

UNEMPLOYMENT RATE OF U.S. SCIENTISTS AND ENGINEERS DROPS TO RECORD LOW 2.5% IN 2006

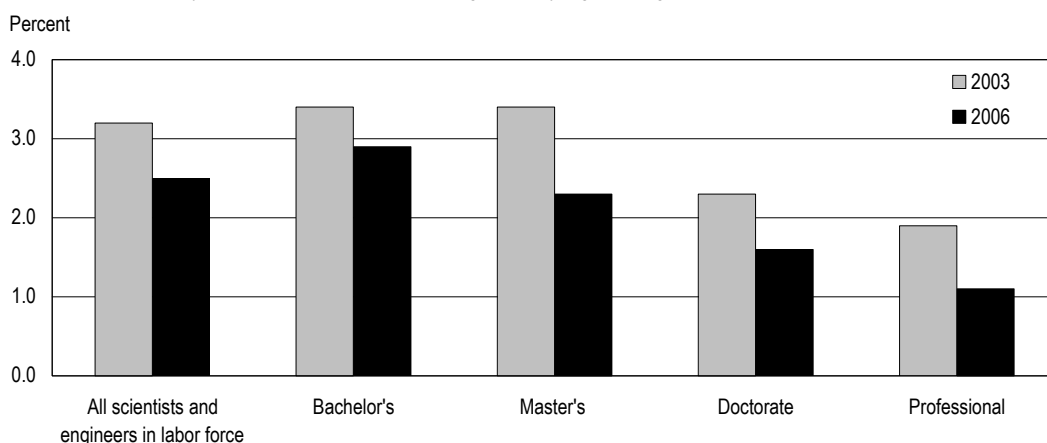
by Nirmala Kannankutty¹

The overall unemployment rate of scientists and engineers in the United States dropped from 3.2% in 2003 to 2.5% in 2006 (figure 1), according to data from the National Science Foundation (NSF) Scientists and Engineers Statistical Data System (SESTAT).² This is the lowest unemployment rate measured by SESTAT since the early 1990s. It continues a trend of lower unemployment rates for scientists and engineers compared with unemployment rates in the rest of the U.S. economy.³ Comparable unemployment rates for the

entire U.S. labor force in 2003 and 2006 were 6.0% and 4.7%, respectively.⁴ (See “Data Comments and Availability” for the definition of *scientists and engineers* and other variables and for notes on SESTAT.)

The total number of scientists and engineers in the United States grew by almost 1 million between 2003 and 2006 (table 1). The number of individuals working in science and engineering (S&E) occupations grew by 4.3%, whereas the number working in S&E-related

FIGURE 1. Unemployment rates of scientists and engineers by highest degree attained: 2003 and 2006



NOTE: *Scientists and engineers* refers to all persons who have received a bachelor's degree or higher in science, engineering (S&E), or S&E-related fields, plus persons holding a non-S&E bachelor's or higher degree who were employed in an S&E or S&E-related occupation in 2003.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT): 2003, 2006.



TABLE 1. U.S. scientists and engineers by labor force status: 2003 and 2006

Population	2003		2006		% change
	Number	Percent	Number	Percent	
All scientists and engineers	21,647,000	100.0	22,630,000	100.0	4.5
In labor force	18,616,000	86.0	19,412,000	85.8	4.3
Employed	18,021,000	83.2	18,927,000	83.6	5.0
S&E occupations	4,817,000	22.3	5,024,000	22.2	4.3
S&E-related occupations	5,331,000	24.6	5,246,000	23.2	-1.6
Non-S&E occupations	7,873,000	36.4	8,657,000	38.3	10.0
Unemployed	595,000	2.7	485,000	2.1	-18.5
Not in labor force	3,031,000	14.0	3,218,000	14.2	6.2 r

S&E = science and engineering.

r = data significantly revised; replaces previously published data.

NOTES: *Scientists and engineers* refers to all persons who have received a bachelor's degree or higher in a science, engineering (S&E), or S&E-related field, plus persons holding a non-S&E bachelor's or higher degree employed in an S&E or S&E-related occupation in 2003. See <http://sestat.nsf.gov/docs/occ03maj.html> for detailed description of occupational classifications. Numbers are rounded to nearest 1,000. Detail may not add to total because of rounding.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT): 2003, 2006.

occupations remained about the same. The number of scientists and engineers working in non-S&E occupations grew by 10%. This InfoBrief examines the changes in the unemployment rates between 2003 and 2006 in the S&E labor force and provides a general profile of scientists and engineers in 2006.

Changes in Unemployment Rates

Unemployment rates dropped for most S&E occupations and for individuals at all degree levels (*level* in this report is highest degree attained). Unemployment rates, and the amount of change in those rates from 2003 to 2006, varied by occupation (table 2). All major S&E occupation groups showed declines in unemployment rates except social scientists.⁵ The change for social scientists is not statistically significant, but there was a 2.6 percentage point increase among economists and a 4.0 percentage point increase among political scientists—the greatest increase in unemployment rate among all reported S&E occupations.⁶

Unemployment rates dropped for all degree levels (figure 1). Together, doctorate and professional degree holders had the lowest unemployment rate in 2006, at 1.6%. Bachelor's, master's, and doctoral degree holders in all major S&E, S&E-related, and non-S&E fields had lower unemployment rates in 2006 than in 2003, except

individuals whose highest degree was a bachelor's in a non-S&E field (table 3).

The percentage of scientists and engineers not in the labor force remained about the same between 2003 and 2006 (table 1), although the S&E labor force expanded by almost 800,000 individuals. These general trends across the entire S&E labor force indicate a stronger labor market for scientists and engineers in 2006 than in 2003.

Demographic Profile of Scientists and Engineers in 2006

Scientists and engineers in the United States totaled 22.6 million in 2006 (table 4), almost half of them women (45%). Close to half of all bachelor's and master's degree holders were women, and just under one-third of all doctorate and professional degree holders were women. Some 5.7% of the male scientists and engineers held doctorates, whereas 3.0% of female scientists and engineers held such degrees.

Female scientists and engineers were younger and more likely to be nonwhite than were male scientists and engineers. Just over 40% of women were younger than 40 compared with just over 30% of men. Additionally, among those under 30, women outnumber men. Among women, 25% were nonwhite or multiracial, compared

TABLE 2. Unemployment rate of scientists and engineers in the United States, by occupation: 2003 and 2006

Population	Unemployment rate		Change 2003-06	Population	Unemployment rate		Change 2003-06
	2003	2006			2003	2006	
Scientists and engineers in labor force ^a	3.2	2.5	-0.7	Engineer	3.7	2.3	-1.4
S&E occupations	3.3	2.4	-0.9	Aerospace/aeronautical/ astronautical engineer	2.0	2.0	0.0
Biological/agricultural/other				Chemical engineer	2.0	1.8	-0.1
life scientist	2.4	2.1	-0.3	Civil/architectural/sanitary engineer	2.6	1.7	-0.9
Agricultural/food scientist	5.4	1.0	-4.4	Electrical/computer hardware engineer	5.5	3.3	-2.3
Biological/medical scientist	2.5	2.6	0.1	Industrial engineer	6.3	2.6	-3.7
Environmental life scientist	0.2	1.2	1.0	Mechanical engineer	4.0	2.3	-1.8
Postsecondary teacher, life/related sciences	0.9	1.4	0.5	Other engineer	2.8	2.1	-0.7
Computer/mathematical scientist	3.8	2.5	-1.2	Postsecondary teacher, engineering	2.3	1.0	-1.3
Computer/information scientist	4.0	2.6	-1.4	S&E-related occupations	2.0	1.5	-0.4
Mathematical scientist	1.3	0.8	-0.6	Health-related occupation	1.3	1.4	0.0
Postsecondary teacher, computer/ math sciences	1.1	3.2	2.1	S&E manager	5.3	2.9	-2.4
Physical scientist	2.7	2.4	-0.3	S&E-precollege teacher	0.9	0.6	-0.3
Chemist, except biochemist	3.1	4.1	1.0	S&E-technician/technologist	5.5	4.0	-1.5
Earth scientist/geologist/ oceanographer	2.6	1.1	-1.4	Other S&E-related occupation	1.2	0.6	-0.5
Physicist/astronomer	3.4	1.4	-2.0	Non-S&E occupations	3.8	3.0	-0.8
Other physical scientist	1.7	0.8	-1.0	Non-S&E manager	3.0	2.1	-0.9
Postsecondary teacher, physical/ related sciences	2.3	1.5	-0.8	Management-related occupation	3.6	2.6	-1.0
Social scientist	1.6	2.6	1.0	Non-S&E precollege teacher	3.9	1.6	-2.3
Economist	1.7	4.3	2.6	Non-S&E postsecondary teacher	3.8	1.7	-2.1
Political scientist	1.7	5.7	4.0	Social services/related occupation	3.0	2.0	-1.0
Psychologist	1.1	1.1	-0.1	Sales/marketing occupation	4.4	3.2	-1.2
Sociologist/anthropologist	2.6	4.0	1.4	Art/humanities/related occupation	4.0	3.6	-0.4
Other social scientist	1.6	5.5	3.9	Other non-S&E occupation	4.1	4.0	-0.1
Postsecondary teacher, social/ related sciences	2.0	0.9	-1.1				

S&E = science and engineering.

^aIndividuals who are unemployed and have never worked are included in the overall unemployment rate but are not shown separately.

NOTES: *Scientists and engineers* refers to all persons who have received a bachelor's degree or higher in science, engineering (S&E), or S&E-related fields, as well as persons holding a non-S&E bachelor's or higher degree who were employed in an S&E or S&E-related occupation in 2003. See <http://sestat.nsf.gov/docs/occ03maj.html> for a detailed description of occupational classification.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT): 2003, 2006.

with just over 21% of men. The vast majority of scientists and engineers in the United States were U.S. citizens (95%), with permanent residents (3.7%) and temporary residents (1.3%) constituting the remainder.⁷ A higher proportion of men (5.7%) than women (4.2%) were not U.S. citizens.

Most scientists and engineers were married or lived in a marriage-like relationship. However, men were more likely to report being in these categories (79.5%) than were women (69.8%). Women (17.9%) were also more

likely than men (13.6%) to report that they had never been married. Similar percentages of men and women reported having children in the home (49.0% of women and 48.0% of men).

Employment Profile of Scientists and Engineers in 2006

Of the 18.9 million employed scientists and engineers in the United States, some 5.0 million worked in S&E occupations, 5.2 million worked in S&E-related

TABLE 3. Unemployment rate of scientists and engineers in the United States, by level and field of highest degree: 2003 and 2006

Level and field of highest degree	Unemployment rate		Change 2003–06
	2003	2006	
Scientists and engineers in labor force ^a	3.2	2.5	-0.7
Level and field of highest degree			
Bachelor's	3.4	2.9	-0.5
S&E fields	4.4	3.4	-0.9
Biological/agricultural/environmental life sciences	3.5	3.4	*
Computer/math sciences	4.6	3.9	-0.7
Physical sciences	4.0	3.9	-0.1
Social sciences	4.6	3.9	-0.7
Engineering	4.4	2.3	-2.2
S&E-related fields ^b	2.0	1.5	-0.5
Health	1.4	1.3	-0.1
Non-S&E fields	0.3	2.0	1.6
Master's	3.4	2.3	-1.0
S&E fields	3.9	2.5	-1.5
Biological/agricultural/environmental life sciences	2.6	2.2	-0.3
Computer/math sciences	6.3	3.5	-2.8
Physical sciences	3.9	2.3	-1.6
Social sciences	2.8	1.9	-0.8
Engineering	4.3	2.5	-1.7
S&E-related fields ^b	2.6	1.8	-0.8
Health	2.7	1.9	-0.8
Non-S&E fields	3.2	2.5	-0.7
Doctorate	2.3	1.6	-0.8
S&E fields	2.6	1.8	-0.8
Biological/agricultural/environmental life sciences	2.9	2.5	-0.4
Computer/math sciences	2.2	0.9	-1.3
Physical sciences	2.7	2.3	-0.4
Social sciences	1.6	1.0	-0.6
Engineering	3.4	1.5	-1.9
S&E-related fields ^b	1.1	0.6	-0.4
Health	1.5	0.9	-0.7
Non-S&E fields	1.7	1.0	-0.7

S&E = science and engineering.

* = unemployment rate difference < 0.1%.

^a Total includes professional degrees not shown separately.^b Includes science and math teacher education, technology and technical fields, and other S&E-related fields not shown separately.NOTE: *Scientists and engineers* refers to all persons who have received a bachelor's degree or higher in a science, engineering (S&E), or S&E-related field, plus persons holding a non-S&E bachelor's or higher degree employed in an S&E or S&E-related occupation in 2003.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Scientists, and Engineers Statistical Data System (SESTAT): 2003, 2006.

occupations, and 8.7 million worked in non-S&E-related occupations (table 5). The greater proportion of scientists and engineers working in S&E-related or non-S&E occupations than in S&E occupations is not a new characteristic, nor is it surprising. S&E occupations are a narrowly defined set of occupations that cover core scientific and engineering work in the United States. However, there are many S&E-related and non-S&E occupations in which individuals with S&E or S&E-related degrees may work. For example, 3.6 million individuals worked in health-related occupations (e.g., physicians, nurses, technicians, and technologists in health fields), where scientific knowledge and training is crucial to the work being done. Similarly, S&E-related occupations include such jobs as S&E managers (individuals who manage the S&E enterprise in technical organizations), precollege S&E teachers (secondary math and science teachers), technicians and technologists (e.g., computer programmers, engineering technicians), architects, and actuaries. Many S&E-educated individuals also go on to earn higher degrees in professional fields, such as law, and then move into non-S&E occupations.

The business/industry sector employed the largest share of scientists and engineers (69.4%), followed by educational institutions (18.8%) and government (11.8%). Among those with S&E occupations, biological/agricultural/other life scientists and social scientists were the least likely to work in industry (37.3% and 39.6, respectively) and the most likely to work in educational institutions or government (62.7% and 60.4%, respectively). Engineers were the least likely to work in educational institutions—5.6% of engineers worked in this setting.

Salaries of scientists and engineers vary widely by degree attainment, occupation, and employment sector, but the data show some general trends. Individuals with higher degree levels earned higher median salaries. Those with professional degrees, such as medicine or law, earned the highest median salaries (\$120,000), followed by those with doctorates (\$79,000), master's degrees (\$64,000), and bachelor's degrees (\$53,000).

TABLE 4. Demographic characteristics of scientists and engineers in the United States, by sex: 2006

(Thousands of individuals)

Characteristic	Both sexes	Female	Male
All scientists and engineers	22,630	10,230	12,400
Highest degree attained			
Bachelor's	13,228	6,223	7,005
Master's	6,411	3,039	3,373
Doctorate	1,018	308	710
Professional	1,973	660	1,312
Age			
29 or younger	2,732	1,542	1,190
30–39	5,302	2,596	2,705
40–49	5,849	2,699	3,150
50–59	5,400	2,303	3,097
60–69	2,497	835	1,662
70 or older	851	254	596
Race/ethnicity			
American Indian/Alaska Native	102	51	50
Asian	2,255	994	1,261
Black	1,258	738	520
Hispanic, any race	1,193	588	605
Native Hawaiian/Other Pacific Islander	85	33	53
White	17,420	7,670	9,751
Multiple race	316	156	159
Citizenship status			
U.S. citizen, native	19,131	8,743	10,387
U.S. citizen, naturalized	2,373	1,062	1,311
Non-U.S. citizen, permanent resident	835	330	505
Non-U.S. citizen, temporary resident	291	95	196
Marital status			
Married	16,100	6,655	9,445
Living in marriage-like relationship	892	482	410
Widowed	356	245	111
Separated	243	131	111
Divorced	1,518	887	631
Never married	3,521	1,829	1,692
Children in the home?			
Yes	10,966	5,015	5,951
No	11,664	5,215	6,449

NOTES: *Scientists and engineers* refers to all persons who have received a bachelor's degree or higher in a science, engineering (S&E), or S&E-related field, plus persons holding a non-S&E bachelor's or higher degree employed in an S&E or S&E-related occupation in 2003. Detail may not add to total because of rounding.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT): 2006.

Among the business/industry, government, and education sectors, salaries were lowest in the education sector. Individuals working in S&E occupations earned higher median salaries (\$72,000) than those working in S&E-related (\$60,000) or non-S&E occupations (\$50,000).

The difference in median salary from highest to lowest degree level was smaller for those working in S&E occupations (\$9,000) than it was for those working in S&E-related (\$70,000) or non-S&E occupations (\$45,000). Within S&E occupations, the greatest difference was among those working as biological/agricultural/other scientists, where the bachelor's level median salary was \$45,000 and the professional level median salary was \$110,000. This is driven by the relatively higher salaries earned by those with doctorates and professional degrees in this broad occupation. Engineers reported the highest median salaries among all the major S&E occupations at each degree level except the professional degree.

Data Comments and Availability

Data presented here are from the 2003 and 2006 Scientists and Engineers Statistical Data System (SESTAT), which comprises three large demographic and workforce surveys of individuals conducted by NSF: the National Survey of College Graduates, the National Survey of Recent College Graduates, and the Survey of Doctorate Recipients. The 2006 surveys included 105,064 individuals representing a population of about 22 million scientists and engineers, including people trained in S&E or S&E-related fields or working in S&E or S&E-related occupations. The 2003 SESTAT surveys had a reference date of 1 October 2003; the 2006 SESTAT surveys had a reference date of 1 April 2006. All demographic, employment, and education data on scientists and engineers represent the status of these individuals at the respective survey reference dates.

Scientists and engineers refers to all persons who have ever received a bachelor's degree or higher in an S&E or S&E-related field, plus persons holding a non-S&E bachelor's or higher degree who were employed in an

TABLE 5. Profile of employed scientists and engineers in the United States by employment sector and occupation group: 2006

Characteristic	S&E occupations								
	All occupations	Scientists						S&E-related ^a	Non-S&E
		All S&E	Biological/agri-cultural/other life	Computer/math	Physical	Social	Engineers		
All employed scientists and engineers	18,927,000	5,024,000	487,000	2,112,000	334,000	470,000	1,621,000	5,246,000	8,657,000
	Percent distribution								
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Highest degree attained									
Bachelor's	57.5	57.9	41.7	66.0	47.7	23.0	64.5	53.6	59.7
Master's	28.4	29.8	23.1	29.7	25.2	42.5	29.2	24.1	30.3
Doctorate	4.7	11.3	31.5	3.9	26.6	30.2	6.1	1.8	2.5
Professional	9.4	1.0	3.6	0.4	0.5	4.3	0.1	20.5	7.5
Employment sector									
Educational institution	18.8	16.6	41.9	11.3	27.5	44.2	5.6	24.2	16.9
4-year institution ^b	8.2	13.4	38.9	8.2	25.1	30.7	5.2	9.0	4.6
2-year college	1.0	1.6	2.6	1.8	2.0	3.6	0.3	0.6	0.8
Precollege/other institution	9.7	1.6	0.4	1.3	0.4	9.9	0.1	14.6	11.4
Government	11.8	12.7	20.8	8.8	17.9	16.2	13.1	8.8	13.0
Federal	4.4	6.0	11.6	3.8	7.1	7.0	6.6	3.4	4.0
State	3.5	3.7	6.6	2.8	7.5	4.0	3.1	2.5	4.1
Local	3.9	3.0	2.6	2.2	3.3	5.3	3.4	3.0	5.0
Business/industry	69.4	70.7	37.3	79.8	54.6	39.6	81.3	67.0	70.1
For-profit	40.6	55.0	25.8	63.7	42.0	13.4	67.0	29.4	39.0
Self-employed, incorporated	12.1	8.3	3.6	8.6	7.4	5.5	10.3	13.4	13.6
Self-employed, not incorporated	7.0	3.6	1.9	3.1	3.1	12.1	2.5	6.8	9.1
Nonprofit	9.7	3.8	6.1	4.4	2.1	8.6	1.4	17.3	8.4
	Median annual salary (dollars)								
All employed scientists and engineers	60,000	72,000	55,000	75,000	60,000	55,000	79,000	60,000	50,000
Highest degree attained									
Bachelor's	53,000	70,000	45,000	72,000	51,000	45,000	75,000	50,000	45,000
Master's	64,000	77,000	55,000	81,000	64,000	50,000	85,000	59,000	60,000
Doctorate	79,000	78,000	70,000	85,000	80,000	67,000	94,000	88,000	78,000
Professional	120,000	79,000	110,000	80,000	65,000	66,000	85,000	120,000	90,000
Employment sector									
Educational institution	45,000	47,000	42,000	48,000	45,000	49,000	54,000	49,000	41,000
4-year institution ^b	48,000	47,000	42,000	50,000	45,000	45,000	54,000	56,000	43,000
2-year college	42,000	42,000	41,000	40,000	48,000	40,000	50,000	45,000	42,000
Precollege/other institution	44,000	51,000	60,000	42,000	62,000	54,000	80,000	46,000	40,000
Government	60,000	68,000	58,000	66,000	60,000	65,000	76,000	60,000	55,000
Federal	75,000	80,000	68,000	79,000	81,000	90,000	86,000	70,000	70,000
State	52,000	59,000	50,000	63,000	48,000	49,000	65,000	51,000	49,000
Local	55,000	60,000	48,000	55,000	57,000	59,000	74,000	58,000	52,000
Business/industry	68,000	78,000	68,000	80,000	66,000	60,000	80,000	66,000	55,000
For-profit	72,000	80,000	72,000	80,000	67,000	75,000	80,000	65,000	62,000
Self-employed, incorporated	75,000	78,000	80,000	80,000	59,000	60,000	80,000	98,000	60,000
Self-employed, not incorporated	50,000	60,000	50,000	65,000	60,000	60,000	65,000	75,000	40,000
Nonprofit	50,000	62,000	50,000	65,000	82,000	50,000	80,000	56,000	38,000

S&E = science and engineering.

^a Category includes health-related occupations, S&E managers, S&E pre-college teachers, S&E technicians and technologists, architects and actuaries.^b Category includes 4-year colleges and universities, medical schools, and university-affiliated research institutes.

NOTES: *Scientists and engineers* refers to all persons who have received a bachelor's degree or higher in a science, engineering (S&E), or S&E-related field, plus persons holding a non-S&E bachelor's or higher degree employed in an S&E or S&E-related occupation in 2003. See <http://sestat.nsf.gov/docs/occ03maj.html> for detailed description of occupational classifications. Salaries rounded to nearest \$1,000. Detail may not add to total because of rounding.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT): 2006.

S&E or S&E-related occupation in 2003. *Unemployment rate* is defined as $U/U+E$, where U = unemployed (the total number of individuals not working, but who have looked for a job in the four weeks preceding the survey reference date), and E = employed (the total number of individuals who are working as of the survey reference date). *Labor force* is defined as U+E. Occupational unemployment rates are calculated using the last job of those currently unemployed for classification purposes. Further information on the SESTAT system can be found at <http://www.nsf.gov/statistics/sestat/>. The full set of detailed tables from the SESTAT integrated database will be available in the forthcoming report *Characteristics of Scientists and Engineers in the United States: 2006*, at <http://www.nsf.gov/statistics/us-workforce/>.

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Notes

1. Nirmala Kannankutty, Human Resources Statistics Program, Division of Science Resources Statistics, National Science Foundation, 4201 Wilson Boulevard, Suite 965, Arlington VA 22230 (nkannank@nsf.gov; 703-292-7797).
2. All differences stated in this InfoBrief are significant at the 95% level unless otherwise noted.

3. National Science Board. 2008. *Science and Engineering Indicators 2008*. Two volumes, NSB 08-01, NSB 08-01A. Arlington, VA: National Science Foundation. Available at <http://www.nsf.gov/statistics/seind/>.
4. See the Bureau of Labor Statistics national unemployment rate page at http://data.bls.gov/PDQ/servlet/SurveyOutputServlet?data_tool=latest_numbers&series_id=LNS14000000. Accessed February 2008.
5. The major science and engineering occupation groups are biological/agricultural/other life scientists, computer/mathematical scientists, physical scientists, social scientists, and engineers.
6. Although social scientists showed an increase in unemployment rate, individuals whose highest degree is in the social sciences did not. This is because a large number of individuals with social sciences degrees work in non-social science occupations.
7. Recent immigrants directly entering the United States without going through the U.S. postsecondary education system are generally not covered in the SESTAT surveys, so there is some undercoverage of these individuals in the data.

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