie Friedman, Jonathan Gordon, Jane Griffin, Ruth Heuer, and Robert Steele.

May Aydin, Catherine Corlies, and Rajinder Raut (NCSES) coordinated this report's publication process, including the management of its edit and development of its digital platform. Christine Hamel and Tanya Gore (NCSES) conducted composition review. OmniStudio, Inc., designed the cover and layout. Staff at Penobscot Bay Media, LLC (PenBay Media) created the report site.



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## Suggested citation

National Center for Science and Engineering Statistics,  
National Science Foundation. 2021. *Doctorate Recipients from  
U.S. Universities: 2020*. NSF 22-300. Alexandria, VA. Available  
at <https://ncses.nsf.gov/pubs/nsf22300/>.





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