

Update on the 2001–2002 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 in the box on page 812 of this report. Departments in the former Group Vb (operations research and management science) are no longer being surveyed.

This Second Report includes data from two parts of the 2002 Annual Survey. First, we update information about new doctoral recipients reported earlier in the February 2003 issue. Second, we present the starting salaries of the new doctoral recipients who responded to a follow-up survey. Prior to 2000 this report contained a third part presenting information about the faculties and instructional programs at the undergraduate and graduate levels in these departments. Starting with the 2000 survey, we chose to present this data in a separate report that is now published in the September issue of the *Notices of the AMS*.

The names of the 2001–2002 doctoral recipients and their thesis titles were published in “Doctoral Degrees Conferred” (*Notices of the AMS*, February 2003, pages 264–80). This list has been supplemented by fourteen additional new doctorates, twelve of which have been reported since the original list was published. The supplemental listing appears at the end of this report on page 813.

Information about recipients of doctoral degrees awarded between July 1, 2001, and June 30, 2002, was collected from doctorate-granting departments beginning in late spring 2002 and from a follow-up census of individual degree recipients beginning in October. The “2002 Annual Survey First Report” (*Notices of the AMS*, February 2003, pages 238–53) 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 2002 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 2001–2002 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 1993 through 2002. Final counts include those new doctoral re-

cipients reported from departments who missed the deadline for inclusion in the First Report. Numbers in this table have been revised from reports prior to 1998–1999 to exclude new doctorates data from Group Vb departments, which are no longer surveyed.

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. There was a drop of 111 new doctorates from 1997–1998 to 2000–2001, mostly explained by a drop of 106 non-U.S. citizen new doctoral recipients. This year the total number of new doctoral recipients was down

**Table 1A: Annual U.S. Doctoral Recipients,
Fall and Final Counts, 1993 to 2002**

Year	Fall	Final
1992–1993	1104	1116
1993–1994	1025	1034
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

**Table 1B: Citizenship of Annual U.S. Doctoral
Recipients, 1998 to 2002**

Year	U.S.	Non-U.S.	TOTAL
1997–1998	537	639	1176
1998–1999	560	575	1135
1999–2000	566	561	1127
2000–2001	532	533	1065
2001–2002	428	532	960

from the previous year by 105, with a drop of 104 in U.S. citizens. The count of 428 U.S. citizens is the lowest figure reported since 1989–1990. The all-time high number of non-U.S. citizen new doctoral

**Table 1C: 2001–2002 U.S. Doctoral Recipients
by Type of Degree-Granting Department**

	I (Pu)	I (Pr)	II	III	IV	Va
Number	218	140	173	124	224	81
%	23	15	18	13	23	8

recipients was 679 in 1992–1993. These trends bear watching in the future.

Table 1C gives a breakdown of the 960 doctoral degrees awarded in the mathematical sciences between July 1, 2001, and June 30, 2002, by type of degree-granting department.

Table 2A: 2001–2002 U.S. Doctoral Recipients: Field of Thesis by Fall 2002 Employment Status, Updated April 2003

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/Approximations	Linear Nonlinear Optim./Control	Differential, Integral, & Difference Equations	Math. Educ.	Other/Unknown	
Group I (Public)	16	9	15	9	3	0	3	4	1	13	0	0	73
Group I (Private)	12	8	13	5	0	1	9	5	1	8	0	0	62
Group II	19	11	6	3	4	2	5	7	1	6	1	0	65
Group III	4	0	2	2	0	4	1	4	1	2	2	0	22
Group IV	0	0	0	0	4	41	0	0	0	0	0	0	45
Group Va	1	0	0	0	2	1	3	1	0	2	0	0	10
Master's	6	3	4	8	2	6	7	3	1	0	2	1	43
Bachelor's	27	19	8	13	1	10	10	1	1	9	5	1	105
Two-Year College	3	2	4	1	0	1	1	0	0	1	1	0	14
Other Academic Dept.	6	4	2	7	3	38	9	7	2	8	4	0	90
Research Institute/Other Nonprofit	5	1	2	0	0	9	1	2	2	2	0	0	24
Government	1	2	3	3	0	11	11	6	2	4	0	0	43
Business and Industry	5	3	8	9	9	71	17	6	2	4	1	1	136
Non-U.S. Academic	12	11	13	6	3	15	7	4	3	10	0	2	86
Non-U.S. Nonacademic	0	3	1	0	0	4	2	0	1	0	0	0	11
Not Seeking Employment	2	1	1	1	1	3	2	0	0	1	0	0	12
Still Seeking Employment	2	3	1	1	0	7	4	4	0	3	0	0	25
Unknown (U.S.)	6	5	7	5	4	21	5	7	0	1	1	0	62
Unknown (non-U.S.) ¹	4	0	4	2	2	8	4	2	2	3	0	1	32
TOTAL	131	85	94	75	38	253	101	63	20	77	17	6	960
Column Subtotals													
Male	101	61	69	52	30	146	78	49	18	47	8	5	664
Female	30	24	25	23	8	107	23	14	2	30	9	1	296

¹ Includes those whose status is reported as "unknown" or "still seeking employment".

Table 2B: 2001–2002 U.S. Doctoral Recipients: Type of Degree-Granting Department by Fall 2002 Employment Status, Updated April 2003

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)	37	19	12	0	0	5	73	57	16	
Group I (Private)	18	32	5	5	0	2	62	44	18	
Group II	27	11	16	9	0	2	65	46	19	
Group III	6	3	2	9	2	0	22	12	10	
Group IV	0	1	0	3	40	1	45	29	16	
Group Va	1	0	1	1	1	6	10	9	1	
Master's	7	1	15	9	6	5	43	25	18	
Bachelor's	18	7	34	37	7	2	105	69	36	
Two-Year College	2	0	6	5	1	0	14	11	3	
Other Academic Dept.	12	6	13	13	36	10	90	52	38	
Research Institute/Other Nonprofit	5	6	3	0	9	1	24	15	9	
Government	7	8	8	4	7	9	43	29	14	
Business and Industry	18	12	19	7	65	15	136	97	39	
Non-U.S. Academic	30	18	10	10	12	6	86	63	23	
Non-U.S. Nonacademic	2	3	1	1	2	2	11	9	2	
Not Seeking Employment	2	2	3	2	3	0	12	7	5	
Still Seeking Employment	5	1	8	1	7	3	25	20	5	
Unknown (U.S.)	12	7	13	7	17	6	62	47	15	
Unknown (non-U.S.) ¹	9	3	4	1	9	6	32	23	9	
TOTAL	218	140	173	124	224	81	960	664	296	
Column Subtotals										
Male	171	100	120	78	130	65	664			
Female	47	40	53	46	94	16	296			

¹ Includes those whose status is reported as "unknown" or "still seeking employment".

Table 2C: 2001–2002 U.S. Doctoral Recipients: Field of Thesis by Type of Degree-Granting Department, Updated April 2003

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)	44	29	40	22	10	3	21	17	3	27	2	0	218
Group I (Private)	31	14	32	13	5	8	17	3	3	11	0	3	140
Group II	40	27	11	11	7	8	23	20	3	18	3	2	173
Group III	14	14	10	20	3	15	17	7	1	11	12	0	124
Group IV	0	0	0	0	7	215	1	1	0	0	0	0	224
Group Va	2	1	1	9	6	4	22	15	10	10	0	1	81
TOTAL	131	85	94	75	38	253	101	63	20	77	17	6	960

Tables 2A, 2B, and 2C display updates of employment data, found in these same tables in the First Report, for the fall count of 2001–2002 doctoral recipients plus twelve additional doctoral recipients reported late. These tables are partitioned by field of thesis research, by the survey group of their degree department, and by type of employer. At the time of this Second Report, the fall 2002 employment status of 866 of the 960 doctoral recipients was known.

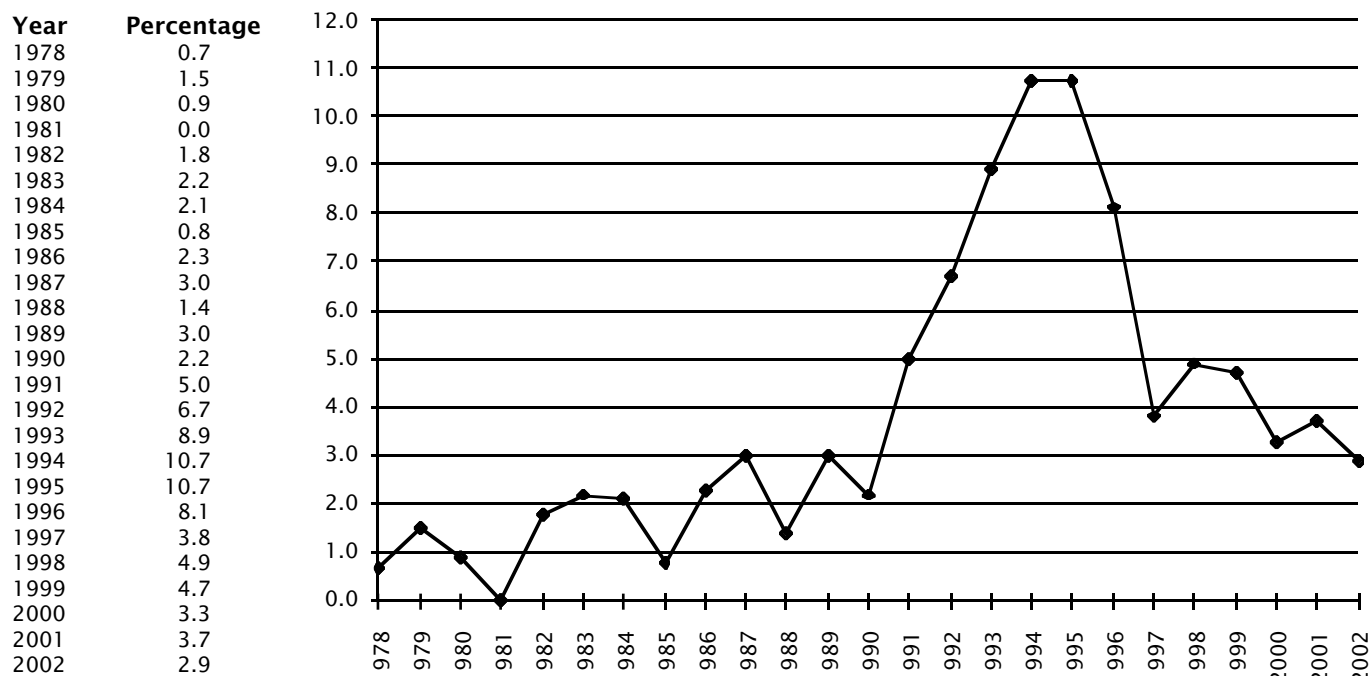
The fall 2002 unemployment rate for new doctoral recipients, based on information gathered by the time of the Second Report, was 2.9%. The unemployment rate rose steadily in the early 1990s and reached its all-time high of 10.7% in both 1994 and 1995. Since then the rate has fluctuated between 3.3% and 4.9%, until this year's figure of 2.9%, the lowest rate reported since 1990. Figure 1 presents the

Table 2D: Percentage of Total Employed New Doctoral Recipients by Type of Employer, Fall 1998 to Fall 2002

%	U.S. Employed		Non-U.S. Employed		TOTAL NUMBER
	Academic	Nonacademic	Academic	Nonacademic	
Fall 1998	57	29	12	2	965
Fall 1999	64	23	11	2	955
Fall 2000	62	28	10	1	957
Fall 2001	63	27	9	2	914
Fall 2002	67	22	10	1	829

fall 1978 through fall 2002 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

Figure 1: Percentage of New Doctoral Recipients Unemployed, As Reported in the Respective Annual Survey Second Reports, 1978 to 2002



the Second Report. Note that prior to 1999 the new doctoral recipients from Group Vb are included in the total unemployment rate for each year.

Of the 866 new doctoral recipients whose employment is known, 732 were employed in the U.S., 97 were employed outside the U.S., 25 were still seeking employment, and 12 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 is at a five-year high, while the

Table 3A: Number of New Doctoral Recipients Taking Positions in Business and Industry in the U.S. by Type of Degree-Granting Department, Fall 1998 to Fall 2002

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Fall 1998	37	27	44	25	75	26	234
Fall 1999	32	24	28	21	66	14	185
Fall 2000	33	28	37	24	83	18	223
Fall 2001	28	15	27	26	75	23	194
Fall 2002	18	12	19	7	65	15	136

percentage of the total employed in U.S. nonacademic positions is at a five-year low.

Among new doctoral recipients who are employed, the percentage taking nonacademic employment (U.S. government, U.S. business and industry, and non-U.S. nonacademic) varied significantly by field of thesis. For those whose field of thesis is in the first three columns in Table 2A, this percentage is

Table 3B: Number of New Doctoral Recipients Taking U.S. Academic Positions by Type of Degree-Granting Department, Fall 1998 to Fall 2002

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Fall 1998	133	100	138	61	85	30	547
Fall 1999	166	91	146	82	86	39	610
Fall 2000	144	82	126	79	131	28	590
Fall 2001	159	71	126	80	108	30	574
Fall 2002	133	86	107	91	102	34	553

the lowest at 9%, while the percentage for those with theses in probability or statistics is the highest at 39%.

Tables 3A through 3D first appeared in the First Report for 2000–2001, although they do not have the same table numbers in that report. They have all been updated with information obtained from the individual new doctoral recipients who responded to

a follow-up questionnaire. The next few paragraphs discuss some of the information presented in these tables.

The fall 2002 numbers in Table 3A are down from last year in each category, and over five years the total shows a 42% decrease. The trend

Table 3C: Number of New Doctoral Recipients Taking U.S. Academic Positions by Type of Hiring Department, Fall 1998 to Fall 2002

Group	I-III	IV	Va	M&B	Other	TOTAL
Fall 1998	187	36	5	203	116	547
Fall 1999	233	47	19	193	118	610
Fall 2000	216	51	11	180	132	590
Fall 2001	214	49	11	178	122	574
Fall 2002	222	45	10	148	128	553

away from jobs in business and industry most likely reflects problems in the economy.

Table 3C shows that the number of new doctoral recipients hired by Groups M and B has been dropping each of the past five years, and there has been a 27% decrease in the number of new doctoral recipients hired by master’s and bachelor’s departments from fall 1998 to fall 2002. This decline may reflect more hiring at these institutions of individuals completing a postdoctoral appointment.

Table 3D gives information about the production and hiring of female new doctoral recipients in the doctoral-granting departments of this survey. From Table 2B we see that 42% of the new doctoral recipients hired by Group M departments were female, while 34% of those hired by Group B departments were female.

Table 3D: Females as a Percentage of 2001–2002 U.S. Doctoral Recipients Produced by and Hired by Doctoral-Granting Groups, Fall 2002

%	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Produced	22	29	31	37	42	20	31
Hired	22	29	29	45	36	10	29

Updated Information about 2001–2002 U.S. Doctoral Recipients by Sex and Citizenship

Tables 3E and 3F show the sex and citizenship of the 960 new doctoral recipients and the fact that 732 new doctoral recipients found jobs in the U.S. this year. This is 88% of the 829 new doctoral recipients known to have jobs in fall 2002. Last year this percentage was 89%.

Sex and citizenship is known for all of the 960 new doctoral recipients. The final count of new doctoral recipients who are U.S. citizens is 428 (45%). For the previous three years, this figure remained very close to 50%, the largest percentages

Table 3E: 2001–2002 Male U.S. Doctoral Recipients: Type of Citizenship by Fall 2002 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	245	20	228	2	495
U.S. Academic	184	12	172	1	369
Groups I, II, III, and Va	77	6	85	0	168
Group IV	10	1	17	1	29
Non-Ph.D. Department	92	5	60	0	157
Research Institute/Other Nonprofit	5	0	10	0	15
U.S. Nonacademic	61	8	56	1	126
Non-U.S. Employer	13	1	58	0	72
Non-U.S. Academic	13	1	49	0	63
Non-U.S. Nonacademic	0	0	9	0	9
Not Seeking Employment	2	0	5	0	7
Still Seeking Employment	10	2	8	0	20
Subtotal	270	23	299	2	594
Unknown (U.S.)	28	2	16	1	47
Unknown (non-U.S.) ¹	0	0	20	3	23
TOTAL	298	25	335	6	664

¹ Includes those whose status is reported as "unknown"

Table 3F: 2001–2002 Female U.S. Doctoral Recipients: Type of Citizenship by Fall 2002 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	117	15	101	4	237
U.S. Academic	95	8	77	4	184
Groups I, II, III, and Va	30	1	33	0	64
Group IV	4	0	11	1	16
Non-Ph.D. Department	58	7	27	3	95
Research Institute/Other Nonprofit	3	0	6	0	9
U.S. Nonacademic	22	7	24	0	53
Non-U.S. Employer	1	1	22	1	25
Non-U.S. Academic	1	1	20	1	23
Non-U.S. Nonacademic	0	0	2	0	2
Not Seeking Employment	1	0	4	0	5
Still Seeking Employment	2	1	2	0	5
Subtotal	121	17	129	5	272
Unknown (U.S.)	9	0	5	1	15
Unknown (non-U.S.) ¹	0	2	6	1	9
TOTAL	130	19	140	7	296

¹ Includes those whose status is reported as "unknown" or "still seeking employment".

ported by the Annual Survey since the mid-1980s. Pages 243–6 of the First Report present further information related to the citizenship of the 2001–2002 new doctoral recipients.

Of the 428 U.S. citizen new doctoral recipients, 130 are female and 298 are male. The 130 female new doctoral recipients comprise 30% of the U.S. citizen total for 2001–2002, a decrease from last year's count of 166 (down 22%); last year female new doctoral recipients were 31% of the U.S. citizen new doctoral recipients. The number of U.S. citizen males, 298, is down 68 (19%) from 366 last year.

Table 3G shows that while U.S. academic doctoral departments, Groups I through Va, hired 44% U.S.

citizens, U.S. academic positions other than in the doctoral departments hired 57% U.S. citizens. Those hired for nonacademic positions in the U.S. who are U.S. citizens was 46%. Among those 732 2001–2002

Table 3G: Number of 2001–2002 New 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	121	156	277
Academic, Other	158	118	276
Nonacademic	83	96	179
TOTAL	362	370	732

Table 4A: Number (and Percentage) of Annual EENDR Respondents Taking U.S. Positions by Job Status, Fall 1998 to Fall 2002

U.S. Employed	Fall 1998	Fall 1999	Fall 2000	Fall 2001	Fall 2002
TOTAL	539	512	536	473	510
Permanent	313 (58)	273 (53)	317 (59)	266 (56)	264 (52)
Temporary	225 (42)	237 (46)	218 (41)	205 (43)	245 (48)
Perm not avail.	127 (56)	101 (43)	92 (42)	93 (45)	110 (45)
Postdoctorate	129 (57)	155 (65)	157 (72)	163 (80)	234 (96)
Perm not avail.	56 (43)	58 (37)	55 (35)	50 (31)	86 (37)
Unknown	1	2	1	2	1

Table 4B: Percentage of Annual EENDR Respondents Taking U.S. Positions by Employment Sector within Job Status, Fall 1998 to Fall 2002

U.S. Employed	Fall 1998	Fall 1999	Fall 2000	Fall 2001	Fall 2002
Permanent					
Academia	55	59	59	62	70
Government	4	4	4	6	6
Business/Ind.	41	37	36	32	23
Temporary					
Academia	90	94	95	95	93
Government	7	5	2	4	6
Business/Ind.	4	0	2	0	1

doctoral recipients taking employment in the U.S., 24% took nonacademic employment (government or business and industry). This is down from 30% in 2000-2001 and from 31% in 1999-2000.

New Information from the EENDR Survey
 Of the 948 new doctoral recipients reported in the First Report, the 890 whose addresses were known were sent the Employment Experiences of New Doctoral Recipients (EENDR) survey in October

2002, and 572 (64%) 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, 75%, was from those in academia in the U.S., while the lowest, 10%, was from those in foreign nonacademia.

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 2001-2002 doctoral recipients.

Table 4A provides the trend in EENDR respondents taking permanent and temporary positions in the U.S for fall 1998 through fall 2002. This year we see that among the 510 employed in the U.S., 264 reported obtaining a permanent position and 245 a temporary position (one individual did not answer this question). Of the 245 in temporary positions, 110 (45%) reported taking temporary employment because a suitable permanent position was not available and 234 (96%) classified their position as postdoctoral. Furthermore, among those in postdoctoral positions, 37% responded that they took the position because a suitable permanent position was not available. Of particular note in Table 4A is the steady increase in the percentage of temporarily employed respondents who reported taking a postdoctoral position.

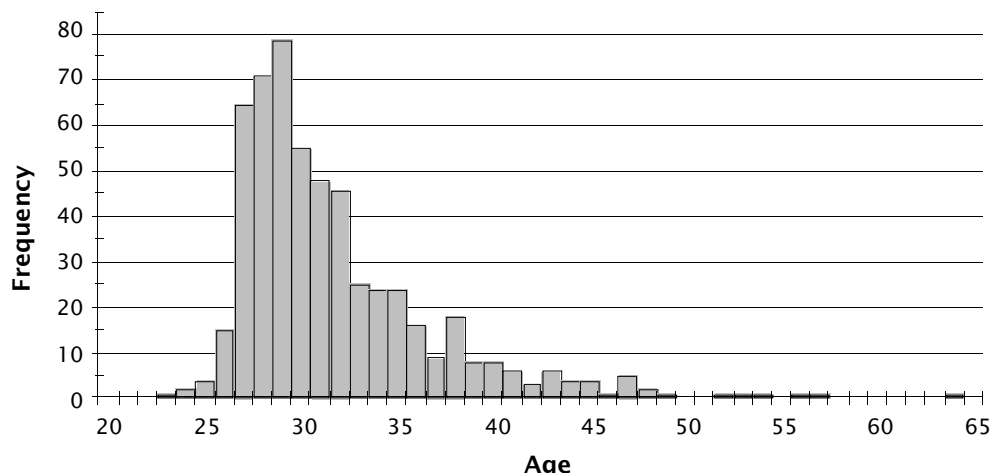
Table 4B shows the employment trends of permanent and temporary positions broken down by sector for the last five years. There has been a continuing increase in the proportion of EENDR respondents taking permanent employment in academia and an offsetting decline in the proportion taking permanent positions in business and industry.

Among the 264 who reported obtaining a permanent position in the U.S. in fall 2002, 70% were employed in academia (including 3% in research institutes and other non-profits), 6% in government, and 23% in business or industry. Women held 36% of the permanent positions.

Among the 245 individuals with temporary employment in the U.S. this year, 93% were employed in academia (including 5% in research institutes and other non-profits), 6% in government, and 1% in business or industry.

Figure 2 gives the age distribution of the 556 new doctoral recipients who

Figure 2: Age Distribution of 2001-2002 EENDR Respondents



responded to this question. The median age of new doctoral recipients was 30 years, while the mean age was 32 years. The first and third quartiles were 28 and 34 years, respectively. These figures are very similar to those reported in previous years.

Previous Annual Survey Reports

The 2002 First Annual Survey Report was published in the *Notices of the AMS* in the February 2003 issue. For the last full year of reports, the 2001 First, Second, and Third Annual Survey Reports were published in the *Notices of the AMS* in the February, August, and September 2002 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.