

Report on the 2013-2014 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, 2013 through June 30, 2014. Information in the report was provided by the departments that awarded the degrees with additional information provided by the individual new doctoral recipients. The report includes an analysis of the fall 2014 employment plans of 2013–2014 doctoral recipients and a demographic profile summarizing characteristics of citizenship status, gender, and racial/ethnic group. This report is based on a complete census of the 2013–2014 new doctorates and includes information about 2013–2014 doctoral recipients that were not included in the preliminary report in the March 2015 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

1,926 PhDs were awarded by the 315 doctoral-granting departments. We are pleased to report that we had a 100% response rate for this survey, and we thank the departments for their cooperation.

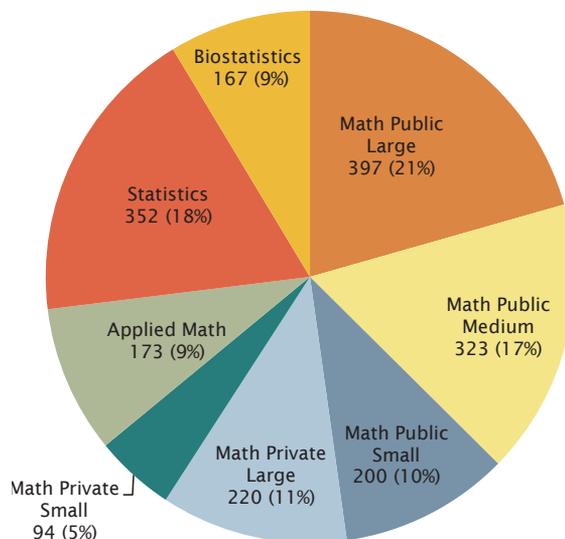
Math Public Medium reported the largest increase in the number of doctoral recipients, up 35 over the total of 288 reported for 2012–2013.

33% (629) of the new PhDs had a dissertation in statistics/biostatistics, followed by algebra/number theory with 16% (300) and applied mathematics with 12% (236).

Comparing PhDs awarded this year to last year, the number of PhDs awarded:

- Increased about 5% from 1,843 to 1,926.
- Increased in all groups except Math Public Large and Math Public Small.
- Increased 22% in Math Private Small.
- Decreased 9% in Math Public Small.

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



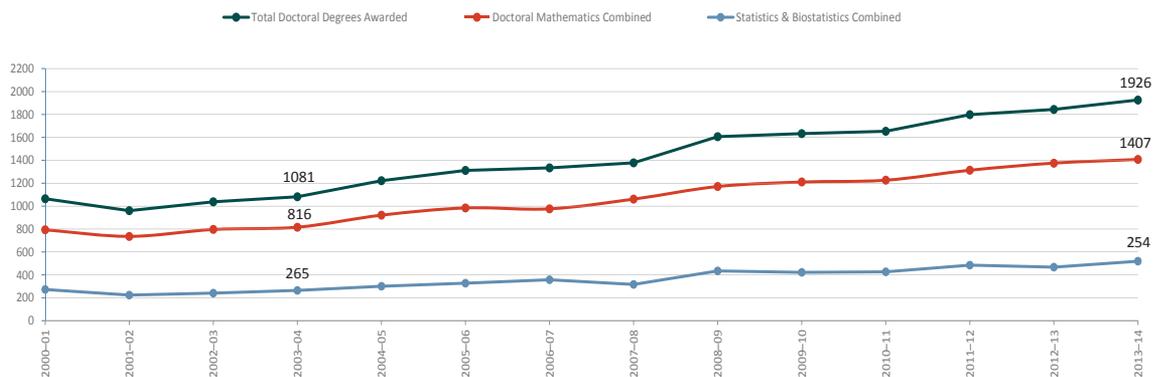
Total Degrees Awarded: 1,926

*See page 781 for a description of the department groupings.

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Doctoral Degrees Awarded

Figure A.2: New PhDs Awarded by Group



Comparing PhDs awarded this year with those awarded in 2003–2004:

- PhDs awarded have increased more than 78% over the last 10 years.
- Degrees awarded by Doctoral Mathematics combined and by Statistics & Biostatistics combined have increased 72% and 96%, respectively. Some of this latter increase is due to the increase in response rate among the Statistics & Biostatistics departments and an increase in the number of biostatistics programs included in the Annual Survey over the last 3 years.

Employment

The overall US unemployment rate for the new doctoral recipients is 6.2%, up from 5.7% last year. (Details on the calculations are on page 781.) The employment plans are known for 1,749 of the 1,926 new doctoral recipients. The number of new doctoral recipients employed in the US is 1,412, up 6% from last year’s number of 1,334. 71% of PhDs employed in Doctoral Math departments are in postdoc positions, up from 69% last year. The number of new PhDs taking positions in Business & Industry has increased to 409 this year compared to 381 last year. All groups except Math Public Large and Biostatistics showed an increase in Business & Industry, and 61% of the increase was accounted for by the Statistics Group.

Figure E.1: Employment Status

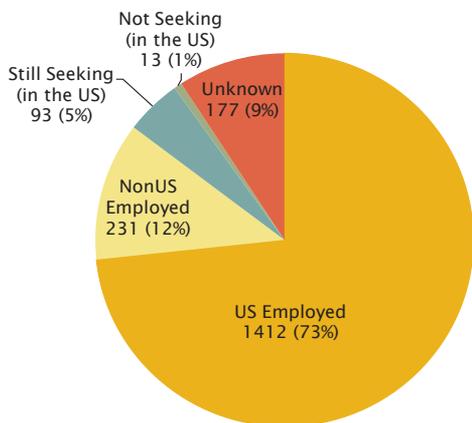
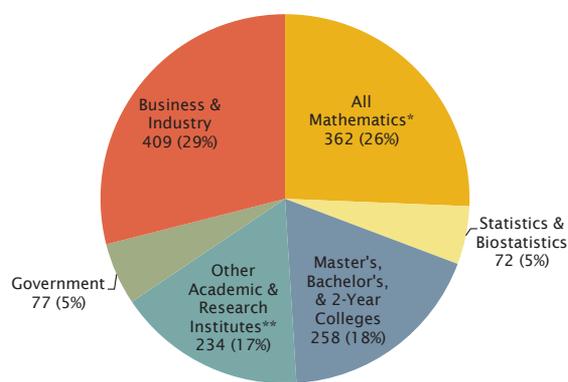


Figure E.2: US Employed by Type of Employer



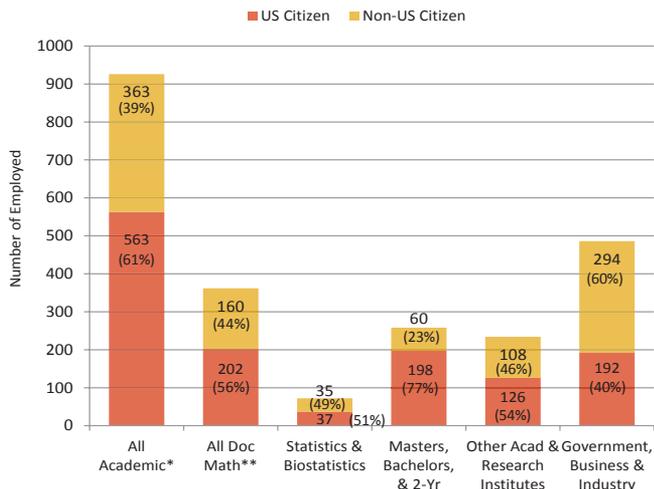
- 53% (755) of those who are employed in the US are US citizens, up slightly from 52% last year.
- 75% (657) of non-US citizens whose employment status is known are employed in the US, the remaining 222 non-US citizens are either employed outside of the US or are unemployed.
- 8% (126) of the new PhDs who are employed are working at the institution which granted their degree, up from 6% last year. These individuals constitute 14% of total US academic employed.
- 63% of those still seeking employment in the US are US citizens.

*Includes all Math Public, Math Private, and Applied Math departments.
 **Other Academic consists of departments outside the mathematical sciences including numerous medical-related units.

- US academic hiring increased 5% to 926 compared to 878 last year.
- Government hiring increased 3% (from 75 to 77); all doctoral-granting groups except Math Public Large, Math Public Small, Math Private Large, and Biostatistics showed an increase in the number of PhDs taking positions in this sector.

Employment

Figure E.3: Employment in the US by Type of Employer and Citizenship
Total: 1,412



* Includes all Math sciences departments plus other academic and research institutes/nonprofit.
** Includes all Math Public, Math Private, and Applied Math departments.

- Total known to be employed: 1,643
- 38% (626) of the new PhDs that are employed are reported to be in postdoc positions, the same percentage as last year but up in number from 600.
- 57% of the new PhDs awarded by the Math Private Large group are employed in postdocs, while only 19% of new PhDs awarded by the Math Public Small group and 18% of PhDs awarded by the Statistics group are in postdocs.
- 48% of the new PhDs having US academic employment are in postdocs, up from 46% last year.

Of the US citizens whose employment status is known, 87% (755) are employed in the US, and of these:

- 32% are employed in PhD-granting departments
- 43% are employed in all other academic categories
- 25% are employed in government, business and industry

Figure E.4: PhDs Employed in Postdocs by Degree-Granting Department Group

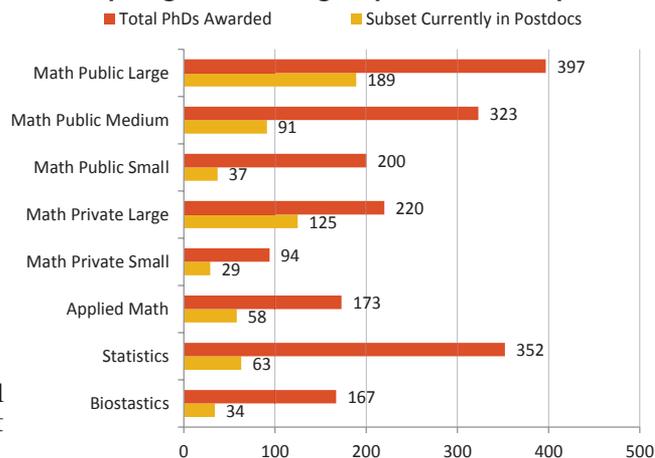
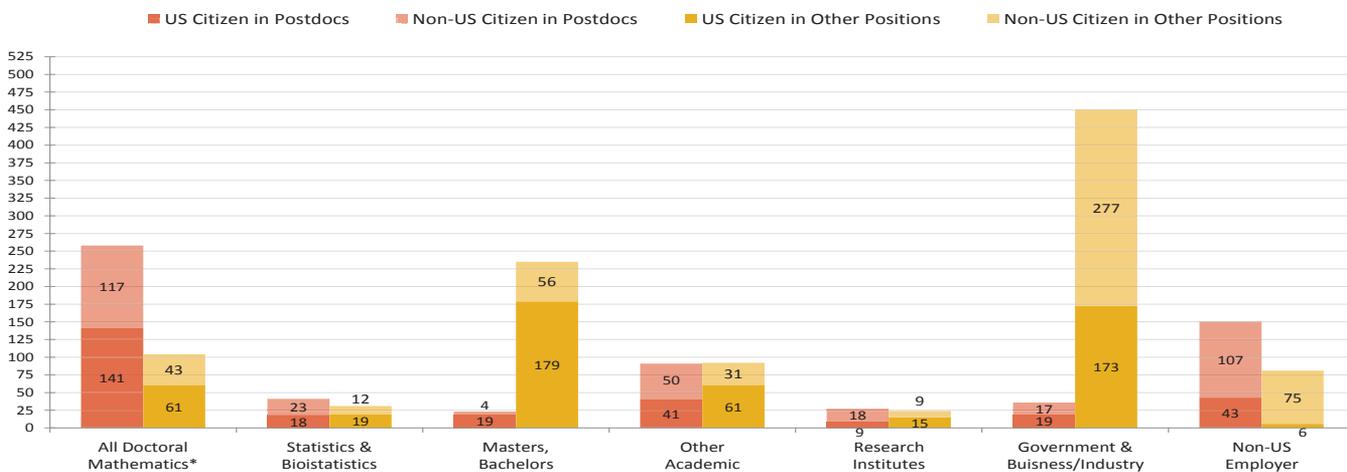


Figure E.5: New PhDs Employment by Citizenship, Type of Position and Type of Employer



* Includes all Math Public, Math Private, and Applied Math departments.

- 24% of the new PhDs in postdoc positions are employed outside the US; last year, this percentage was 27%.
- 93% of the new PhDs employed in the Math Private Large Group are in postdoc positions, up from 92% last year.
- 71% of the new PhDs employed in Doctoral Math departments are in postdoc positions, up from 69% last year.

Employment

Figure E.6 displays the US unemployment rate for new doctorates; details on the calculations are on page 781.

Figure E.6: Percentage of New Doctoral Recipients Unemployed 2004-2013*

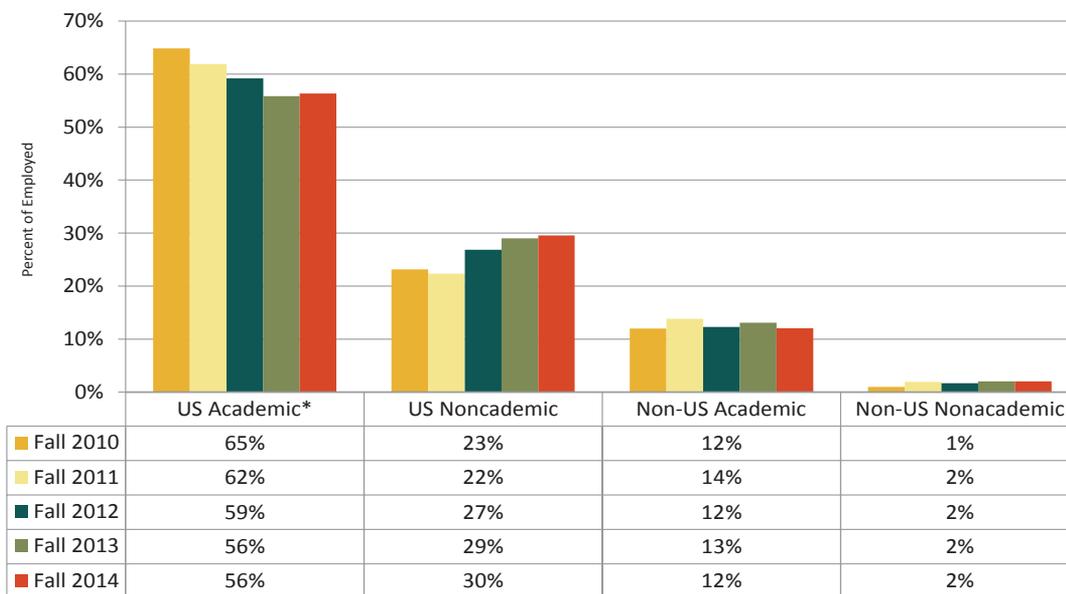


Among new doctorates reported to be in the US:

- Unemployment among those whose employment status is known is 6.2%, up from 5.7% for Fall 2013.
- 7.2% of US citizens are unemployed, compared to 6.5% in Fall 2013.
- 4.9% of non-US citizens are unemployed, compared to 4.7% in Fall 2013.
- New doctorates from the Math Public Small Group reported the highest unemployment rate at 12.0%, up from 8.9% last year.
- New doctorates from the Biostatistics Group reported the lowest unemployment at 1.8%.

*The difficult employment years of the 1990s are not shown here but are located on the AMS website at www.ams.org/annual-survey/2014Survey-NewDoctorates-Report.

Figure E.7: Percentage of Employed New PhDs by Type of Employer



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

- US academic hiring has remained at 56%, while US nonacademic hiring has jumped to 30% (a five-year high).
- Detailed information on new PhDs employed in the US by degree-granting department group is available on the AMS website at www.ams.org/annual-survey/2014Survey-NewDoctorates-Report.

Demographics

Gender and citizenship was known for all 1,926 new PhDs reported for 2013–2014. The number of US citizens is 920 (48%), up slightly from 47% last year. Females accounted for 28% of the US citizen total (up from 27% last year). Non-US citizens receiving a PhD decreased to 52% from 53% last year. 11% (70) of the non-US citizens employed in the US have permanent visa status (down from 13% last year).

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

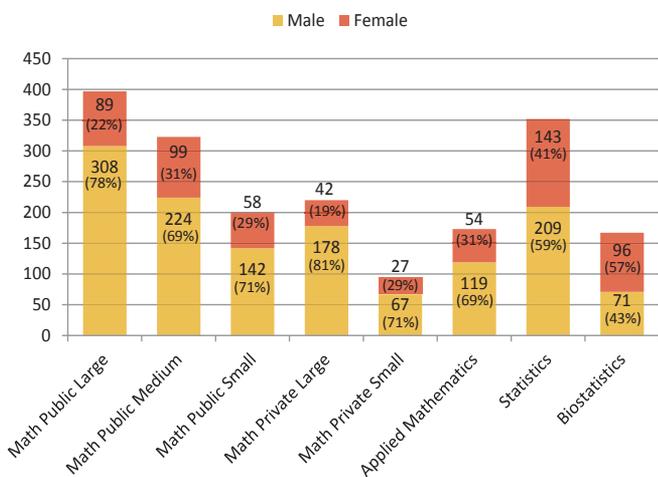
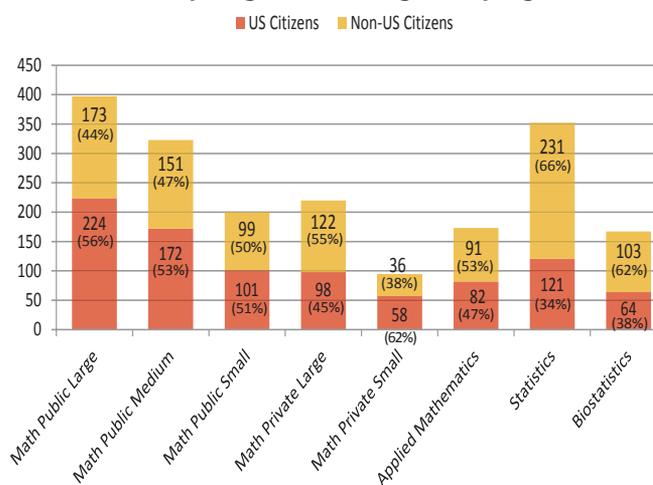


Figure D.2: Citizenship of Doctoral Recipients by Degree-Granting Grouping



- Females account for 32% (608) of 1,926 PhDs, up from 31% last year.

- 61% of all the PhDs awarded by the Math Private Small group were to US citizens, while only 34% of the PhDs awarded by the Statistics group were to US citizens.

Figure D.3: Gender of US Citizen Doctoral Recipients by Degree-Granting Grouping

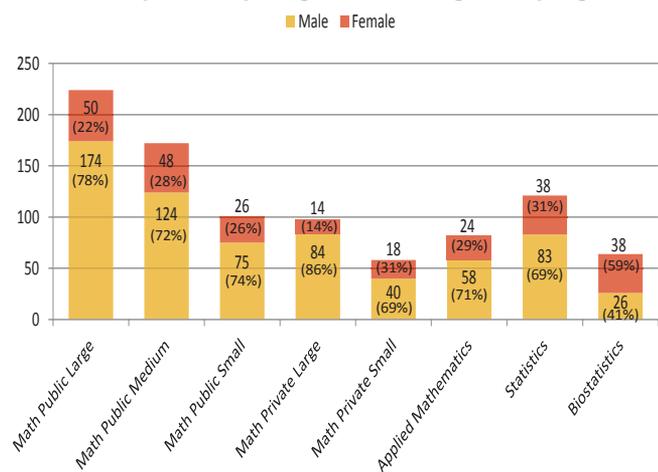
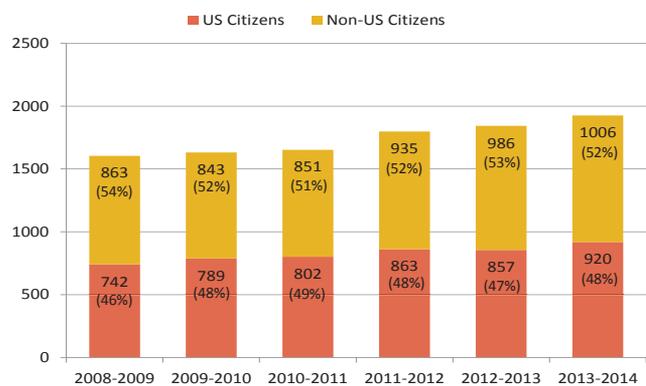


Figure D.4: Citizenship of New PhD* Recipients, 2007–2013



- 50% of the males and 42% of the females are US citizens.
- Females accounted for 28% of the US citizens.
- Among the US citizens: 7 are American Indian or Alaska Native, 61 are Asian, 25 are Black or African American, 29 are Hispanic or Latino, 4 are Native Hawaiian or Other Pacific Islander, 762 are White, and 32 are of unknown race/ethnicity.
- Math Public Large awarded the highest number (16) of PhDs to US citizen minorities, while Biostatistics awarded the smallest number (3), followed by Math Public Small and Math Public Large with 4 each.

*The increase shown from 2007–2008 to 2008–2009 is due in part to the increase in the response rate for statistics and biostatistics departments.

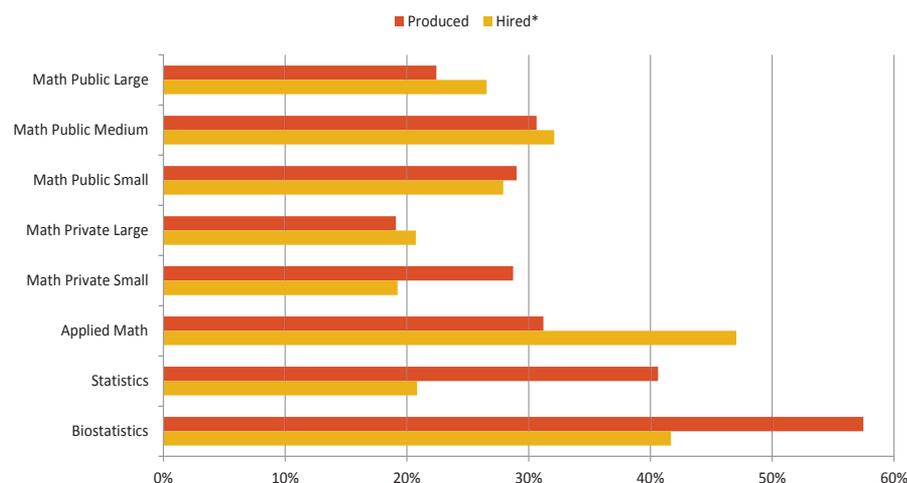
Looking at the last six years we see that:

- US citizen counts, which had been increasing steadily, increased to 920 this year. While this is a 7% increase from last year, it is a 24% increase from Fall 2008–2009.
- Non-US citizen counts have increased for the fourth consecutive year to 1,006. While this is a 17% increase from Fall 2008–2009, it represents a 2% increase from last year.

Female New Doctoral Recipients

After remaining at 31% for the last few years, the proportion of female new doctoral recipients increased to 32% this year. Of the 926 new PhDs hired into academic positions, 32% (300) were women, the same percentage as last year. 25% of those hired into postdoc positions were women, with 43% of the women in postdocs being US citizens, up from 39% last year. The US unemployment rate for females is 4.6%, compared to 6.9% for males and 6.2% overall.

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



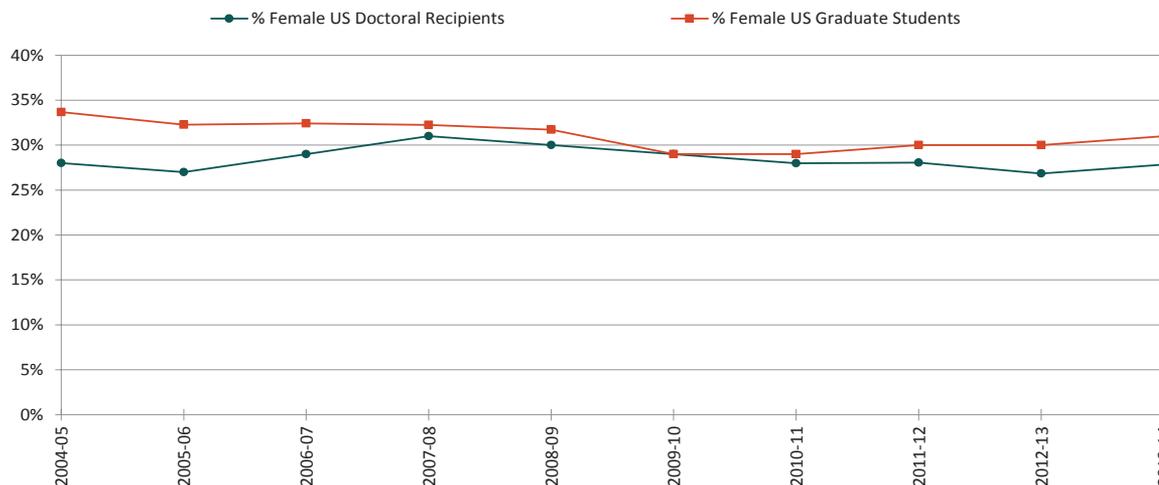
* Females as a percentage of total hires by the department grouping.

Table F.1: Number of Female New Doctoral Recipients Produced by and Hired by Department Groupings

Department Grouping	Females Produced	Females Hired
Math Public Large	89	30
Math Public Medium	99	26
Math Public Small	58	12
Math Private Large	42	17
Math Private Small	27	5
Applied Math	54	8
Statistics	143	10
Biostatistics	96	10
Total	608	118

- 44% of those hired by the Bachelors Group were women (up from 36% last year) and 34% of those hired by the Masters Group were women (up from 31% last year).
- 33% of those hired into Research Institutes/Other non-profit positions were women (down from 46% last year).
- 34% of those hired into Government positions were women (up from 32% last year).
- 64% of the women employed in all doctoral groups are in postdoc positions, compared to 71% of males employed in these groups.

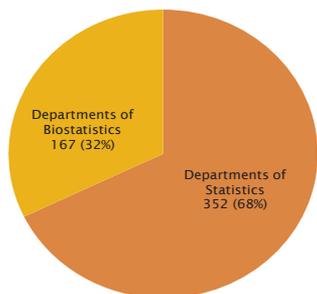
Figure F.2: Females as a Percentage of US Citizen Doctoral Recipients



PhDs Awarded by Statistics and Biostatistics Departments

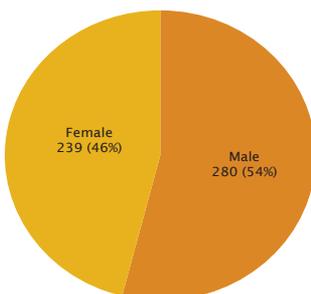
This section contains information about new doctoral recipients in these departments (58 statistics and 44 biostatistics departments). Statistics and Biostatistics departments produced 519 new doctorates, of which all had dissertations in statistics/biostatistics. This is an 11% increase in the number reported for fall 2013, which was 468. In addition, Math Public, Math Private and Applied Math departments combined had 115 PhD recipients with dissertations in statistics. 36% (185) of the new PhDs awarded by Statistics and Biostatistics departments are US citizens (while in the other groups combined, 52% are US citizens). The US unemployment among this group of new PhDs is 2.5%, up from 2.1%.

Figure S.1: PhDs Awarded by Statistics/Biostatistics Departments



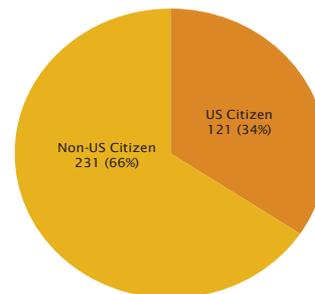
- 27% of all PhDs awarded were in Statistics/Biostatistics.
- Females account for 41% of statistics and 57% of biostatistics PhDs awarded.

Figure S.2: Gender of PhD Recipients from Statistics/Biostatistics Departments



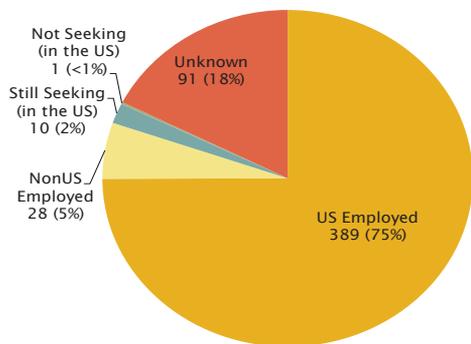
- Females accounted for 47% of the 519 PhDs in Statistics and Biostatistics, compared to all other groups combined, where 26% are female.

Figure S.3: Citizenship of PhD Recipients from Statistics/Biostatistics Departments



- 41% of Statistics/Biostatistics US citizen PhD recipients are females, while in all other groups combined 25% of the US citizens are females.

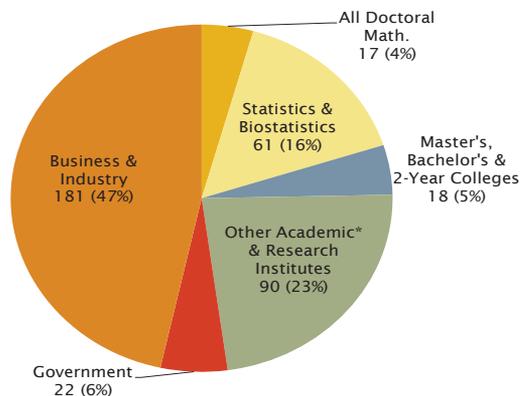
Figure S.4: Employment Status of PhD Recipients from Statistics/Biostatistics Departments



Total PhDs Awarded: 519

- 2.5% of Statistics/Biostatistics PhDs are unemployed compared to 6.9% among all other groups. This is up from 2.1% last year.
- Unemployment among new PhDs with dissertations in statistics/probability is 3.7%, up from 3.1%. Among all other dissertation groupings, 6.0% are unemployed.

Figure S.5: US-Employed PhD Recipients from Statistics/Biostatistics Departments by Type of Employer



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

Total US Employed: 389

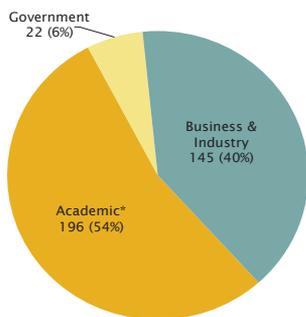
- 47% of Statistics/Biostatistics PhDs are employed in Business/Industry, compared to 25% in all other groups.
- 28% of those hired by statistics and biostatistics were females, the same percentage as that in all other groups.

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

This section contains additional information on employment gathered from a subset of the 2013-2014 new PhDs on the EENDR Survey. It expands on the details of employment which are not available through the departments.

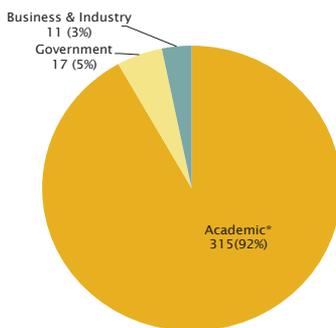
The EENDR survey was sent to the 1,702 new PhDs for which departments provided current contact information by early October of 2014. Of these individuals, 821 (48%) responded. The employment status is known for 851 of these individuals; the US unemployment among this group is 1.7%. Of the 796 who reported being employed, 30% indicated they were actively looking for new employment.

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



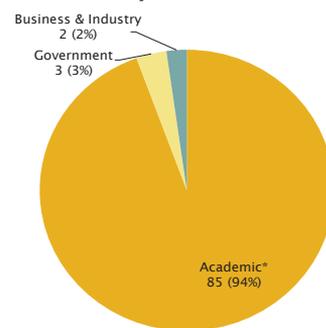
* Includes research institutes and other non-profits.

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



* Includes research institutes and other non-profits.

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



* Includes research institutes and other non-profits.

Of the 363 permanently employed:

- 34% are women.
- 71% of those reporting academic employment hold tenured/tenure-track positions.

Of the 343 temporarily employed:

- 31% are women.
- 43% were unable to find a suitable permanent position (down from 52% last year).
- 76% are employed in postdocs and 34% of these reported they could not find a suitable permanent position.

Of the 90 employed outside the US:

- 18% are women.
- 32% are US Citizens.
- 80% are employed in postdocs.

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

Year	Perm		Temp		Temporary		Temporary Postdocs				#(%) Unknown
	Total	%	Total	%	Perm Not Avail	% of Temp Total	Total	% of Temp Total	Perm Not Avail	% of Temp Postdocs	
Fall 2010	320	48%	341	52%	140	41%	246	72%	68	28%	0
Fall 2011	251	44%	319	56%	133	42%	225	71%	87	39%	0
Fall 2012	261	44%	328	56%	127	39%	242	74%	108	45%	0
Fall 2013	374	53%	335	47%	173	52%	247	74%	106	43%	0
Fall 2014	363	51%	343	49%	148	43%	260	76%	88	34%	0

Comparing the employment status of EENDR respondents employed in the US over the last five years, we see that:

- Permanent positions have decreased to 51% this year, from last year's five-year high of 53%.
- Temporary positions increased to 49% this year.
- 43% of those holding temporary positions were unable to find suitable permanent positions, down from last year's five-year high of 52%.
- 34% of those holding postdoc positions were unable to find suitable permanent positions, down four percentage points from last year and up 6 percentage points from the five-year low of 28% for fall 2010.

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

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

Year	Permanent			Temporary		
	Acad	Govn	B/I	Acad	Govn	B/I
Fall 2010	64%	8%	28%	93%	5%	2%
Fall 2011	61%	8%	31%	94%	5%	1%
Fall 2012	61%	8%	32%	92%	5%	2%
Fall 2013	53%	7%	40%	92%	4%	4%
Fall 2014	54%	6%	40%	92%	5%	3%

Looking at Table EE.2, we see that

- Permanent academic employment has increased to 54%, while temporary employment in this sector has leveled off at 92%.
- Permanent and temporary government employment has dropped to 6%, while temporary positions increased to 50%.
- Business/Industry permanent employment remains stable at 40% (a five-year high), while temporary positions decreased to 3%.

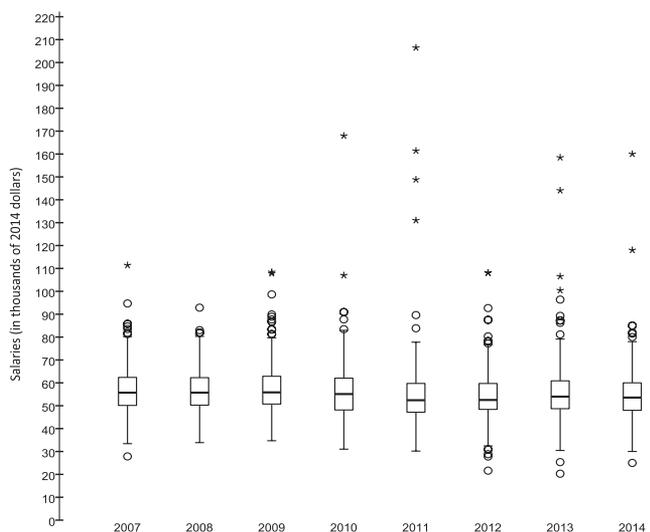
Starting Salaries of the 2013–2014 Doctoral Recipients

The starting salary figures were compiled from information gathered on the EENDR questionnaires sent to 1,702 individuals using addresses provided by the departments granting the degrees; 821 individuals responded between late October and April. Responses with insufficient data or from individuals who indicated they had part-time or non-US 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. Detailed information, including boxplots which traditionally appeared in this report, is available on the AMS website at www.ams.org/annual-survey/survey-reports.

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

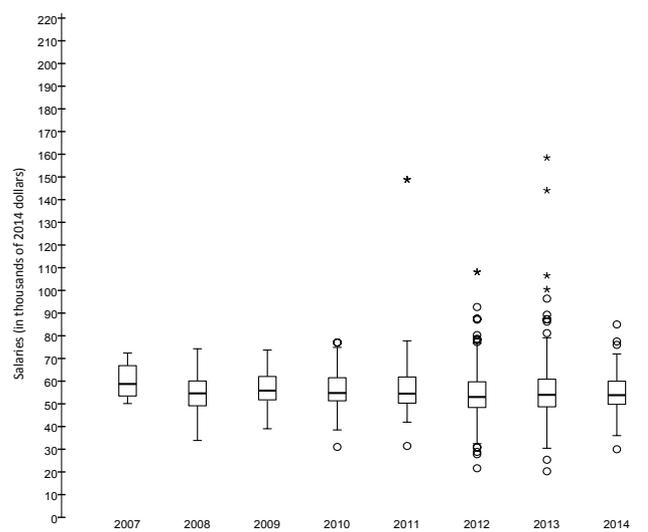
PhD Year	Min	Q ₁	Median	Q ₃	Max
Total (187 male/108 female)					
2014 M	36.0	48.0	53.0**	60.0	160.0
2014 F	25.0	50.0	54.8	60.0	85.0
One year or less experience (151 male/97 female)					
2014 M	36.0	48.0	53.0	60.0	160.0
2014 F	25.0	50.0	54.0	60.0	85.0



* Includes postdoctoral salaries.

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

PhD Year	Min	Q ₁	Median	Q ₃	Max
Total (69 male/34 female)					
2014 M	40.0	50.0	55.0	60.0	76.0
2014 F	30.0	46.0	51.5	55.0	85.0
One year or less experience (69 male/34 female)					
2014 M	40.0	50.0	55.0	60.0	76.0
2014 F	30.0	46.0	51.5	55.0	85.0



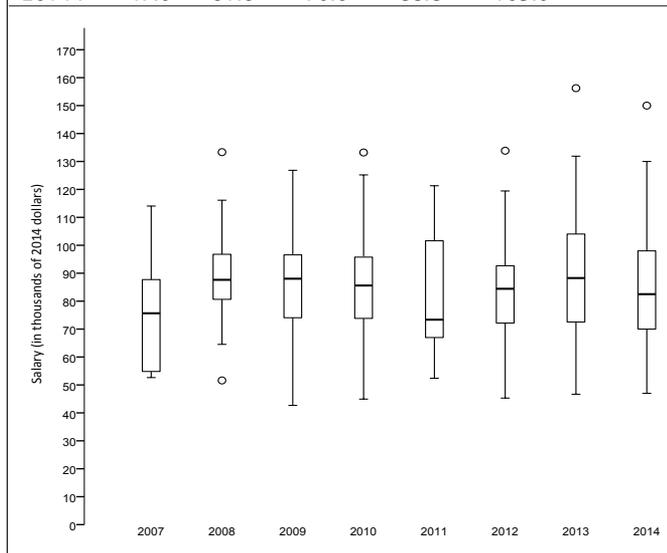
* A postdoctoral appointment is a temporary position primarily intended to provide an opportunity to extend graduate training or to further research experience.

** Note: The published report incorrectly cited this as 73.0.

Starting Salaries of the 2013–2014 Doctoral Recipients

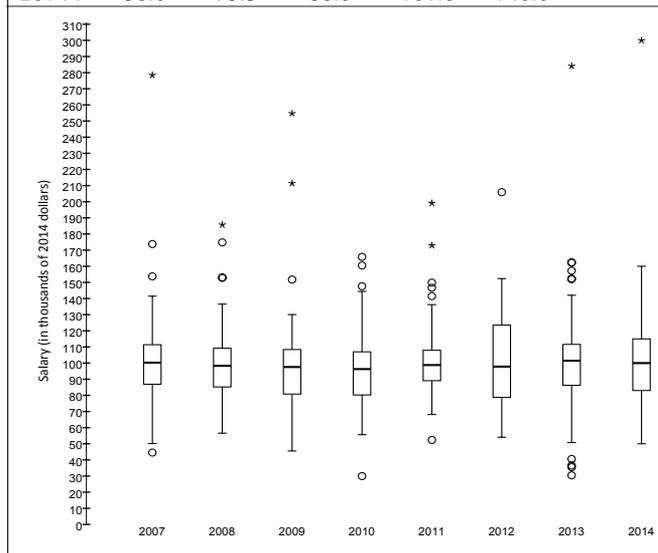
Government 11–12-Month Starting Salaries (in thousands of dollars)

PhD Year	Min	Q ₁	Median	Q ₃	Max
Total (28 male/10 female)					
2014 M	60.0	75.0	88.2	99.0	150.0
2014 F	47.0	58.0	70.0	84.9	105.0
One year or less experience (24 male/10 female)					
2014 M	60.0	75.0	87.1	96.8	130.0
2014 F	47.0	61.6	70.0	88.8	105.0



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

PhD Year	Min	Q ₁	Median	Q ₃	Max
Total (108 male/39 female)					
2014 M	56.0	86.2	100.0	120.0	300.0
2014 F	50.0	80.0	91.0	101.0	140.0
One year or less experience (93 male/35 female)					
2014 M	56.0	85.5	100.0	120.0	300.0
2014 F	50.0	79.5	86.0	101.0	140.0



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, 2013–June 30, 2014 is designated as 2014. 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 2007 through 2014. Values plotted for 2007 through 2014 are converted to 2014 dollars using the implicit price deflator prepared annually by the Bureau of Economic Analysis, US 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 \circ 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.

Remarks on US Unemployment Rate Calculations

In the unemployment calculations provided in this report, the individuals employed outside the US 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 US 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.

Departmental Groupings and Response Rates

Starting with reports on the 2012 AMS-ASA-IMS-MAA-SIAM Annual Survey of the Mathematical Sciences, the Joint Data Committee has implemented a new method for grouping the doctorate-granting mathematics departments. These departments are first grouped into those at public institutions and those at private institutions. These groups are further subdivided based on the size of their doctoral program as reflected in the average annual number of PhDs awarded between 2000 and 2010, based on their reports to the Annual Survey during this period. Furthermore, doctorate-granting

departments which self-classify their PhD program as being in applied mathematics will join with the other applied mathematics departments previously in Group Va to form their own group. The former Group IV will be divided into two groups, one for departments in statistics and one for departments in biostatistics.

For further details on the change in the doctoral department groupings, see the article in the October 2012 issue of *Notices of the AMS* at www.ams.org/notices/201209/rtx120901262p.pdf.

Group Descriptions

Math Public Large consists of departments with the highest annual rate of production of PhDs ranging between 7.0 and 24.2 per year.

Math Public Medium consists of departments with an annual rate of production of PhDs ranging between 3.9 and 6.9 per year.

Math Public Small consists of departments with an annual rate of production of PhDs of 3.8 or less per year.

Math Private Large consists of departments with an annual rate of production of PhDs ranging between 3.9 and 19.8 per year.

Math Private Small consists of departments with an annual rate of production of PhDs of 3.8 or less per year.

Applied Mathematics consists of doctoral-degree-granting applied mathematics departments.

Statistics consists of doctoral-degree-granting statistics departments.

Biostatistics consists of doctoral-degree-granting biostatistics departments.

Group M contains US departments granting a Master's degree as the highest graduate degree.

Group B contains US 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.

Survey Response Rates by New Groupings

Doctorates Granted Departmental Response Rates*

Math Public Large	26 of 26 including 0 with no degrees
Math Public Medium	40 of 40 including 0 with no degrees
Math Public Small	64 of 64 including 8 with no degrees
Math Private Large	24 of 24 including 0 with no degrees
Math Private Small	28 of 28 including 4 with no degrees
Applied Math	31 of 31 including 2 with no degrees
Statistics	58 of 58 including 1 with no degrees
Biostatistics	44 of 44 including 13 with no degrees
Total	315 of 315 including 28 with no degrees