

Report on the 2009-2010 New Doctoral Recipients

Richard Cleary, James W. Maxwell, and Colleen Rose

This report presents a statistical profile of recipients of doctoral degrees awarded by departments in the mathematical sciences at universities in the United States during the period July 1, 2009, through June 30, 2010. All information in the report was provided over the summer and fall of 2010 by the departments that awarded the degrees with information provided by the individual new doctoral recipients. The report includes an analysis of the fall 2010 employment plans of 2009–2010 doctoral recipients and a demographic profile summarizing characteristics of citizenship status, sex, and racial/ethnic group. This report provides a more extensive look at the 2009–2010 new doctorates and includes information about 2009–2010 doctoral recipients that were not included in the preliminary report.

Detailed information, including tables which traditionally appeared in this report, is available on the AMS website at www.ams.org/annual-survey/survey-reports.

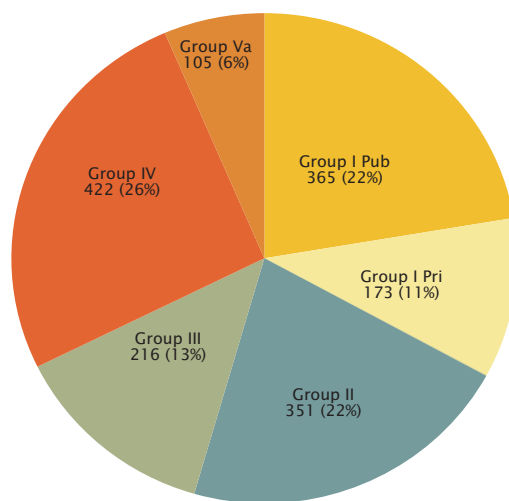
Doctoral Degrees Awarded

1,632 Ph.D.s were awarded by the 299 doctoral-granting departments that we surveyed. For the first time ever we had a 100% response rate. The 292 departments responding both this year and last year reported a total of 1,625 new doctoral recipients, an increase of 20 over the 1,605 new doctoral recipients they reported last year.

Again considering only the 292 departments responding both years, the twenty-three departments in Group 1 Private responding to both surveys reported 52 fewer new doctoral recipients for 2010, 225 for 2009–2010 compared to 173 for 2008–2009. (See page 954 for a description of the department groupings.)

35% (568) of the new Ph.D.s had a dissertation in statistics/biostatistics, followed by algebra/number theory (230) and applied mathematics (229) both with 14%.

Figure A.1: Number and Percentage of Degrees Awarded by Department Groupings

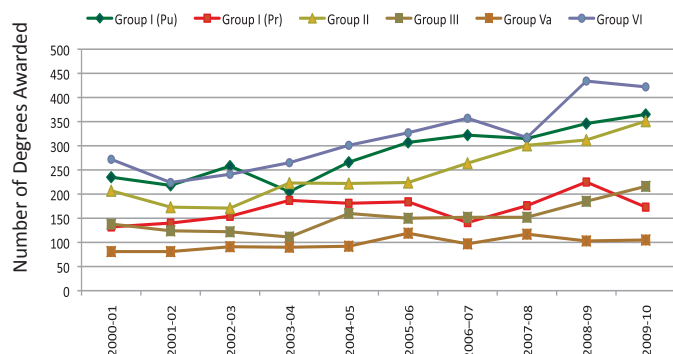


Total Degrees Awarded: 1,632

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Doctoral Degrees Awarded

Figure A.2: New Ph.D.s Awarded by Group



Comparing Ph.D.s awarded this year to last year, the number of Ph.D.s awarded:

- Increased 2% overall.
- Groups I (Pr) and IV awarded 23% and 3% fewer degrees.
- Groups II and III awarded 13% and 17% more degrees.

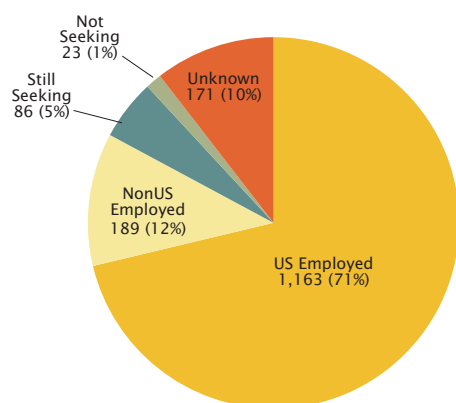
Looking at Ph.D.s awarded this year with those awarded in 2000-2001:

- Ph.D.s awarded have increased more than 53% over the last 10 years in all groups combined.
- Groups I (Pu), II, and III continue to report record numbers each year.

Employment

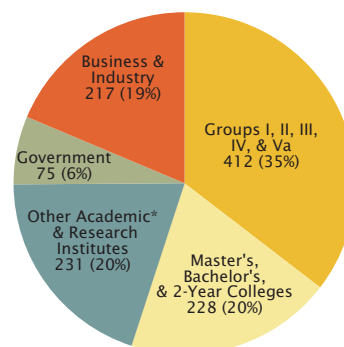
The overall unemployment rate is 6.9%, up from 4.9% last year. (Details on the calculations are on page 954.) The employment plans are known for 1,461 of the 1,632 new doctoral recipients. The number of new doctoral recipients employed in the U.S. is 1,163, down slightly from last year's number of 1,166. Employment in the U.S. increased in all employer types except Groups I and Va which decreased 1%. The number of new Ph.D.s taking positions in government has increased to 75 this year. Academic hiring of new doctoral recipients increased to 871, compared to 741 last year.

Figure E.1: Employment Status



- 53% (621) of those employed in the U.S. are U.S. citizens, up from 51% last year.
- 75% (542) of non-U.S. citizens known to have employment are employed in the U.S., the remaining 178 non-U.S. citizens are either employed outside of the U.S. or are unemployed.
- 8% of new Ph.D.s are working at the institution which granted their degree, up from 7% last year.

Figure E.2: U.S. Employed by Type of Employer

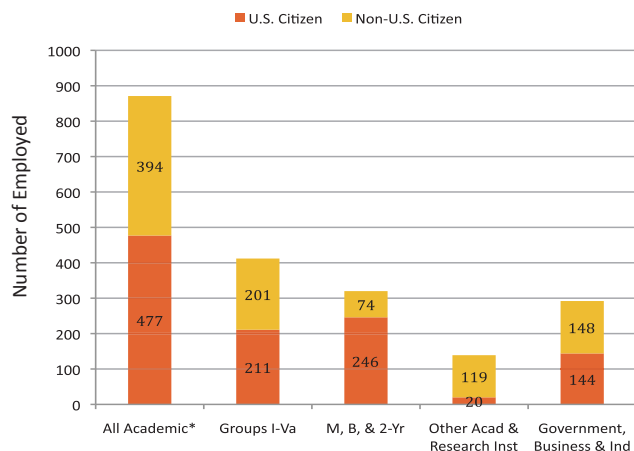


*Other Academic consists of departments outside the mathematical sciences including numerous medical related units.

- Total U.S. employed: 1,163
- U.S. Academic hiring increased 18% overall, all groups except M&B reported increases.
- Business & Industry hiring decreased 29% (from 305 to 217); all groups showed a decrease in the number of Ph.D.s taking positions in this sector.

Employment

**Figure E.3: Employment in the U.S.
by Type of Employer and Citizenship**
Total: 1,163

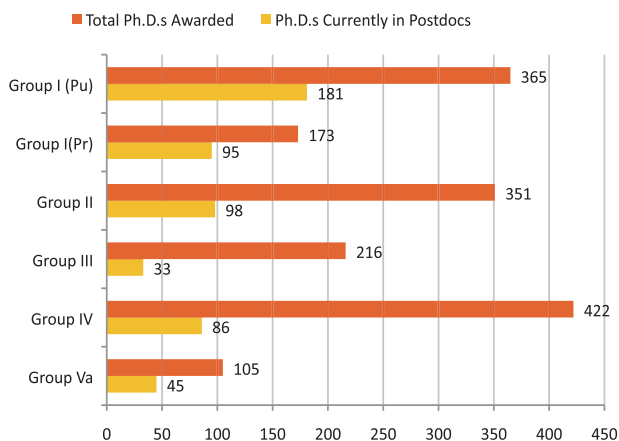


*Includes Groups I-Va, M, B, 2-Yr, other academic and research institutes/nonprofit.

Looking at U.S. citizens whose employment status is known:

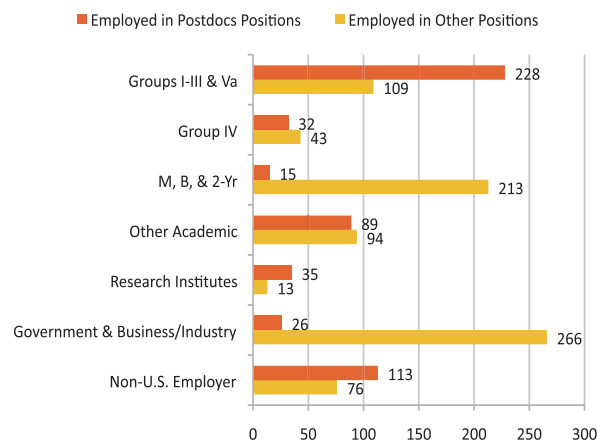
- 85% (621) are employed in the U.S., of these:
 - 34% are employed in Ph.D.-granting departments
 - 43% are employed in all other academic positions
 - 23% are employed in government, business and industry positions

**Figure E.4: New Ph.D.s Employed in Postdocs
by Degree-Granting Department**



- 40% (538) of the new Ph.D.s are reported to be in postdoc positions, up 10% from last year.
- 20% of the new Ph.D.s in postdoc positions are employed outside the U.S.
- 49% of the new Ph.D.s having U.S. academic employment are in postdocs; last year this percentage was 43%.
- 55% of the new Ph.D.s awarded by Group I (Pr) are employed in postdocs, while only 15% of new Ph.D.s awarded by Group III are in postdocs.

**Figure E.5: Postdoc vs Non-Postdoc Employment
by Type of Employer**



- Total known to be employed: 1,352
- 63% of the new Ph.D.s employed in Groups I-Va are in postdoc positions. The analogous percent for Group I is 80%.

Employment

Figure E.1 displays the U.S. unemployment rate for new doctorates, details on the calculations are on page 954.

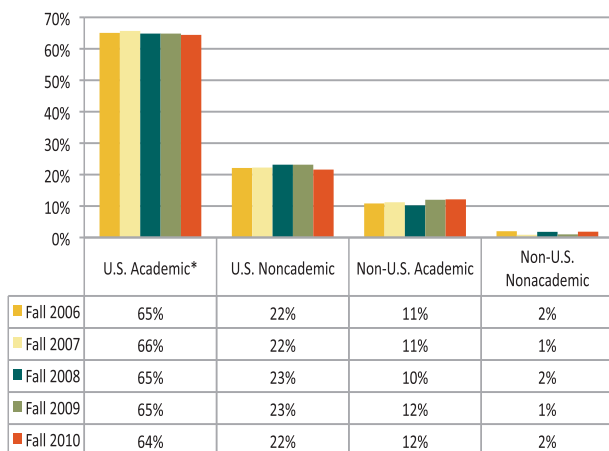
Figure E.1: Percentage of New Doctoral Recipients Unemployed 2001–2010*



*The difficult employment years of the 1990's are not shown here but are located on the AMS website at www.ams.org/annual-survey/2010Survey-NewDoctorates.

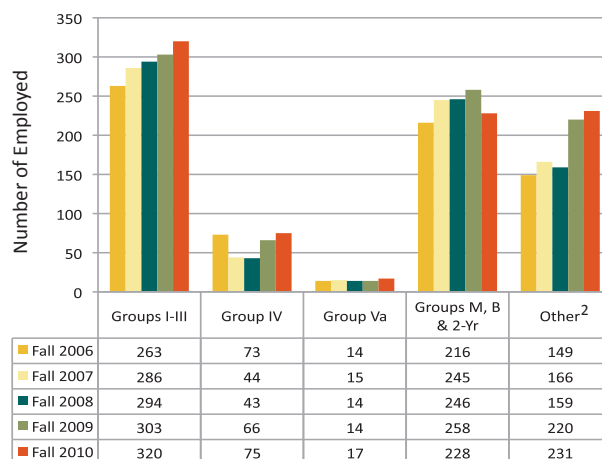
- Unemployment among those whose employment status is known is 6.9%, up from 4.9% for fall 2009.
- Group II reported highest unemployment at 11.6%.
- Group IV reported the lowest unemployment at 2.3%.
- 7% of U.S. citizens are unemployed, compared to 8% in fall 2009.
- 6.7% of non-U.S. citizens are unemployed; the rates by visa status are
 - 10.1% for those holding a permanent visa.
 - 8.1% for those holding a temporary visa, almost double last year's figure of 4.4%.

Figure E.7: Percentage of Employed New Ph.D.s by Type of Employer



* Includes research institutes and other non-profits.

Figure E.8: New Ph.D.s Employed in U.S. Academic Positions by Hiring Department Group¹



¹ For definitions of groups see page 954.

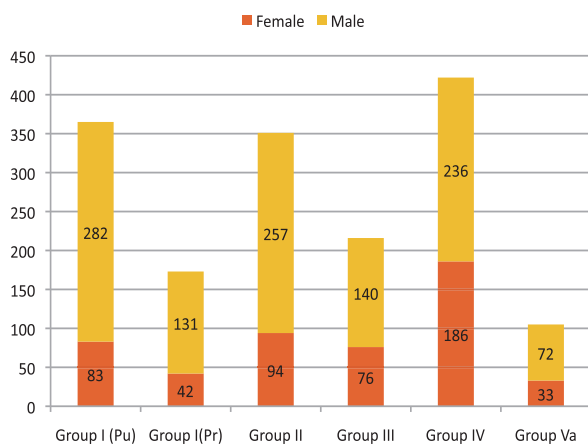
² Includes other academic departments and research institutes/other nonprofits.

- Hiring of new Ph.D.s has increased in all groups except Groups M&B which hired 13% fewer new Ph.D.s than last year.
- Comparing the last 5 years we see that:
 - The percentage of Ph.D.s hired into academic and nonacademic positions shows little variability over the years.
 - Groups I-III and Other have showed an increasing trend in the hiring of new Ph.D.s, hiring 22% and 54% more new Ph.D.s than for Fall 2006.
 - Groups IV, Va, and M&B all show some variability over the years, but all groups hired a few more new Ph.D.s this year than they did in Fall 2006.
 - Detailed information on new Ph.D.s employed in the U.S. by degree-granting department group is available on the website at www.ams.org/annual-survey/2010Survey-NewDoctorates.

Demographics

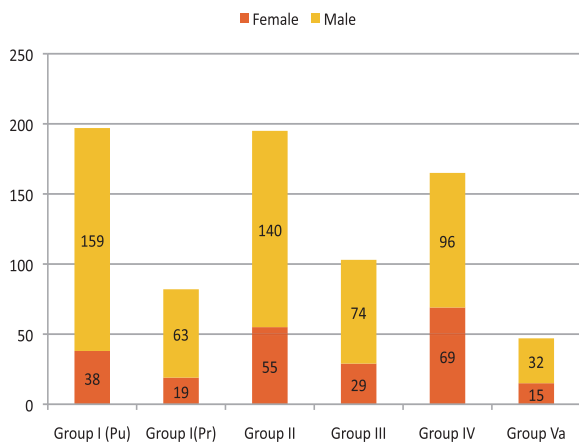
Gender and citizenship was known for all 1,632 new Ph.D.s reported for 2009-2010. The number of U.S. citizens is 789 (48%) (up from 46% last year). The number of females accounted for 29% of the U.S. citizen total (down from 31% last year). The number of non-U.S. citizens receiving a Ph.D decreased to 52% from 54% last year.

Figure D.1: Gender of Doctoral Recipients by Degree-Granting Department



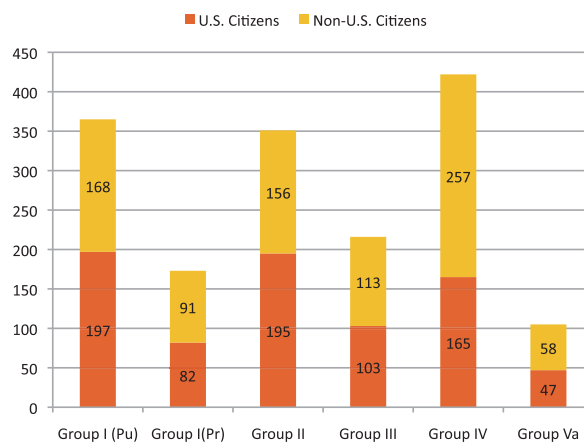
- Females account for 31% (514) of the 1,632 Ph.D.s, down from last year's figure of 33%.

Figure D.3: Gender of U.S. Citizen Doctoral Recipients by Degree-Granting Department



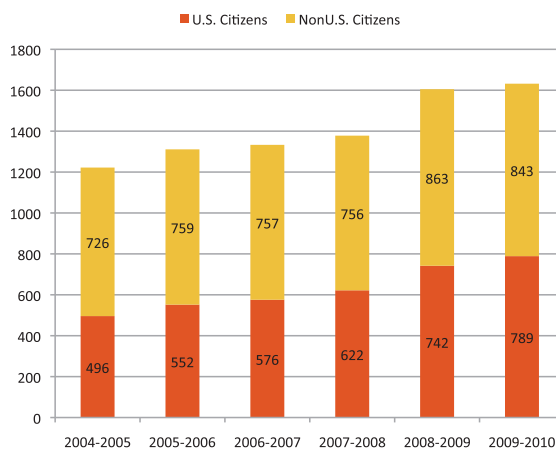
- 50% of the males and 44% of the females are U.S. citizens.
- Females accounted for 29% of the U.S. citizens,
- Among the U.S. citizens: 2 are American Indian or Alaska Native, 42 are Asian, 28 are Black or African American, 24 are Hispanic or Latino, 6 are Native Hawaiian or Other Pacific Islander, 668 are White, and 19 are of unknown race/ethnicity.

Figure D.2: Citizenship of Doctoral Recipients by Degree-Granting Department



- All groups reported awarding more degrees to non-U.S. citizens than U.S. citizens, with the exception of Groups I (Pr) and III, which awarded 54% and 56% of their Ph.D.s to U.S. citizens.

Figure D.4: Citizenship of New Ph.D. Recipients, 2004-2010



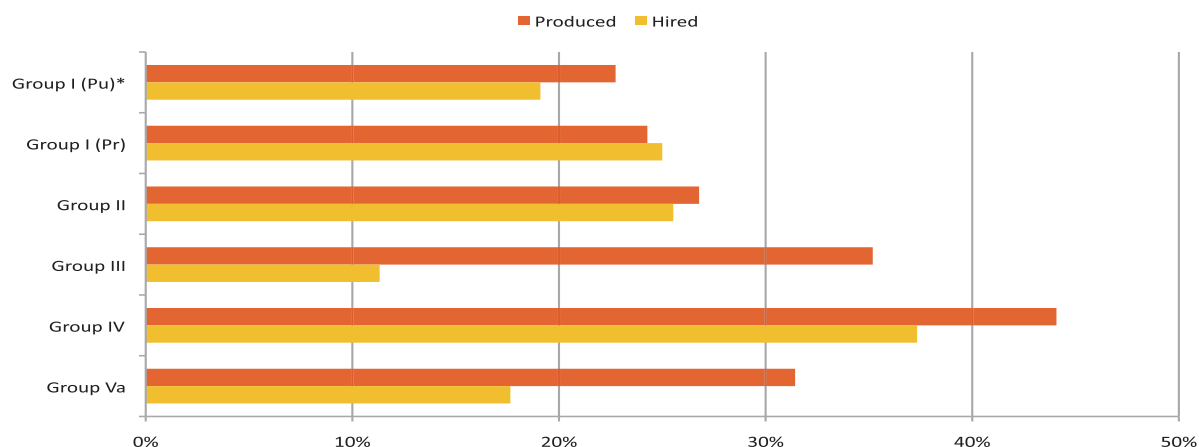
Looking at the last six years we see that:

- U.S. citizen counts have been increasing steadily, reaching a high of 789 this year. This is a 59% increase from Fall 2004-2005.
- Non-U.S. citizen counts which had been hovering around 750, jumped to 863 last year before dropping to 843 this year. While this is a 16% increase from Fall 2004-2005, it represents a 2% decrease from last year.

Female New Doctoral Recipients

After increasing to 33% last year, the number of female new doctoral recipients decreased to 31% this year. Of the 871 new Ph.D.s hired into academic positions 33% (287) were women, up from 29% last year. 20% of those hired into postdoc positions were women, with 57% of those being U.S. citizens. The U.S. unemployment rate for females is 5.6%, compared to 7.5% for males and 6.9% overall.

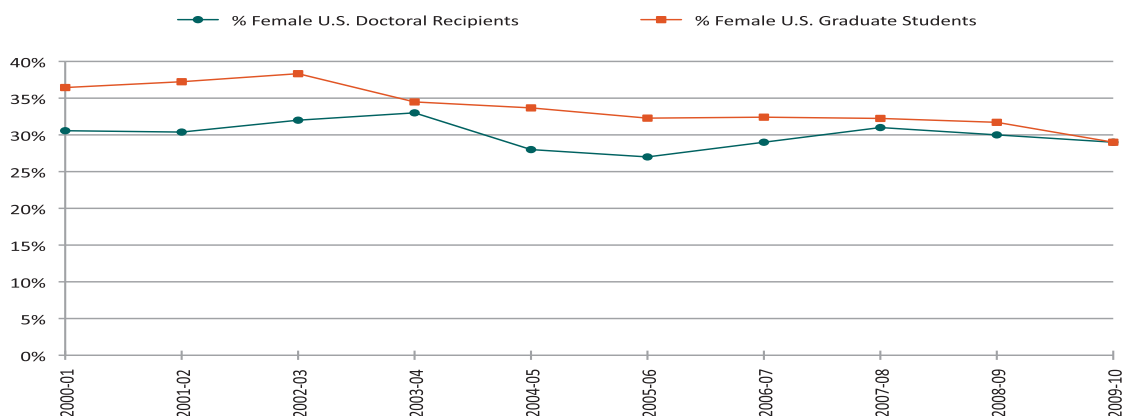
Figure F.1: Females as a Percentage of New Doctoral Recipients Produced by and Hired by Doctoral-Granting Department



* For definitions of groups see page 954.

- 43% of those hired by Group B were women (the same as last year) and 39% of those hired by Group M were women (down from 40% last year).
- 35% of those hired into Research Institutes/Other non-profit positions were women.
- 36% of those hired into Government positions were women.
- 61% of the women employed in Groups I-Va are in postdoc positions, compared to 64% of the men employed in postdocs in these groups.

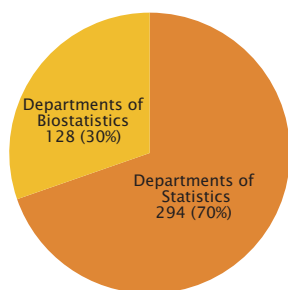
Figure F.2: Females as a Percentage of U.S. Citizen Doctoral Recipients



Ph.D.s Awarded in Group IV (Statistics/Biostatistics)

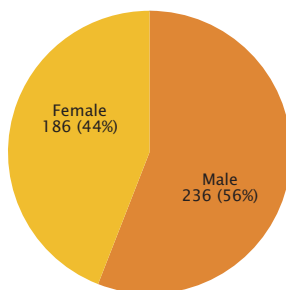
This section contains information about new doctoral recipients in Group IV. Group IV produced 422 new doctorates, of which all but 5 had dissertations in statistics/biostatistics. This is a 3% decrease in the number reported for fall 2009 of 434. In addition, Groups I-III and Va combined had 152 Ph.D. recipients with dissertations in statistics. In Group IV, 165 (39%) of the new doctoral recipients are U.S. citizens (while in the other groups combined 52% are U.S. citizens). The 89 departments responding last year and this year reported a total of 416 new doctoral recipients, a decrease of 4% from last year. While the unemployment rate for new Ph.D.s with dissertations in statistics or probability has increased to 3.4%, the unemployment among the Group IV new Ph.D.s is 2.3%.

Figure S.1: Ph.D.s Awarded in Group IV



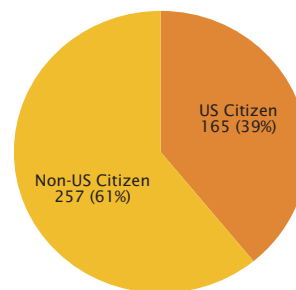
- 26% of all Ph.D.s awarded were in Group IV.
- Females account for 39% of statistics and 55% of biostatistics Ph.D.s awarded.

Figure S.2: Gender of Group IV Ph.D. Recipients



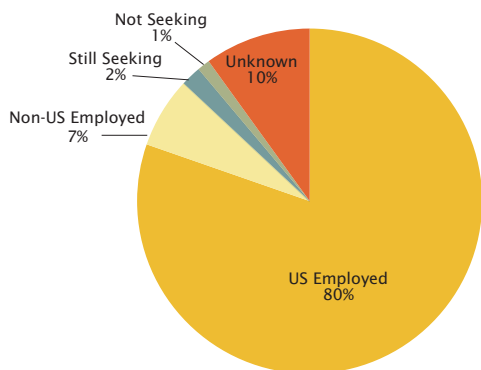
- Females accounted for 44% of the 422 Ph.D.s in Group IV, compared to all other groups combined, where 27% (328) are female.

Figure S.3: Citizenship of Group IV Ph.D. Recipients



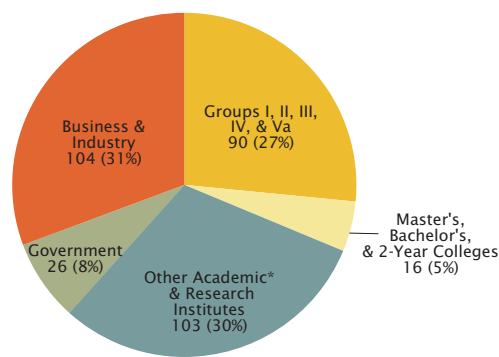
- 42% of Group IV U.S. citizen Ph.D. recipients are females, while in all other groups combined 25% of the U.S. citizens are females.

Figure S.4: Employment Status of Group IV Ph.D. Recipients



- 2.3% of Group IV Ph.D.s are unemployed compared to 8.6% among all other groups. This is up from 1.8% last year.
- Unemployment among new Ph.D.s with dissertations in statistics/probability is 3.4%, up from 2.9%. Among all other dissertation groupings 7.2% are unemployed.

Figure S.5: U.S. Employed Group IV Ph.D. Recipients by Type of Employer



*Other Academic consists of departments outside the mathematical sciences including numerous medical related units.

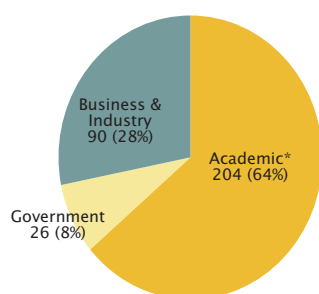
- Group IV total U.S. employed: 339
- 31% of Group IV Ph.D.s are employed in Business/Industry, compared to 14% in all other groups.
- 37% of those hired by Group IV were females, compared to 21% in all other groups.

Information from the Employment Experiences of New Doctorates (EENDR) Survey

This section contains additional information on employment gathered from a subset of the 2009–2010 new Ph.D.s on the EENDR Survey. It expands on the details of employment which are not available through the departments.

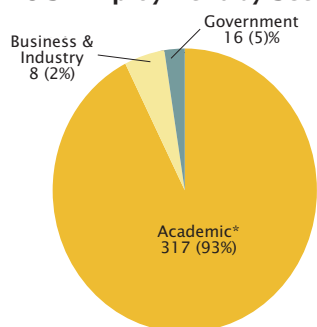
The 1,476 new Ph.D.s reported in our Preliminary Report were sent this survey; of those individuals 802 (54%) responded. The employment status is known for 792 of these individuals, the U.S. unemployment among this group is less than 2.6%. 33% of EENDR respondents who are employed reported they are actively looking for another position. The median age among this group of respondents is 30.

Figure EE.1: EENDR Respondents Reporting Permanent U.S. Employment by Sector



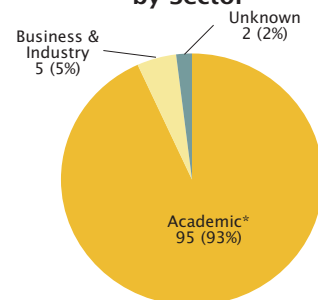
* Includes research institutes and other non-profits.

Figure EE.2: EENDR Respondents Reporting Temporary U.S. Employment by Sector



* Includes research institutes and other non-profits.

Figure EE.3: EENDR Respondents Employed Outside the U.S. by Sector



* Includes research institutes and other non-profits.

Of the 320 permanently employed:

- 38% are women.
- 51% were unable to find a suitable permanent position.
- 73% of those reporting academic employment hold tenured/tenure-track positions.

Of the 341 temporarily employed:

- 31% are women.
- 51% were unable to find a suitable permanent position.
- 72% are employed in postdocs and 28% of these reported they could not find a suitable permanent position.

Of the 102 employed outside the U.S.:

- 25% are women.
- 26% are U.S. Citizens.
- 96% of the U.S. Citizens are employed in postdocs and 72% of these reported they could not find a suitable permanent position.

Table EE.1: Number and Percentage of EENDR Respondents Employed in the U.S. by Job Status

Year	Perm Total	%	Temp Total	%	Temporary		Temporary Postdocs				Unkown
					Perm	Not Avail	Total	%	Perm	Not Avail	
Fall 2006	289	51%	274	49%	98	36%	209	76%	57	27%	0
Fall 2007	259	53%	227	47%	88	39%	172	76%	57	33%	0
Fall 2008	245	49%	222	45%	74	33%	172	77%	47	27%	0
Fall 2009	318	49%	326	51%	146	45%	234	72%	68	29%	0
Fall 2010	320	48%	341	52%	140	41%	246	72%	68	28%	0

Comparing the employment status of EENDR respondents over the last five years we see that:

- Permanent positions have dropped to 48%, but the number has increased to a high of 320.
- Temporary positions have increased to 52% (341), reaching a five-year high.
- 41% of those holding temporary positions were unable to find suitable permanent positions, a 4% decrease from Fall 2009.
- Postdoc positions have reached a five-year high (246) this year. Although, the highest percentage of postdoc positions reported was 77% for Fall 2008.

Information from the Employment Experiences of New Doctorates (EENDR) Survey

Table EE.2: Percentage of EENDR Respondents Employed in the U.S. by Employment Sector within Job Status

Year	Permanent			Temporary		
	Acad	Govn	B/I	Acad	Govn	B/I
Fall 2006	66%	4%	30%	93%	5%	2%
Fall 2007	68%	3%	29%	93%	4%	3%
Fall 2008	63%	6%	31%	95%	4%	1%
Fall 2009	64%	6%	29%	91%	5%	4%
Fall 2010	64%	8%	28%	93%	5%	2%

Looking at Table EE.2 we see that

- Permanent academic employment has remained steady at 64%, although it is down 2% from Fall 2006. While temporary employment in this sector tends to be around 93%.
- Permanent government employment has steadily increased, reaching 8% this year.
- Business/Industry shows a decreasing trend in permanent employment, while temporary positions shows some variability.

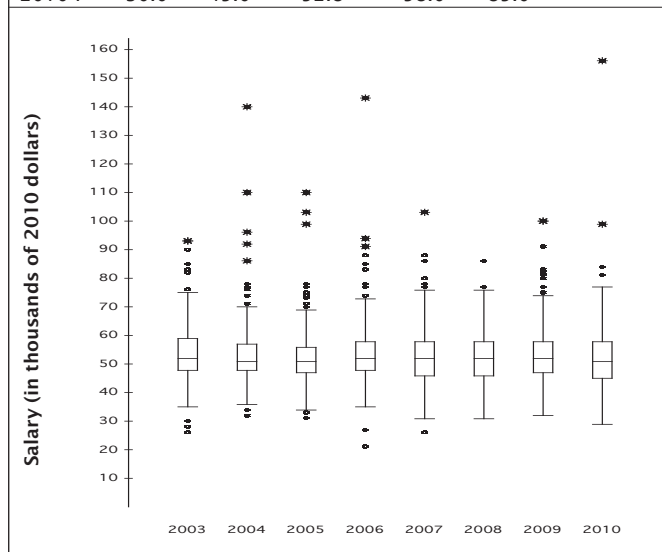
Starting Salaries of the 2009-2010 Doctoral Recipients

The starting salary figures were compiled from information gathered on the EENDR questionnaires sent to 1,476 individuals using addresses provided by the departments granting the degrees; 802 individuals responded between late October and April. Responses with insufficient data or from individuals who indicated they had part-time or non-U.S. employment were excluded. Numbers of usable responses for each salary category are reported in the following tables.

Readers should be warned that the data in this report are obtained from a self-selected sample, and inferences from them may not be representative of the population.

Academic Teaching/Teaching and Research 9-10-Month Starting Salaries* (in thousands of dollars)

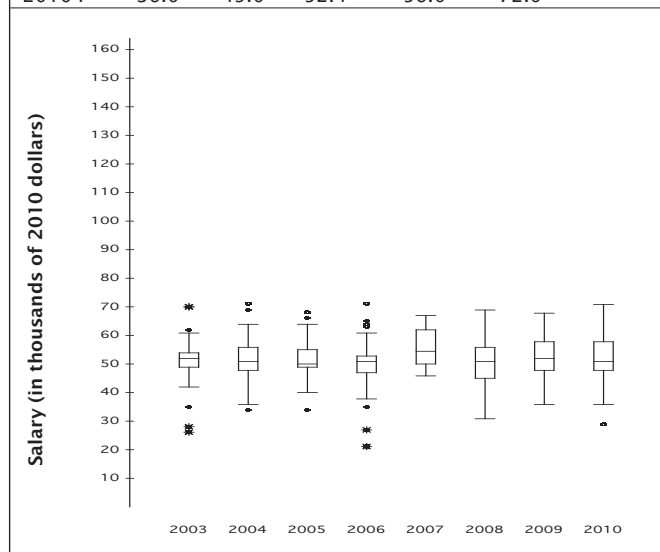
Ph.D. Year	Min	Q ₁	Median	Q ₃	Max
Total (183 male/96 female)					
2010 M	29.0	45.4	51.0	58.0	157.0
2010 F	30.0	45.0	52.2	57.3	85.0
One year or less experience (162 male/83 female)					
2010 M	29.0	45.0	50.3	58.0	157.0
2010 F	30.0	45.0	52.8	58.0	85.0



* Includes postdoctoral salaries.

Academic Postdoctorates Only* 9-10-Month Starting Salaries (in thousands of dollars)

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max
Total (68 male/19 female)					
2010 M	29.0	48.0	50.6	57.3	72.0
2010 F	36.0	47.0	52.0	56.0	72.0
One year or less experience (66 male/17 female)					
2010 M	29.0	48.0	51.0	57.8	72.0
2010 F	36.0	49.0	52.4	56.0	72.0

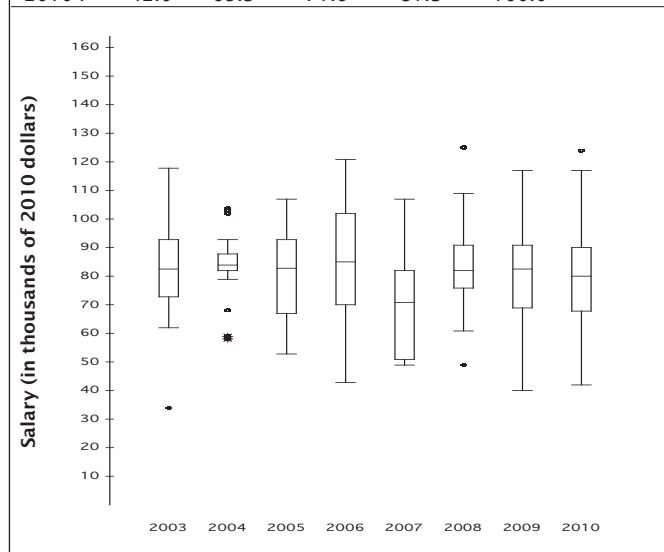


* A postdoctoral appointment is a temporary position primarily intended to provide an opportunity to extend graduate training or to further research experience.

Starting Salaries of the 2009-2010 Doctoral Recipients

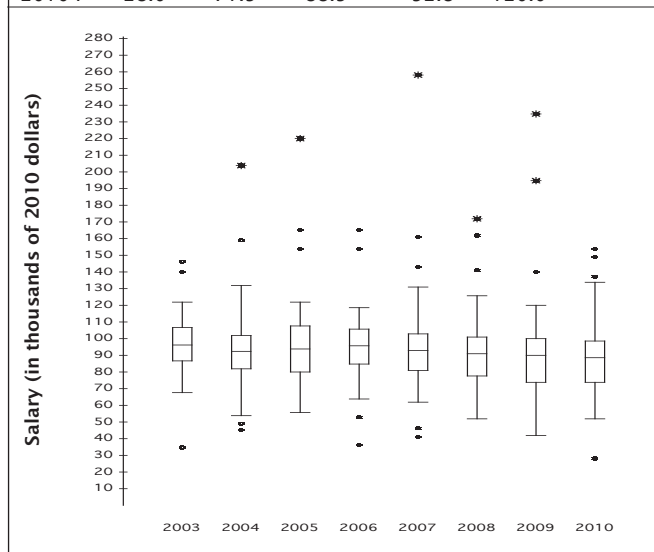
Government
11-12-Month Starting Salaries
(in thousands of dollars)

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max
Total (23 male/16 female)					
2010 M	62.0	70.5	80.0	89.0	124.5
2010 F	42.0	66.0	73.7	90.0	117.0
One year or less experience (22 male/12 female)					
2010 M	62.0	70.3	80.6	89.0	125.4
2010 F	42.0	65.3	71.6	81.3	100.0



Business and Industry
11-12-Month Starting Salaries
(in thousands of dollars)

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max
Total (56 male/28 female)					
2010 M	52.0	77.6	90.0	100.0	155.0
2010 F	28.0	72.9	90.0	96.8	120.0
One year or less experience (47 male/24 female)					
2010 M	52.0	77.3	90.0	100.0	155.0
2010 F	28.0	71.9	88.9	92.8	120.0



Remarks on Starting Salaries

Key to Tables and Graphs. Salaries are those reported for the fall immediately following the survey cycle. Years listed denote the survey cycle in which the doctorate was received—for example, survey cycle July 1, 2009–June 30, 2010, is designated as 2010. Salaries reported as 9–10 months exclude stipends for summer grants or summer teaching or the equivalent. M and F are male and female respectively. Male and female figures are not provided when the number of salaries available for analysis in a particular category was five or fewer. All categories of “Teaching/Teaching and Research” and “Research Only” contain those recipients employed at academic institutions only.

Graphs. The graphs show standard boxplots summarizing salary distribution information for the years 2003 through 2010. Values plotted for 2003 through 2010 are converted to 2010 dollars using the implicit price deflator prepared annually by the Bureau of Economic Analysis, U.S. Department of Commerce. These categories are based on work activities reported in EENDR. Salaries of postdoctorates are shown

separately. They are also included in other academic categories with matching work activities.

For each boxplot the box shows the first quartile (Q₁), the median (M), and the third quartile (Q₃). The interquartile range (IQR) is defined as Q₃–Q₁. Think of constructing invisible fences 1.5 IQR below Q₁ and 1.5 IQR above Q₃. Whiskers are drawn from Q₃ to the largest observation that falls below the upper invisible fence and from Q₁ to the smallest observation that falls above the lower invisible fence. Think of constructing two more invisible fences, each falling 1.5 IQR above or below the existing invisible fences. Any observation that falls between the fences on each end of the boxplots is called an outlier and is plotted as • in the boxplots. Any observation that falls outside of both fences either above or below the box in the boxplot is called an extreme outlier and is marked as * in the boxplot.

Other Information

Survey Response Rates

Doctorates Granted Departmental Response Rates

Group I (Pu)	25 of 25 including	0 with no degrees
Group I (Pr)	23 of 23 including	0 with no degrees
Group II	56 of 56 including	2 with no degrees
Group III	81 of 81 including	9 with no degrees
Group IV	92 of 92 including	11 with no degrees
Statistics	57 of 57 including	4 with no degrees
Biostatistics	35 of 35 including	7 with no degrees
Group Va	22 of 22 including	4 with no degrees

Group Descriptions

Group I is composed of 48 departments with scores in the 3.00–5.00 range. Group I Public and Group I Private are Group I departments at public institutions and private institutions, respectively.

Group II is composed of 56 departments with scores in the 2.00–2.99 range.

Group III contains the remaining U.S. departments reporting a doctoral program, including a number of departments not included in the 1995 ranking of program faculty.

Group IV contains U.S. departments (or programs) of statistics, biostatistics, and biometrics reporting a doctoral program.

Group V contains U.S. departments (or programs) in applied mathematics/applied science, operations research, and management science which report a doctoral program.

Group Va is applied mathematics/applied science; Group Vb, which was no longer surveyed as of 1998–99, was operations research and management science.

Group M contains U.S. departments granting a master's degree as the highest graduate degree.

Group B contains U.S. departments granting a baccalaureate degree only.

Listings of the actual departments which compose these groups are available on the AMS website at www.ams.org/annual-survey/groups_des.

U.S. Unemployment Rate Calculations

In the unemployment calculations provided in this report the individuals employed outside the U.S. have been removed from the denominator used in the calculation of the rate, in addition to the routine removal of all individuals whose employment status is unknown. This is a change from Annual Survey Reports prior to 2009. As a consequence, the unemployment rate now being reported more accurately reflects the U.S. labor market experienced by the new doctoral recipients. This change tends to increase the rate of unemployment over that reported in prior years.

In a further small change from prior years, those individuals reported as not seeking employment have also been removed from the denominator. The number of individuals so designated is small each year, and the impact of this change is to produce a slight increase in the rate over that reported in prior years.

The unemployment rates for years prior to 2009 shown in this report have been recalculated using this new method. One can view a comparison of the unemployment rates using the traditional method and the new method by visiting the AMS website at www.ams.org/annual-survey/surveyreports.html.

About the Annual Survey

The Annual Survey series, begun in 1957 by the American Mathematical Society, is currently under the direction of the Data Committee, a joint committee of the American Mathematical Society, the American Statistical Association, the Mathematical Association of America, and the Society of Industrial and Applied Mathematics. The current members of this committee are Pam Arroway, Richard Cleary (chair), Steven R. Dunbar, Susan Geller, Abbe H. Herzig, Ellen Kirkman, Joanna Mitro, James W. Maxwell (ex officio), Bart S. Ng, Douglas Ravel, and Marie Vitulli. The committee is assisted by AMS survey analyst Colleen A. Rose. In addition, the Annual Survey is sponsored by the Institute of Mathematical Statistics. Comments or suggestions regarding this Survey Report may be directed to the committee.

Other Sources of Data

Visit the AMS website at www.ams.org/annual-survey/other-sources for a listing of additional sources of data on the Mathematical Sciences.