

Update on the 2003–2004 U.S. Doctoral Recipients

Introduction

The Annual Survey of the Mathematical Sciences collects information each year about departments, faculties, and students in the mathematical sciences at four-year colleges and universities in the United States. Definitions of the various groups surveyed in the Annual Survey can be found on page 756 of this report.

This Second Report includes data from two parts of the 2004 Annual Survey. First, we update information about new doctoral recipients reported earlier in the February 2005 issue. Second, we present the starting salaries of the new doctoral recipients who responded to a follow-up survey.

The names of the 2003–2004 doctoral recipients and their thesis titles were published in “Doctoral Degrees Conferred” (*Notices*, February 2005, pages 264–82). This list has been supplemented by forty additional new doctorates. The supplemental listing appears at the end of this report on pages 757–8.

Information about recipients of doctoral degrees awarded between July 1, 2003, and June 30, 2004, was collected from doctorate-granting departments beginning in late spring 2004 and from a follow-up census of individual degree recipients beginning in October. The “2004 Annual Survey First Report” (*Notices*, February 2005, pages 236–51) presented survey results obtained about new doctoral recipients from the departments. Here we update information for new doctoral recipients using data gathered with a questionnaire, Employment Experiences of New Doctoral Recipients (EENDR). The EENDR was sent in early October 2004 to all new doctoral recipients whose address was known. When a new doctoral recipient did not respond or no address was known, information supplied by the department was used.

Updated Employment Status of 2003–2004 U.S. Doctoral Recipients

Table 1A shows the fall and final counts of doctoral recipients in the mathematical sciences awarded by U.S. institutions in each year from 1994 through 2004. Final counts include those new doctoral recipients reported from departments who missed the deadline for inclusion in the First Report. This year the total number of new doctoral recipients is 1,081, up from the previous year by 44.

**Table 1A: U.S. Doctoral Recipients:
Fall and Final Counts**

Year	Fall	Final
1994–1995	1148	1157
1995–1996	1098	1099
1996–1997	1123	1130
1997–1998	1163	1176
1998–1999	1133	1135
1999–2000	1119	1127
2000–2001	1008	1065
2001–2002	948	960
2002–2003	1017	1037
2003–2004	1041	1081

Table 1B shows trends in the number of new doctoral recipients for the past five years broken down by U.S. citizens and non-U.S. citizens. This year the number of new doctoral recipients who are U.S. citizens is 513, an increase of 14 over last year and the highest number reported since 2000–2001. The number of non-U.S. citizen new doctoral recipients has reached a five-year high of 568, but it was 679 in 1992–1993.

Table 1B: U.S. Doctoral Recipients: Citizenship

Year	U.S.	Non-U.S.	TOTAL
1999–2000	566	561	1127
2000–2001	532	533	1065
2001–2002	428	532	960
2002–2003	499	538	1037
2003–2004	513	568	1081

Table 1C gives a breakdown of the 1,081 doctoral degrees awarded in the mathematical sciences between July 1, 2003, and June 30, 2004, by type of degree-granting department.

**Table 1C: 2003–2004 U.S. Doctoral Recipients
by Type of Degree-Granting Department**

Group ¹	I (Pu)	I (Pr)	II	III	IV	Va
Number	205	187	223	111	265	90
Percent	19	17	21	10	25	8

¹ For definitions of groups see page 756.

Tables 2A, 2B, and 2C display updates of employment data, found in these same tables in the First Report, for the fall count of 2003–2004 doctoral recipients plus forty additional doctoral recipients reported late. These tables are partitioned by field

**Table 2A: Fall 2004 Employment Status of 2003–2004 U.S. Doctoral Recipients:
Field of Thesis (updated April 2005)**

TYPE OF EMPLOYER	FIELD OF THESIS												TOTAL	
	Algebra Number Theory	Real, Comp., Funct., & Harmonic Analysis	Geometry/ Topology	Discr. Math./ Combin./ Logic/ Comp. Sci.	Probability	Statistics/ Biostat.	Applied Math.	Numerical Analysis/ Approx- imations	Linear Nonlinear Optim./ Control	Differential, Integral, & Difference Equations	Math. Educ.	Other/ Unknown		
Group I (Public) ¹	19	4	9	5	3	4	9	7	1	10	0	0	71	
Group I (Private)	10	6	18	3	2	0	6	0	0	9	0	1	55	
Group II	16	8	10	6	2	1	6	3	0	18	0	0	60	
Group III	4	3	4	4	2	10	2	1	0	1	3	0	34	
Group IV	0	0	0	0	2	63	1	0	0	0	0	0	66	
Group Va	1	0	0	3	1	1	3	6	0	3	1	0	19	
Master's	11	9	3	7	2	15	5	8	3	3	2	0	68	
Bachelor's	15	13	14	11	4	15	6	8	3	11	4	0	104	
Two-Year College	6	5	6	1	0	1	0	3	0	2	0	0	24	
Other Academic Dept.	5	2	6	8	3	57	19	7	4	3	6	0	120	
Research Institute/ Other Nonprofit	2	2	5	3	1	12	3	3	0	3	0	0	34	
Government	3	2	1	4	0	8	4	2	2	1	0	0	27	
Business and Industry	9	2	5	8	6	56	15	4	1	4	0	0	110	
Non-U.S. Academic	19	11	14	12	3	10	11	5	5	17	0	1	108	
Non-U.S. Nonacademic	1	0	0	1	0	5	2	0	0	1	0	0	10	
Not Seeking Employment	1	0	0	1	0	6	0	1	0	1	0	0	10	
Still Seeking Employment	8	1	4	7	1	10	6	1	2	2	0	0	42	
Unknown (U.S.)	11	6	3	7	1	20	3	6	2	4	1	0	64	
Unknown (non-U.S.) ²	10	6	3	8	2	17	4	3	0	2	0	0	55	
TOTAL	151	80	105	99	35	311	105	68	23	85	17	2	1081	
Column	Male	113	58	75	74	28	186	80	49	19	56	8	2	748
Subtotals	Female	38	22	30	25	7	125	25	19	4	29	9	0	333

¹ For definitions of groups see page 756.

² Includes those whose status is reported as "unknown" or "still seeking employment".

**Table 2B: Fall 2004 Employment Status of 2003–2004 U.S. Doctoral Recipients:
Type of Degree-Granting Department (updated April 2005)**

TYPE OF EMPLOYER	TYPE OF DOCTORAL DEGREE-GRANTING DEPARTMENT						TOTAL	Row Subtotals	
	Group I (Public) Math.	Group I (Private) Math.	Group II Math.	Group III Math.	Group IV Statistics	Group Va Applied Math.		Male	Female
Group I (Public) ¹	33	25	8	0	1	4	71	54	17
Group I (Private)	15	30	6	0	0	4	55	45	10
Group II	21	16	18	2	1	2	60	41	19
Group III	5	8	6	9	6	0	34	21	13
Group IV	1	1	0	2	61	1	66	48	18
Group Va	1	3	1	0	0	14	19	15	4
Master's	11	3	26	18	9	1	68	46	22
Bachelor's	14	10	51	17	8	4	104	71	33
Two-Year College	4	0	9	10	1	0	24	15	9
Other Academic Dept.	6	14	14	15	51	20	120	70	50
Research Institute/ Other Nonprofit	7	8	5	0	12	2	34	20	14
Government	5	3	7	1	8	3	27	15	12
Business and Industry	13	15	10	10	53	9	110	76	34
Non-U.S. Academic	33	23	25	10	8	9	108	83	25
Non-U.S. Nonacademic	0	4	0	0	4	2	10	9	1
Not Seeking Employment	1	1	2	2	4	0	10	4	6
Still Seeking Employment	6	8	12	5	7	4	42	28	14
Unknown (U.S.)	15	8	16	5	15	5	64	46	18
Unknown (non-U.S.) ²	14	7	7	5	16	6	55	41	14
TOTAL	205	187	223	111	265	90	1081	748	333
Column	Male	156	137	159	72	158	66	748	
Subtotals	Female	49	50	64	39	107	24	333	

¹ For definitions of groups see page 756.

² Includes those whose status is reported as "unknown" or "still seeking employment".

Table 2C: Field of Thesis of 2003–2004 U.S. Doctoral Recipients: by Type of Degree-Granting Department (Updated April 2005)

TYPE OF DOCTORAL DEGREE-GRANTING DEPARTMENT	FIELD OF THESIS												TOTAL
	Algebra Number Theory	Real, Comp., Funct., & Harmonic Analysis	Geometry/Topology	Discr. Math./Combin./Logic/Comp. Sci.	Probability	Statistics/Biostat.	Applied Math.	Numerical Analysis/Approximations	Linear Nonlinear Optim./Control	Differential, Integral, & Difference Equations	Math. Educ.	Other/Unknown	
Group I (Public) ¹	56	26	33	21	9	6	17	11	1	25	0	0	205
Group I (Private)	45	15	35	22	10	6	30	4	1	18	0	1	187
Group II	36	31	29	27	4	10	23	28	12	19	4	0	223
Group III	14	8	8	18	2	19	8	11	2	9	12	0	111
Group IV	0	0	0	0	6	256	3	0	0	0	0	0	265
Group Va	0	0	0	11	4	14	24	14	7	14	1	1	90
TOTAL	151	80	105	99	35	311	105	68	23	85	17	2	1081

¹ For definitions of groups see page 756.

Table 2D: Percentage of Total Employed New Doctoral Recipients by Type of Employer

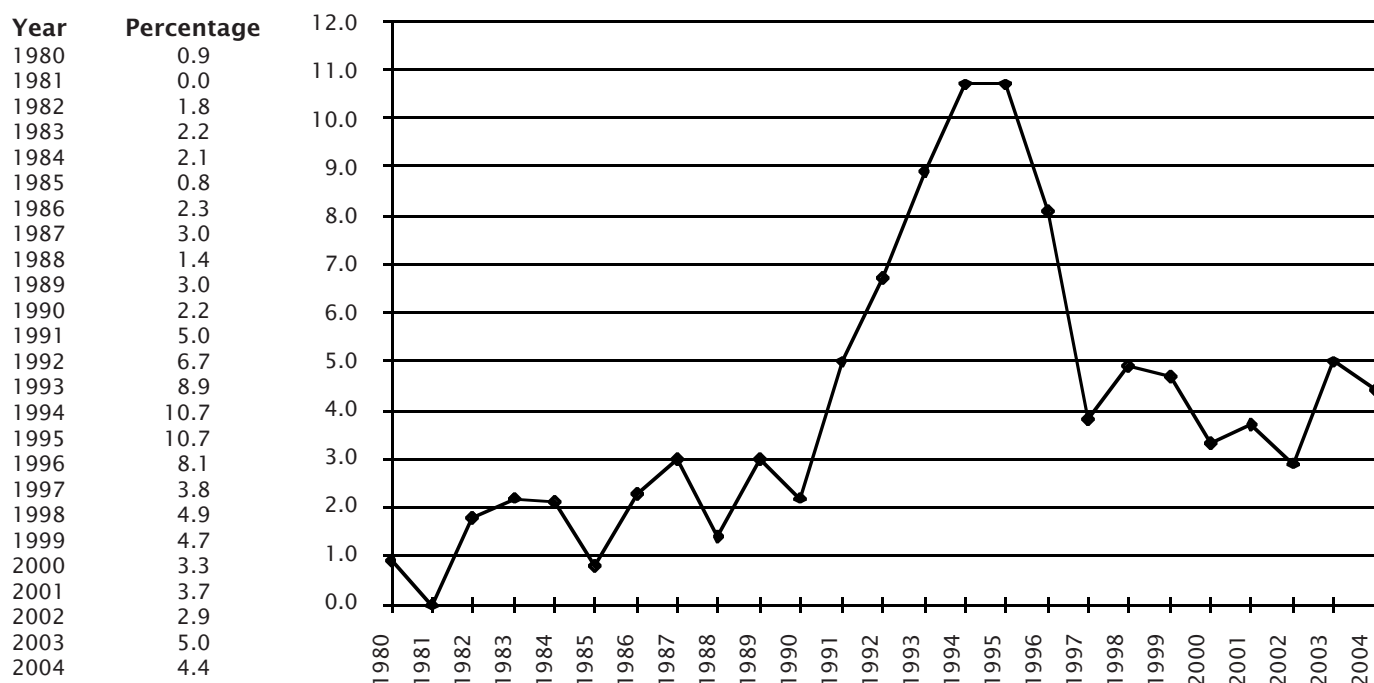
	U.S. Employed		Non-U.S. Employed		TOTAL NUMBER EMPLOYED
	Academic	Nonacademic	Academic	Nonacademic	
Fall 2000	62%	28%	10%	1%	957
Fall 2001	63%	27%	9%	2%	914
Fall 2002	67%	22%	10%	1%	829
Fall 2003	70%	17%	12%	2%	792
Fall 2004	72%	15%	12%	1%	910

of thesis research, by the survey group of their degree-granting department, and by type of employer. New doctoral recipients are grouped by field of thesis using the *Mathematical Reviews* 2000 Mathematics Subject Classification list. A complete list

of these groups is available on the AMS website at www.ams.org/employment/Thesis_groupings.pdf. At the time of this Second Report, the fall 2004 employment status of 962 of the 1,081 doctoral recipients was known.

The fall 2004 unemployment rate for new doctoral recipients, based on information gathered by the time of the Second Report, was 4.4%. Figure 1 presents the fall 1980 through fall 2004 trend in the final unemployment rate of new doctoral recipients. The counts on which these rates are determined do not include those new doctoral recipients whose fall employment status was unknown at the time of the Second Report. After spiking to a high of 193 last year, this year the number of recipients whose employment status was reported as unknown dropped to 119.

Figure 1: Percentage of New Doctoral Recipients Unemployed¹



¹ As reported in the respective Annual Survey Second Reports.

Table 3A: New Doctoral Recipients Taking Employment in the U.S.

Group ¹	Type of Degree-Granting Department												TOTAL	
	I (Pu)		I (Pr)		II		III		IV		Va		Academia	Business/Industry
	Academia	Business/Industry	Academia	Business/Industry	Academia	Business/Industry	Academia	Business/Industry	Academia	Business/Industry	Academia	Business/Industry	Academia	Business/Industry
Fall 2000	144	33	82	28	126	37	79	24	131	83	28	18	590	223
Fall 2001	159	28	71	15	126	27	80	26	108	75	30	23	574	194
Fall 2002	133	18	86	12	107	19	91	7	102	65	34	15	553	136
Fall 2003	123	19	90	14	118	5	61	8	119	46	40	7	551	99
Fall 2004	118	13	118	15	144	10	73	10	150	53	52	9	655	110

¹ For definitions of groups see page 756.

Of the 962 new doctoral recipients whose employment is known, 792 were employed in the U.S., 118 were employed outside the U.S., 42 were still seeking employment, and 10 were not seeking employment.

Table 2D presents the trend in the percentage of employed new doctoral recipients by type of employer for the last five years. Academic employment includes those employed by research institutes and other nonprofits. The percentage of the total employed new doctoral recipients that are in U.S. academic positions has increased in each of the last five years, and consequently the percentage of the total employed in U.S. nonacademic positions (U.S. government, U.S. business and industry, and non-U.S. nonacademic) has decreased each of the past five years.

Among new doctoral recipients who are employed, the percentage taking nonacademic employment varied significantly by field of thesis. For those whose field of thesis is in the first three columns in Table 2A, this percentage is the lowest at 8% (down from 11%), while the percentage for those with theses in probability or statistics is the highest at 26% (down from 30%).

Table 3A shows that the fall 2004 total number of doctoral recipients taking positions in business or industry is 110; this number reflects an overall increase of 11% since last year. All groups have shown an increase in number of graduates finding employment in business and industry, except Group I Public.

Table 3B shows that the number of new doctoral recipients taking U.S. academic positions has increased to a five-year high of 655, from 551 in 2003. Doctoral hires into U.S. academic positions are up in all groups except Group I Private (down to 71 from 84 last year) and Group B (down to 104 from 108 last year); the biggest percentage increases are in Group Va (111%) and Group IV (69%). Doctoral hires into non-U.S. academic positions are also up.

Table 3C gives information about the production and hiring of female new doctoral recipients in

Table 3B: New Doctoral Recipients Taking U.S. Academic Positions

Group ¹	Type of Hiring Department					TOTAL
	I-III	IV	Va	M&B	Other	
Fall 2000	216	51	11	180	132	590
Fall 2001	214	49	11	178	122	574
Fall 2002	222	45	10	148	128	553
Fall 2003	216	39	9	158	129	551
Fall 2004	220	66	19	172	178	655

¹ For definitions of groups see page 756.

the doctoral-granting departments of this survey. From Table 3C we see that the percentage of females hired ranges from a high of 38% in Group III to a low of 18% in Group I (private). The percentage of female new doctoral recipients produced is highest in Group IV (40%).

Table 3C: Females as a Percentage of 2003-2004 U.S. Doctoral Recipients

	Degree-Granting Department							TOTAL
	I (Pu)	I (Pr)	II	III	IV	Va		
Produced	24%	27%	29%	35%	40%	27%	31%	
Hired	24%	18%	32%	38%	27%	21%	27%	

Updated Information about 2003-2004 U.S. Doctoral Recipients by Sex and Citizenship

Tables 3D and 3E show the sex and citizenship of the 1,081 new doctoral recipients and the fact that 792 new doctoral recipients found jobs in the U.S. this year. This is 87% of the 910 new doctoral recipients known to have jobs in fall 2004. Last year this percentage was 86%.

Sex and citizenship are known for all of the 1,081 new doctoral recipients. The final count of new doctoral recipients who are U.S. citizens is 513 (47%) (down from 48% last year). For the last five years this figure has remained very close to 50%, the largest percentage reported by the Annual Survey since the mid-1980s. Pages 241-4 of the First Report present further information related to the citizenship of the 2003-2004 new doctoral recipients.

Table 3D: Citizenship of 2003–2004 Male U.S. Doctoral Recipients by Fall 2004 Employment Status

TYPE OF EMPLOYER	CITIZENSHIP				TOTAL MALE DOCTORAL RECIPIENTS
	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	242	39	244	12	537
U.S. Academic	197	27	213	9	446
Groups ¹ I, II, III, and Va	76	11	86	3	176
Group IV	12	2	30	4	48
Non-Ph.D. Department	105	14	81	2	202
Research Institute/Other Nonprofit	4	0	16	0	20
U.S. Nonacademic	45	12	31	3	91
Non-U.S. Employer	56	1	31	4	92
Non-U.S. Academic	52	1	28	2	83
Non-U.S. Nonacademic	4	0	3	2	9
Not Seeking Employment	2	1	1	0	4
Still Seeking Employment	16	2	10	0	28
Subtotal	316	43	286	16	661
Unknown (U.S.)	30	1	12	3	46
Unknown (non-U.S.) ²	1	1	28	11	41
TOTAL	347	45	326	30	748

¹ For definitions of groups see page 756.

² Includes those whose status is reported as "unknown" or "still seeking employment".

Table 3E: Citizenship of 2003–2004 Female U.S. Doctoral Recipients by Fall 2004 Employment Status

TYPE OF EMPLOYER	CITIZENSHIP				TOTAL FEMALE DOCTORAL RECIPIENTS
	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	126	22	102	5	255
U.S. Academic	105	19	81	4	209
Groups ¹ I, II, III, and Va	25	8	29	1	63
Group IV	11	3	4	0	18
Non-Ph.D. Department	64	8	39	3	114
Research Institute/Other Nonprofit	5	0	9	0	14
U.S. Nonacademic	21	3	21	1	46
Non-U.S. Employer	18	0	8	0	26
Non-U.S. Academic	18	0	7	0	25
Non-U.S. Nonacademic	0	0	1	0	1
Not Seeking Employment	4	0	2	0	6
Still Seeking Employment	7	4	3	0	14
Subtotal	155	26	115	5	301
Unknown (U.S.)	9	3	4	2	18
Unknown (non-U.S.) ²	2	0	10	2	14
TOTAL	166	29	129	9	333

¹ For definitions of groups see page 756.

² Includes those whose status is reported as "unknown" or "still seeking employment".

Of the 513 U.S. citizen new doctoral recipients reported for 2003–2004, 166 are female and 347 are male. While females accounted for 32% of the U.S. citizen total both this year and last year, both the number of female U.S. citizens and the number of male U.S. citizens represent an increase over last year's counts of 158 and 341, respectively.

Table 3F shows that non-U.S. citizens accounted for 54% of those employed in the U.S. (last year this percentage was 44%). U.S. academic doctoral departments, Groups I through Va, hired 41% U.S. citizens, while groups M, B, and all other academic departments hired 51% U.S. citizens (last year these percentages were 52% and 61%, respectively). U.S. citizens represented 48% of those hired into nonacademic positions (last year 56%). Among the

Table 3F: Number of 2003–2004 Doctoral Recipients Employed in the U.S. by Citizenship and Type of Employer

U.S. EMPLOYER	CITIZENSHIP		TOTAL
	U.S.	Non-U.S.	
Academic, Groups I–Va	124	181	305
Academic, Other	178	172	350
Nonacademic	66	71	137
TOTAL	388	424	792

792 new 2003–2004 doctoral recipients employed in the U.S., 17% took nonacademic employment (government or business and industry.) This percentage is down from 19% in 2002–2003 and from 24% in 2001–2002.

New Information from the EENDR Survey

Of the 1,041 new doctoral recipients reported in the First Report, the 914 whose addresses were known were sent the Employment Experiences of New Doctoral Recipients (EENDR) survey in October 2004, and 525 (50%) responded. The response rates varied considerably among the various subgroups of new doctoral recipients defined by their employment status as reported by departments. Among those who were employed, the highest response rate, 62%, was from those in academia in the U.S., while the lowest, 38%, was from those in non-U.S. nonacademic.

The EENDR gathered details on employment experiences not available through departments. The rest of this section presents additional information available on this subset of the 2003–2004 doctoral recipients.

Table 4A provides the trend in EENDR respondents taking permanent and temporary positions in the U.S for fall 2000 through fall 2004. This year we see that among the 449 employed in the U.S., 220 reported obtaining a permanent position and 229 a temporary position; this is the only time in the last five years when the number of temporary hires exceeded the number of permanent hires. Of the 229 in temporary positions, 81 (35%) reported taking temporary employment because a suitable permanent position was not available, and 176 (77%) classified their position as postdoctoral. Of the 176 respondents taking positions they classified as postdoctoral, 49 (28%) reported that a suitable permanent position was not available.

Table 4B shows the employment trends of permanent and temporary positions broken down by sector for the last five years. After steadily increasing over the last four years, the percentage of permanently employed EENDR respondents taking employment in academia has declined this year, and there was an offsetting increase in the proportion of permanently employed EENDR respondents taking positions in business and industry.

Among the 220 who reported obtaining a permanent position in the U.S. in fall 2004, 72% were employed in academia (including 1% in research institutes and other nonprofits), 5% in government, and 23% in business or industry. Women held 36% of the permanent positions.

Table 4A: Number (and Percentage) of Annual EENDR Respondents Taking U.S. Positions by Job Status

	U.S. Employed					Unknown
	Permanent Total	Temporary Total	Temporary			
			Permanent not available	Postdoctoral		
				Total	Permanent not available	
Fall 2000	317(59)	218(41)	92(42)	157(72)	55(35)	1
Fall 2001	266(56)	205(43)	107(52)	143(70)	42(29)	2
Fall 2002	264(52)	245(48)	90(37)	203(83)	69(34)	1
Fall 2003	253(54)	216(46)	87(40)	164(76)	53(32)	--
Fall 2004	220(49)	229(51)	81(35)	176(77)	49(28)	--

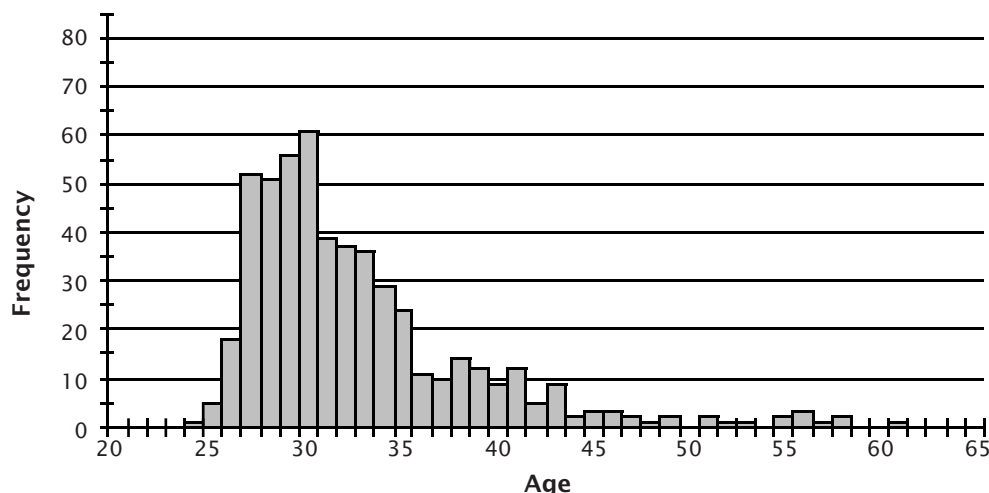
Table 4B: Percentage of Annual EENDR Respondents Taking U.S. Positions by Employment Sector within Job Status

	U.S. Employed					
	Permanent			Temporary		
	Academia	Government	Business/Industry	Academia	Government	Business/Industry
Fall 2000	59%	4%	36%	95%	2%	2%
Fall 2001	62%	6%	32%	95%	4%	--
Fall 2002	70%	6%	23%	93%	6%	1%
Fall 2003	76%	4%	20%	94%	3%	3%
Fall 2004	72%	5%	23%	97%	3%	--

Among the 229 individuals with temporary employment in the U.S. this year, 97% were employed in academia (including 9% in research institutes and other nonprofits), less than 1% in government, and 3% in business or industry.

Figure 2 gives the age distribution of the 525 new doctoral recipients who responded to this question. The median age of new doctoral recipients

Figure 2: Age Distribution of 2003–2004 EENDR Respondents



ents was 31 years, while the mean age was 33 years. The first and third quartiles were 29 and 35 years, respectively. In the previous six years the median age has generally been 30 and the mean age has been 32, with first and third quartiles at 28 and 34 years, respectively.

Previous Annual Survey Reports

The 2004 First Annual Survey Report was published in the *Notices* in the February 2005 issue. For the last full year of reports, the 2003 First, Second, and Third Annual Survey Reports were published in the *Notices* in the February, August, and September 2004 issues respectively. These reports and earlier reports, as well as a wealth of other information from these surveys, are available on the AMS website at www.ams.org/employment/surveyreports.html.