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NUMBERS OF DOCTORATES AWARDED CONTINUE TO GROW IN 2009; INDICATORS OF EMPLOYMENT OUTCOMES MIXED

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This InfoBrief uses data collected from the 2009 Survey of Earned Doctorates (SED) to report on trends in the numbers of individuals who earn research doctoral degrees from U.S. academic institutions. Postgraduation plans of new doctorate recipients are examined from 2004 to 2009, a period that includes the recent economic decline. The following key findings are described in detail in this report:

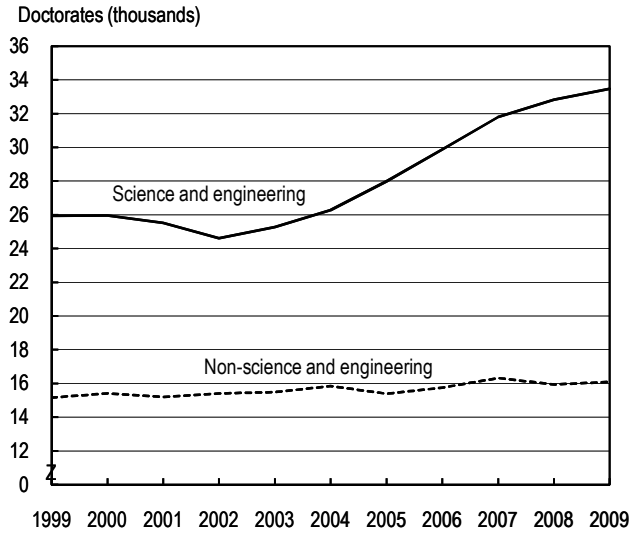
- 49,562 research doctorates were awarded in 2009, up 1.6% over the 2008 total.
- Doctorates awarded in science and engineering (S&E) fields were up 1.9% over 2008, owing entirely to growth in numbers of female S&E doctorate recipients.
- The number of doctorates earned by U.S. citizens and permanent residents who are members of racial/ethnic minority groups continues to grow faster than the number earned by white recipients.
- The number of doctorate recipients with temporary visas was down 3.5% from 2008.
- The proportion of 2009 doctorate recipients with employment prospects in the coming year (gauged by definite commitments to a position) was slightly less than that reported in 2008 and about the same as that reported in 2007, the year before the advent of the recession.
- Among doctorate recipients reporting definite commitments, a growing proportion are taking postdoctoral (postdoc) positions; 2009 marked the largest single-year increase in the proportion of doctorate recipients taking postdoc positions during the 2004–09 period.

Field of Study

Science and Engineering

The 49,562 research doctorate degrees awarded by U.S. academic institutions in 2009 represent the highest number ever reported by the SED. Doctorates awarded in S&E fields of study accounted for most of the overall growth in doctorate awards in 2009 (figure 1, table 1). In total, 33,470 S&E doctorates were awarded in 2009 (67.5% of all doctorates), an increase of 29.1% since 1999 but only a 1.9% rise over 2008. The 2009 growth rate is dramatically slower than in the period 2004–07, when the numbers of S&E doctorates were increasing at more than 6.5% per year. Doctorate awards were up from 2008 in seven of the eight major science fields of study, with biological sciences having the greatest number of awards (8,026, or 16.2% of all doctorates) and mathematics showing the largest increase over 2008 (11.1%). Although doctorates in computer science declined 9.8% from 2008, this field had the largest rate of increase among the science fields over the past decade, nearly doubling from 1999 to 2009. Doctorates

FIGURE 1. Doctorates awarded in science and engineering and non-S&E fields: 1999–2009



NOTE: See table 1 for fields included.

SOURCE: NSF/NIH/USED/NEH/USDA/NASA, 2009 Survey of Earned Doctorates.

awarded in psychology fell by 5.4% over the decade, but the number of doctorates in all other major science fields increased over the period.

Doctorates awarded in engineering fields reached 7,634 in 2009, a 43.2% increase over the 1999 total but a 2.9% decline from 2008, making 2009 the first year since 2002 to show a year-over-year drop in engineering doctorates awarded. Aerospace/aeronautical engineering and mechanical engineering were the only engineering fields showing growth in doctorate awards in 2009, by 11.3% and 1.3%, respectively. Except for other engineering (a category that includes 20 separate engineering subfields), electrical engineering remains the largest engineering subfield, even though doctorates awarded in this subfield decreased 10.2% from 2008.

Overall, the trend for the decade was growth in all engineering subfields. Materials science engineering showed the largest rate of increase over the decade, 58.3%.

Non-Science and Engineering

The number of doctorates awarded in non-S&E fields in 2009 increased 1.0% over the 2008 total, to 16,092 (figure 1, table 1). Most of this increase was accounted for by the greater number of humanities doctorates, 3.7% over 2008. The number of doctorates awarded in education, health, and professional fields changed little.

Doctorate awards in non-S&E fields increased 6.1% during the past decade, but the growth was unevenly distributed among the fields of degree. The number of doctorates awarded in health showed substantial growth (48.8%) over this period, as did the number of doctorates in professional fields (28.9%). The number of doctorates awarded in education has fluctuated around a flat trend line over the past decade, and the number of humanities doctorates fell 7.3% from 1999 to 2009.

Demographics

Sex

The 1.9% growth in total S&E doctorates awarded between 2008 and 2009 was entirely accounted for by growth in female doctorate recipients (622, a 4.8% increase). The count of male S&E doctorate recipients declined slightly (table 2). The numbers of all doctorate recipients in S&E fields increased each year between 2004 and 2009, but the rate of growth for women was much greater than for men over the 5-year period. S&E doctorates awarded to women were 37.9% higher in 2009 than in 2004, nearly double the 20.9% growth rate in S&E doctorates awarded to men. As a result of the differential growth rates, the proportion of S&E doctorates awarded to women increased from 37.5% in 2004 to 40.6% in 2009.

Men and women contributed nearly equally to the increased number of non-S&E doctorates from 2008 to 2009, with awards to men increasing by 80 (1.2%) and awards to women rising by 78 (0.8%). Over the period 2004–09, however, growth in the number of men earning doctorates in non-S&E fields fell 0.9%, and the number of awards to women increased 3.2%. The proportion of non-S&E degrees awarded to women grew from 58.7% in 2004 to 59.7% in 2009.

Race and Ethnicity

A total of 4,719 U.S. citizens and permanent residents who are members of racial/ethnic minority groups earned S&E doctoral degrees in 2009 (table 2).[2] This represents a 34.3% increase in the number reported in 2004 and is up 6.4% from the 2008 total. In comparison, the number of white U.S. citizens and permanent residents earning S&E doctorates grew 22.3% from 2004 to

TABLE 1. Doctorates awarded, by major field of study, 1999–2009

Field	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All fields	41,098	41,366	40,737	40,025	40,759	42,118	43,381	45,617	48,130	48,763	49,562
Science and engineering	25,931	25,966	25,529	24,608	25,283	26,275	27,985	29,866	31,806	32,832	33,470
Science	20,601	20,643	20,019	19,527	20,002	20,498	21,558	22,681	24,061	24,973	25,836
Agricultural sciences	1,065	1,037	977	1,009	1,060	1,045	1,038	1,033	1,133	1,087	1,166
Biological sciences	5,581	5,853	5,694	5,695	5,696	5,942	6,366	6,649	7,187	7,798	8,026
Biochemistry	759	776	729	781	772	703	693	784	863	898	859
Molecular biology	716	706	711	623	615	725	724	780	701	786	763
Neurosciences	431	495	486	491	474	584	690	741	764	884	979
Other biological sciences	3,675	3,876	3,768	3,800	3,835	3,930	4,259	4,344	4,859	5,230	5,425
Computer sciences	856	861	830	809	867	948	1,129	1,453	1,656	1,787	1,611
Earth, atmospheric, and ocean sciences	706	665	630	671	647	671	714	757	878	865	877
Mathematics	1,083	1,050	1,010	919	993	1,076	1,205	1,325	1,393	1,399	1,554
Physical sciences[a]	3,579	3,407	3,396	3,205	3,323	3,350	3,643	3,927	4,101	4,082	4,289
Chemistry	2,132	1,989	1,982	1,923	2,040	1,986	2,126	2,362	2,324	2,247	2,398
Physics and astronomy	1,430	1,389	1,384	1,264	1,247	1,349	1,517	1,565	1,777	1,835	1,891
Psychology	3,668	3,615	3,401	3,206	3,277	3,327	3,322	3,260	3,291	3,356	3,471
Social sciences	4,063	4,155	4,081	4,013	4,139	4,139	4,141	4,277	4,422	4,599	4,842
Engineering	5,330	5,323	5,510	5,081	5,281	5,777	6,427	7,185	7,745	7,859	7,634
Aerospace/aeronautical engineering	206	214	202	209	200	201	219	238	267	266	296
Chemical engineering	576	619	636	607	568	638	774	799	807	872	808
Civil engineering	506	480	501	540	552	547	622	655	701	712	708
Electrical engineering	1,236	1,330	1,346	1,211	1,238	1,389	1,547	1,786	1,968	1,887	1,694
Industrial/manufacturing engineering	211	176	206	230	214	217	221	234	281	280	252
Materials science engineering	393	404	448	364	438	474	493	583	648	635	622
Mechanical engineering	786	807	878	771	752	754	892	1,044	1,072	1,081	1,095
Other engineering	1,416	1,293	1,293	1,149	1,319	1,557	1,659	1,846	2,001	2,126	2,159
Non-science and engineering	15,167	15,400	15,208	15,417	15,476	15,843	15,396	15,751	16,324	15,931	16,092
Education	6,552	6,436	6,349	6,503	6,644	6,633	6,225	6,120	6,456	6,554	6,531
Health	1,407	1,591	1,540	1,655	1,633	1,718	1,784	1,905	2,132	2,090	2,094
Humanities	5,036	5,213	5,178	5,050	5,019	5,012	4,950	5,124	4,890	4,502	4,667
Foreign languages and literature	626	642	620	627	623	587	607	615	609	627	602
History	960	1,019	991	983	895	927	881	917	888	923	989
Letters	1,516	1,612	1,493	1,455	1,416	1,407	1,389	1,457	1,355	1,420	1,414
Other humanities	1,934	1,940	2,074	1,985	2,085	2,091	2,073	2,135	2,038	1,532	1,662
Professional fields	2,172	2,160	2,141	2,209	2,180	2,480	2,437	2,602	2,846	2,785	2,800
Business management/administration	1,111	1,070	1,067	1,114	1,037	1,254	1,170	1,311	1,508	1,421	1,403
Communication	418	434	431	429	457	473	517	540	592	588	651
Other professional fields	642	652	643	666	686	753	749	743	726	776	746
Unknown	1	4	0	0	0	0	1	8	20	0	0

[a] Field totals for 1999–2004 include other physical sciences fields not shown separately.

NOTE: Groupings of major fields and subfields of study differ from questionnaire and summary reports in that American/U.S. studies, archaeology, and history, science, and technology and society are in social sciences, not humanities; agricultural economics is in social sciences, not agricultural sciences; and public administration is in social sciences, not professional fields, according to National Science Foundation taxonomy.

SOURCE: National Science Foundation/Division of Science Resources Statistics, 2009 Survey of Earned Doctorates.

TABLE 2. Doctorates awarded, by selected characteristics of doctorate recipients: 2004–09

Characteristic	2004	2005	2006	2007	2008	2009
All doctorate recipients	42,118	43,381	45,617	48,130	48,763	49,562
Science and engineering doctorate recipients[a]	26,274	27,944	29,847	31,794	32,825	33,442
Male	16,418	17,405	18,369	19,529	19,854	19,849
Female	9,856	10,539	11,478	12,265	12,971	13,593
U.S. citizen or permanent resident[b]	15,578	15,910	16,676	17,170	18,344	19,473
American Indian/Alaska Native	60	67	45	81	59	75
Asian	1,496	1,635	1,790	1,689	1,914	1,970
Black	755	707	747	792	825	947
Hispanic[c]	719	805	889	930	1,085	1,093
White	12,063	12,289	12,767	13,173	13,910	14,754
Native Hawaiian/Other Pacific Islander	45	39	46	45	48	46
Two or more races	227	244	297	319	326	427
Other	213	124	95	141	177	161
Temporary visa holders	9,164	10,427	11,587	12,371	12,628	12,217
Non-science and engineering doctorate recipients[a]	15,842	15,371	15,729	16,310	15,928	16,086
Male	6,546	6,330	6,649	6,675	6,409	6,489
Female	9,296	9,041	9,080	9,635	9,519	9,597
U.S. citizen or permanent resident[b]	12,141	11,841	12,032	12,117	12,207	12,488
American Indian/Alaska Native	71	73	73	62	63	71
Asian	565	550	628	644	639	717
Black	1,234	1,092	1,068	1,181	1,192	1,274
Hispanic[c]	583	626	646	722	684	773
White	9,388	9,217	9,370	9,204	9,315	9,299
Native Hawaiian/Other Pacific Islander	18	30	19	20	21	29
Two or more races	162	155	172	189	194	224
Other	120	98	56	95	99	101
Temporary visa holders	2,469	2,421	2,618	2,805	2,629	2,507

[a] Total excludes individuals for whom sex was not reported.

[b] Total excludes individuals with unknown race and ethnicity.

[c] Includes Mexican American, Puerto Rican, and other Hispanic ethnicities.

SOURCE: NSF/NIH/USED/NEH/USDA/NASA, 2009 Survey of Earned Doctorates.

2009 and 6.1% in the last year of that period. Members of minority groups earned 22.6% of the total number of S&E doctorates awarded in 2004, and 24.2% of the total in 2009. Asians constituted the largest group (41.7%) of minority S&E doctorate recipients in 2009, followed by Hispanics (23.2%), blacks (20.1%), American Indians/Alaska Natives (1.6%), and Native Hawaiians/Other Pacific Islanders (1.0%). Individuals reporting two or more races constituted 9.0% of the total number of minority S&E doctorate recipients in 2009.

The numbers of S&E doctorate recipients in all racial/ethnic minority groups except Native Hawaiians/Other Pacific Islanders grew substantially over the period 2004–09: 25.0% for American Indians/Alaska Natives, 31.7% for Asians, 25.4% for blacks, 52.0% for Hispanics, and 88.1% for individuals reporting two or more races. Although the number of American Indian/Alaska Native S&E doctorate recipients increased over the 5-year period, the numbers showed considerable year-to-year fluctuations. The number of Native Hawaiian/Other Pacific Islander S&E doctorate recipients fluctuated little over the period.

U.S. citizens and permanent residents who were members of minority groups earned 3,189 non-S&E doctorates in 2009, 15.8% more than in 2004 and a 10.3% increase over 2008. The number of white doctorate recipients in non-S&E fields has declined 0.9% since 2004 and dropped by 0.2% from 2008. From 2004 to 2009 the number of non-S&E doctorates awarded to Asians increased by 26.9%, the number awarded to blacks by increased 3.2%, the number of Hispanic doctorate recipients increased by 32.6%, and the total

earned by individuals reporting two or more races grew by 38.3%. The number of non-S&E doctorates earned by American Indians/Alaska Natives and by Native Hawaiians/Other Pacific Islanders fluctuated modestly over the 5-year period.

Citizenship

Following several years of growth in the number of doctorates awarded to temporary visa holders (annual growth rates exceeded 10% from 2004 to 2006), the number of doctorate recipients with temporary visas declined 3.5% from 2008 to 2009 (table 2). Declines occurred in both S&E (3.3%) and non-S&E fields (4.6%). The 5-year rate of growth in the number of S&E doctorates awarded to temporary visa holders was a substantial 33.3% despite the downturn in 2009. The corresponding 5-year growth rate in the number of non-S&E doctorates earned by temporary visa holders was a much smaller 1.5%.

Employment Outcomes

SED data on the postgraduation plans of doctorate recipients were used to examine whether employment prospects of new doctorate recipients changed during the recent (2008 and 2009) period of economic decline.

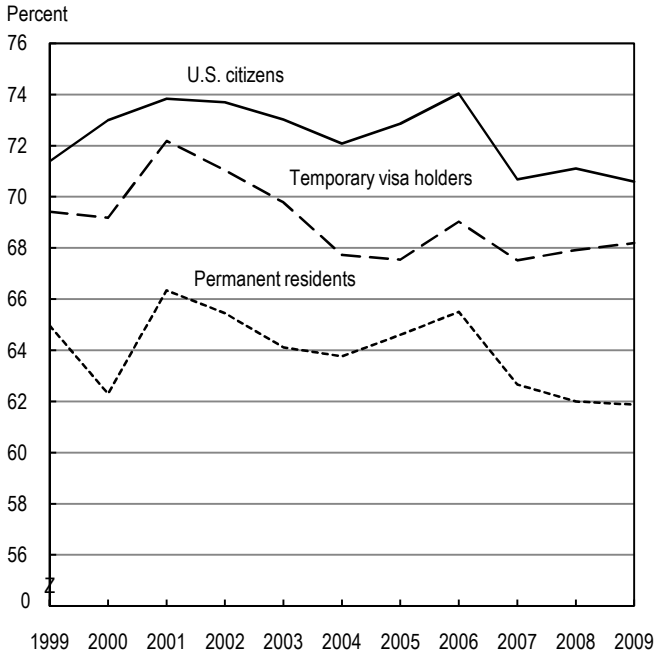
Definite Postgraduation Commitments

Respondents to the SED indicate the status of their postgraduation plans for the coming year: whether they plan to return to their predoctoral position; have signed a contract or otherwise made a commitment for a new position (postdoc or employed)[3]; are seeking a position; or have made other plans. Doctorate recipients whose postgraduation status involves either returning to their predoctoral position or accepting a new position are considered to have *definite commitments* for a position in the coming year. The proportion of doctorate recipients reporting definite commitments is an indicator of the overall strength of the job market for doctorate recipients and the availability of positions relative to the supply of new doctorate recipients.

The job market for doctorate recipients varies according to the citizenship status of doctorate recipients (figure 2). Each year from 1999 to 2009, U.S. citizens were more likely (by an annual average difference of 3.3 percentage points) than temporary visa holders to have definite postgraduation commitments for a position, and each year temporary visa holders were more likely (by an annual average difference of 5.1 percentage points) than permanent residents to report definite commitments. Although doctorate recipients in the three citizenship categories differ with respect to their rates of definite commitments, the data trends for the three groups have been similar. The proportions of definite commitments were at high points in 2001 and 2006 for all three citizenship groups, and 2007 to 2009 marked a low period for all three. Direct comparison of pre-2007 data on definite postgraduation commitments with later data should be made with caution, however, as one response category for the postgraduation status item—signed contract or commitment for a new position—was changed beginning with the 2007 SED, which may have resulted in an overstatement of the rate of definite commitments in the pre-2007 data (see "Data Sources and Limitations," below). Consequently, the remainder of this discussion focuses on the 2007 to 2009 period.

During the period 2007 to 2009, the rate of definite commitments changed little for all three citizenship

FIGURE 2. Doctorate recipients with definite commitments for postdoc or employment, by citizenship status: 1999–2009



NOTE: Percentages calculated on those responding to item on postgraduation status.

SOURCE: NSF/NIH/USED/NEH/USDA/NASA, 2009 Survey of Earned Doctorates.

groups. The proportion of U.S. citizen doctorate recipients reporting definite commitments remained essentially unchanged, the rate of permanent resident doctorate recipients with definite commitments declined slightly (-0.8 percentage points), and the percentage of temporary visa holder doctorate recipients with definite commitments increased slightly (0.7 percentage points).

The job market has been relatively stronger for doctorate recipients in some fields of study than in others (table 3). The rate of definite commitments among doctorate recipients in physical sciences, social sciences, education, health, and professional fields exceeded 70% in every year from 2007 to 2009. Humanities and life sciences doctorate recipients had the lowest rates of definite commitments, at or below 65% in those years. The year-to-year changes also varied by field of study. In every non-S&E field of study, the percentage of doctorate recipients reporting definite commitments increased from 2007 to 2008, whereas the proportion of definite commitments declined in 2008 or stayed roughly the same for doctorate recipients in every S&E field except social sciences. From 2008 to 2009, the overall rate of definite commitments for all fields fell by 0.5 percentage points, with declines in every field except social sciences and life sciences. The data suggest that the 2009 job market for new doctorate recipients was only slightly weaker than in 2008 and was essentially the same as in 2007, the year before the advent of the recession.

A closer look at the data on postgraduation status provides mixed indicators of the state of the job market for new doctorate recipients from 2007 to 2009. The data show a declining proportion of doctorate recipients returning to predoctoral positions, as the overall rate fell 1.0 percentage point from 2007 to 2009 (table 3).[4] Over the same period, however, the overall proportion of doctorate recipients having definite commitments for a new position increased by a comparable amount (0.9 percentage points), and the overall rate at which doctorate recipients reported they were still seeking a position decreased slightly (0.5 percentage points). Compared with 2008, employment conditions in 2009 were worse for non-S&E doctorate recipients than for S&E doctorate recipients. In every non-S&E field, 2009 doctorate recipients were less likely to have a signed contract or commitment for a new position and were more likely to report they were still seeking a position than were 2008 doctorate recipients. 2009 S&E doctorate recipients in every field except engineering were more likely than their 2008 counterparts to have a signed contract or commitment for a new position. However, when the 2009 data are compared with the 2007 (prerecession) data, no strong claims can be made about the different employment conditions faced by S&E versus non-S&E doctorate recipients.

The "other postgraduation status" category includes doctorate recipients who do not plan to work or study in the coming year and, beginning in 2007, doctorate recipients who plan to pursue another full-time degree program. Since 2007, other postgraduation status has become a more frequently reported postgraduation plan of doctorate recipients in all fields of study except education and professional fields, where the percentages declined slightly. The higher rate of this response among doctorate recipients in life sciences may be attributable to doctorate recipients who are in joint MD/PhD programs and are still in school for the MD degree.

Type of Position

Four types of positions are discussed here: postdoc position, employed position in academe, employed position in industry/business, and other employed position.[5] The overall trends from 2004 to 2009 (table 4) show that doctorate recipients are increasingly likely to accept postdoc positions (2.8 percentage points) and employed positions in industry/business (1.9 percentage points), and are less likely to take positions in academe (-3.2 percentage points) and other employment (-1.6 percentage points). 2009 had the largest single-year increase in the proportion of doctorate recipients taking postdoc positions during the 5-year span (2.0 percentage points) and the largest single-year decrease in the rate of academic employment (-1.4 percentage points).

Over the past 5 years the data trends within each type of position have varied by field of study. Historically, postdoc positions have been far more common among S&E doctorate recipients than among doctorate recipients in education, humanities, and professional fields. In every S&E field, the proportion of doctorate recipients accepting postdoc positions declined from 2004 to 2006 and then increased from 2006 to 2009. In every S&E field except social sciences, the largest single-year increase in the proportion of doctorate recipients accepting postdoc positions occurred in 2009. Although postdoc positions remain relatively uncommon in humanities and professional fields, the proportion of

TABLE 3. Postgraduation status of U.S. citizen and permanent resident doctorate recipients, by broad field of study: 2004–09
(Percent)

Postgraduation status	All fields	Life sciences[a]	Physical sciences[b]	Social sciences[c]	Engineering	Education	Health	Humanities	Professional fields
Have definite commitment[d]									
2004	71.6	71.8	72.3	71.6	69.1	76.1	74.1	63.9	76.9
2005	72.4	71.4	75.0	73.2	71.0	75.3	73.7	65.7	75.6
2006	73.5	72.3	74.8	74.9	69.4	76.9	77.2	67.6	77.9
2007	70.1	65.2	75.8	72.4	69.8	73.2	71.1	63.4	73.4
2008	70.5	63.2	73.5	72.9	69.7	75.2	74.2	64.7	77.5
2009	70.0	65.2	73.1	73.4	68.2	73.3	72.2	62.6	76.4
Returning to predoctoral position									
2004	25.2	12.0	11.9	20.2	19.9	52.5	32.3	20.6	30.6
2005	24.3	11.7	11.6	19.8	18.7	51.5	33.3	20.1	27.9
2006	22.8	12.0	10.6	18.0	17.1	49.6	35.0	18.3	25.1
2007	21.5	8.6	8.9	16.7	16.8	50.6	30.4	18.1	22.6
2008	21.2	7.0	9.2	15.7	15.7	52.5	32.0	16.7	24.0
2009	20.5	7.4	8.3	15.5	14.9	51.4	32.5	17.4	23.8
Contract or commitment for new position									
2004	46.4	59.8	60.4	51.4	49.2	23.6	41.8	43.3	46.3
2005	48.1	59.7	63.4	53.4	52.3	23.8	40.4	45.6	47.7
2006	50.7	60.3	64.2	56.9	52.3	27.3	42.2	49.3	52.8
2007	48.6	56.6	66.9	55.7	53.0	22.6	40.7	45.3	50.8
2008	49.3	56.2	64.3	57.2	54.0	22.7	42.2	48.0	53.5
2009	49.5	57.8	64.8	57.9	53.3	21.9	39.7	45.2	52.6
Seeking position[e]									
2004	26.7	26.8	26.4	26.6	29.6	21.8	25.1	34.1	21.7
2005	25.8	27.2	24.0	24.6	27.8	22.1	25.1	32.4	22.2
2006	24.9	26.2	24.0	23.6	29.2	21.3	21.1	30.8	20.2
2007	26.1	27.3	21.8	25.3	27.4	23.7	26.0	33.0	24.0
2008	25.2	26.7	23.8	24.3	27.2	21.9	22.8	32.2	20.3
2009	25.6	25.3	23.9	24.0	28.1	23.6	24.6	33.8	21.3
Other postgraduation status[f]									
2004	1.6	1.4	1.2	1.9	1.3	2.1	0.8	2.0	1.3
2005	1.8	1.4	0.9	2.2	1.2	2.6	1.2	1.9	2.2
2006	1.6	1.5	1.2	1.5	1.5	1.8	1.7	1.5	1.8
2007[g]	3.7	7.5	2.4	2.3	2.8	3.2	3.0	3.5	2.5
2008	4.3	10.2	2.7	2.8	3.2	2.9	3.1	3.1	2.2
2009	4.3	9.5	2.9	2.6	3.7	3.1	3.2	3.6	2.3

[a] Includes agricultural sciences and biological sciences.

[b] Includes computer sciences; earth, atmospheric, and ocean sciences; and mathematics.

[c] Includes psychology.

[d] Includes individuals with definite postgraduation commitment for position outside of the United States.

[e] Includes individuals who indicated "negotiating with one or more specific organizations."

[f] Includes individuals who indicated "do not plan to work or study" and, from 2007 to 2009, individuals who indicated plans for "other full-time degree program."

[g] Increases in this category beginning in 2007 may be partly attributable to changed wording of survey item.

NOTES: Percentages are based on number responding to item on postgraduation status. Due to rounding, percentages may not sum to 100.

SOURCE: NSF/NIH/USED/USDA/NEH/NASA, 2009 Survey of Earned Doctorates.

TABLE 4. U.S. citizen and permanent resident doctorate recipients with definite postgraduation commitments for position in the U.S., by type of position and broad field of study: 2004–09

Type of position	All fields	Life sciences[a]	Physical sciences[b]	Social sciences[c]	Engineering	Education	Health	Humanities	Professional fields
	Number								
All definite U.S. commitments postgraduation									
2004	18,110	3,122	2,116	3,349	1,377	3,779	848	2,449	1,070
2005	18,513	3,284	2,288	3,412	1,495	3,635	882	2,430	1,087
2006	19,678	3,430	2,526	3,593	1,608	3,737	994	2,618	1,172
2007	19,086	3,358	2,611	3,393	1,643	3,678	995	2,287	1,121
2008	19,395	3,312	2,573	3,515	1,836	3,789	1,013	2,161	1,196
2009	20,082	3,644	2,829	3,638	1,916	3,684	1,028	2,139	1,204
	Percent								
Postdoc position[d]									
2004	30.8	75.5	50.2	31.9	28.6	4.7	28.1	9.3	4.5
2005	31.3	74.9	49.0	32.1	27.5	5.1	25.4	9.8	5.0
2006	30.1	71.3	47.6	31.0	27.1	4.0	27.8	9.5	4.9
2007	31.9	71.6	48.7	35.1	29.0	4.8	25.8	10.6	6.4
2008	31.6	72.3	48.9	35.0	26.6	4.2	26.8	11.8	6.1
2009	33.6	73.3	49.5	35.3	31.4	4.9	27.1	12.1	5.8
Employed position in academe									
2004	39.3	10.6	20.3	40.4	16.4	47.0	48.3	75.3	68.9
2005	38.5	10.8	21.0	40.8	14.9	46.9	50.1	74.0	68.2
2006	38.1	11.6	21.3	40.6	12.6	48.0	43.6	72.5	66.3
2007	37.4	12.0	20.5	38.2	12.6	48.2	43.0	75.3	69.5
2008	37.5	12.1	19.5	39.4	15.2	47.5	43.9	74.6	70.5
2009	36.1	10.9	19.9	39.3	11.6	46.8	47.3	73.5	70.5
Employed position in industry/business[e]									
2004	10.4	6.7	20.7	9.0	37.9	3.6	8.7	3.9	9.9
2005	11.6	7.6	22.2	9.7	41.3	3.8	9.4	3.9	12.0
2006	11.9	8.7	22.3	9.3	44.5	3.5	8.4	3.8	11.1
2007	12.5	9.1	22.9	9.3	43.9	4.1	11.4	3.2	9.6
2008	12.6	9.2	23.2	8.9	43.9	3.8	8.5	3.0	10.5
2009	12.3	7.9	21.7	9.4	42.5	3.7	8.6	3.3	10.4
Other employed position[f]									
2004	19.6	7.2	8.8	18.6	17.1	44.6	14.9	11.4	16.7
2005	18.6	6.8	7.8	17.4	16.3	44.2	15.1	12.3	14.9
2006	19.8	8.4	8.9	19.1	15.8	44.4	20.3	14.1	17.7
2007	18.2	7.3	7.9	17.4	14.4	43.0	19.8	10.9	14.5
2008	18.3	6.4	8.4	16.8	14.3	44.4	20.8	10.6	12.9
2009	18.0	8.0	8.9	16.0	14.5	44.7	17.0	11.1	13.3

[a] Includes agricultural sciences and biological sciences.

[b] Includes computer sciences; earth, atmospheric, and ocean sciences; and mathematics.

[c] Includes psychology.

[d] Aggregated totals of postdoc positions in academe, industry/business, and other sectors.

[e] Includes respondents who indicated definite commitments for self-employment.

[f] Includes respondents who indicated definite commitments for employment in government; not-for-profit organization; preschool, elementary, middle, secondary school or school system; and other employment.

NOTES: Percentages are based on number reporting definite commitments for employment or postdoctoral training/study in the United States. Due to rounding, percentages may not sum to 100.

SOURCE: NSF/NIH/USED/USDA/NEH/NASA, 2009 Survey of Earned Doctorates.

doctorate recipients in those fields taking postdoc positions has increased over the period 2004–09.

Employment in academe is the most likely early career destination for doctorate recipients in non-S&E fields, and also for social sciences doctorate recipients. However, the proportion of doctorate recipients taking positions in academe declined over the period 2004–09 in every non-S&E field except professional fields and in every S&E field except life sciences. The drop from 2008 to 2009 in the rate of academic employment resulted from decreases in life sciences (-1.2 percentage points), engineering (-3.6 percent points), and humanities (-1.1 percentage points). The rate of employment in academe increased in 2009 for doctorate recipients in health and physical sciences, by 3.4 and 0.4 percentage points, respectively.

Employment in industry/business is the most likely initial destination for new doctorate recipients in engineering and is also a common postgraduation position for new doctorate recipients in physical sciences. In both of these fields, and in life sciences, the proportion of doctorate recipients taking employed positions in industry/business increased from 2004 to 2008 and then decreased in 2009. The proportion of humanities doctorate recipients taking industry/business positions dropped slightly over the 2004–09 period, but none of the remaining fields showed a discernible trend over the past 5 years.

A large and nearly constant proportion of doctorate recipients in education secured positions in other employment over the period 2004–09. (This is to be expected, as employment in "preschool, elementary, middle, secondary school or school system" is one of the survey response categories aggregated within the other employed position category.) In every non-education field but engineering, the proportion of doctorate recipients taking other employed positions increased from 2004 to 2006, and then (including engineering) decreased or did not change from 2006 to 2009.

Data Sources and Limitations

The data presented here are from the Survey of Earned Doctorates (SED) for academic year 2009 (1 July 2008 to 30 June 2009). The SED is sponsored by six federal agencies: the National Science Foundation, the National Institutes of Health (U.S. Department of Health and Human Services), the U.S. Department of Education, the U.S. Department of Agriculture, the National Endowment for the Humanities, and the National Aeronautics and Space Administration.

Each individual completing requirements for a research doctorate from a university in the United States or Puerto Rico receives the SED. Research doctoral programs are oriented toward preparing students to make original contributions to knowledge in a field and typically entail writing a dissertation. Doctoral degrees such as the PhD, DSc, and research EdD are considered research doctorates and are covered by this survey; professional degrees (e.g., MD, DDS, JD, and PsyD) are not. The terms "doctorate" and "doctoral degree" are used to represent any of the research doctoral degrees covered by the survey.

In 2009, 92.3% of the 49,562 new doctorate recipients completed the survey. Limited records are constructed for nonrespondents from administrative lists of the university, such as commencement programs and graduation lists. Consequently, the 2009 item response rates for some items exceed the 92.3% unit response rate: the field of study information used in this report was obtained for all doctorate recipients, information on sex was obtained for 99.9%, race/ethnicity for 94.1%, and citizenship status for 94.7%. The response rate for the postgraduation status item over the period reported in table 3 ranged from 92.2% in 2006 to 89.6% in 2009.

The major fields and subfields of study are reported differently in this InfoBrief than in the SED questionnaire instrument and the interagency report *Doctorate Recipients from U.S. Universities: 2009* (forthcoming). In this InfoBrief, the major field "health" is in the non-S&E category rather than in S&E. The fine fields American/U.S. studies; archeology; and history, science, and technology and society are counted in social sciences (S&E category) rather than humanities (non-S&E category). Agricultural economics is included in social sciences rather than agricultural sciences. Finally, public administration is counted in social sciences (S&E category) rather than professional fields (non-S&E category).

Before 2007 the "signed contract" response category to the postgraduation status item was worded, "Have signed contract or made definite commitment for other work or study." Commitments for a postdoc position and commitments for a full-time degree program could both be considered commitments for "study." Thus, to distinguish these commitments the wording of this response category was changed in 2007 to "have signed

contract or made definite commitment for a 'postdoc' or other work," and a new response category, "other full-time degree program," was added to the postgraduation status item. In this report, "other full-time degree program" responses are aggregated within the "other postgraduation status" reporting category. Changes in the proportions of doctorate recipients in the "other postgraduation status" and "signed contract" categories beginning 2007 may be partly attributable to the changed wording of the survey item. As a result, the pre-2007 percentages of doctorate recipients indicating the "have signed contract" response are slightly overstated in comparison with the 2007 to 2009 data because the figures include an indeterminate number of respondents who might have selected the "other full-time degree program" response had it been available. Similarly, the pre-2007 percentages of doctorate recipients in the "other postgraduation status" category are slightly understated in comparison with the later data.

The full set of detailed tables from this survey, providing more information on doctorates awarded in S&E fields, will appear in *Doctorate Recipients from U.S. Universities: 2009* and forthcoming reports of the *Science and Engineering Doctorate Awards* series, at http://www.nsf.gov/statistics/doctorates/. Individual detailed tables from recent surveys may be available in advance of publication of the full reports. For further information, please contact the author.

Notes

1. Mark K. Fiegener, Human Resources Statistics Program, Division of Science Resources Statistics, National Science Foundation, 4201 Wilson Boulevard, Suite 965, Arlington, VA 22230 (mfiegene@nsf.gov; 703-292-4622).

2. Minority groups include American Indian/Alaska Native, Asian, black, Hispanic (Mexican American, Puerto Rican, and other Hispanic ethnicities), Native Hawaiian/Other Pacific Islander, persons who reported two or more races, and other race/ethnicity.

3. On the SED, postdoc is defined as "a temporary position primarily for gaining additional education and training in research, usually awarded in academe, industry, government, or a non-profit organization." Some institutions consider postdocs to be employment, whereas other institutions consider them to be "study."

4. Returning to predoctoral employment is a common postgraduation plan of doctorate recipients in education and (to a lesser extent) health, as many doctoral programs in these fields enroll graduate students who pursue the degree on a part-time basis and remain employed during their doctoral studies.

5. The use of the term "employed position" is intended to distinguish postdoc from non-postdoc positions, and is not meant to suggest that a postdoc position is not a form of employment.

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