

2003 Annual Survey of the Mathematical Sciences

(First Report)

Report on the 2002–2003 New Doctoral Recipients Faculty Salary Survey

Ellen E. Kirkman, James W. Maxwell, and Colleen Rose

The First Report of the 2003 Annual Survey gives a broad picture of 2002–03 new doctoral recipients from U.S. departments in the mathematical sciences, including their employment status in fall 2003. The First Report also presents salary data for faculty members in U.S. departments of mathematical sciences in four-year colleges and universities. This report is based on information collected from two questionnaires distributed to departments in May 2003. A follow-up questionnaire was distributed to the individual new doctoral recipients in October 2003. This questionnaire will be used to update and revise results in this report, which are based on information from the departments that produced the new doctorates. Those results will be published in the Second Report of the 2003 Annual Survey in the August 2004 issue of the *Notices of the AMS*. Another questionnaire concerned with data on fall 2003 course enrollments, majors, graduate students, and departmental faculty was distributed to departments in September 2003. Results from this questionnaire will appear in the Third Report of the 2003 Annual Survey in the September 2004 issue of the *Notices of the AMS*.

The 2003 Annual Survey represents the forty-seventh in an annual series begun in 1957 by the American Mathematical Society. The 2003 Survey is conducted by staff at the American Mathematical Society with guidance from the Data Committee, a joint committee of the American Mathematical Society, the American Statistical Association, the Institute of Mathematical Statistics, and the Mathematical Association of America. The current members of this committee are Amy Cohen-Corwin, Donald M. Davis, Lorraine Denby, J. Douglas Faires, Alexander Hahn, Naresh Jain, G. Samuel Jordan, David J. Lutzer, Stephen F. Kennedy, Ellen E. Kirkman (chair), and James W. Maxwell (ex officio). The committee is assisted by AMS survey analyst Kinda Remick Priestley and survey coordinator Colleen Rose. Comments or suggestions regarding this Survey Report may be directed to the members of the Data Committee.

Report on the 2002–2003 New Doctoral Recipients

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, 2002, through June 30, 2003. It includes a preliminary analysis of the fall 2003 employment plans of 2002–03 doctoral recipients and a demographic profile summarizing characteristics of citizenship status, sex, and racial/ethnic group. All information came from the departments that gave the degrees.

Table 1: Doctorates Granted Response Rates

Group I (Pu)	25 of 25 including	0 with 0 degrees
Group I (Pr)	21 of 23 including	0 with 0 degrees
Group II	54 of 56 including	4 with 0 degrees
Group III	70 of 73 including	21 with 0 degrees
Group IV	74 of 86 including	12 with 0 degrees
Group Va	21 of 23 including	5 with 0 degrees

See "Definitions of the Groups" on page 233.

Table 1 provides the departmental response rates for the 2003 Survey of New Doctoral Recipients. See page 233 for a description of the groups. No adjustments were made in this report for nonresponding departments.

This preliminary report will be updated in the Second Report of the 2003 Annual Survey using information gathered from the new doctoral recipients. The Second Report will appear in the August 2004 issue of the *Notices of the AMS*.

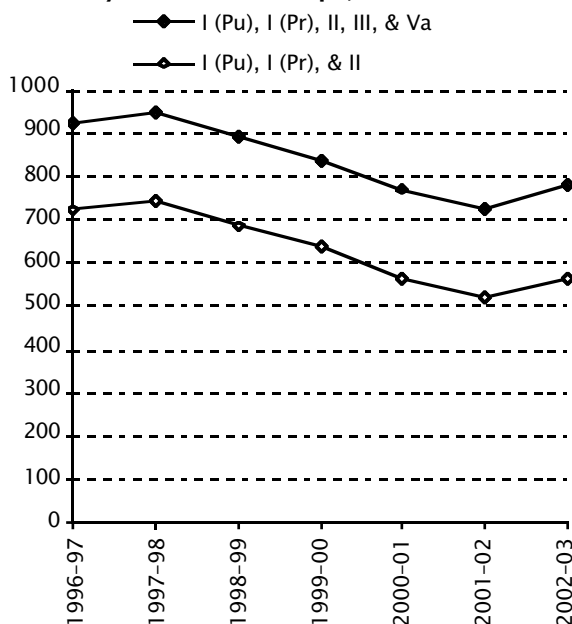
Changes in the Annual Survey occur over time, and these changes need to be considered when comparing results in this report to those in prior years. Information about changes that occurred in 1997 or later can be found in the First Report for the 2000 Annual Survey in the February 2001 issue of the *Notices of the AMS*.

In this First Report's tables referring to new doctoral recipients, "Fall" refers to results based on information about new doctoral recipients received from departments granting their degrees. This information is gathered in the first fall following the academic year in which the degrees were granted. "Final" refers to results based on supplemental information received from the new doctoral

Table 2: New Doctoral Degrees Awarded by Group, Fall Count

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
1996-97	297	187	238	132	197	72	1123
1997-98	306	174	264	129	213	77	1163
1998-99	292	152	241	136	243	69	1133
1999-00	256	157	223	132	284	67	1119
2000-01	233	129	203	125	237	81	1008
2001-02	218	139	164	124	222	81	948
2002-03	258	138	170	121	239	91	1017

Figure 1: New Doctoral Degrees Awarded by Combined Groups, Fall Count



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Highlights

- There were 1,017 new doctoral recipients reported for 2002-03 by departments responding in time for the 2003 First Report. This is the first increase in new doctoral recipients since 1997-98, when the number began declining.
- The number of new doctoral recipients from Groups I (Pu), I (Pr), and II combined has increased from 521 in 2001-02 to 566 this year, an increase of 45 (9%).
- Only 489 (48%) of the new doctoral recipients for 2002-03 are U.S. citizens, an increase of 71 (17%) from 2001-02 but down 97 (16.5%) from 586 in 1997-98.
- The numbers of various types of graduate students in U.S. doctoral departments in the mathematical sciences were dropping from 1992 to 1997 or 1998 and have been increasing since then. This is true for first-year full-time and first-year U.S. citizen full-time graduate students. These increasing numbers perhaps suggest that the number of new doctoral recipients may continue to increase gradually for the next few years.
- Based on responses from departments alone, the fall 2003 unemployment rate for the 824 new doctoral recipients whose employment status is known is 5.1%, up from 4.3% for fall 2001.
- Sixty new doctoral recipients hold positions at the institution that granted their degree, although not necessarily in the same department. This is 8% of the new doctoral recipients who are currently known to have jobs and 11% of those who have academic positions in the U.S. Ten new doctoral recipients have part-time positions.
- The number of new doctoral recipients employed in the U.S. is 663, down 1 from 664 last year. The numbers employed in the two categories "Master's, Bachelor's, and Two-Year Colleges" and "Other Academic and Research Institutes" were up, while the categories "Groups I, II, III, IV, and Va", "Government", and "Business and Industry" were down.
- Of the 663 new doctoral recipients taking positions in the U.S., 97 (15%) have jobs in business and industry; the number of new doctoral recipients with jobs in business and industry has been decreasing over the past three years (123 in fall 2002, 168 in fall 2001, and 206 in fall 2000).
- Among the 251 new doctoral recipients hired by U.S. doctoral-granting departments, 52% are U.S. citizens. Among the 283 having other academic positions in the U.S., 61% are U.S. citizens.
- Of the 1,017 new doctoral recipients, 304 (30%) are females, up just 14 from fall 2002. Of the 489 U.S. citizen new doctoral recipients, 157 (32%) are females, up 30 from fall 2002. The all-time high was 187 in fall 1998.
- Among the 489 U.S. citizen new doctoral recipients, 1 is American Indian or Alaska Native, 24 are Asians, 16 are Blacks or African Americans, 12 are Hispanics or Latinos, 405 are Whites, and 31 are other.
- Group IV produced 239 new doctorates, of which 98 (41%) are females, compared to all other groups combined, where 206 (26%) are females. In group IV 109 (46%) of the new doctoral recipients are U.S. citizens (while in the other groups 28% are U.S. citizens).
- Three hundred two new doctorates had a dissertation in statistics/biostatistics (273) and probability (29). The next highest number was in algebra and number theory with 160. Those with dissertations in statistics/biostatistics and probability accounted for 30% of the new doctorates in 2002-03.

Table 3: Full-Time Graduate Students in Groups I, II, III, & Va, Fall 1993 to Fall 2002

GRADUATE STUDENTS	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total full-time	10525	10185	9761	9476	9003	8791	8838	9637	9361	997
First-year full-time	2762	2668	2601	2443	2386	2510	2664	2839	2875	2996
U.S. citizen full-time	5865	5945	5623	5445	4947	4831	4668	5085	4631	5055
First-year U.S. citizen full-time	1700	1664	1551	1465	1316	1349	1401	1527	1517	1630

(Data Reprinted from Table 6B in Third Report, 2002 Annual Survey)

recipients themselves as well as additional new doctoral recipients not reported by departments in time for publication in the First Report. These results are published each August in the Second Report.

Doctoral Degrees Granted in 2002-03

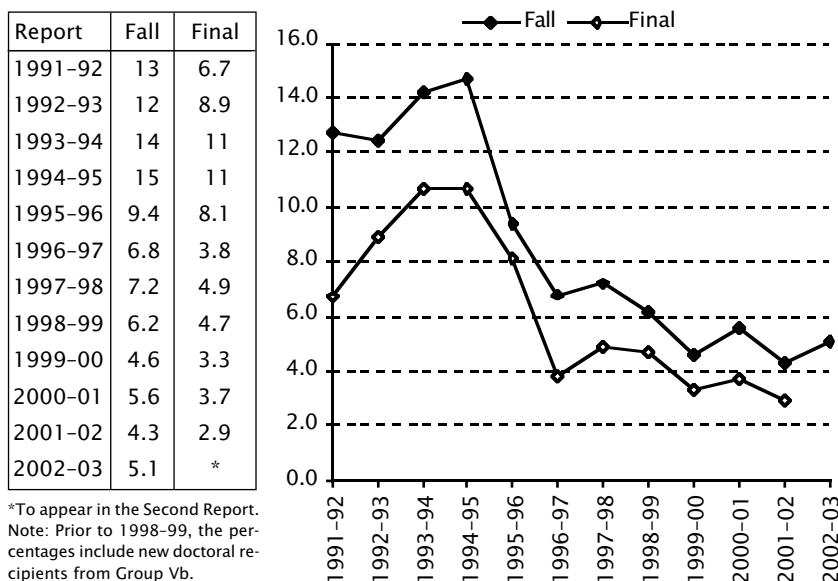
Table 2 shows the number of new doctoral degrees granted by the different doctoral groups surveyed in the Annual Survey for the past seven years. The 1,017 new doctorates granted by these departments in 2002-03 is an increase of 69 from the fall count for 2001-02. Figure 1 presents the trends in doctorates granted for Groups I (Pu), I (Pr), II, III, and Va combined and Groups I (Pu), I (Pr), and II combined.

Group I (Pu) shows the largest increase (40), while Groups II, IV, and Va also had an increase. Groups I (Pr) and III showed only slight decreases of 1 and 3 respectively. The response rates were above 90% for every group except Group IV, which historically has had slightly lower response rates than the other groups. Two fewer departments responded in time for the First Report this year than responded by this time last year.

The 1,017 new doctoral recipients is a preliminary count. A final count will appear in the Second Report in the August 2004 issue of the *Notices of the AMS*. Efforts are under way to obtain data from as many of the nonresponding departments as possible. A careful look at the past history of the nonresponding departments makes it unlikely that the final count of new doctoral recipients will increase by more than 35.

From Table 2 we see that while the number of doctoral recipients from Group I (public) is up this year, it is still 48 below its high of 1997-98. The number of doctoral recipients from Group I (private) continues a decline evident in all but two years in the table. The number of doctoral recipients from Group II is up this year, but still 94 below its high in 1997-98. The number of doctoral recipients from Group III is still declining slowly, down 15 from its high in 1998-99. The number of doctoral recipients from Group IV is up over last year, but down 45 from its high in 1999-2000. The number of doctoral recipients from Group Va is at the highest level in Table 2.

Table 3 gives historical information about various types of full-time graduate students in Groups I, II, III, and Va combined. These data, gathered in the 2002 Departmental Profile survey, are reprinted from Table 6B of the Third Report of the 2002 Annual Survey (*Notices of the AMS*, September 2003). It sheds some light on the downward trend in number of new doctorates as shown in Table 2 and Figure 1. The total number of full-time graduate students fell from 10,525 in 1993 to 8,791 in 1998 and has increased to 9,972 in fall 2002. The number of first-year full-time graduate students fell from 2,762 in 1993 to 2,386 in 1997 and has increased to 2,996 in fall 2002. Full-time first-year U.S. citizen graduate students fell from 1,700 in 1993 to 1,316 in 1997 and was 1,630 in fall 2002. The increase in new doctoral recipients reported for 2002-03 may be the first indication of a moderate trend upward over the next few years, most likely a result of the rebound in first-year full-time graduates starting in the fall of 1998.

Figure 2: Percentage of New Doctoral Recipients Unemployed (as reported in the respective Annual Survey Reports 1992-2003)

**Table 4A: Employment Status of 2002-03 U.S. New Doctoral Recipients
in the Mathematical Sciences by Field of Thesis**

		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/ Approxi- mations	Linear Nonlinear Optim./ Control	Differential, Integral, & Difference Equations	Math. Educ.	Other/ Unknown	
TYPE OF EMPLOYER														
Group I (Public)		24	7	13	4	5	0	5	6	1	12	0	1	78
Group I (Private)		10	4	9	3	1	2	3	0	1	14	0	0	47
Group II		7	3	9	3	2	2	9	3	4	9	2	0	53
Group III		0	4	1	3	0	10	1	1	1	3	1	0	25
Group IV		0	0	1	0	2	36	0	0	0	0	0	0	39
Group Va		0	0	0	2	1	0	4	2	0	0	0	0	9
Master's		8	9	6	3	3	6	4	2	0	2	3	2	48
Bachelor's		30	11	16	8	1	7	6	7	4	13	5	0	108
Two-Year College		0	0	0	0	0	0	1	1	0	1	0	0	3
Other Academic Dept.		7	3	2	5	3	56	15	3	1	6	6	0	107
Research Institute/ Other Nonprofit		3	0	0	3	0	10	0	1	0	0	0	0	17
Government		6	0	1	2	2	11	3	4	0	3	0	0	32
Business and Industry		9	5	2	8	4	49	11	5	3	1	0	0	97
Non-U.S. Academic		22	4	10	8	0	14	6	14	2	15	1	0	96
Non-U.S. Nonacademic		2	1	1	0	0	4	1	2	0	2	0	0	13
Not Seeking Employment		1	1	0	0	0	5	0	2	0	1	0	0	10
Still Seeking Employment		8	1	3	2	0	8	7	4	3	6	0	0	42
Unknown (U.S.)		11	10	9	8	0	34	17	8	1	6	1	4	109
Unknown (non-U.S.)*		12	8	9	6	5	19	14	6	0	4	1	0	84
TOTAL		160	71	92	68	29	273	107	71	21	98	20	7	1017
Column Subtotals	Male	124	58	67	52	21	161	75	54	18	72	6	5	713
	Female	36	13	25	16	8	112	32	17	3	26	14	2	304

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

**Table 4B: Employment Status of 2002-03 U.S. New Doctoral Recipients
in the Mathematical Sciences by Type of Degree-Granting Department**

TYPE OF EMPLOYER	TYPE OF DOCTORAL DEGREE-GRANTING DEPARTMENT						TOTAL	Row Subtotals Male Female	
	Group I (Public) Math.	Group I (Private) Math.	Group II Math.	Group III Math.	Group IV Statistics	Group Va Applied Math.			
Group I (Public)	44	19	9	2	0	4	78	59	19
Group I (Private)	18	23	1	0	2	3	47	38	9
Group II	17	5	23	3	2	3	53	39	14
Group III	2	1	5	10	4	3	25	19	6
Group IV	1	2	1	0	35	0	39	20	19
Group Va	1	0	0	0	1	7	9	6	3
Master's	8	1	19	14	6	0	48	25	23
Bachelor's	20	11	45	19	7	6	108	73	35
Two-Year College	0	0	3	0	0	0	3	1	2
Other Academic Dept.	10	8	11	12	52	14	107	66	41
Research Institute/ Other Nonprofit	2	6	0	0	9	0	17	8	9
Government	5	2	8	2	8	7	32	19	13
Business and Industry	19	13	5	8	45	7	97	74	23
Non-U.S. Academic	33	20	11	14	13	5	96	75	21
Non-U.S. Nonacademic	2	2	3	2	2	2	13	12	1
Not Seeking Employment	2	0	2	2	4	0	10	7	3
Still Seeking Employment	7	8	8	11	4	4	42	27	15
Unknown (U.S.)	34	8	9	13	31	14	109	81	28
Unknown (non-U.S.)*	33	9	7	9	14	12	84	64	20
TOTAL	258	138	170	121	239	91	1017	713	304
Column	Male	201	112	120	67	141	72	713	
Subtotals	Female	57	26	50	54	98	19	304	

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

Table 4C: Field of Thesis of 2002–03 New Doctoral Recipients by Type of Degree-Granting Department

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)	72	33	41	21	11	4	16	15	5	38	1	1	258
Group I (Private)	34	8	24	14	5	7	19	7	1	17	0	2	138
Group II	39	17	23	10	5	6	21	18	7	21	2	1	170
Group III	13	13	3	11	2	17	11	19	1	14	17	0	121
Group IV	0	0	0	0	4	230	2	0	0	0	0	3	239
Group Va	2	0	1	12	2	9	38	12	7	8	0	0	91
Column Total	160	71	92	68	29	273	107	71	21	98	20	7	1017

Table 5A: U.S. Employed 2002–03 New Doctoral Recipients by Type of Degree-Granting Department

U.S. EMPLOYER	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Groups I, II, III, IV, and Va	83	50	39	15	44	20	251
Master's, Bachelor's, and 2-Year Colleges	28	12	67	33	13	6	159
Other Academic and Research Institutes	12	14	11	12	61	14	124
Government	5	2	8	2	8	7	32
Business and Industry	19	13	5	8	45	7	97
Total	147	91	130	70	171	54	663

The 2002–03 numbers in Table 2 will be broken down in various ways, such as by sex, in later sections of this report. The names of the 1,017 new doctoral recipients are found on pages 246–263 of this issue of the *Notices*.

Employment Status of 2002–03 New Doctoral Recipients

Tables 4A, 4B, and 4C each provide a different cross-tabulation of the 1,017 new doctoral recipients in the mathematical sciences. These tables contain a wealth of information about these new doctoral recipients, some of which will be discussed in this report. Note that these tables give a breakdown by sex for type of employer, type of degree-granting department, and field of thesis. Keep in mind that the results in this report come

Table 5B: Number of New Doctoral Recipients Taking Positions in Business and Industry in the U.S. by Type of Degree-Granting Department, Fall 1999 to Fall 2003

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Fall 1999	28	19	23	19	57	14	160
Fall 2000	31	23	34	25	79	14	206
Fall 2001	24	15	25	21	59	24	168
Fall 2002	15	12	19	6	56	15	123
Fall 2003	19	13	5	8	45	7	97

from the departments giving the degrees and not from the degree recipients themselves. These tables will be revised using information from the doctoral recipients themselves and will appear in the 2003 Second Report in the August 2004 issue of the *Notices of the AMS*.

The last column (Total) in Table 4A can be used to find the overall unemployment rate. In this and other unemployment calculations in this report, the individuals whose employment status is not known (Unknown (U.S.) and Unknown (non-U.S.)) are first removed, and the unemployment fraction is the number still seeking employment divided

Table 5C: Number of New Doctoral Recipients Taking U.S. Academic Positions by Type of Degree-Granting Department, Fall 1999 to Fall 2003

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Fall 1999	157	87	130	70	82	38	564
Fall 2000	133	78	112	75	126	27	551
Fall 2001	146	70	109	74	84	27	510
Fall 2002	120	83	91	86	92	31	503
Fall 2003	123	76	117	60	118	40	534

by the total number of individuals left after the “Unknowns” are removed. The overall unemployment rate for these data is 5.1%. This figure will be updated later with information gathered from the individual new doctoral recipients. The figure for fall 2002 was 4.3%. Figure 2 shows how this unemployment rate compares with other years over the past decade. The unemployment rates, calculated using Table 4B, vary from group to group, with a high of 11.1% for Group III and lows of 2.1% and 3.7% for Groups IV and I (Public) respectively.

There are 663 new doctoral recipients employed in the U.S. Table 5A gives a breakdown of type of employer by type of degree-granting department for these 663 new doctoral recipients. Of these, 534 (81%) hold academic positions, 32 (5%) are employed by government, and 97 (15%) hold positions in business and industry.

Table 5D: U.S. Academic Positions Filled by New Doctoral Recipients by Type of Hiring Department, Fall 1999 to Fall 2003

Group	I-III	IV	Va	M&B	Other	TOTAL
Fall 1999	221	49	17	175	102	564
Fall 2000	209	46	13	158	125	551
Fall 2001	199	41	12	161	97	510
Fall 2002	213	46	7	138	99	503
Fall 2003	203	39	9	156	127	534

In the First Report for 2001-02, there were 664 new doctoral recipients employed in the U.S., of which 503 (76%) held academic positions, 38 (6%) were in government, and 123 (19%) were in business and industry. The number of new doctoral recipients employed in academic positions in the U.S. increased

Table 5E: Females as a Percentage of 2002-03 New Doctoral Recipients Produced by and Hired by Doctoral-Granting Groups

%	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Produced	22	19	29	45	41	21	30
Hired	24	19	26	24	49	33	28

in the two categories "Master's, Bachelor's, and Two-Year Colleges" and "Other Academic and Research Institutes", while the number employed in the category "Groups I, II, III, IV, and Va" decreased.

Table 5B shows the number of new doctoral recipients who took positions in business and industry by the type of department granting their degree for fall 1999 to fall 2003. The number of new doctoral recipients taking jobs in business and industry, which had been rising steadily in the

mid-1990s and oscillating in the late 1990s, has now had drops three consecutive years of 38 in fall 2001, 45 in fall 2002, and 26 in fall 2003. Among the 663 new doctoral recipients known to have employment in the U.S. in fall 2003, Group II has the smallest percentage taking jobs in business and industry at 4% and Group IV the highest at 26%.

Table 5C shows the number of new doctoral recipients who took academic positions in the U.S. by type of department granting their degree for fall 1999 to fall 2003. It also shows a moderate rebound in the total number of new doctoral recipients taking academic employment in fall 2003, compared with the previous two years. Among the 663 new doctoral recipients employed in the U.S. in fall 2003, 81% have academic positions. This percentage is highest for Group II at 90% and lowest for Groups IV at 69% and Va at 74%.

Table 5D shows how many positions were filled with new doctoral recipients for each type of academic employer. All of the increase in positions filled by new doctoral recipients was accounted for by Groups M, B, and "Other Academic and Research Institutes".

Table 5G: 2002-03 New Doctoral Recipients Having Employment in the U.S. by Type of Employer and Citizenship

U.S. EMPLOYER	CITIZENSHIP		TOTAL
	U.S.	Non-U.S.	
Academic, Groups I-Va	130	121	251
Academic, Other	173	110	283
Nonacademic	73	56	129
Total	376	287	663

Table 5F: Employment Status of 2002-03 U.S. New Doctoral Recipients by Citizenship Status

	CITIZENSHIP				TOTAL
TYPE OF EMPLOYER	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	376	30	231	26	663
U.S. Academic	303	25	187	19	534
Groups I, II, III, and Va	108	7	86	11	212
Group IV	22	2	14	1	39
Non-Ph.D. Department	165	16	79	6	266
Research Institute/Other Nonprofit	8	0	8	1	17
U.S. Nonacademic	73	5	44	7	129
Non-U.S. Employer	13	1	93	2	109
Non-U.S. Academic	11	1	83	1	96
Non-U.S. Nonacademic	2	0	10	1	13
Not Seeking Employment	8	0	2	0	10
Still Seeking Employment	22	6	14	0	42
SUBTOTAL	419	37	340	28	824
Unknown (U.S.)	69	11	25	4	109
Unknown (non-U.S.)*	1	0	65	18	84
TOTAL	489	48	430	50	1017

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

Table 6: Sex, Race/Ethnicity, and Citizenship of 2002–03 U.S. New Doctoral Recipients

RACIAL/ETHNIC GROUP	MALE					FEMALE					TOTAL
	U.S. CITIZENS	NON-U.S. CITIZENS			Total Male	U.S. CITIZENS	NON-U.S. CITIZENS			Total Female	
		Permanent Visa	Temporary Visa	Unknown Visa			Permanent Visa	Temporary Visa	Unknown Visa		
American Indian or Alaska Native	1	0	3	0	4	0	0	0	1	1	5
Asian	13	6	147	17	183	11	8	56	6	81	264
Black or African American	8	3	9	0	20	8	2	0	0	10	30
Hispanic or Latino	7	1	30	3	41	5	2	10	1	18	59
Native Hawaiian or Other Pacific Islander	0	0	0	0	0	0	0	0	0	0	0
White	277	14	128	14	433	128	11	42	5	186	619
Unknown	26	0	5	1	32	5	1	0	2	8	40
TOTAL	332	24	322	35	713	157	24	108	15	304	1017

In fall 2003, 60 new doctoral recipients held positions in the institution that granted their degree, although not necessarily in the same department. This represents 8% of new doctoral recipients who are currently employed and 11% of the U.S. academic positions held by new doctoral recipients. In fall 2002 there were 61 such individuals making up 8% of the new doctoral recipients who were employed at the time of the First Report. Ten new doctoral recipients have taken part-time positions in fall 2003 compared with 9 in fall 2002.

Information about 2002–03 Female New Doctoral Recipients

Tables 4A and 4B give male and female breakdowns of the new doctoral recipients in 2002–03 by Field of Thesis, by Type of Degree-Granting Department, and by Type of Employer.

Overall, 304 (30%) of the 1,017 new doctoral recipients in 2002–03 are female. In 2001–02, 290 (31%) of the new doctoral recipients were female. This percentage varies over the different groups, and these percentages are given in the first row of Table 5E. This year the percentage of females produced is highest for Group III at 45%, while last year it was highest in Group IV. While the lowest percentage last year was for Group Va at 20%, this year it is for Group I (Pr) at 19%.

The second row of Table 5E gives the percentage of the new doctoral recipients hired who are female for each of the Groups I, II, III, IV, and Va. In addition, 48% of the new doctoral recipients hired in Group M, master's departments, are female; 32% of the new doctoral recipients hired in Group B, bachelor's departments, are female; and 24% of new doctoral recipients hired in business and industry are female.

The unemployment rate for female new doctoral recipients is 6% compared to 5% for males and 5.1% overall.

The percentage of female new doctoral recipients within fields of thesis ranged from 14% in optimization/control to 41% in statistics and 70% in mathematics education.

Later sections in this First Report give more information about the female new doctoral recipients by citizenship and the female new doctoral recipients in Group IV.

Employment Information about 2002–03 New Doctoral Recipients by Citizenship and Type of Employer

Table 5F shows the pattern of employment within employer categories broken down by citizenship status of the new doctoral recipients.

The unemployment rate for the 489 U.S. citizens is 5.3% compared to 4.8% in fall 2002. The unemployment rate for non-U.S. citizens is 4.9%. This varies by type of visa. The unemployment rate for non-U.S. citizens with a permanent visa is 16.2%, while that for non-U.S. citizens with a temporary visa is 4.1%. Last year the unemployment rate for non-U.S. citizens with a permanent visa was only 5.1%, but since this category has a relatively small number of people, this percentage can show much variability.

Among U.S. citizens whose employment status is known, 90% are employed in the U.S. Among non-U.S. citizens with a permanent visa whose employment status is known, 81% have jobs in the U.S., while the percentage for non-U.S. citizens with a temporary visa is 68%.

Table 5G is a cross-tabulation of the 663 new doctoral recipients who have employment in the U.S. by citizenship and broad employment categories, using numbers from Table 5F. Of the 663 new doctoral recipients having jobs in the U.S., 57% are U.S. citizens. Of the 251 new doctoral recipients who took jobs in U.S. doctoral-granting departments, 52% are U.S. citizens. Of the 283 who took other academic positions, 61% are U.S.

Table 7: U.S. Citizen Doctoral Recipients

Year	Total Doctorates Granted by U.S. Institutions	Total U.S. Citizen Doctoral Recipients	%
1980-81	839	567	68
1985-86	755	386	51
1990-91	1061	461	43
1995-96	1150	493	43
1996-97	1158	516	45
1997-98	1216	586	48
1998-99*	1133	554	49
1999-00	1119	537	48
2000-01	1008	494	49
2001-02	948	418	44
2002-03	1017	489	48

*Prior to 1998-99, the counts include new doctoral recipients from Group Vb. In addition, prior to 1982-83, the counts include recipients from computer science departments.

citizens. Of the 129 who took nonacademic positions, 57% are U.S. citizens. Of the 376 U.S. citizens employed in the U.S., 35% have jobs in a doctoral-granting department, 46% are in other academic positions, and 19% are in nonacademic positions. For the 287 non-U.S. citizens employed in the U.S., the analogous percentages are 42%, 38%, and 20% respectively.

Sex, Race/Ethnicity, and Citizenship Status of 2002-03 New Doctoral Recipients

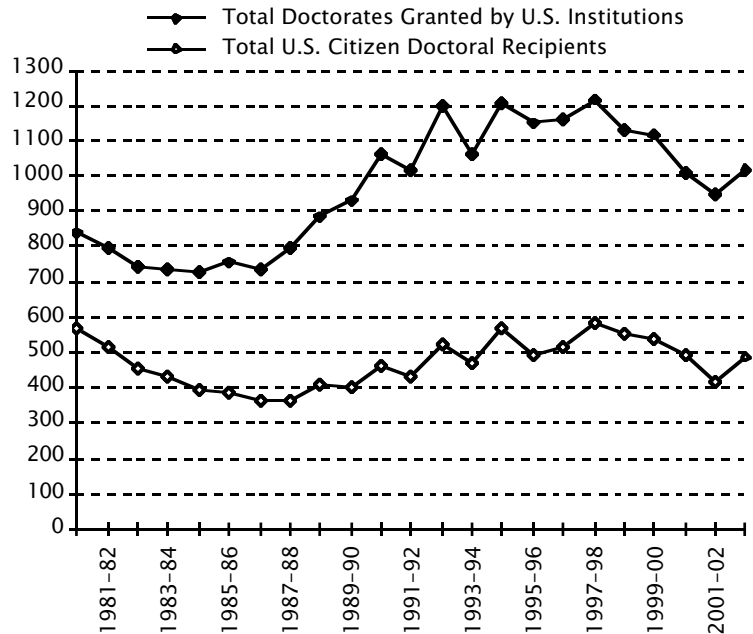
Table 6 presents a breakdown of new doctoral recipients according to sex, racial/ethnic group, and citizenship status. The information reported in this table was obtained in summary form from the departments granting the degrees.

There were 489 (48%) U.S. citizens among the 1,017 new doctoral recipients in 2002-03. Among U.S. citizens, 1 is American Indian or Alaska Native (male),

Table 8: U.S. Citizen Doctoral Recipients by Sex

Year	Total U.S. Citizen Doctoral Recipients	Male	Female	% Female
1980-81	567	465	102	18
1985-86	386	304	82	21
1990-91	461	349	112	24
1995-96	493	377	116	24
1996-97	516	368	148	29
1997-98	586	423	163	28
1998-99*	554	367	187	34
1999-00	537	379	158	29
2000-01	494	343	151	31
2001-02	418	291	127	30
2002-03	489	332	157	32

*Prior to 1998-99, the counts include new doctoral recipients from Group Vb. In addition, prior to 1982-83, the counts include recipients from computer science departments.

Figure 3: U.S. Citizen Doctoral Recipients

24 are Asian (13 males and 11 females), 16 are Black or African American (8 males and 8 females), 12 are Hispanic or Latino (7 males and 5 females), 405 are White (277 males and 128 females), and 31 are other. Among non-U.S. citizens, there are 4 American Indians or Alaska Natives, 240 Asians, 14 Blacks or African Americans, 47 Hispanics or Latinos, 214 Whites, and 9 other.

Table 7 and Figure 3 give the number of new U.S. doctoral recipients and the number of U.S. citizens back to 1980-81. The 489 U.S. citizen new doctoral recipients is down by 97 (20%) since 1997-98. The

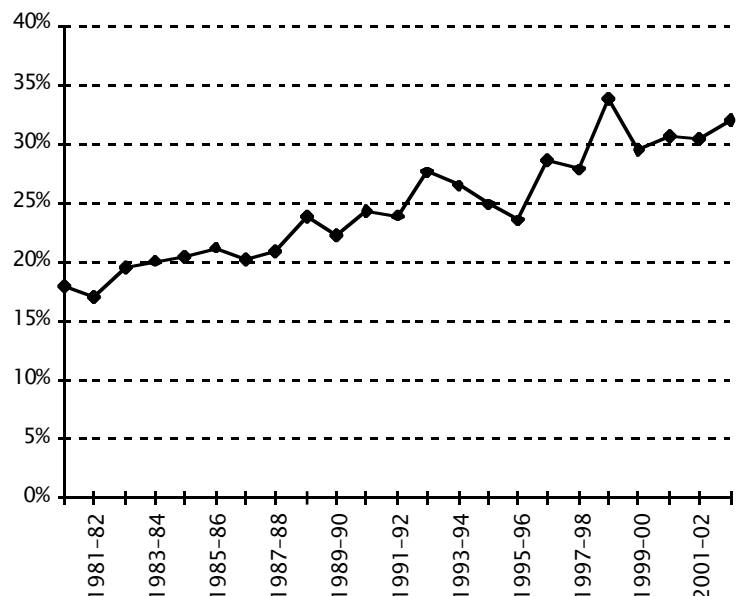
Figure 4: Females as a Percentage of U.S. Citizen New Doctoral Recipients

Table 9: Sex and Citizenship of 2002–03 New Doctoral Recipients by Granting Department

CITIZENSHIP	GROUP												TOTAL	
	I (Pu)		I (Pr)		II		III		IV		Va			
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
U.S.	89	28	50	11	63	29	29	27	59	50	42	12	332	157
Non-U.S.	112	29	62	15	57	21	38	27	82	48	30	7	381	147
TOTAL	201	57	112	26	120	50	67	54	141	98	72	19	713	304

percentage of U.S. citizens, which dropped last year to 44% after remaining steady at 48%–49% during 1997–2001, has increased to 48% this year.

Females make up 32% of the 489 U.S. citizens receiving doctoral degrees in the mathematical sciences in 2002–03. Last year this percentage was 30%, and in 1998–99 it was 34%, the highest percentage of females among U.S. citizen new doctoral recipients ever reported by the Annual Survey. Among the 528 non-U.S. citizen new doctoral recipients, 147 (28%) are female, down from last year's 31%.

Table 8 and Figure 4 give the historical record of U.S. citizen new doctoral recipients, broken down by male and female for past years, going back to 1980–81. The number of male U.S. citizen new doctoral recipients increased by 41 from 2001–02 but is down by 91 (21%) from 1997–98. The number of female U.S. citizen new doctoral recipients is down 30 (16%) from an all-time high of 187 in 1998–99.

Table 9 gives a sex and citizenship breakdown of the new doctorates within each of the six types of doctoral-granting departments. Among all 1,017 new doctoral recipients, 46% of the males and 52% of the females are U.S. citizens. Within the groups the percentage of the new doctoral recipients who are U.S. citizens is lowest in Group I (Pr) at 44% and highest in Group Va at 59%. Groups II and Va are the only groups to have more U.S. citizen than non-U.S. citizen new doctoral recipients in 2002–03.

2002–03 New Doctoral Recipients with Dissertations in Statistics/Biostatistics and Probability

Group IV contains U.S. departments (or programs) of statistics, biostatistics, and biometrics reporting a doctoral program. In the Annual Survey Reports, Group IV is referred to as the Statistics Group. In addition, other groups in the Annual Survey produce new doctoral recipients with dissertations in statistics/biostatistics and probability. The other groups produced 68 new doctoral recipients with dissertations in statistics/biostatistics and probability in 2002–03 and have averaged 79 per year over the past seven years. Information about these 68 new doctoral recipients and the 239 new doctoral recipients in Group IV is found in this section of the report.

For eight years substantial effort has gone into making Group IV an appropriate set of departments for the Annual Survey and increasing the number of Group IV departments that respond to the Annual Survey. Table 10 contains information about new doctoral recipients in Group IV as well as those with dissertations in statistics/biostatistics and probability in other groups for the past seven years. The last two rows of Table 10 give a split of the 2002–03 results between the 55 statistics departments and the 31 biostatistics and biometrics departments in Group IV. Quite a bit of the variation in numbers from year to year in this table is due to the changes made in the departments in Group IV over the seven years and to the relatively low response rate for this group. At the time

Table 10: Information about New Doctoral Recipients with Dissertations in Statistics/Biostatistics and Probability

Year	Depts Surveyed	Depts Responding (percent)	New Doctoral Recipients in Group IV				New Doctoral Recipients in Statistics/Biostatistics and Probability				New Doctoral Recipients Hired by Group IV	
			Total	Female (percent)	Jobs in Bus & Ind	Percentage Unemployed	Total	Group IV	Other Groups	Percentage Unemployed	Male	Female
1996–97	81	60 (74)	197	74 (38)	70	4.2	292	187	105	5.1	24	9
1997–98	82	59 (72)	213	73 (34)	70	3.2	294	199	95	3.7	25	10
1998–99	91	72 (79)	243	87 (36)	57	4.9	320	240	80	5.8	29	20
1999–00	89	75 (84)	284	110 (39)	79	2.4	351	278	73	2.0	24	22
2000–01	86	70 (81)	237	98 (41)	59	5.1	289	221	68	5.3	27	14
2001–02	86	72 (84)	222	92 (41)	56	6.0	288	221	67	5.0	31	15
2002–03	86	74 (86)	239	98 (41)	45	2.0	302	234*	68**	3.0	20	19
Statistics	55	51 (93)	175	61 (35)	39	2.0					13	12
Biostatistics	31	23 (74)	64	37 (58)	6	1.0					7	7

* Of 234, there were 230 in statistics/biostatistics and 4 in probability. For complete details, see Table 4C.

** Of 68, there were 43 in statistics/biostatistics and 25 in probability. For complete details, see Table 4C.

of the Second Report last year, 77 of 86 (90%) of Group IV departments had responded, which is the largest percentage ever.

Group IV has 86 departments for 2002–03, 13 more than the next largest doctoral group. It contains 30% of all doctoral departments surveyed, and the 74 Group IV departments responding to the Annual Survey reported 239 new doctoral recipients, 24% of all new doctoral recipients in 2002–03. The number of new doctoral recipients in Group IV is up 17 from the number reported at this time last year, the number of departments responding is also up two from the number responding by this time last year.

Because of its size, the data from Group IV have a large effect on the results when all doctoral groups are combined. Furthermore, Group IV results are often quite different from those for Groups I (Pu), I (Pr), II, III, and Va. Group IV results can mask important changes in the other doctoral groups. In the following paragraphs some of these differences are presented.

Table 9 shows that for the Group IV new doctoral recipients, 98 of 239 (41%) are female, while 206 of 778 (26%) are female in the other doctoral groups. Among U.S. citizens, females accounted for 50 of the 109 (46%) Group IV new doctoral recipients, while for the other groups 107 of 380 (28%) were female. Overall, 157 of 489 (32%) U.S. citizen new doctoral recipients were female.

In Group IV, 109 of 239 (46%) new doctoral recipients are U.S. citizens, while in other groups 380 of 778 (49%) are U.S. citizens.

Of the 171 new doctoral recipients from Group IV who found employment in the U.S., 45 (26%) took jobs in business or industry. From the other groups, 492 new doctoral recipients found employment in the U.S., of which 52 (11%) took jobs in business or industry.

The employment status for 194 Group IV new doctoral recipients is known, and 4 (2.1%) are unemployed. For the other groups, the employment status of 630 is known, and 38 (6.0%) are unemployed. Nineteen of 39 (49%) new doctoral recipients hired by Group IV departments were female, up from last year's 33% but comparable to the 48% reported in 1999–2000. The other doctoral groups reported that 51 of 212 (24%) new doctoral recipients hired were female, down from last year's 27% but significantly more than the 16% reported in 1999–2000.

Group IV had 234 new doctoral recipients with fields of thesis in statistics/biostatistics (230) and probability (4), and the other doctoral departments had 68 with field of thesis in statistics/biostatistics (43) and probability (25). The distribution of these 68 degrees among the various groups can be found in Table 4C. The number of new doctoral recipients with theses in statistics/biostatistics and probability (302) is substantially larger than any

other field, with algebra and number theory next with 160.

Faculty Salary Survey

The charts on the following pages display faculty salary data for Groups I (Pu), I (Pr), II, III, IV (Statistics), IV (Biostatistics), Va, M, and B: faculty salary distribution by rank, mean salaries by rank, information on quartiles by rank, and the number of returns for the group. Results reported here are summaries based on the departments who responded to this portion of the Annual Survey. This is the second year that salary information has been reported separately for statistics departments and biostatistics and biometrics departments in Group IV.

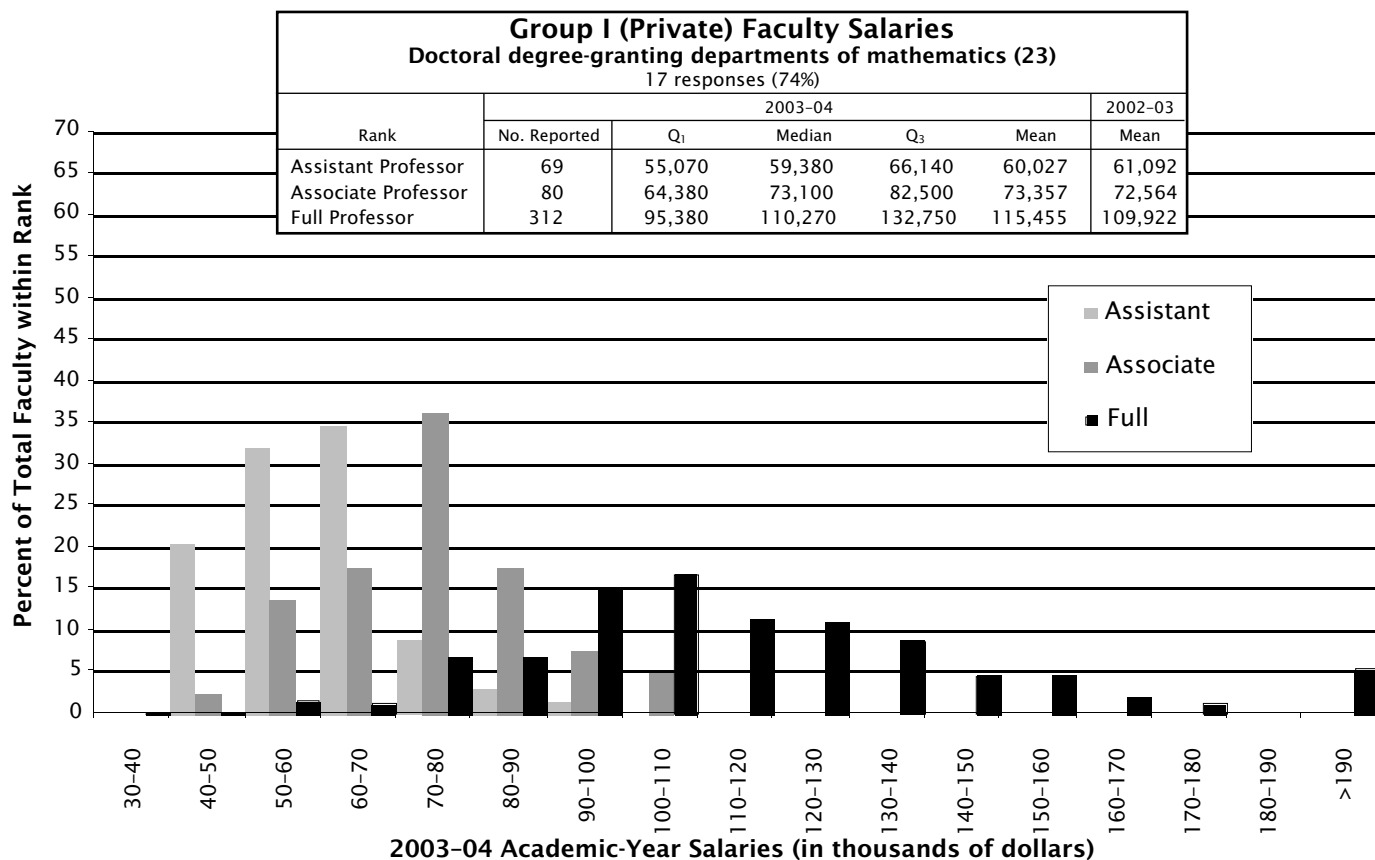
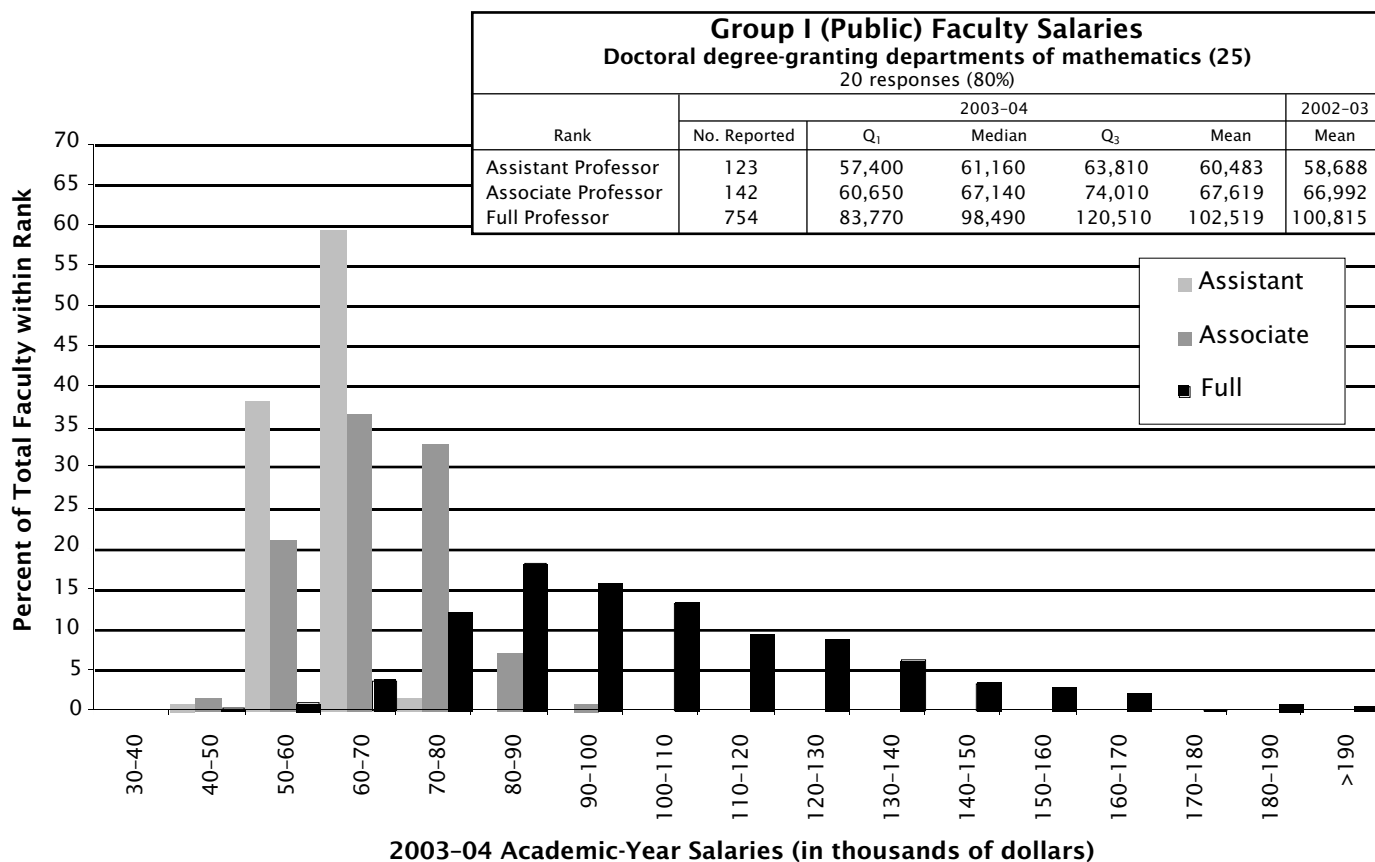
Table 11 provides the departmental response rates for the 2003 Faculty Salary Survey. Departments were asked to report for each rank the number of tenured and tenure-track faculty whose 2003–04 academic-year salaries fell within given salary intervals. Reporting salary data in this fashion eliminates some of the concerns about confidentiality but does not permit determination of actual quartiles. Although the actual quartiles cannot be determined from the data gathered, these quartiles have been estimated assuming that the density over each interval is uniform.

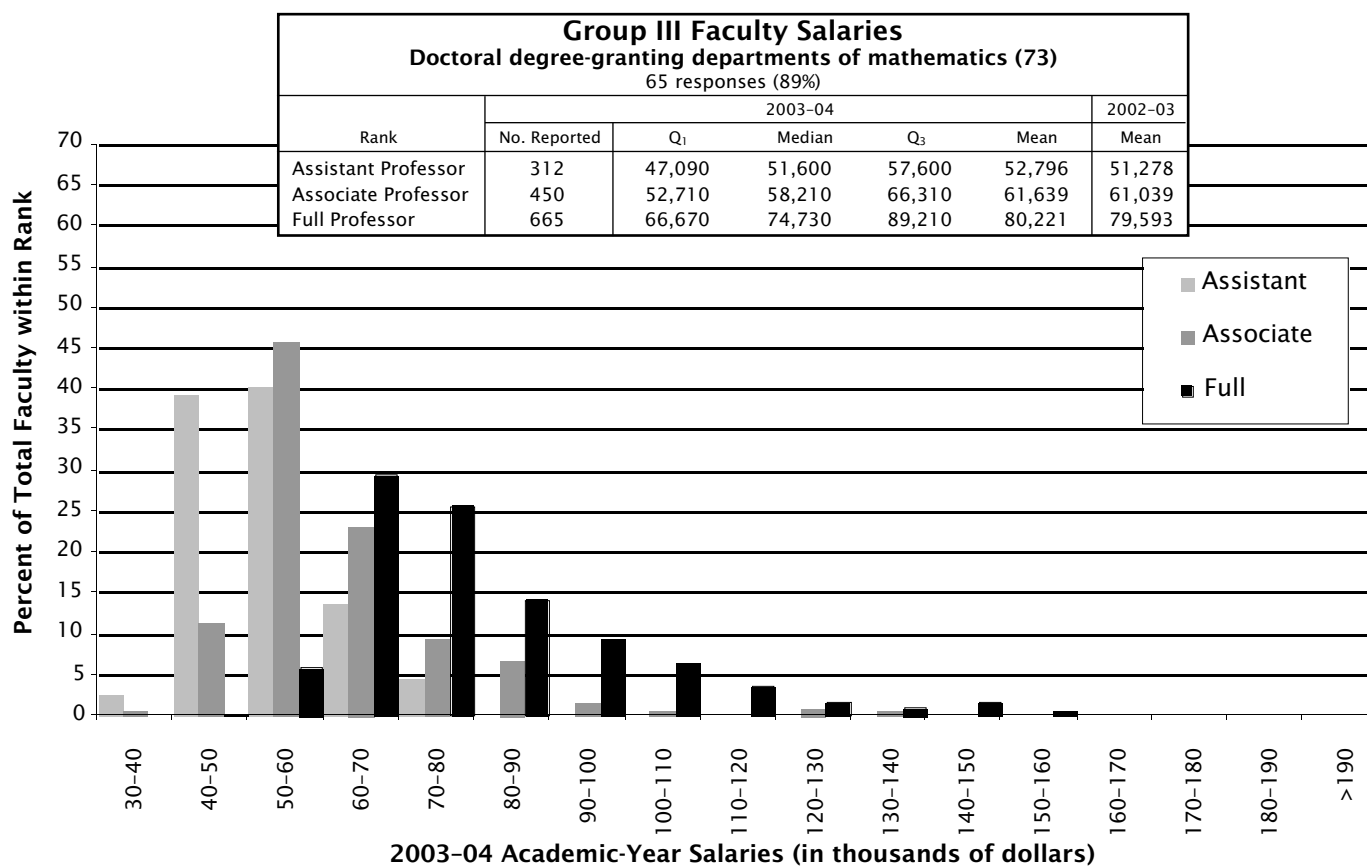
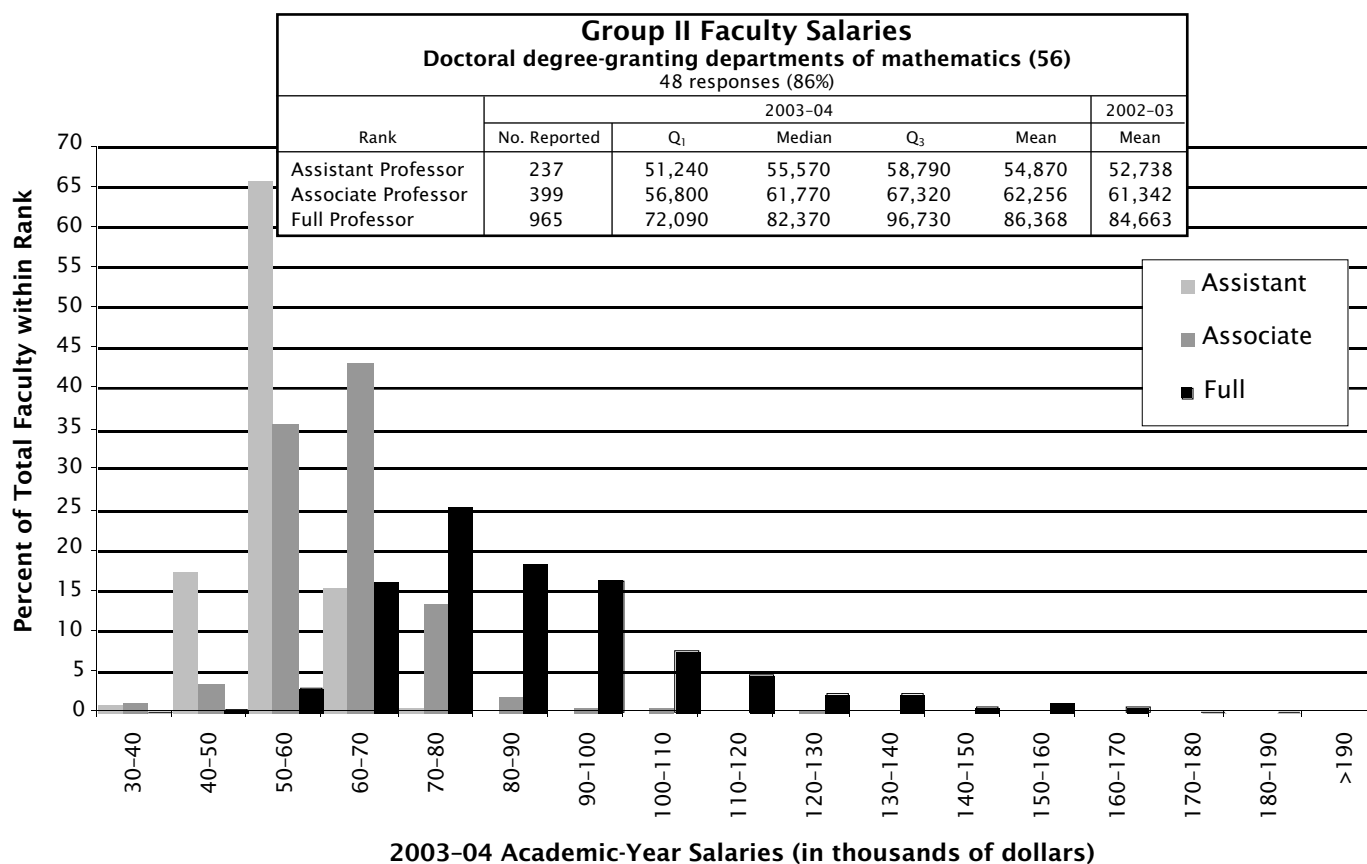
Table 11: Faculty Salary Response Rates

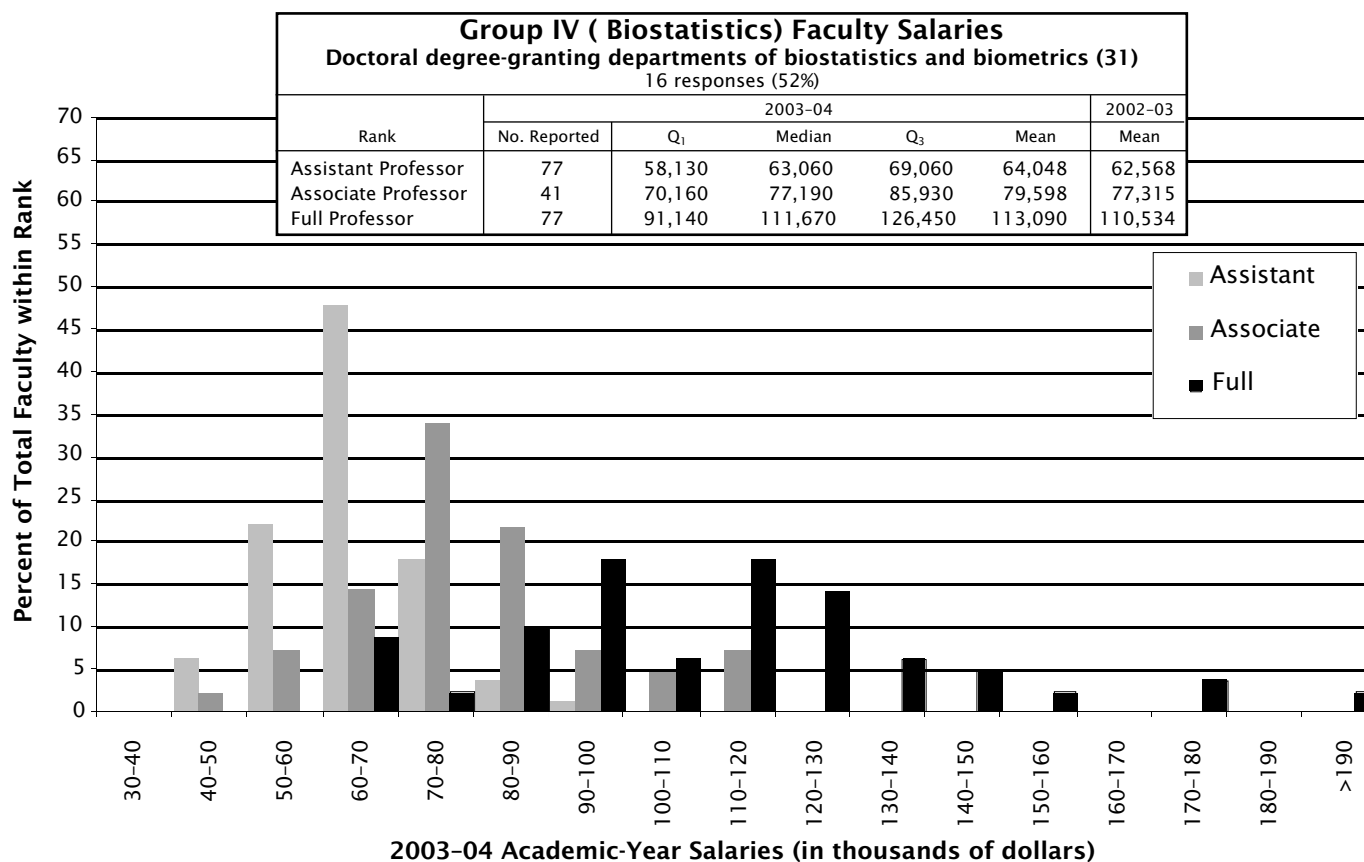
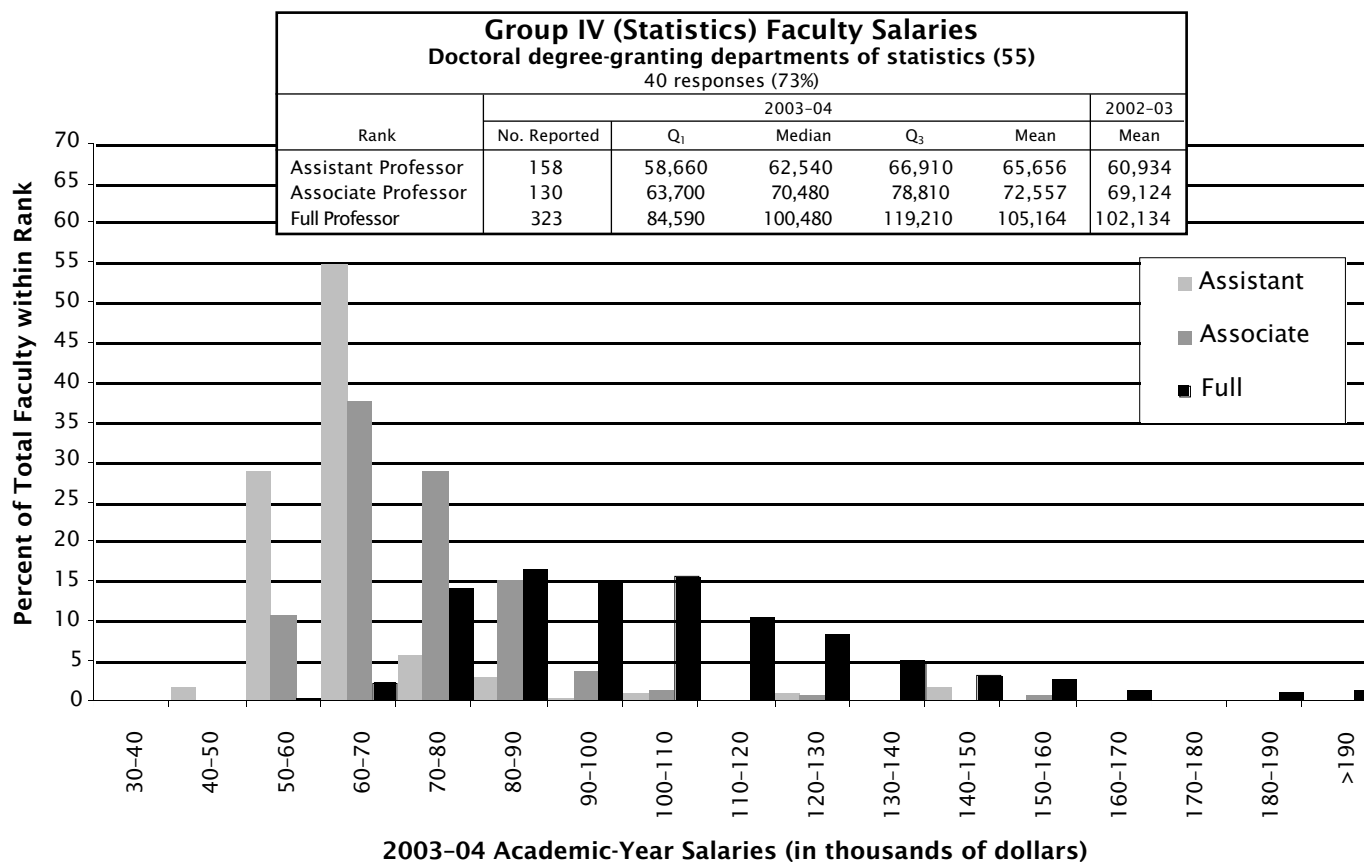
Department	Number	Percent
Group I (Public)	20 of 25	80
Group I (Private)	17 of 23	74
Group II	48 of 56	86
Group III	65 of 73	89
Group IV (Statistics)	40 of 55	73
Group IV (Biostatistics)	16 of 31	52
Group Va	12 of 18*	67
Group M	107 of 192	56
Group B	371 of 1028	36

* The population for Group Va is slightly less than for the Doctorates Granted Survey, because some departments grant degrees but do not formally "house" faculty and their salaries.

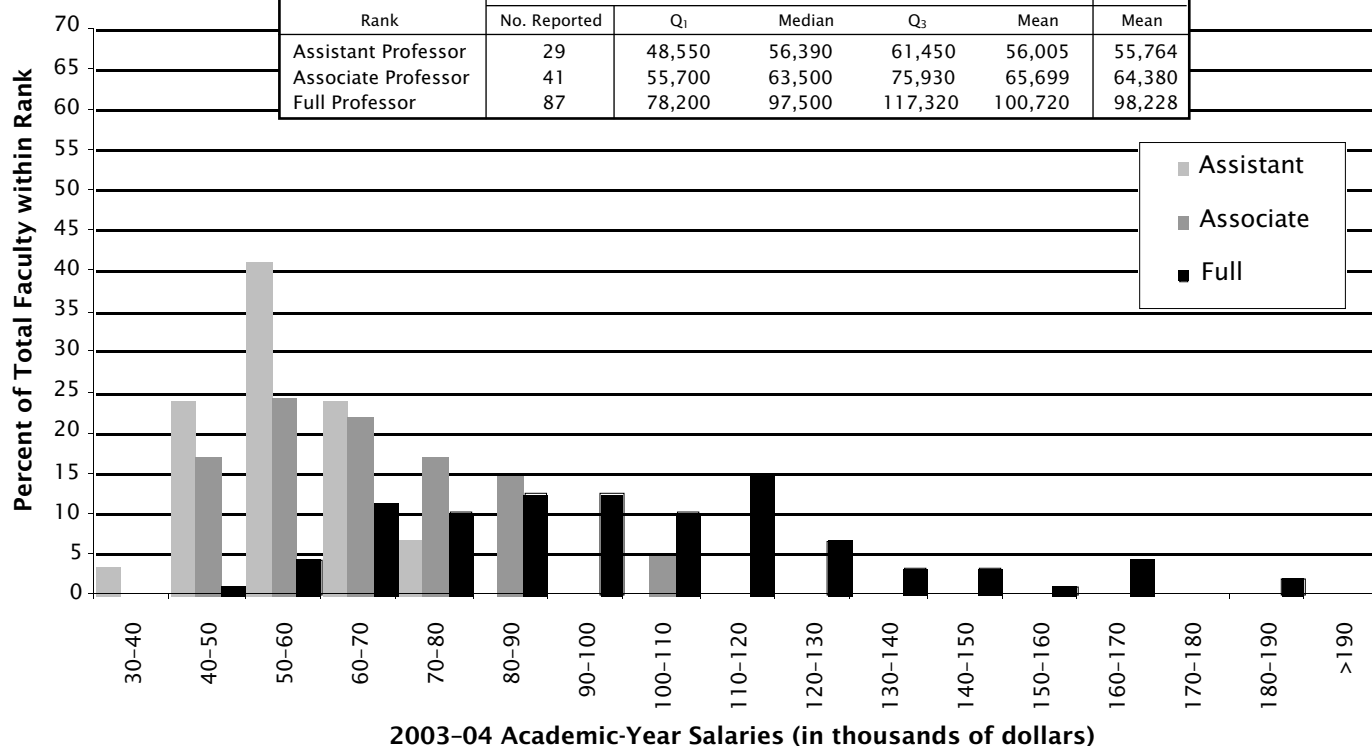
Since departments in Groups I, II, and III were changed in 1995–96 (see definitions of the groups on page 233), comparisons are possible only to the last six years' data. In addition, prior to the 1998 survey Groups Va and Vb were reported together as Group V.



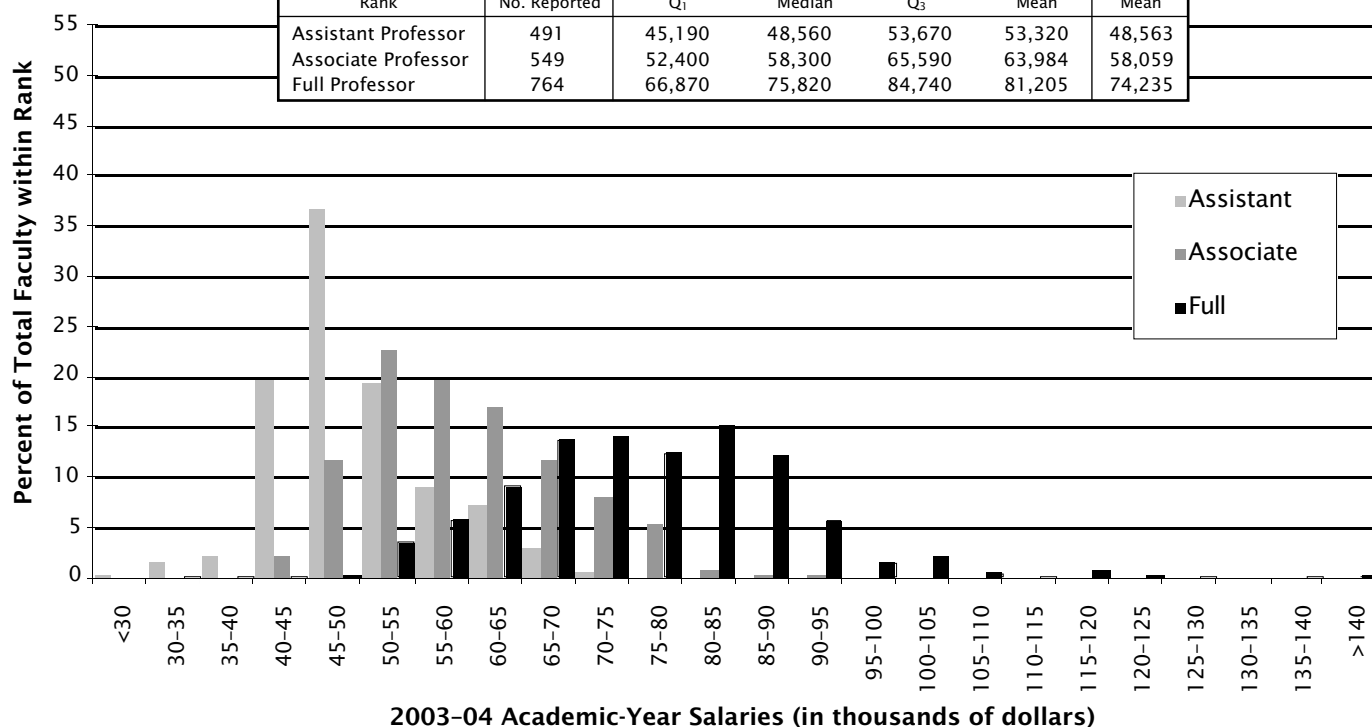


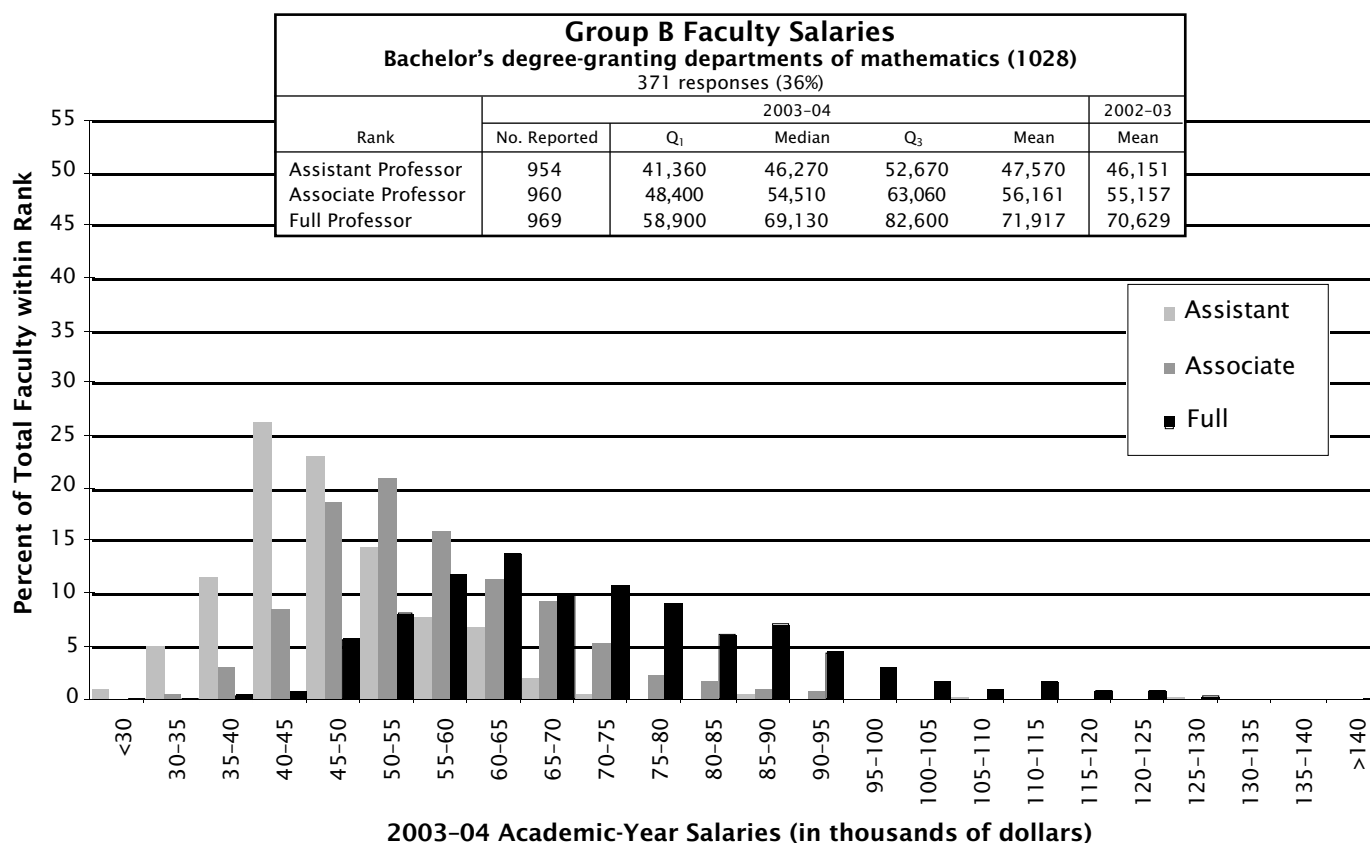


Group Va Faculty Salaries						
Doctoral degree-granting departments of applied mathematics (18)						
12 responses (67%)						
Rank	2003-04					2002-03
	No. Reported	Q ₁	Median	Q ₃	Mean	Mean
Assistant Professor	29	48,550	56,390	61,450	56,005	55,764
Associate Professor	41	55,700	63,500	75,930	65,699	64,380
Full Professor	87	78,200	97,500	117,320	100,720	98,228



Group M Faculty Salaries						
Master's degree-granting departments of mathematics (192)						
107 responses (56%)						
Rank	2003-04					2002-03
	No. Reported	Q ₁	Median	Q ₃	Mean	Mean
Assistant Professor	491	45,190	48,560	53,670	53,320	48,563
Associate Professor	549	52,400	58,300	65,590	63,984	58,059
Full Professor	764	66,870	75,820	84,740	81,205	74,235





Previous Annual Survey Reports

The 2002 First, Second, and Third Annual Survey Reports were published in the *Notices of the AMS* in the February, August, and September 2003 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.

Acknowledgments

The Annual Survey attempts to provide an accurate appraisal and analysis of various aspects of the academic mathematical sciences scene for the use and benefit of the community and for filling the information needs of the professional organizations. Every year, college and university departments in the United States are invited to respond. The Annual Survey relies heavily on the conscientious efforts of the dedicated staff members of these departments for the quality of its information. On behalf of the Annual Survey Data Committee and the Annual Survey Staff, we thank the many secretarial and administrative staff members in the mathematical sciences departments for their cooperation and assistance in responding to the survey questionnaires.

Other Data Sources

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—, *Science and Engineering Degrees, by Race/Ethnicity of Recipient: 1991–2000* (NSF 02-329), Detailed Statistical Tables, Arlington, VA, 2002.

—, *Science and Engineering Doctorate Awards: 2001* (NSF 03-300), Detailed Statistical Tables, Arlington, VA, 2002.

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—, *Who Is Unemployed? Factors Affecting Unemployment among Individuals with Degrees in Science and Engineering*, Higher Education Surveys Report (NSF 97-336), Arlington, VA, 1997.

Definitions of the Groups

As has been the case for a number of years, much of the data in these reports is presented for departments divided into groups according to several characteristics, the principal one being the highest degree offered in the mathematical sciences. Doctoral-granting departments of mathematics are further subdivided according to their ranking of “scholarly quality of program faculty” as reported in the 1995 publication *Research-Doctorate Programs in the United States: Continuity and Change*.¹ These rankings update those reported in a previous study published in 1982.² Consequently, the departments which now comprise Groups I, II, and III differ significantly from those used prior to the 1996 survey.

The subdivision of the Group I institutions into Group I Public and Group I Private was new for the 1996 survey. With the increase in number of the Group I departments from 39 to 48, the Annual Survey Data Committee judged that a further subdivision of public and private would provide more meaningful reporting of the data for these departments.

Brief descriptions of the groupings are as follows:

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

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

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

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

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

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

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

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

Listings of the actual departments which comprise these groups are available on the AMS website at www.ams.org/employment/.

¹Research-Doctorate Programs in the United States: Continuity and Change, edited by Marvin L. Goldberger, Brendan A. Maher, and Pamela Ebert Flattau, National Academy Press, Washington, DC, 1995.

²These findings were published in An Assessment of Research-Doctorate Programs in the United States: Mathematical and Physical Sciences, edited by Lyle V. Jones, Gardner Lindzey, and Porter E. Coggeshall, National Academy Press, Washington, DC, 1982. The information on mathematics, statistics, and computer science was presented in digest form in the April 1983 issue of the Notices of the AMS, pages 257–67, and an analysis of the classifications was given in the June 1983 Notices of the AMS, pages 392–3.