

Report on the 2010-2011 New Doctoral Recipients

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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, 2010, through June 30, 2011. All information in the report was provided between July 2011 and April 2012 by the departments that awarded the degrees with information provided by the individual new doctoral recipients. The report includes an analysis of the fall 2011 employment plans of 2010-2011 doctoral recipients and a demographic profile summarizing characteristics of citizenship status, gender, and racial/ethnic group. This report provides a more extensive look at the 2010-2011 new doctorates and includes information about 2010-2011 doctoral recipients that were not included in the preliminary report in the April 2012 issue of *Notices*.

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

1,653 Ph.D.'s were awarded by 298 of the 302 doctoral-granting departments that we surveyed.

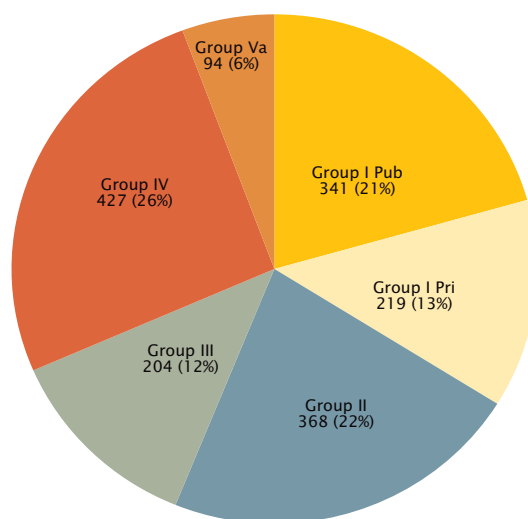
Group 1 Private reported the largest increase in the number of doctoral recipients, up 46 over the total of 173 reported for 2009-2010.

27% (448) of the new Ph.D.'s had a dissertation in statistics/biostatistics, followed by applied mathematics (251) with 15% and algebra/number theory (229) with 14%.

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

- Increased about 1% from 1,632 to 1,653.
- Groups I (Pu), III and Va awarded 7%, 6%, and 10% fewer degrees.
- Groups I (Pr), II and IV awarded 27%, 5%, and 1% more degrees.

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



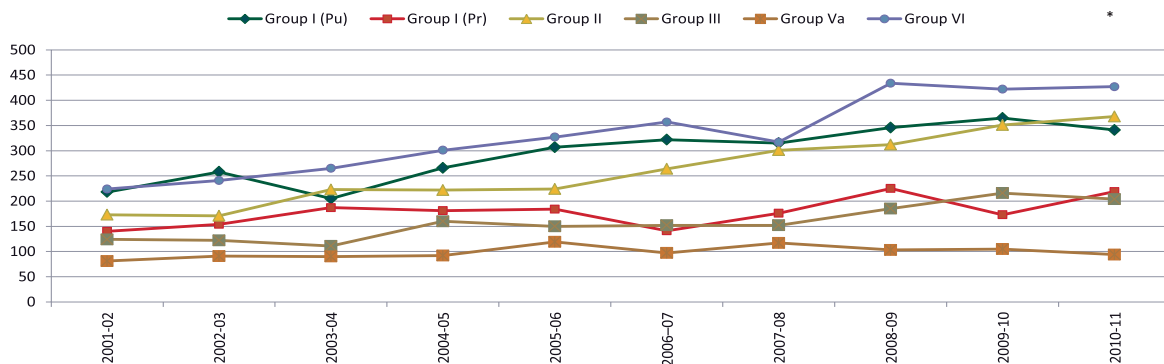
Total Degrees Awarded: 1,653

*See page 1093 for a description of the department groupings.

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Doctoral Degrees Awarded

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



*The increase shown in Group IV is due in part to the increase in response rate.

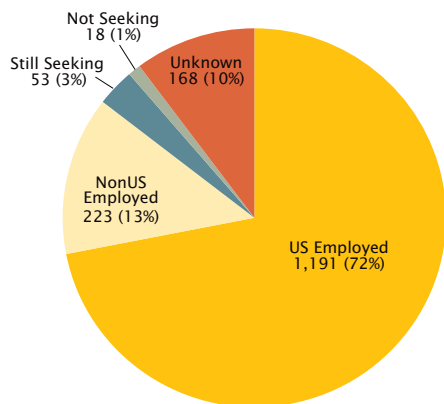
Looking at Ph.D.'s awarded this year with those awarded in 2001-2002:

- Ph.D.'s awarded have increased more than 72% over the last 10 years in all groups combined.
- Groups II continues to report record numbers each year, up 113% from 2001-2002.

Employment

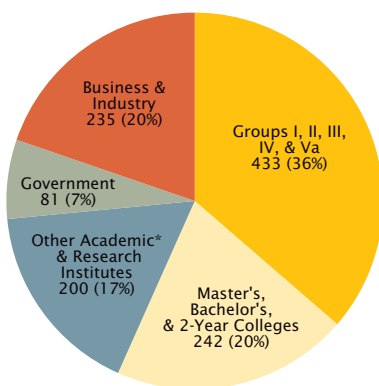
The overall unemployment rate is 4.3%, down from 6.9% last year. (Details on the calculations are on page 1093.) The employment plans are known for 1,485 of the 1,653 new doctoral recipients. The number of new doctoral recipients employed in the U.S. is 1,191, up slightly from last year's number of 1,163. Employment in the U.S. increased in all employer types except Groups IV, Va, B, and Other Academic. The number of new Ph.D.'s taking positions in government has increased to 81 this year compared to 75 last year. Academic hiring of new doctoral recipients increased slightly to 875.

Figure E.1: Employment Status



- 54% (642) of those employed in the U.S. are U.S. citizens, up from 53% last year.
- 74% (549) of non-U.S. citizens whose employment status is known are employed in the U.S., the remaining 194 non-U.S. citizens are either employed outside of the U.S. or are unemployed.
- 8% (110) of all new Ph.D.'s are working at the institution which granted their degree, the same percent as last year. These individuals constitute 13% of total U.S. Academic Employed.

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

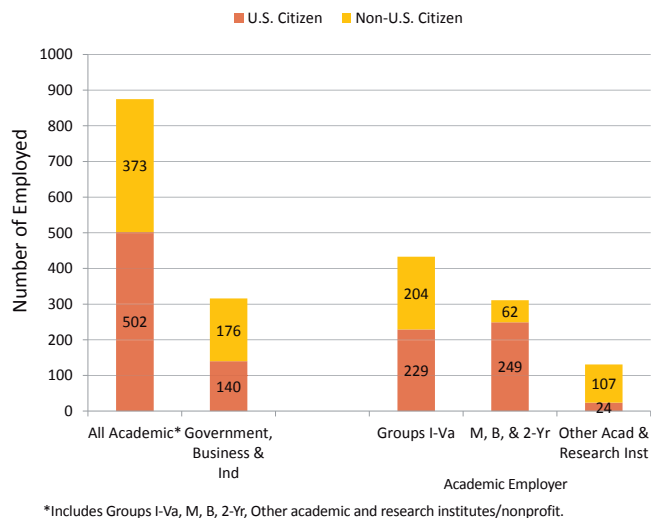


*Other Academic consists of departments outside the mathematical sciences including numerous medical related units.

- Total U.S. employed: 1,191
- U.S. Academic hiring increased slightly to 875 and all groups except IV, Va, B, and Other Academic reported increases.
- Business & Industry hiring increased 8% (from 217 to 235); all groups except Groups 1 (Pr) and II showed an increase in the number of Ph.D.'s taking positions in this sector.

Employment

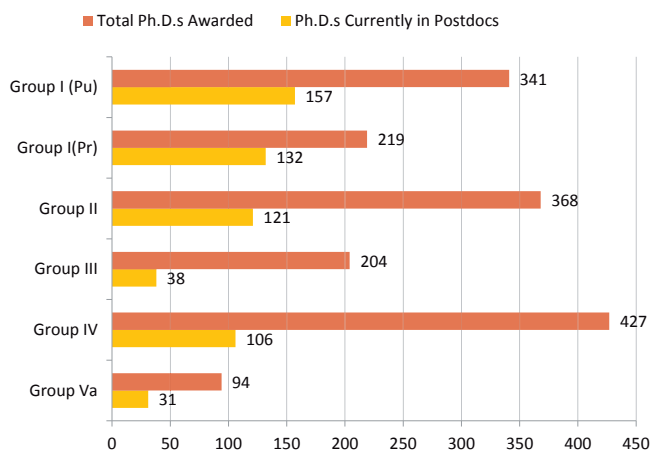
Figure E.3: Employment in the U.S. by Type of Employer and Citizenship
Total: 1,191



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

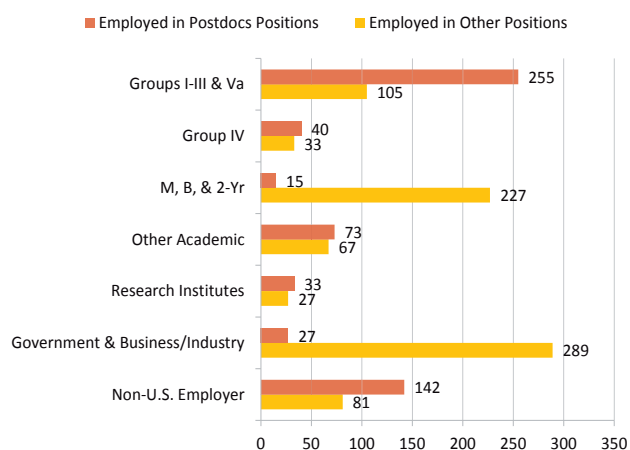
- 87% (642) are employed in the U.S., of these:
 - 36% are employed in Ph.D.-granting departments
 - 43% are employed in all other academic categories
 - 22% are employed in government, business and industry

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



- 41% (585) of the new Ph.D.'s are reported to be in postdoc positions, up from 40% last year.
- 24% of the new Ph.D.'s in postdoc positions are employed outside the U.S., last year this percentage was 20%.
- 48% of the new Ph.D.'s having U.S. academic employment are in postdocs; last year this percentage was 49%.
- 60% of the new Ph.D.'s awarded by Group I (Pr) are employed in postdocs, while only 19% of new Ph.D.'s awarded by Group III are in postdocs.

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

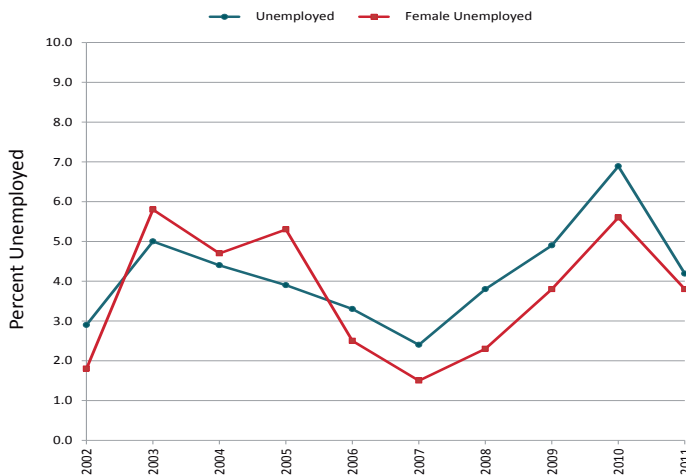


- Total known to be employed: 1,414
- 70% of the new Ph.D.'s employed in Groups I-Va are in postdoc positions, up from 68% last year. The analogous percent for Group I is 79%.

Employment

Figure E.6 displays the U.S. unemployment rate for new doctorates; details on the calculations are on page 1093.

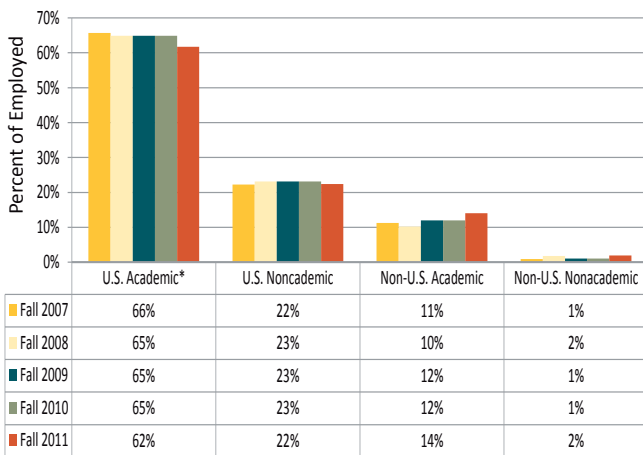
Figure E.6: Percentage of New Doctoral Recipients Unemployed 2002-2011*



*The difficult employment years of the 1990's are not show 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 4.3%, down from 6.9% for fall 2010.
- Group I Pri reported highest unemployment at 5.2%.
- Group Va reported the lowest unemployment at 3.2%.
- 4.6% of U.S. citizens are unemployed, compared to 7% in fall 2010.
- 3.9% of non-U.S. citizens are unemployed; the rates by visa status are
 - 3.8% (3) for those holding a permanent visa, down significantly from last year's figure of 10.1% (7).
 - 4.0% for those holding a temporary visa.

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



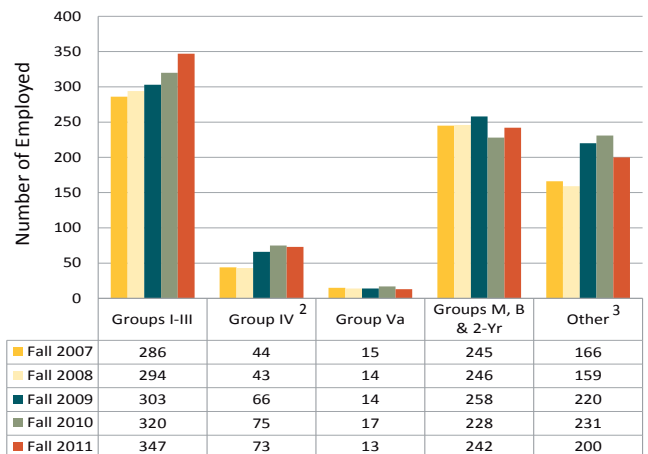
* Includes other academic departments and research institutes/other non-profits.

- Hiring of new Ph.D.'s has increased in all groups except Groups M and B combined which hired 3% fewer new Ph.D.'s than last year.
- The percentage of Ph.D.'s hired into academic and nonacademic positions shows little variability over the years.

Comparing the last 5 years in Figure E.8 we see that:

- Groups I-III have showed an increasing trend in the hiring of new Ph.D.'s, hiring 21% more new Ph.D.'s than for Fall 2007.
- Groups IV, Va, M, B & 2-Yr and Other all show some variability over the years, but Groups IV and Other have hired 66% and 20% more new Ph.D.'s this year than they did in Fall 2007.
- 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/2011Survey-NewDoctorates.

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 The increase shown in Group IV is due in part to the increases in response rate starting with fall 2009.

³ Includes other academic departments and research institutes/other non-profits.

Demographics

Gender and citizenship was known for all 1,653 new Ph.D.'s reported for 2010-2011. The number of U.S. citizens is 802 (49%) (up from 48% last year). The number of females accounted for 28% of the U.S. citizen total (down from 29% last year). The number of non-U.S. citizens receiving a Ph.D. decreased to 51% from 52% last year; this is down 8 percentage points from the 10 year high of 59% reported in 2004-2005. 15% (83) of the non-U.S. citizens employed in the U.S. have permanent visa status (up from 13% last year).

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

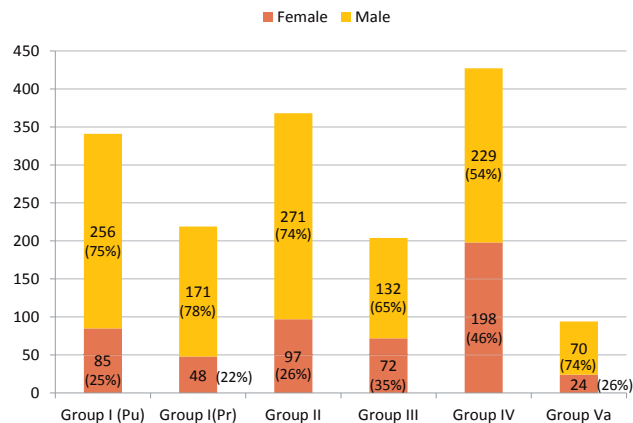
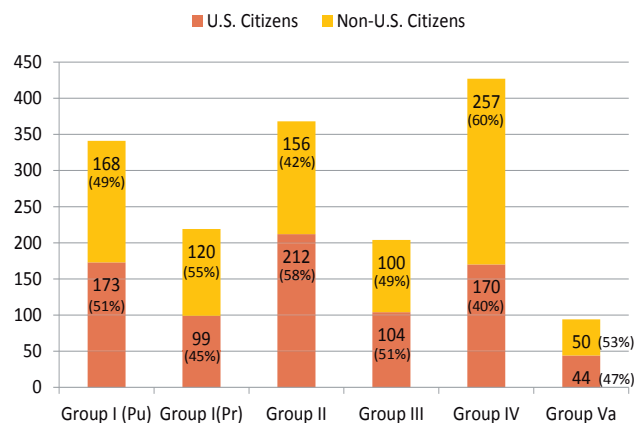


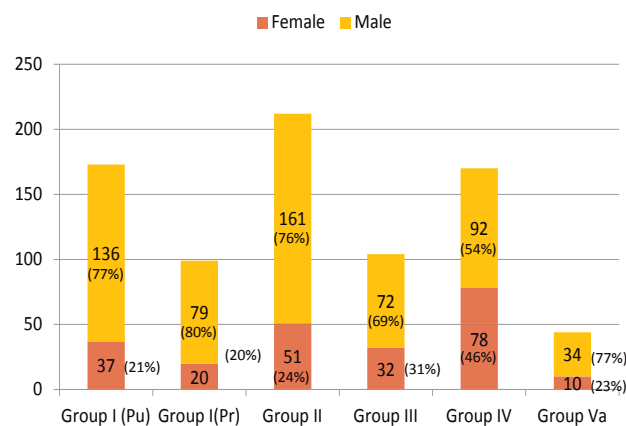
Figure D.2: Citizenship of Doctoral Recipients by Degree-Granting Group



- Females account for 32% (524) of the 1,653 Ph.D.'s, up from last year's figure of 31%.

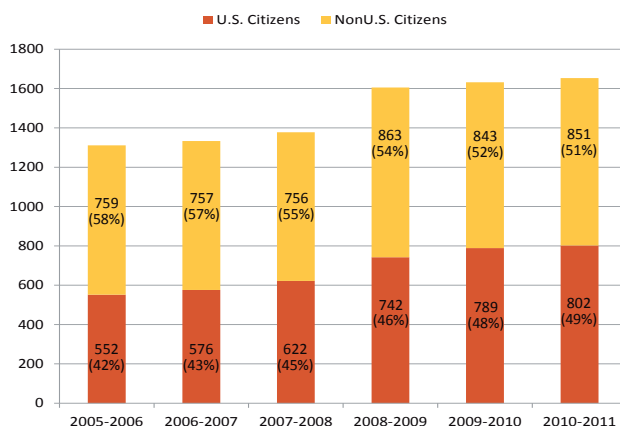
- Groups I (Pu), IV, and Va awarded more degrees to U.S. Citizens than Non-U.S. citizens, awarding 51%, 58% and 51% of their Ph.D.'s to U.S. citizens.

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



- 51% of the males and 44% of the females are U.S. citizens.
- Females accounted for 28% of the U.S. citizens.
- Among the U.S. citizens: 4 are American Indian or Alaska Native, 40 are Asian, 21 are Black or African American, 20 are Hispanic or Latino, 3 are Native Hawaiian or Other Pacific Islander, 635 are White, and 79 are of unknown race/ethnicity.

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



*The increase shown from 2007-2008 to 2008-2009 is due in part to the increase in the response rate for Group IV.

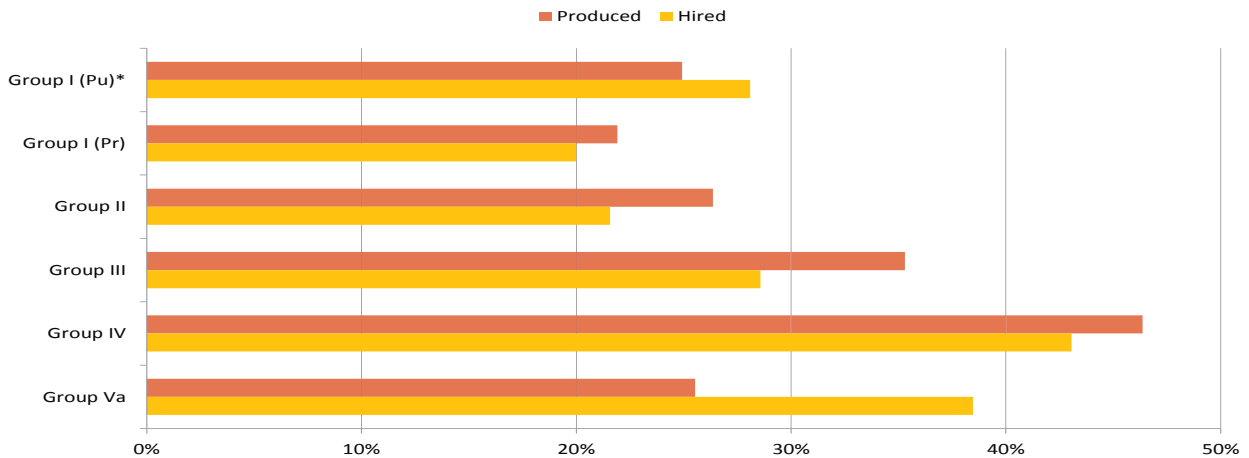
Looking at the last six years we see that:

- U.S. citizen counts have been increasing steadily, reaching a high of 802 this year. This is a 45% increase from Fall 2005-2006.
- Non-U.S. citizen counts which had been hovering around 750, are showing more variability increasing to 851 this year. While this is a 12% increase from Fall 2005-2006, it represents a 1% increase from last year.

Female New Doctoral Recipients

After trailing off slightly to 31% last year, the number of female new doctoral recipients is up slightly to 32% this year. Of the 875 new Ph.D.'s hired into academic positions 33% (289) were women, the same as last year. 28% of those hired into postdoc positions were women, with 41% of the women in postdocs being U.S. citizens, down from 57% last year. The U.S. unemployment rate for females is 3.8%, compared to 4.5% for males and 4.3% overall.

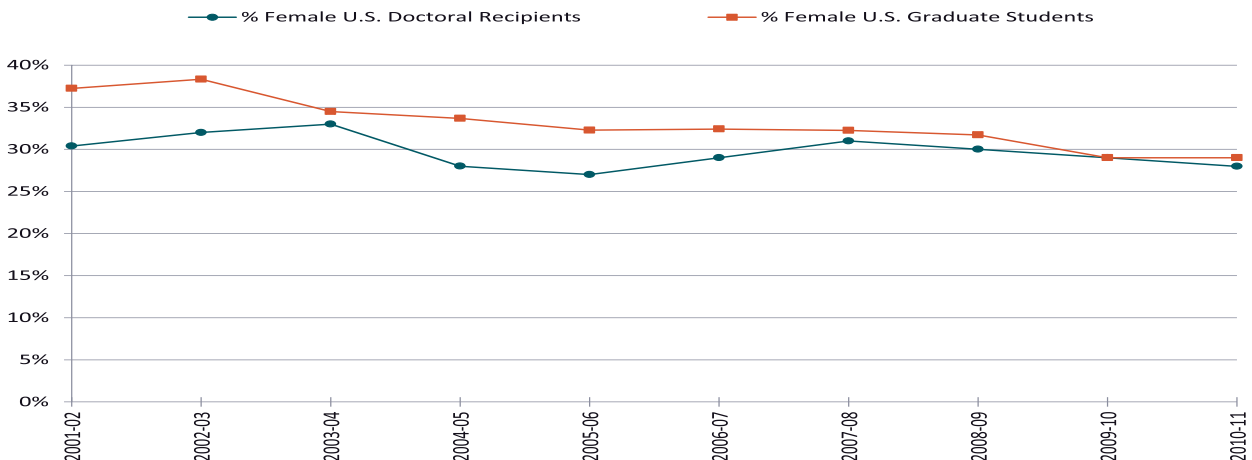
Figure F.1: Females as a Percentage of New Doctoral Recipients Produced by and Hired by Doctoral-Granting Group



* For definitions of groups see page 1093.

- 36% of those hired by Group B were women (down from 43% last year) and 33% of those hired by Group M were women (down from 39% last year).
- 62% of those hired into Research Institutes/Other non-profit positions were women (up from 35% last year).
- 37% of those hired into Government positions were women (up from 36% last year).
- 62% of the women employed in Groups I-Va are in postdoc positions, compared to 70% 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 (58 statistics and 35 biostatistics departments). Group IV produced 427 new doctorates, of which all but 52 had dissertations in statistics/biostatistics. This is a 1% increase in the number reported for fall 2010 of 422. In addition, Groups I-III and Va combined had 67 Ph.D. recipients with dissertations in statistics. In Group IV, 170 (40%) of the new doctoral recipients are U.S. citizens (while in the other groups combined 52% are U.S. citizens). The 90 departments responding last year and this year reported a total of 427 new doctoral recipients, an increase of 4% from last year. The unemployment among the Group IV new Ph.D.'s is 3.8% up from 2.3.

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

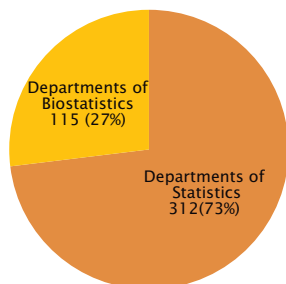


Figure S.2: Gender of Group IV Ph.D. Recipients

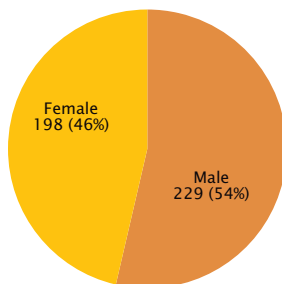
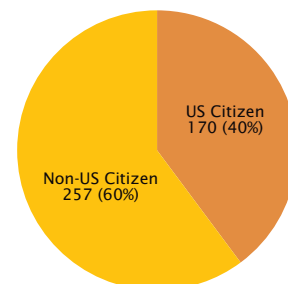


Figure S.3: Citizenship of Group IV Ph.D. Recipients



- 26% of all Ph.D.'s awarded were in Group IV.
- Females account for 41% of statistics and 60% of biostatistics Ph.D.'s awarded.
- Females accounted for 46% of the 427 Ph.D.'s in Group IV, compared to all other groups combined, where 27% are female.
- 46% of Group IV U.S. citizen Ph.D. recipients are females, while in all other groups combined 24% of the U.S. citizens are females.

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

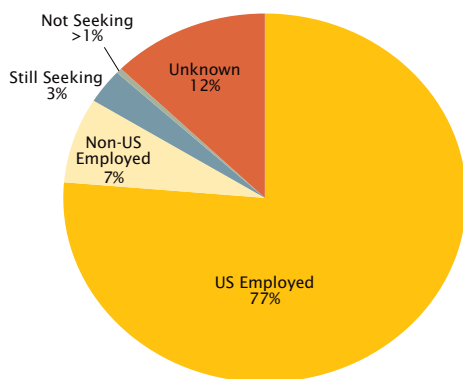
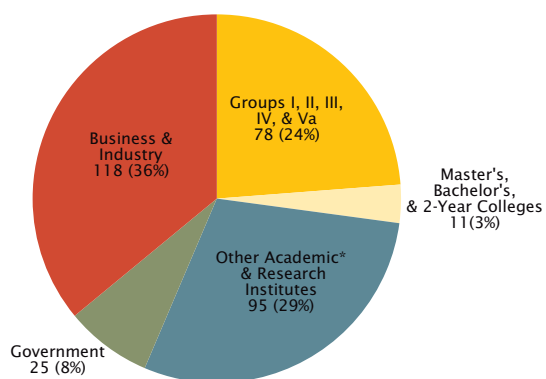


Figure S.5: U.S. Employed Group IV Ph.D. Recipients by Type of Employer



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

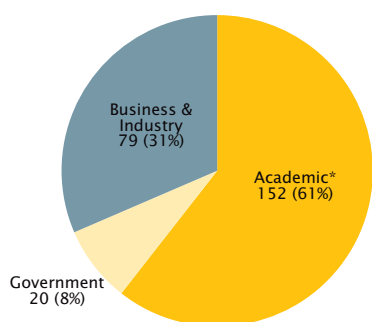
- 3.8% of Group IV Ph.D.'s are unemployed compared to 4.4% among all other groups. This is up from 2.3% last year.
- Unemployment among new Ph.D.'s with dissertations in statistics/probability is 3.6%, up from 3.4%. Among all other dissertation groupings 3.5% are unemployed.
- Group IV total U.S. employed: 328
- 36% of Group IV Ph.D.'s are employed in Business/Industry, compared to 14% in all other groups.
- 42% of those hired by Group IV were females, compared to 24% 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 2010–2011 new Ph.D.'s on the EENDR Survey. It expands on the details of employment which are not available through the departments.

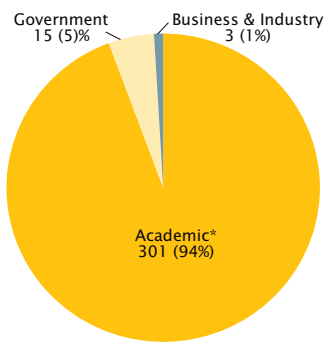
The 1,289 new Ph.D.'s reported in our Preliminary Report were sent this survey; of those individuals 699 (54%) responded. The employment status is known for 692 of these individuals, the U.S. unemployment among this group is 2.2%. The median age among this group of respondents is 30.

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



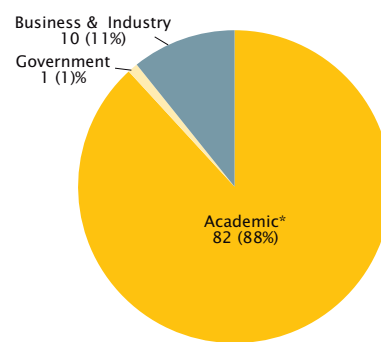
* Includes research institutes and other non-profits.

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 251 permanently employed:

- 34% are women.
- 74% of those reporting academic employment hold tenured/tenure-track positions.

Of the 319 temporarily employed:

- 31% are women.
- 27% were unable to find a suitable permanent position (down from 51% last year).
- 71% are employed in postdocs and 39% of these reported they could not find a suitable permanent position.

Of the 93 employed outside the U.S.:

- 17% are women.
- 27% are U.S. Citizens.
- 79% of the U.S. Citizens are employed in postdocs and 50% 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		Temp		Temporary		Temporary Postdocs				Unkown
	Total	%	Total	%	Perm Not Avail	%	Total	%	Perm Not Avail	%	
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
Fall 2011	251	44%	319	56%	87	27%	225	71%	87	39%	0

Comparing the employment status of EENDR respondents employed in the U.S. over the last five years we see that:

- Permanent positions have dropped to 38% this year, a five-year low and down 22% from Fall 2010.
- Temporary positions have decreased to 48% this year, while this is up from Fall 2007 it is down from last year.
- 27% of those holding temporary positions were unable to find suitable permanent positions, a five-year low and down 38% from Fall 2010.
- 39% of those holding postdoc positions were unable to find suitable permanent positions, a five-year high.

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 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%
Fall 2011	61%	8%	31%	94%	5%	1%

Looking at at Table EE.2 we see that

- Permanent academic employment has dropped to 61%, reaching a five-year low and down 7 percentage points from 2007. While temporary employment in this sector has increased to 94%.
- Permanent government employment has leveled off at 8%.
- Business/Industry shows some variability in permanent employment, while temporary positions are showing a downward trend.

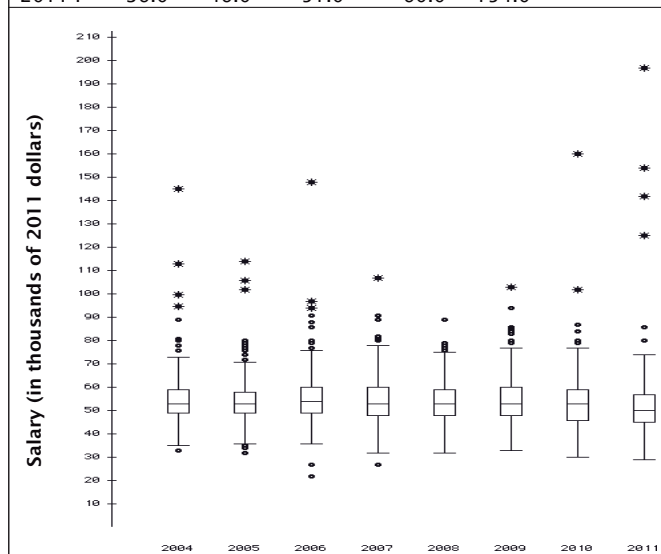
Starting Salaries of the 2010-2011 Doctoral Recipients

The starting salary figures were compiled from information gathered on the EENDR questionnaires sent to 1,289 individuals using addresses provided by the departments granting the degrees; 699 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 full population.

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

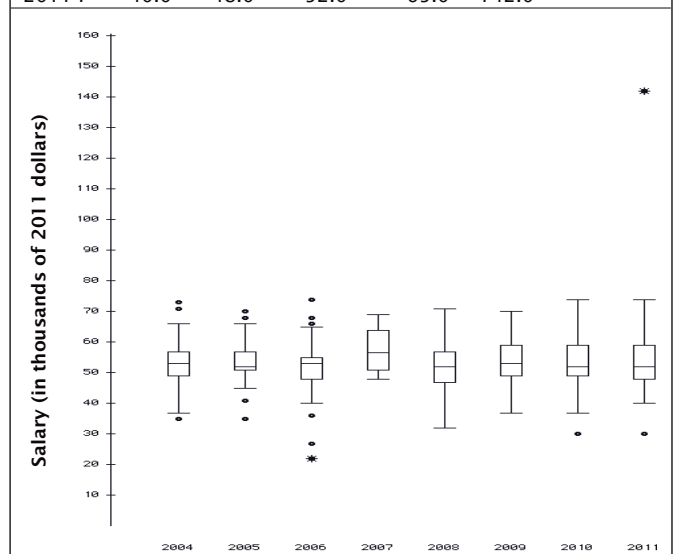
Ph.D. Year	Min	Q ₁	Median	Q ₃	Max
Total (165 male/73 female)					
2011 M	28.8	45.0	50.0	57.0	197.0
2011 F	36.0	46.0	51.0	60.0	154.0
One year or less experience (165 male/73 female)					
2011 M	28.8	45.0	50.0	57.0	197.0
2011 F	36.0	46.0	51.0	60.0	154.0



* 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 (70 male/17 female)					
2011 M	30.0	48.0	52.0	58.5	74.2
2011 F	40.0	48.0	52.0	65.0	142.0
One year or less experience (70 male/17 female)					
2011 M	30.0	48.0	52.0	58.5	74.2
2011 F	40.0	48.0	52.0	65.0	142.0

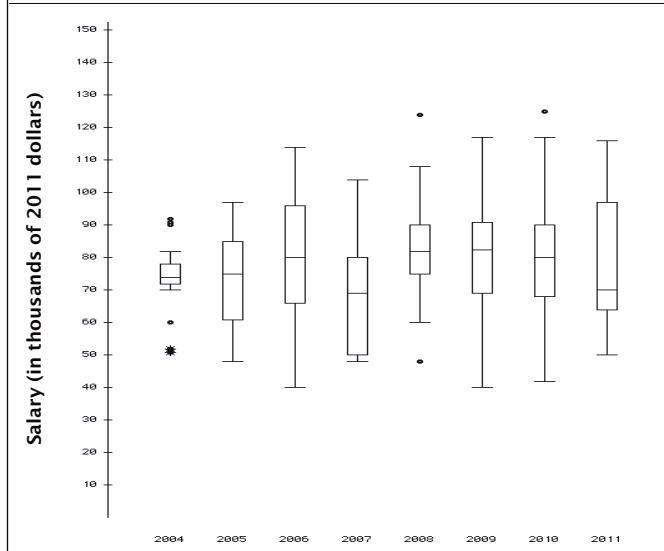


* A postdoctoral appointment is a temporary position primarily intended to provide an opportunity to extend graduate training or to further research experience.

Starting Salaries of the 2010-2011 Doctoral Recipients

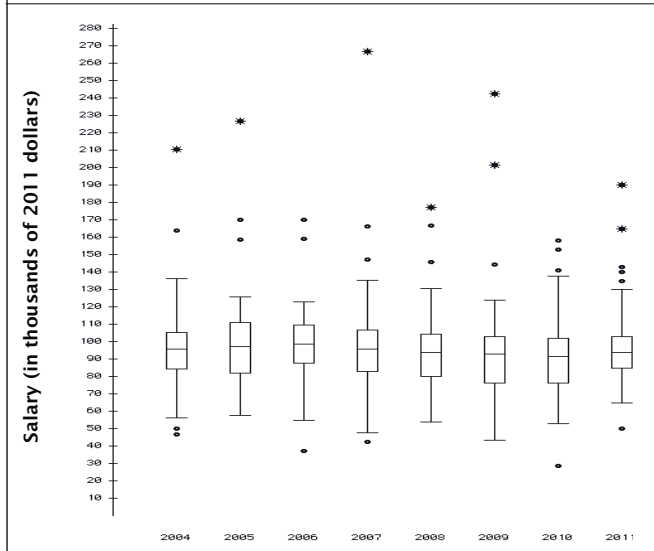
Government
11-12-Month Starting Salaries
(in thousands of dollars)

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max
Total (18 male/14 female)					
2011 M	50.0	65.0	83.2	100.6	115.7
2011 F	52.0	63.9	68.5	85.0	105.0
One year or less experience (17 male/11 female)					
2011 M	50.0	65.0	81.4	97.0	115.7
2011 F	52.0	63.9	70.0	80.0	105.0



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

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max
Total (60 male/18 female)					
2011 M	65.0	90.0	95.0	100.1	190.0
2011 F	50.0	85.0	91.0	106.8	165.0
One year or less experience (54 male/15 female)					
2011 M	65.0	90.0	95.0	100.0	190.0
2011 F	50.0	85.0	92.0	105.5	165.0



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, 2010–June 30, 2011, is designated as 2011. 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 2004 through 2011. Values plotted for 2004 through 2011 are converted to 2011 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	55 of 56 including	1 with no degrees
Group III	81 of 81 including	22 with no degrees
Group IV	90 of 93 including	10 with no degrees
Statistics	57 of 58 including	4 with no degrees
Biostatistics	33 of 35 including	6 with no degrees
Group Va	24 of 24 including	4 with no degrees

Doctoral Degrees Not Reported

The following mathematical sciences departments did not respond with their doctoral degrees awarded:

Baylor University, Department of Statistical Sciences
 The University of Albany, SUNY, Department of
 Epidemiology & Biostatistics
 University of Louisville, Department of Bioinformatics
 & Biostatistics
 University of Miami, Department of Mathematics

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 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.