

2004 Annual Survey of the Mathematical Sciences

(First Report)

Report on the 2003–2004 New Doctoral Recipients Faculty Salary Survey

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

The First Report of the 2004 Annual Survey gives a broad picture of 2003–04 new doctoral recipients from U.S. departments in the mathematical sciences, including their employment status in fall 2004. 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 2004. A follow-up questionnaire was distributed to the individual new doctoral recipients in October 2004. 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 2004 Annual Survey in the August 2005 issue of the *Notices of the AMS*. Another questionnaire concerned with data on fall 2004 course enrollments, majors, graduate students, and departmental faculty was distributed to departments in September 2004. Results from this questionnaire will appear in the Third Report of the 2004 Annual Survey in the September 2005 issue of the *Notices of the AMS*.

The 2004 Annual Survey represents the forty-eighth in an annual series begun in 1957 by the American Mathematical Society. The 2004 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, Nicholas M. Ercolani, J. Douglas Faires, Alexander Hahn, Naresh Jain, Stephen F. Kennedy, Ellen E. Kirkman (chair), David J. Lutzer, James W. Maxwell (ex officio), and Polly Phipps. The committee is assisted by AMS survey analyst Colleen Rose. Comments or suggestions regarding this Survey Report may be directed to the members of the Data Committee.

Report on the 2003–2004 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, 2003, through June 30, 2004. It includes a preliminary analysis of the fall 2004 employment plans of 2003–04 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)	24 of 25 including 0 with 0 degrees
Group I (Pr)	22 of 23 including 0 with 0 degrees
Group II	52 of 56 including 4 with 0 degrees
Group III	70 of 73 including 21 with 0 degrees
Group IV	65 of 87 including 7 with 0 degrees
Group Va	20 of 23 including 1 with 0 degrees

See "Definitions of the Groups" on page 251.

Table 1 provides the departmental response rates for the 2004 Survey of New Doctoral Recipients. See page 251 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 2004 Annual Survey using information gathered from the new doctoral recipients. The Second Report will appear in the August 2005 issue of the *Notices of the AMS*.

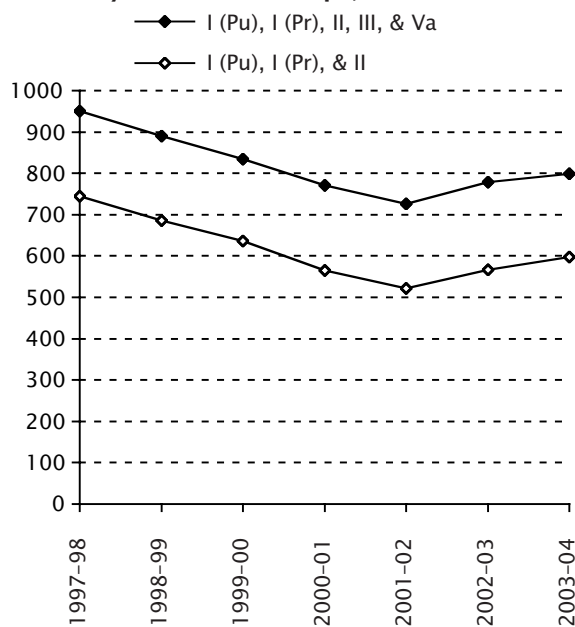
Changes in the Annual Survey occur over time, and these changes need to be considered when comparing results in this report to those in prior years. Information about changes that occurred in 1997 or later can be found in the First Report for the 2000 Annual Survey in the February 2001 issue of the *Notices 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
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
2003-04	195	187	215	111	243	90	1041

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



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Highlights

- There were 1,041 new doctoral recipients reported for 2003-04 by departments responding in time for the 2004 First Report.
- Group I (Pu) reported the smallest number of new doctoral recipients in the last 10 years (down 40% from 1995-96 figure). The number of new doctoral recipients from Groups I (Pu), I (Pr), and II combined has increased from 566 in 2002-03 to 597 this year, an increase of 31 (5%).
- Only 441 (42%) of the new doctoral recipients for 2003-04 are U.S. citizens, a decrease of 48 (10%) from 2002-03 and down 145 (25%) from 586 in 1997-98. The percentage of new doctoral recipients who are U.S. citizens is the lowest percentage observed in the past nine years.
- Based on responses from departments alone, the fall 2004 unemployment rate for the 914 new doctoral recipients whose employment status is known is 5.7%, up from 5.1% for fall 2003.
- Fifty-eight new doctoral recipients hold positions at the institution that granted their degree, although not necessarily in the same department. This is 7% of the new doctoral recipients who are currently known to have jobs and 9% of those who have academic positions in the U.S. Nineteen new doctoral recipients have part-time positions.
- The number of new doctoral recipients employed in the U.S. is 739, up 76 from last year. The number of new doctoral recipients employed in academic positions in the U.S. increased to 614 (a nine-year high) from 534 last year (a 15% increase); there were increases in the categories of the doctoral-employing institutions (combined), but the Master's and Bachelor's institutions hired 2 fewer new doctoral recipients than last year.
- Of the 739 new doctoral recipients taking positions in the U.S., 99 (13%) have jobs in business and industry; the number of new doctoral recipients taking jobs in business and industry, after oscillating in the late 1990s, declined three consecutive years by 38 in fall 2001, 45 in fall 2002, and 26 in fall 2003 before showing a slight increase of 2 in fall 2004. The number of new doctoral recipients taking jobs in government is down 6 (19%) over fall 2003.
- Among the 739 new doctoral recipients having employment in the U.S., 338 (46%) are U.S. citizens (down from 376 (57%) last year). The number of non-U.S. citizens having employment in the U.S. is 401, up 40% from 287 last year.
- Among the 302 new doctoral recipients hired by U.S. doctoral-granting departments, 38% are U.S. citizens (down from 52% last year). Among the 312 having other academic positions in the U.S., 53% are U.S. citizens.
- Of the 1,041 new doctoral recipients, 315 (30%) are females, up just 11 from fall 2003. Of the 441 U.S. citizen new doctoral recipients, 145 (33%) are females, down 12 from fall 2003. The all-time high was 187 in fall 1998.
- Among the 441 U.S. citizen new doctoral recipients, 5 are American Indian or Alaska Native, 23 are Asian, 12 are Black or African American, 13 are Hispanic or Latino, 386 are White, and 2 are Native Hawaiian or Other Pacific Islander.
- Group IV produced 243 new doctorates, of which 97 (40%) are females, compared to all other groups combined, where 218 (27%) are females. In Group IV, 81 (31%) of the new doctoral recipients are U.S. citizens (while in the other groups 45% are U.S. citizens).
- Three hundred eighteen new doctorates had a dissertation in statistics/ biostatistics (289) and probability (29). The next highest number was in algebra and number theory with 144. Those with dissertations in statistics/biostatistics and probability accounted for 31% of the new doctorates in 2003-04.

Table 3: Full-Time Graduate Students in Groups I, II, III, & Va, Fall 1994 to Fall 2003

GRADUATE STUDENTS	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total full-time	10185	9761	9476	9003	8791	8838	9637	9361	9972	9731
First-year full-time	2668	2601	2443	2386	2458	2664	2839	2875	2996	3612
U.S. citizen full-time	5945	5623	5445	4947	4831	4668	5085	4631	5055	5168
First-year U.S. citizen full-time	1664	1551	1465	1316	1349	1401	1527	1517	1630	1426

(Data Reprinted from Table 6B in Third Report, 2003 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 2003-04

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 1,041 new doctorates granted by these departments in 2003-04 is an increase of 24 from the fall count for 2002-03. 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.

The response rates were above 90% for all groups except Groups IV and Va. Group IV historically has had slightly lower response rates than the other groups. Overall, twelve fewer Group IV departments responded in time for the First Report this year than responded by this time last year.

The 1,041 new doctoral recipients is a preliminary count. A final count will appear in the Second Report in the August 2005 issue of the *Notices of the AMS*. Efforts are under way to obtain data from

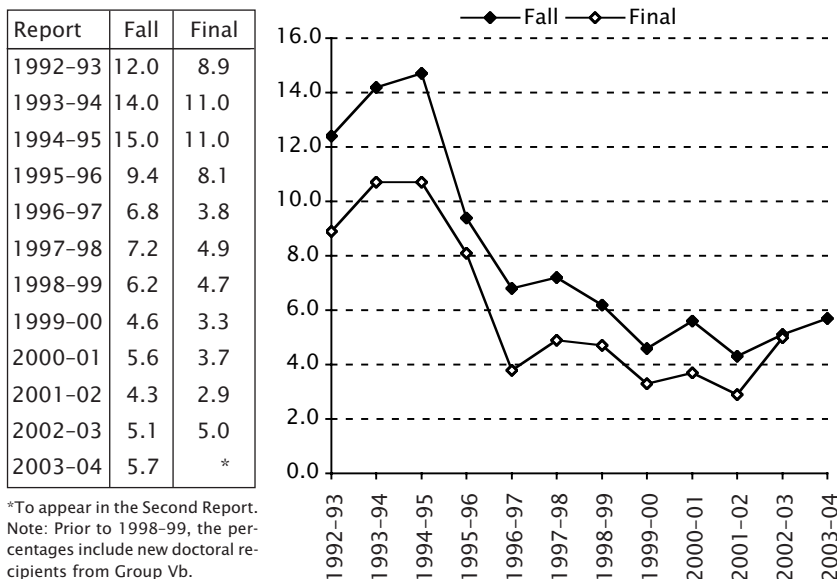
as many of the nonresponding departments as possible. A careful look at the past history of the nonresponding departments makes it unlikely that the final count of new doctoral recipients will increase by more than 35.

From Table 2 we see that Group I (Pr) showed the largest increase (49) in the number of doctoral recipients from the previous year, while Groups II and IV also had an increase. Groups I (Pu), III, and Va showed decreases of 63, 10, and 1 respectively. The total number in doctoral recipients in Group I (Pu) is the lowest number reported by this group in ten years (down 40% from the 1995-96 number of 325). Group III continues to decline slowly, down 25 from its high in 1998-99, and Group Va dropped slightly this year after reaching its highest level last year. In addition, we see that Group I (Pr) reported its highest number of doctoral recipients since 1997-98 with an increase of 49 over last year, Group II increased by 45 but is still down 49 from its high in 1997-98, and Group IV for the second consecutive year shows an increase but is still down 41 from its high in 1999-2000.

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 2003 Departmental Profile survey, are reprinted from Table 6B of the Third Report of the 2003 Annual Survey (*Notices of the AMS*, September 2004). It sheds some light on the downward trend in number of new doctorates as shown in Table 2 and Figure 1. Since 2000 the total number of full-time students has fluctuated in the 9,000s, with the fall 2003 count at 9,731. The number of first-year full-time graduate students fell from 2,668 in 1994 to 2,386 in 1997 before starting to increase in 1998, reaching a high of 3,612 for fall 2003. Full-time first-year U.S. citizen graduate students fell from 1,664 in 1994 to 1,316 in 1997, then climbed to a high of 1,630 for 2002 before declining to 1,426 for fall 2003. The increase in new doctoral recipients reported for 2003-04 continues what appears to be a moderate trend upward.

The 2003-04 numbers in Table 2 will be broken down in various ways, such as by

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



*To appear in the Second Report. Note: Prior to 1998-99, the percentages include new doctoral recipients from Group Vb.

Table 4A: Employment Status of 2003-04 U.S. New Doctoral Recipients in the Mathematical Sciences by Field of Thesis

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)	18	5	8	6	3	2	11	7	1	8	0	0	69	
Group I (Private)	10	8	19	3	2	0	7	0	0	8	0	0	57	
Group II	15	7	12	6	2	4	5	3	0	7	0	0	61	
Group III	4	2	5	4	2	10	4	0	0	1	3	0	35	
Group IV	0	0	0	0	0	62	1	0	0	0	0	0	63	
Group Va	1	0	0	3	0	1	4	5	0	3	0	0	17	
Master's	10	7	4	7	2	14	3	7	3	3	2	0	62	
Bachelor's	16	14	11	8	2	12	5	7	3	11	3	0	92	
Two-Year College	3	3	4	0	0	1	0	1	0	2	0	0	14	
Other Academic Dept.	4	4	5	6	2	56	19	8	3	3	5	0	115	
Research Institute/ Other Nonprofit	2	2	4	3	2	8	3	2	0	3	0	0	29	
Government	2	2	1	3	0	8	5	2	2	1	0	0	26	
Business and Industry	6	1	5	7	3	55	13	5	1	3	0	0	99	
Non-U.S. Academic	18	10	13	12	3	9	11	6	5	15	0	1	103	
Non-U.S. Nonacademic	1	0	0	1	0	3	2	0	0	1	0	0	8	
Not Seeking Employment	1	0	0	1	1	5	2	1	0	1	0	0	12	
Still Seeking Employment	10	2	6	9	1	10	8	2	2	2	0	0	52	
Unknown (U.S.)	12	7	4	6	2	18	6	7	2	4	2	0	70	
Unknown (non-U.S.)*	11	7	5	9	2	11	5	3	0	3	1	0	57	
TOTAL	144	81	106	94	29	289	114	66	22	79	16	1	1041	
Column	Male	107	58	78	71	23	176	84	50	18	53	7	1	726
Subtotals	Female	37	23	28	23	6	113	30	16	4	26	9	0	315

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

Table 4B: Employment Status of 2003-04 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	
	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)	29	25	9	0	1	5	69	53	16
Group I (Private)	15	32	6	0	0	4	57	46	11
Group II	20	17	16	2	4	2	61	41	20
Group III	5	9	5	10	6	0	35	22	13
Group IV	1	1	0	2	59	0	63	48	15
Group Va	0	3	1	0	0	13	17	13	4
Master's	8	1	25	18	9	1	62	42	20
Bachelor's	14	8	46	16	5	3	92	61	31
Two-Year College	4	0	2	7	1	0	14	9	5
Other Academic Dept.	6	10	16	15	48	20	115	69	46
Research Institute/ Other Nonprofit	8	7	4	0	9	1	29	17	12
Government	3	4	6	2	8	3	26	15	11
Business and Industry	9	13	9	9	50	9	99	69	30
Non-U.S. Academic	31	22	24	9	7	10	103	78	25
Non-U.S. Nonacademic	0	4	0	0	3	1	8	6	2
Not Seeking Employment	0	1	6	2	3	0	12	4	8
Still Seeking Employment	8	11	15	6	7	5	52	40	12
Unknown (U.S.)	16	10	19	6	13	6	70	49	21
Unknown (non-U.S.)*	18	9	6	7	10	7	57	44	13
TOTAL	195	187	215	111	243	90	1041	726	315
Column	Male	151	137	152	72	146	68	726	
Subtotals	Female	44	50	63	39	97	22	315	

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

Table 4C: Field of Thesis of 2003–04 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)	52	28	32	21	8	3	20	10	1	20	0	0	195
Group I (Private)	43	15	36	23	9	5	31	4	1	19	0	1	187
Group II	34	30	29	25	3	11	23	27	12	17	4	0	215
Group III	15	8	9	17	2	19	8	10	2	9	12	0	111
Group IV	0	0	0	0	2	239	2	0	0	0	0	0	243
Group Va	0	0	0	8	5	12	30	15	6	14	0	0	90
Column Total	144	81	106	94	29	289	114	66	22	79	16	1	1041

Table 5A: U.S. Employed 2003–04 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	70	87	37	14	70	24	302
Master’s, Bachelor’s, and 2-Year Colleges	26	9	73	41	15	4	168
Other Academic and Research Institutes	14	17	20	15	57	21	144
Government	3	4	6	2	8	3	26
Business and Industry	9	13	9	9	50	9	99
TOTAL	122	130	145	81	200	61	739

sex, in later sections of this report. The names of the 1,041 new doctoral recipients are found on pages 264–82 of this issue of the *Notices*.

Employment Status of 2003–04 New Doctoral Recipients

Tables 4A, 4B, and 4C each provide a different cross-tabulation of the 1,041 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 from the departments giving the degrees and not from the degree recipients themselves. These

Table 5B: Number of New Doctoral Recipients Taking Positions in Business and Industry in the U.S. by Type of Degree-Granting Department, Fall 2000 to Fall 2004

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
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
Fall 2004	9	13	9	9	50	9	99

tables will be revised using information from the doctoral recipients themselves and will appear in the 2004 Second Report in the August 2005 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 by the total number of individuals left after the “Unknowns” are removed. The overall unemploy-

Table 5C: Number of New Doctoral Recipients Taking U.S. Academic Positions by Type of Degree-Granting Department, Fall 2000 to Fall 2004

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
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
Fall 2004	110	113	130	70	142	49	614

ment rate for these data is 5.7%. This figure will be updated later with information gathered from the individual new doctoral recipients. The figure for fall 2003 was 5.1%. 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 7.9% for Group II and lows of 3.2% and 5.0% for Groups IV and I (Pu) respectively.

There are 739 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 739 new doctoral recipients. Of these, 614 (83%) hold academic positions, 26 (4%) are employed by government, and 99 (13%) hold positions in business and industry.

In the First Report for 2002–03, there were 663 new doctoral recipients employed in the U.S., of which

Table 5D: U.S. Academic Positions Filled by New Doctoral Recipients by Type of Hiring Department, Fall 2000 to Fall 2004

Group	I-III	IV	Va	M&B	Other	TOTAL
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
Fall 2004	222	63	17	154	158	614

534 (81%) held academic positions, 32 (5%) were in government, and 97 (15%) were in business and industry. The number of new doctoral recipients employed in the U.S. increased in all categories of Table 5A except "Government".

Table 5E: Females as a Percentage of 2003-04 New Doctoral Recipients Produced by and Hired by Doctoral-Granting Groups

Percent	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Produced	23	27	29	35	40	24	30
Hired	23	19	33	37	24	24	26

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 2000 to fall 2004. The number of new doctoral recipients taking jobs in business and industry, after oscillating in the late 1990s, declined three consecutive years (by 38 in fall 2001, 45 in fall 2002, and 26 in fall 2003) before showing a slight increase of 2 in fall 2004. The fall 2004 number is down 52% from the fall 2000 number.

Among the 739 new doctoral recipients known to have employment in the U.S. in fall 2004, Group II has the smallest percentage taking jobs in business and industry at 6% and Group IV the highest at 25%.

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 2000 to fall 2004. It shows a moderate rebound in the total number of new doctoral recipients taking academic employment in fall 2004, compared with the previous nine years. This year's number is up 15% over last year. Among the 739 new doctoral recipients employed in the U.S. in fall 2004, 83% have academic positions. This percentage is highest for Groups I (Pu) and II at 90% and lowest for Groups IV at 71%.

Table 5D shows the number of positions filled with new doctoral recipients for each type of academic employer. Increases in positions filled by new doctoral recipients were realized by all groups except Group M & B.

In fall 2004, 58 new doctoral recipients held positions in the institution that granted their degree, although not necessarily in the same department.

Table 5G: 2003-04 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	116	186	302
Academic, Other	164	148	312
Nonacademic	58	67	125
TOTAL	338	401	739

Table 5F: Employment Status of 2003-04 U.S. New Doctoral Recipients by Citizenship Status

TYPE OF EMPLOYER	CITIZENSHIP				TOTAL
	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	338	50	326	25	739
U.S. Academic	280	36	278	20	614
Groups I, II, III, and Va	96	16	119	8	239
Group IV	20	5	34	4	63
Non-Ph.D. Department	155	15	106	7	283
Research Institute/Other Nonprofit	9	0	19	1	29
U.S. Nonacademic	58	14	48	5	125
Non-U.S. Employer	23	2	84	2	111
Non-U.S. Academic	21	2	78	2	103
Non-U.S. Nonacademic	2	0	6	0	8
Not Seeking Employment	9	0	3	0	12
Still Seeking Employment	24	7	21	0	52
SUBTOTAL	394	59	434	27	914
Unknown (U.S.)	44	5	19	2	70
Unknown (non-U.S.)*	3	0	46	8	57
TOTAL	441	64	499	37	1041

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

Table 6: Sex, Race/Ethnicity, and Citizenship of 2003–04 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	3	0	0	0	3	2	0	0	0	2	5
Asian	13	17	187	13	230	10	11	86	0	107	337
Black or African American	7	5	10	0	22	5	1	3	1	10	32
Hispanic or Latino	11	1	25	1	38	2	1	4	1	8	46
Native Hawaiian or Other Pacific Islander	2	0	1	0	3	0	0	0	0	0	3
White	260	14	137	8	419	126	11	46	1	184	603
Unknown	0	1	5	3	9	0	1	0	5	6	15
TOTAL	296	38	365	25	724	145	25	139	8	317	1041

This represents 7% of new doctoral recipients who are currently employed and 9% of the U.S. academic positions held by new doctoral recipients. In fall 2003 there were 60 such individuals making up 8% of the new doctoral recipients who were employed at the time of the First Report. Nineteen new doctoral recipients have taken part-time positions in fall 2004 compared with 10 in fall 2003.

Information about 2003–04 Female New Doctoral Recipients

Tables 4A and 4B give male and female breakdowns of the new doctoral recipients in 2003–04 by Field of Thesis, by Type of Degree-Granting Department, and by Type of Employer.

Overall, 315 (30%) of the 1,041 new doctoral recipients in 2003–04 are female. In 2002–03, 304 (30%) 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 IV at 40%, while last year it was highest in Group III. While the lowest percentage last year was for Group I (Pr) at 19%, this year it is for Group I (Pu) at 23%.

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, 32% of the new doctoral recipients hired in Group M, master's departments, are female; 34% of the new doctoral recipients hired in Group B, bachelor's departments, are female; and 30% of new doctoral recipients hired in business and industry are female.

The unemployment rate for female new doctoral recipients is 4% compared to 6% for males and 5.7% overall.

The percentage of female new doctoral recipients within fields of thesis ranged from 18% in optimization/control to 39% in statistics and 56% 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 2003–04 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 441 U.S. citizens is 6.1% compared to 5.1% in fall 2003. The unemployment rate for non-U.S. citizens is 5.4%. This varies by type of visa. The unemployment rate for non-U.S. citizens with a permanent visa is 11.9%, while that for non-U.S. citizens with a temporary visa is 4.8%. Among U.S. citizens whose employment status is known, 86% are employed in the U.S. Among non-U.S. citizens with a permanent visa whose employment status is known, 85% have jobs in the U.S. (last year the percentage was 81%), while the percentage for non-U.S. citizens with a temporary visa is 75% (last year the percentage was 68%). The number of non-U.S. citizens having employment in the U.S. is 401, up 40% from 287 last year.

Table 5G is a cross-tabulation of the 739 new doctoral recipients who have employment in the U.S. by citizenship and broad employment categories, using numbers from Table 5F. Of the 739 new doctoral recipients having jobs in the U.S., 46% are U.S. citizens. Of the 302 new doctoral recipients who took jobs in U.S. doctoral-granting departments, 38% are U.S. citizens (down from 52% last year). Of the 312 who took other academic positions, 53% are U.S. citizens. Of the 125 who took nonacademic positions, 46% are U.S. citizens. Of the 338 U.S. citizens employed in the U.S., 34% have jobs in a doctoral-granting department, 49% are in other academic positions, and 17% are in nonacademic positions. For the 401 non-U.S. citizens employed

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
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
2003-04	1041	441	42

*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.

in the U.S., the analogous percentages are 46%, 37%, and 17% respectively.

Sex, Race/Ethnicity, and Citizenship Status of 2003-04 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.

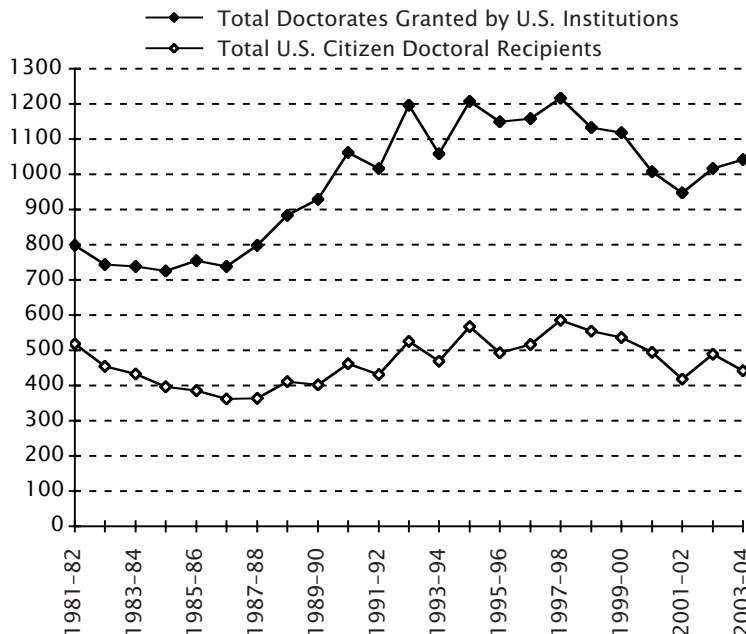
There were 441 (42%) U.S. citizens among the 1,041 new doctoral recipients in 2003-04. Among U.S. citizens, 5 are American Indian or Alaska Native (3 males and 2 females), 23 are Asian (13 males and 10 females), 12 are Black or African American (7 males and 5 females), 13 are Hispanic or Latino (11 males and 2 females), 2 are Native Hawaiian or Other Pacific Islander (males), and 386 are White (260 males and 126 females). Among non-U.S. citizens, there are 314

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
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
2003-04	441	297	144	33

*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



Asians, 20 Blacks or African Americans, 33 Hispanics or Latinos, 1 Native Hawaiian or Other Pacific Islander (male), 217 Whites, and 15 other.

Table 7 (and Figure 3) gives the number of new U.S. doctoral recipients and the number of U.S. citizens back to 1980-81. The 441 U.S. citizen new doctoral recipients is down by 145 (25%) since 1997-98. The percentage of U.S. citizens is the lowest percentage (42%) reported since 1995-96 (43%).

Females make up 33% of the 441 U.S. citizens receiving doctoral degrees in the mathematical

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

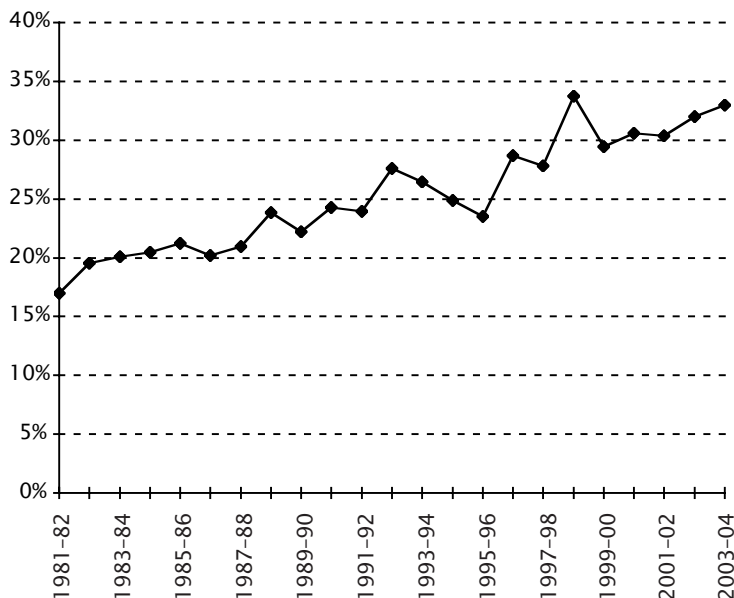


Table 9: Sex and Citizenship of 2003-04 New Doctoral Recipients by Granting Department

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.	67	22	55	23	76	33	29	20	43	38	27	8	297	144
Non-U.S.	84	22	82	27	76	30	43	19	103	59	41	14	429	171
TOTAL	151	44	137	50	152	63	72	39	146	97	68	22	726	315

sciences in 2003-04. This is the second highest percentage of females among U.S. citizen new doctoral recipients reported since 1985-86, when it was 34%, the highest ever reported by the Annual Survey. Last year this percentage was 32%. Among the 600 non-U.S. citizen new doctoral recipients, 29% (172) are female, up from last year's 28%.

Table 8 (and Figure 4) gives 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 female U.S. citizen new doctoral recipients is down 43 (23%) 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 groups of doctoral-granting departments. Among all 1,041 new doctoral recipients, 41% of the males and 46% 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 IV at 33% and highest in Group II at 50%. Groups II is the only group to have more U.S. citizen than non-U.S. citizen new doctoral recipients in 2003-04.

2003-04 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 77 new doctoral recipients with dissertations in statistics/biostatistics and probability in 2003-04 and have averaged 75 per year over the past seven years. Information about these 77 new doctoral recipients and the 243 new doctoral recipients in Group IV is found in this section of the report.

For nine 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 2003-04 results between the 56 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 nine years and to the relatively low response rate for this group. At the time 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 87 departments for 2003-04, 14 more than the next largest doctoral group. It contains 30% of all doctoral departments surveyed, and the 65 Group IV departments responding to the Annual Survey reported 243 new doctoral recipients,

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
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	5.4	31	15
2002-03	86	74 (86)	239	98 (41)	45	2.1	302	234	68	3.3	20	19
2003-04	87	65 (75)	243	97 (40)	50	3.0	318	241*	77**	4.0	48	15
Statistics	56	44 (79)	180	63 (35)	38	3.0					28	10
Biostatistics	31	21 (68)	63	34 (54)	12	3.0					20	5

* Of 241, there were 239 in statistics/biostatistics and 2 in probability. For complete details, see Table 4C.

** Of 77, there were 50 in statistics/biostatistics and 27 in probability. For complete details, see Table 4C.

23% of all new doctoral recipients in 2003–04. The number of new doctoral recipients in Group IV is up four from the number reported at this time last year, while the number of departments responding is down nine 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. The trends noted below have also been observed in past reports.

Table 9 shows that for the Group IV new doctoral recipients, 97 of 243 (40%) are female, while 218 of 798 (27%) are female in the other doctoral groups. Among U.S. citizens, females accounted for 38 of the 81 (47%) Group IV new doctoral recipients, while for the other groups 106 of 360 (29%) were female. Overall, 144 of 441 (33%) U.S. citizen new doctoral recipients were female.

In Group IV, 81 of 243 (33%) new doctoral recipients are U.S. citizens, while in other groups 360 of 798 (45%) are U.S. citizens.

Of the 200 new doctoral recipients from Group IV who found employment in the U.S., 50 (25%) took jobs in business or industry. From the other groups, 539 new doctoral recipients found employment in the U.S., of which 49 (9%) took jobs in business or industry.

The employment status for 220 Group IV new doctoral recipients is known, and 7 (3.2%) are unemployed. For the other groups, the employment status of 694 is known, and 45 (6.5%) are unemployed. Fifteen of 63 (24%) new doctoral recipients hired by Group IV departments were female, down from last year's 49%, the lowest percentage of female hires reported since 1999–2000. The other doctoral groups reported that 64 of 239 (27%) new doctoral recipients hired were female, the same percentage as reported last year, significantly more than the 16% reported in 1999–2000.

Group IV had 241 new doctoral recipients with fields of thesis in statistics/biostatistics (239) and probability (2), and the other doctoral departments had 77 with field of thesis in statistics/biostatistics (50) and probability (27). The distribution of these 77 degrees among the various groups can be found in Table 4C. The number of new doctoral recipients with theses in statistics/biostatistics and probability (318) is substantially larger than any other field, with algebra and number theory next with 144.

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 third 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 2004 Faculty Salary Survey. Departments were asked to report for each rank the number of tenured and tenure-track faculty whose 2004–05 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.

Since departments in Groups I, II, and III were changed in 1995–96 (see definitions of the groups

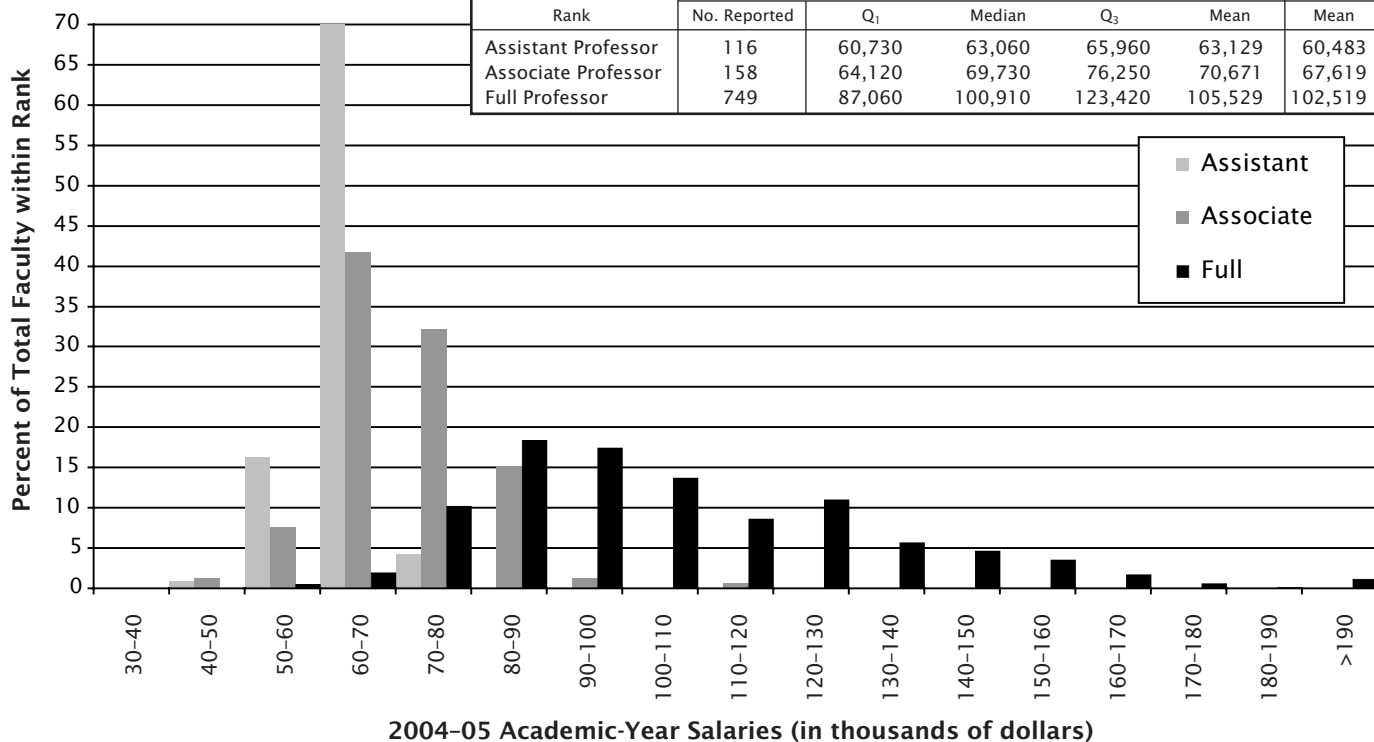
Table 11: Faculty Salary Response Rates

Department	Number	Percent
Group I (Public)	21 of 25	84
Group I (Private)	17 of 23	74
Group II	48 of 56	86
Group III	62 of 73	85
Group IV (Statistics)	39 of 56	70
Group IV (Biostatistics)	20 of 31	65
Group Va	8 of 18*	44
Group M	104 of 192	54
Group B	350 of 1020	34

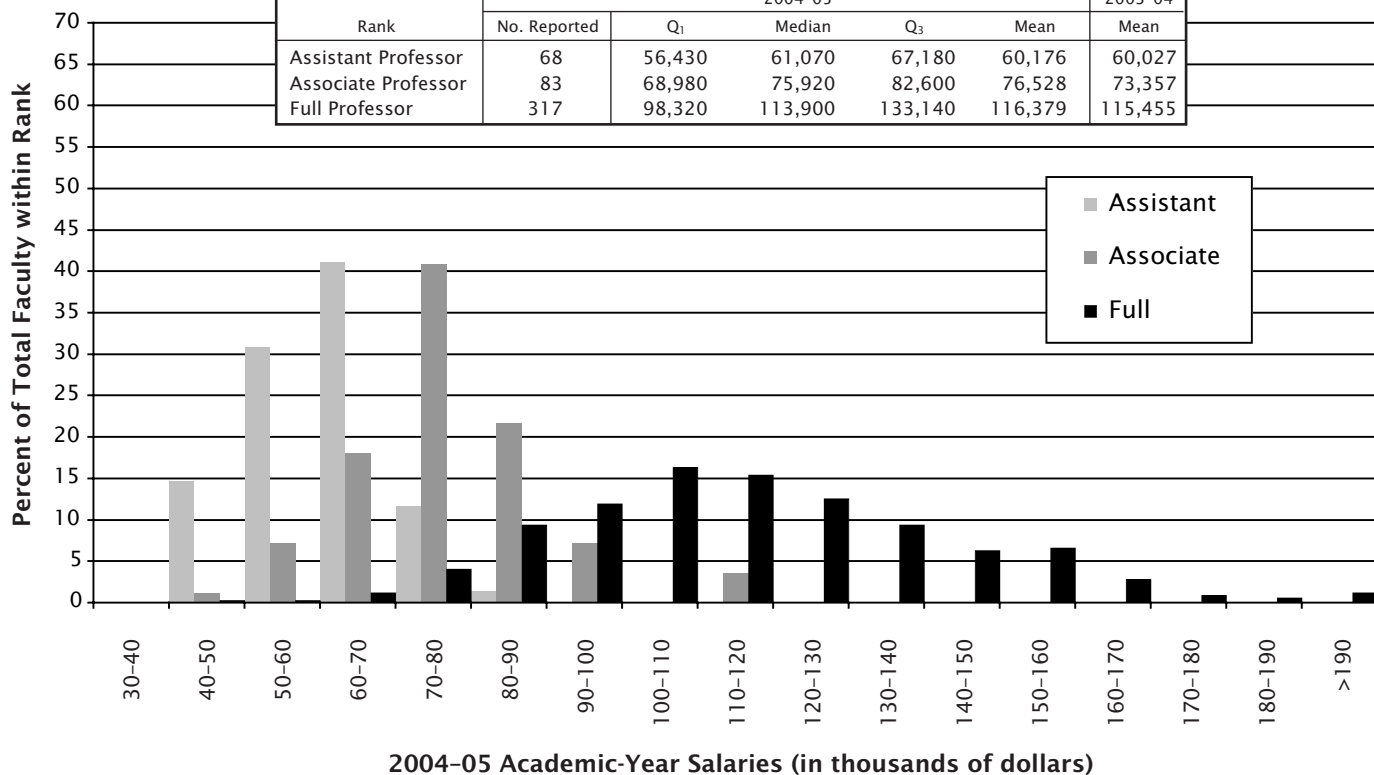
* The population for Group Va is slightly less than for the Doctorates Granted Survey, because some departments grant degrees but do not formally "house" faculty and their salaries.

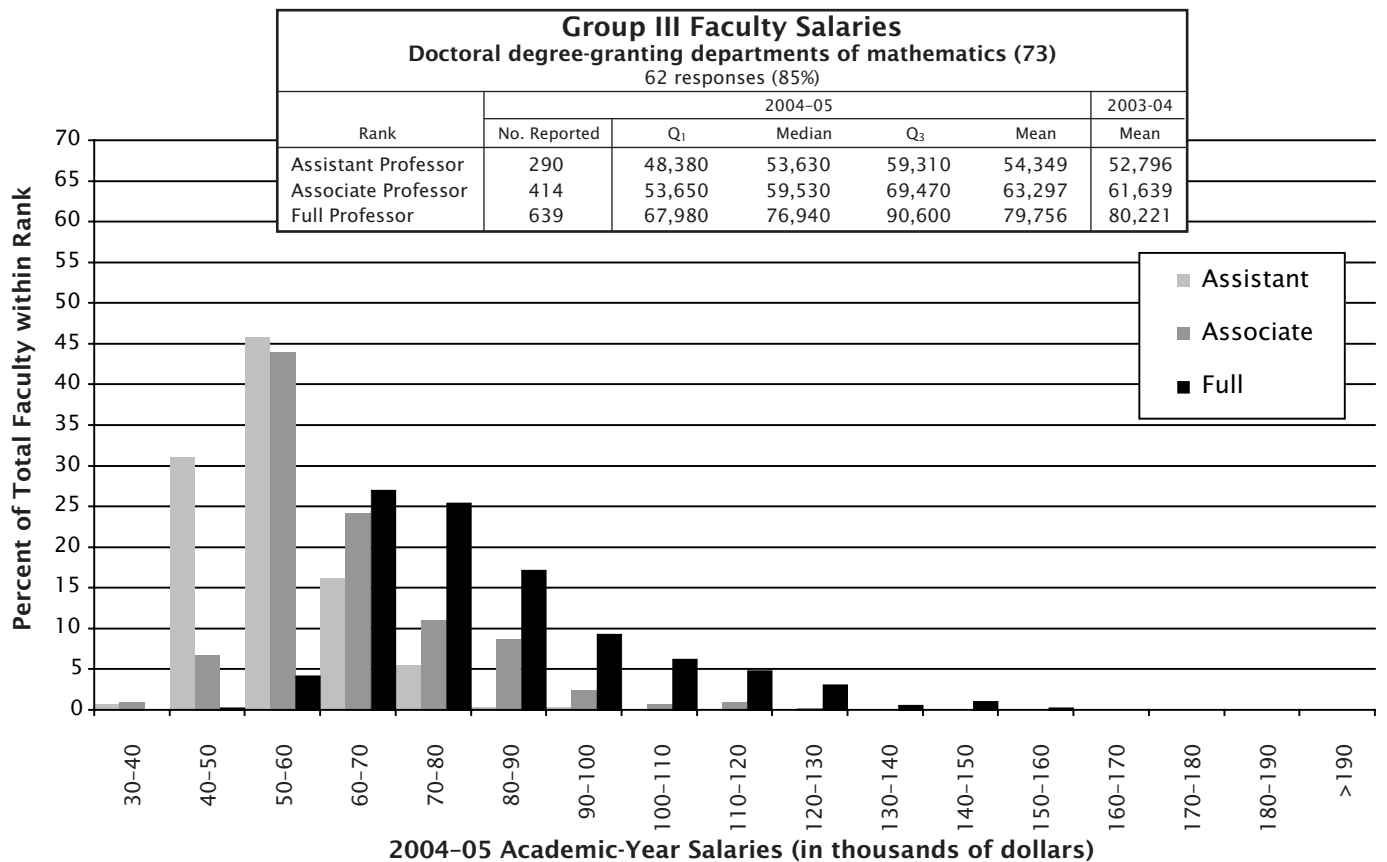
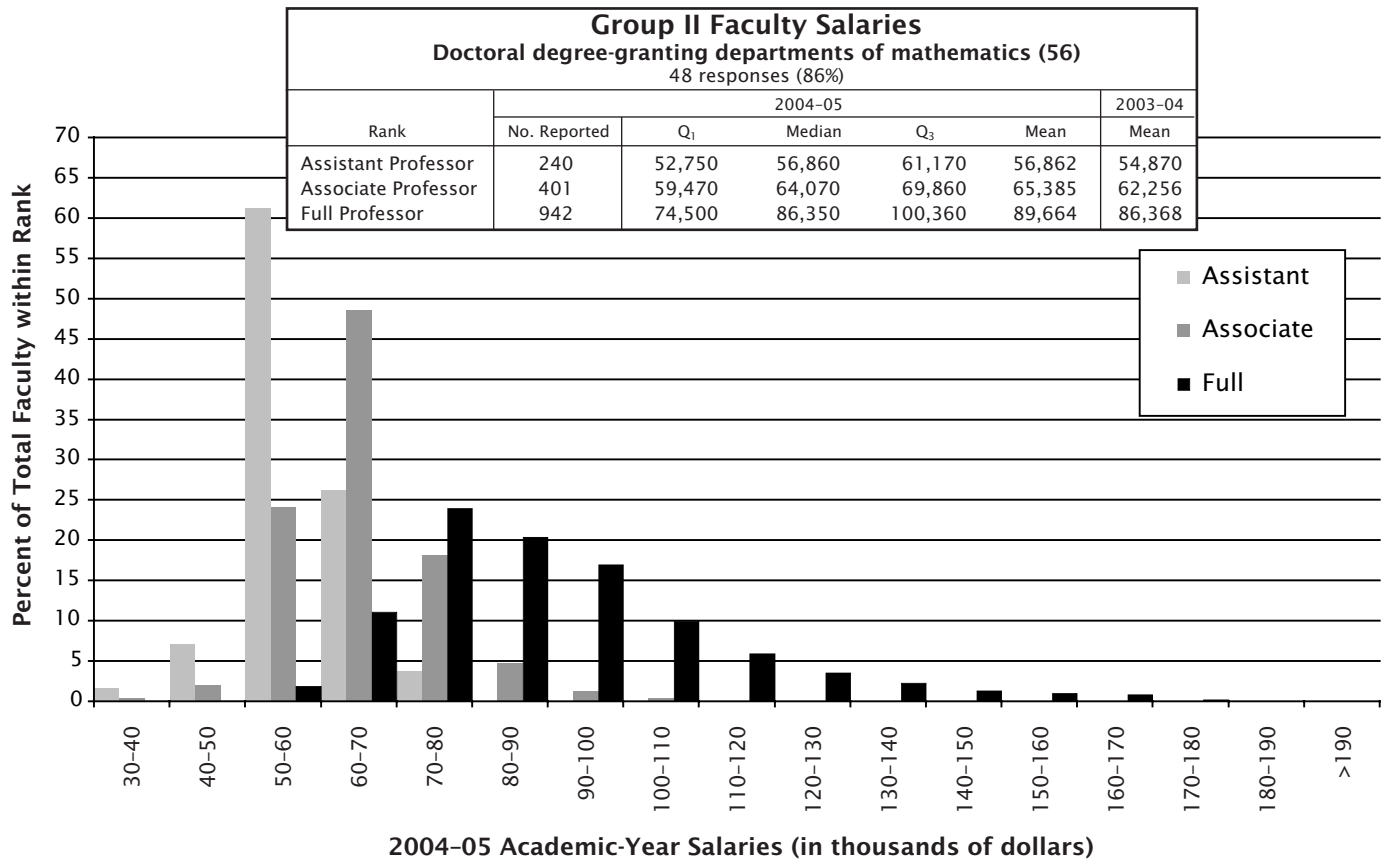
on page 251), comparisons are possible only to the last eight years' data. In addition, prior to the 1998 survey Groups Va and Vb were reported together as Group V. When comparing current and prior year figures, one should keep in mind that differences in the set of responding departments may be a significant factor in the change in the reported mean salaries.

Group I (Public) Faculty Salaries						
Doctoral degree-granting departments of mathematics (25)						
21 responses (84%)						
Rank	2004-05					2003-04
	No. Reported	Q ₁	Median	Q ₃	Mean	Mean
Assistant Professor	116	60,730	63,060	65,960	63,129	60,483
Associate Professor	158	64,120	69,730	76,250	70,671	67,619
Full Professor	749	87,060	100,910	123,420	105,529	102,519

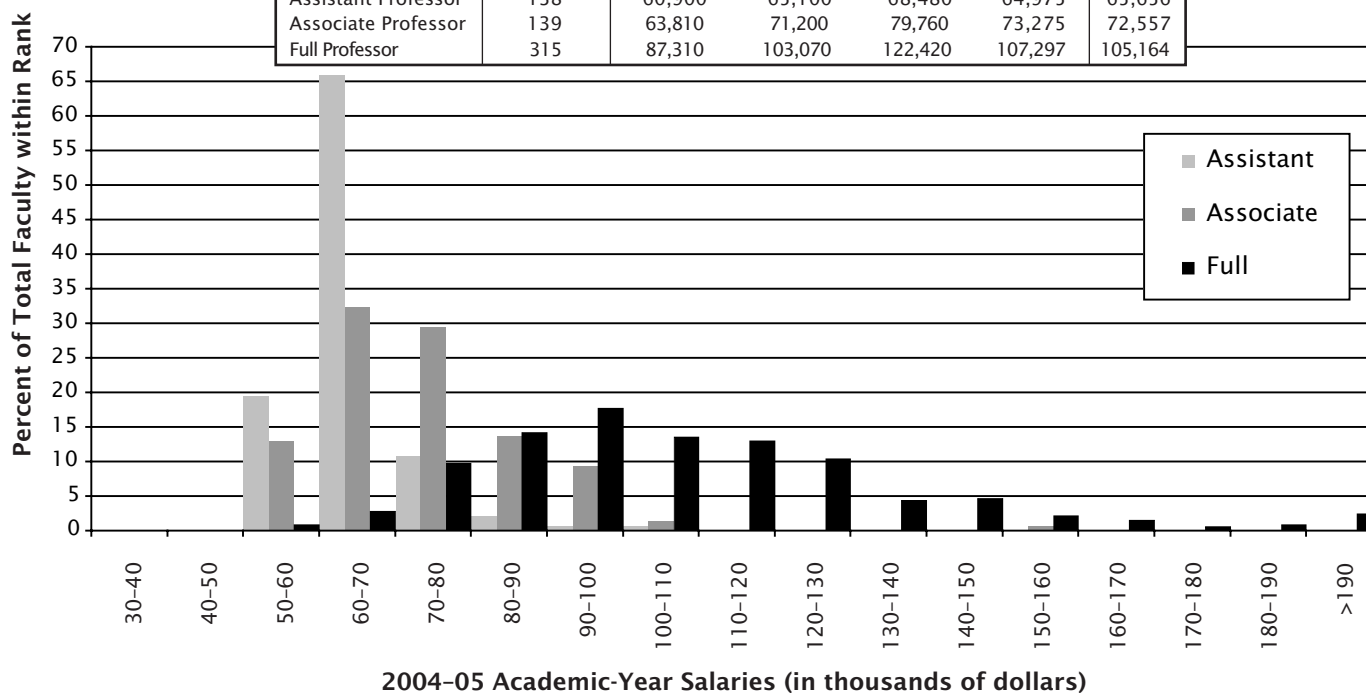


Group I (Private) Faculty Salaries						
Doctoral degree-granting departments of mathematics (23)						
17 responses (74%)						
Rank	2004-05					2003-04
	No. Reported	Q ₁	Median	Q ₃	Mean	Mean
Assistant Professor	68	56,430	61,070	67,180	60,176	60,027
Associate Professor	83	68,980	75,920	82,600	76,528	73,357
Full Professor	317	98,320	113,900	133,140	116,379	115,455

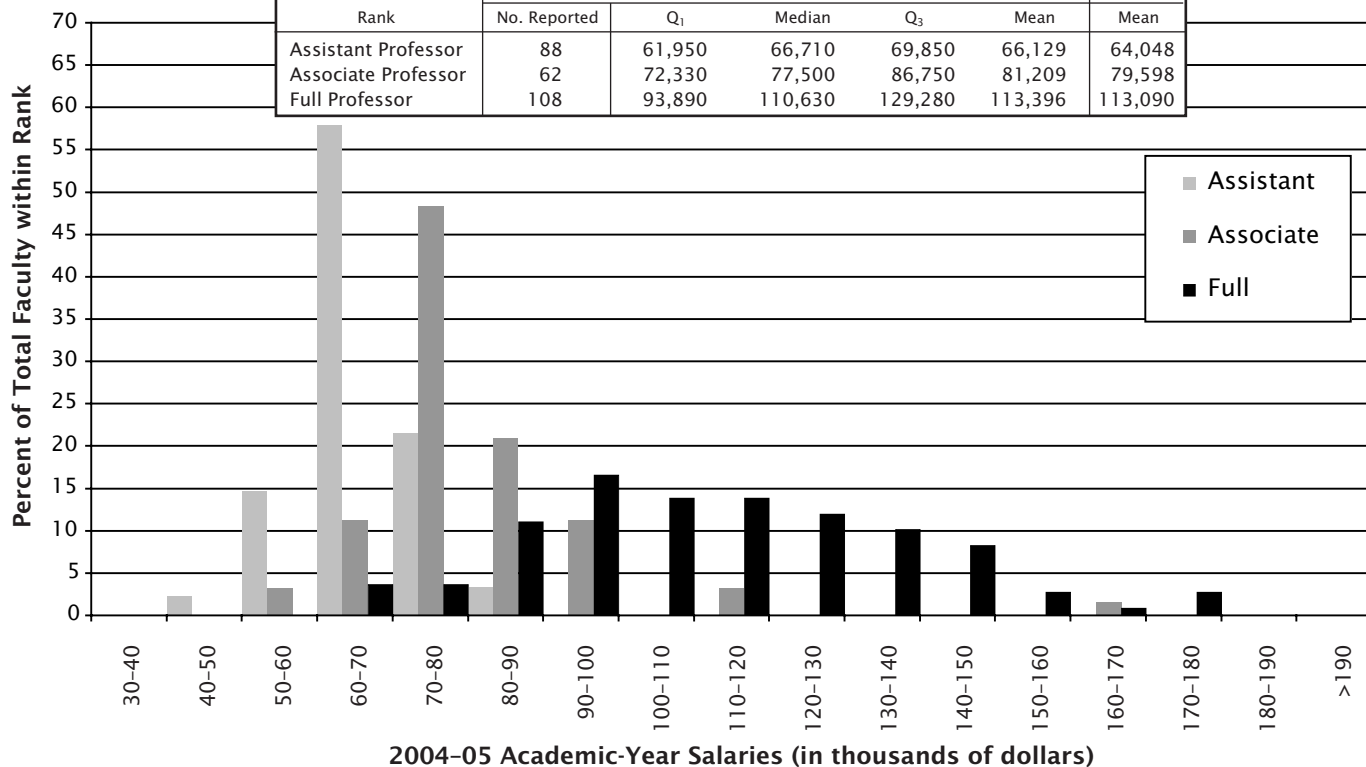




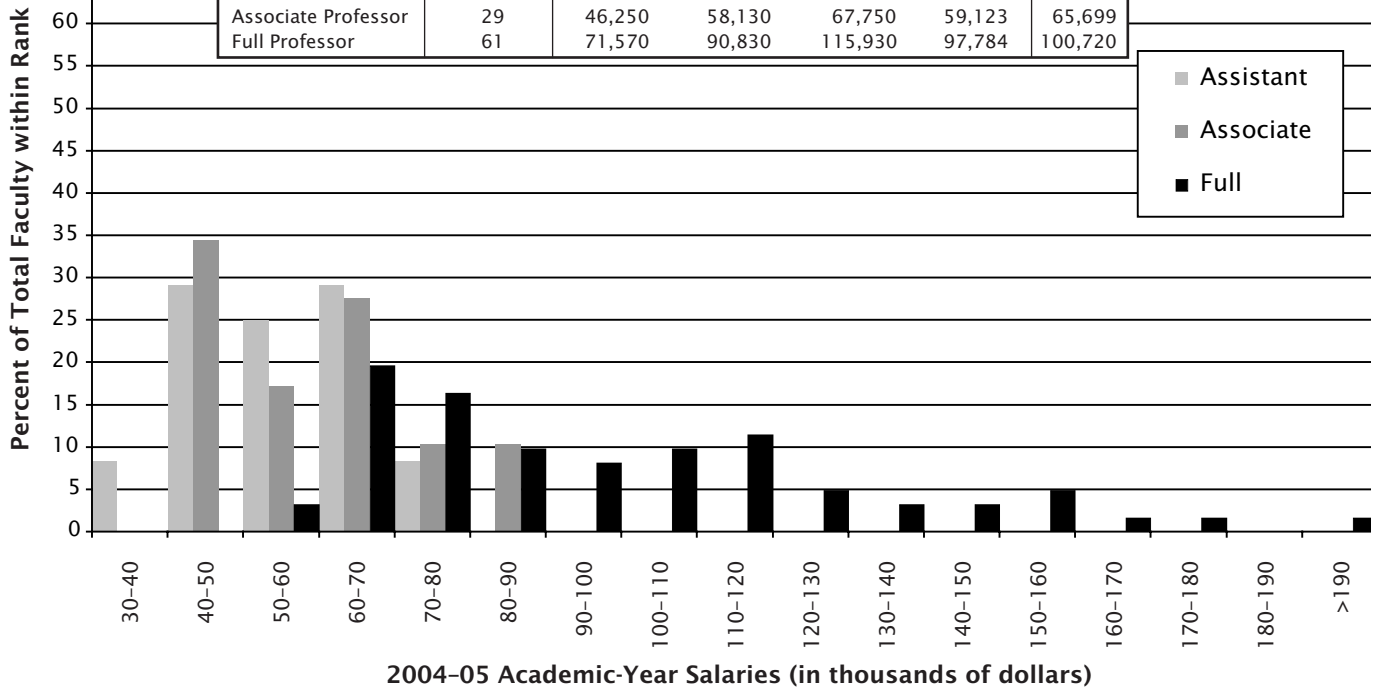
Group IV (Statistics) Faculty Salaries						
Doctoral degree-granting departments of statistics (56)						
39 responses (68%)						
Rank	2004-05					2003-04
	No. Reported	Q ₁	Median	Q ₃	Mean	Mean
Assistant Professor	138	60,900	65,100	68,480	64,975	65,656
Associate Professor	139	63,810	71,200	79,760	73,275	72,557
Full Professor	315	87,310	103,070	122,420	107,297	105,164



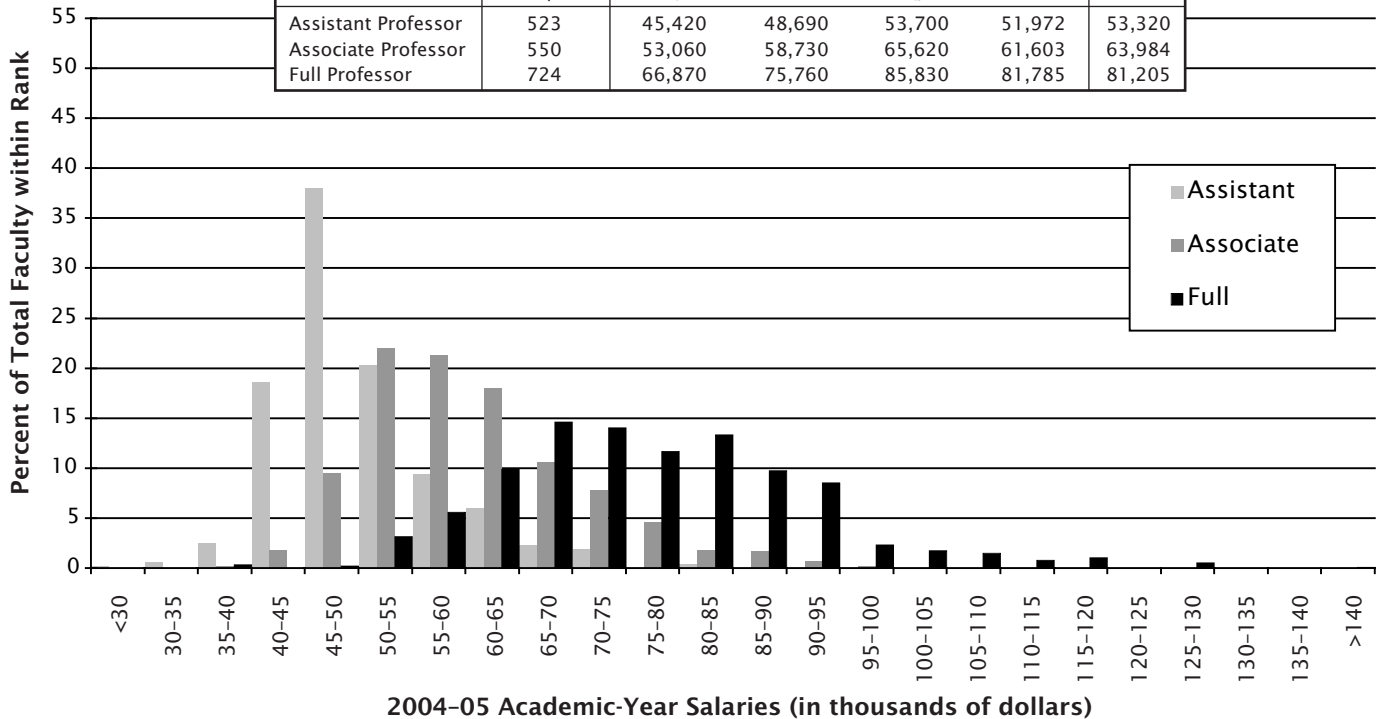
Group IV (Biostatistics) Faculty Salaries						
Doctoral degree-granting departments of biostatistics and biometrics (31)						
20 responses (65%)						
Rank	2004-05					2003-04
	No. Reported	Q ₁	Median	Q ₃	Mean	Mean
Assistant Professor	88	61,950	66,710	69,850	66,129	64,048
Associate Professor	62	72,330	77,500	86,750	81,209	79,598
Full Professor	108	93,890	110,630	129,280	113,396	113,090

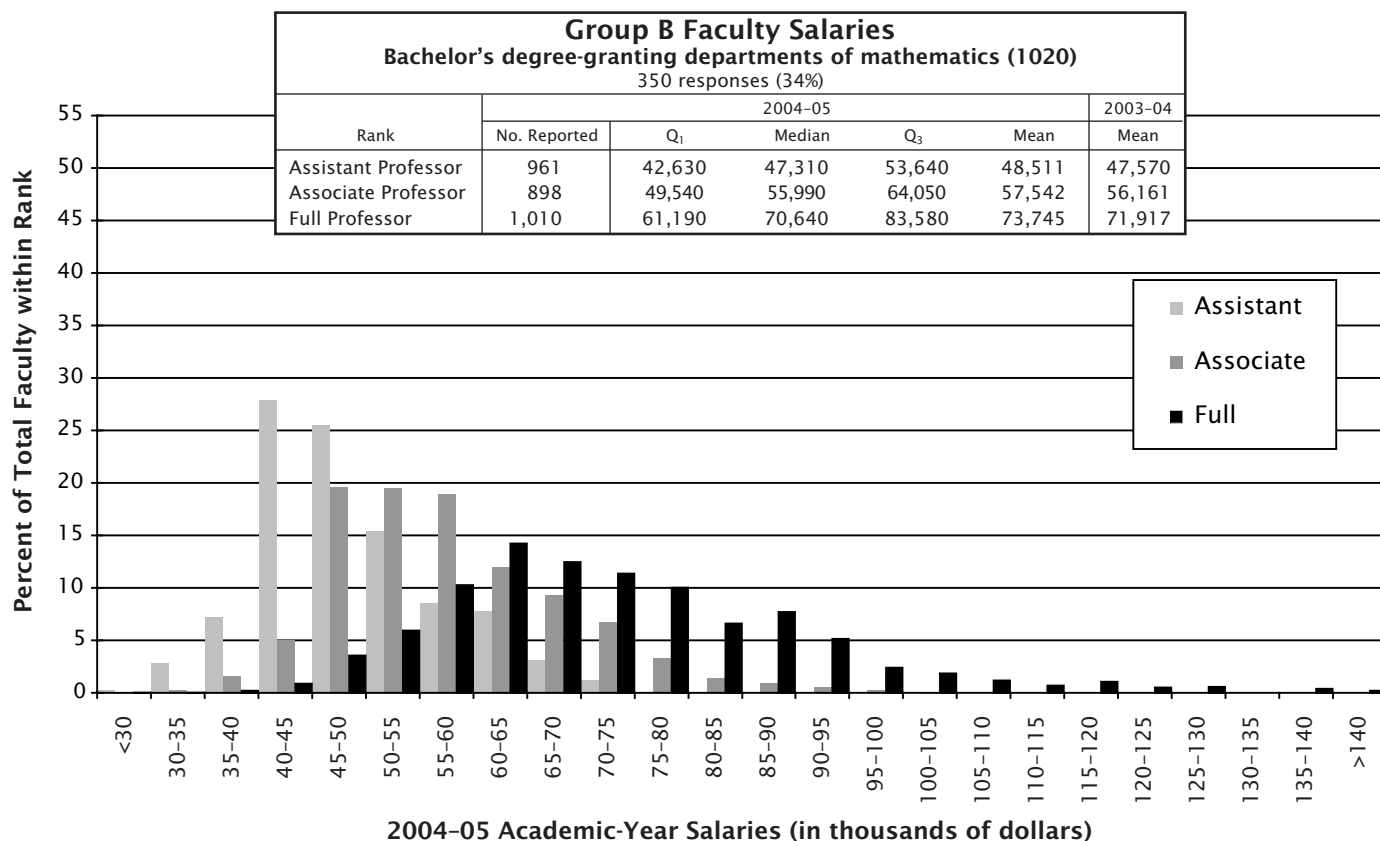


Group Va Faculty Salaries						
Doctoral degree-granting departments of applied mathematics (18)						
8 responses (44%)						
Rank	2004-05					2003-04
	No. Reported	Q ₁	Median	Q ₃	Mean	Mean
Assistant Professor	24	46,670	52,500	63,000	54,418	56,005
Associate Professor	29	46,250	58,130	67,750	59,123	65,699
Full Professor	61	71,570	90,830	115,930	97,784	100,720



Group M Faculty Salaries						
Master's degree-granting departments of mathematics (192)						
104 responses (54%)						
Rank	2004-05					2003-04
	No. Reported	Q ₁	Median	Q ₃	Mean	Mean
Assistant Professor	523	45,420	48,690	53,700	51,972	53,320
Associate Professor	550	53,060	58,730	65,620	61,603	63,984
Full Professor	724	66,870	75,760	85,830	81,785	81,205





Previous Annual Survey Reports

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

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

American Association of University Professors, *The Annual Report on the Economic Status of the Profession 2003-2004*, Academe: Bull. AAUP (March/April 2004), Washington, DC.

Commission on Professionals in Science and Technology, *Professional Women and Minorities*, 15th ed., CPST, Washington, DC, 2004.

_____, *Salaries of Scientists, Engineers, and Technicians: A Summary of Salary Surveys*, 20th ed., CPST, Washington, DC, 2003.

_____, *Employment of Recent Doctoral Graduates in S&E: Results of Professional Society Surveys*, CPST, Washington, DC, 1998.

_____, *Employment Outcomes of Doctorates in Science and Engineering: Report of a CPST Workshop*, CPST, Washington, DC, 1998.

_____, *Supply and Demand Indicators for New Science and Engineering Doctorates: Results of a Pilot Study*, CPST, Washington, DC, 1997.

Conference Board of the Mathematical Sciences, *Statistical Abstract of Undergraduate Programs in the Mathematical Sciences in the United States: Fall 2000 CBMS Survey*, American Mathematical Society, Providence, RI, 2002.

_____, *Statistical Abstract of Undergraduate Programs in the Mathematical Sciences in the United States: Fall 1995 CBMS Survey*, MAA Reports No. 2, 1997.

- National Opinion Research Center, *Doctorate Recipients from United States Universities: Summary Report 2002*, Survey of Earned Doctorates, Chicago, IL, 2003.
- National Research Council, *Strengthening the Linkages between the Sciences and the Mathematical Sciences*, National Academy Press, Washington, DC, 2000.
- , *U.S. Research Institutes in the Mathematical Sciences: Assessment and Perspectives*, National Academy Press, Washington, DC, 1999.
- , *Research-Doctorate Programs in the United States: Continuity and Change*, National Academy Press, Washington, DC, 1995.
- National Science Board, *Science and Engineering Indicators—2004* (NSB 04-01), National Science Foundation, Arlington, VA, 2004.
- National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States: 2001* (NSF 03-310), Detailed Statistical Tables, Arlington, VA, 2003.
- , *Emigration of U.S.-Born S&E Doctorate Recipients* (NSF 04-327), Arlington, VA, June 2004.
- , *Graduate Students and Postdoctorates in Science and Engineering: Fall 2001* (NSF 03-320), Arlington, VA, 2003.
- , *Gender Differences in the Careers of Academic Scientist and Engineers* (NSF 04-323), Arlington, VA, 2004.
- , *Plans for Postdoctoral Research Appointments Among Recent U.S. Doctorate Recipients* (NSF 04-308), Arlington, VA, 2004.
- , *Science and Engineering Degrees: 1966–2000* (NSF 02-327), Detailed Statistical Tables, Arlington, VA, 2002.
- , *Science and Engineering Degrees, by Race/Ethnicity of Recipient: 1992–2001* (NSF 04-318), Detailed Statistical Tables, Arlington, VA, 2004.
- , *Science and Engineering Doctorate Awards: 2002* (NSF 04-303), Detailed Statistical Tables, Arlington, VA, 2003.
- , *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2004* (NSF 004-317), Arlington, VA, 2004.
- , *Statistical Profiles of Foreign Doctoral Recipients in Science and Engineering: Plans to Stay in the United States* (NSF 99-304), Arlington, VA, 1998.
- , *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 compose 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 compose 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.