

# 2002 Annual Survey of the Mathematical Sciences

(First Report)

## Report on the 2001–2002 New Doctoral Recipients Faculty Salary Survey

Don O. Loftsgaarden, James W. Maxwell, and Kinda Remick Priestley

The First Report of the 2002 Annual Survey gives a broad picture of 2001–02 new doctoral recipients from U.S. departments in the mathematical sciences, including their employment status in fall 2002. 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 2002. A follow-up questionnaire was distributed to the individual new doctoral recipients in October 2002. 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 2002 Annual Survey in the August 2003 issue of the *Notices of the AMS*. Another questionnaire concerned with data on fall 2002 course enrollments, majors, graduate students, and departmental faculty was distributed to departments in September 2002. Results from this questionnaire will appear in the Third Report of the 2002 Annual Survey in the September 2003 issue of the *Notices of the AMS*.

The 2002 Annual Survey represents the forty-sixth in an annual series begun in 1957 by the American Mathematical Society. The 2002 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 Lorraine Denby, J. Douglas Faires, Mary W. Gray, Alexander Hahn, Peter E. Haskell, G. Samuel Jordan, Stephen Kennedy, Ellen E. Kirkman, Don O. Loftsgaarden (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 2001–2002 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, 2001, through June 30, 2002. It includes a preliminary analysis of the fall 2002 employment plans of 2001–02 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**

<b>Group I (Pu)</b>	25 of 25 including 0 with 0 degrees
<b>Group I (Pr)</b>	23 of 23 including 0 with 0 degrees
<b>Group II</b>	51 of 56 including 4 with 0 degrees
<b>Group III</b>	71 of 73 including 28 with 0 degrees
<b>Group IV</b>	72 of 86 including 9 with 0 degrees
<b>Group Va</b>	21 of 22 including 2 with 0 degrees
<b>Group Vb</b>	No longer surveyed

Table 1 provides the departmental response rates for the 2002 Survey of New Doctoral Recipients. See page 253 for a description of the groups. No adjustments were made in this report for nonresponding departments.

This preliminary report will be updated, using information gathered from the new doctoral recipients, in the Second Report of the 2002 Annual Survey. It will appear in the August 2003 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*.

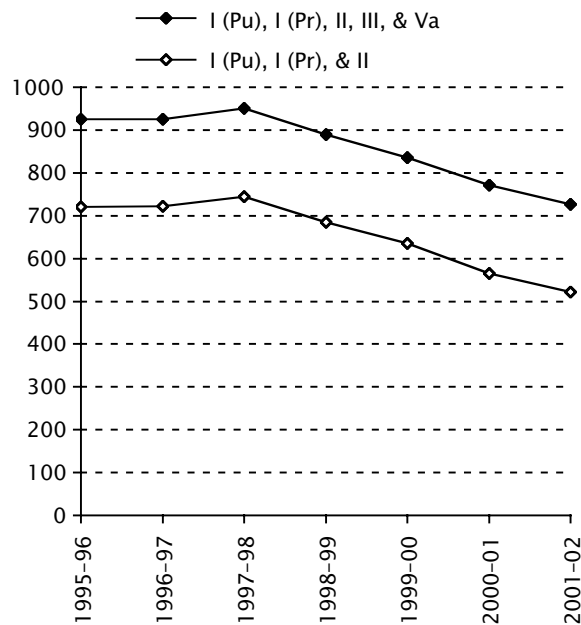
In this First Report's tables referring to new doctoral recipients, "Fall" refers to results based on information about new doctoral recipients received from departments granting their degrees. This information is gathered in the first fall following the academic year in which the degrees were granted.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

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

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL*
1995-96	325	174	222	124	172	81	<b>1098</b>
1996-97	297	187	238	132	197	72	<b>1123</b>
1997-98	306	174	264	129	213	77	<b>1163</b>
1998-99	292	152	241	136	243	69	<b>1133</b>
1999-00	256	157	223	132	284	67	<b>1119</b>
2000-01	233	129	203	125	237	81	<b>1008</b>
2001-02	218	139	164	124	222	81	<b>948</b>

\* Does not include Vb. See "Definitions of the Groups" on page 253.

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



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## Highlights

- There were 948 new doctoral recipients reported for 2001-02 by departments responding in time for the 2002 First Report. This is the fourth consecutive drop in the number of new doctoral recipients. The counts for the preceding four years starting in 1997-98 were 1,163, 1,133, 1,119, and 1,008.
- The number of new doctoral recipients from Groups I (Pu), I (Pr), and II combined has dropped from 744 in 1997-98 to 521 this year, a decrease of 223 (30%).
- Only 418 (44%) of the new doctoral recipients for 2001-02 are U.S. citizens, a drop of 76 (15%) from 2000-01 and down 168 (29%) 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. Based on these numbers and the recent numbers of new doctoral recipients, it appears likely that the downward trends in new doctoral recipients mentioned above will continue for another two years or so, probably at a slower rate. By then the increasing number of first-year full-time graduate students since 1997 should result in a gradually increasing number of new doctoral recipients.
- Based on responses from departments alone, the fall 2002 unemployment rate for the 756 new doctoral recipients whose employment status is known is 4.3%, down from 5.6% for fall 2001 and the lowest fall unemployment rate in the past thirteen years.
- Sixty-one new doctoral recipients hold positions at the institution that granted their degree, although not necessarily in the same department. This is 8.1% of the new doctoral recipients who are currently known to have jobs and 12% of those who have academic positions in the U.S. Nine new doctoral recipients have part-time positions.
- Of the 664 new doctoral recipients taking positions in the U.S., 123 (19%) have jobs in business and industry, down from 168 in fall 2001 and 206 in fall 2000.
- The number of new doctoral recipients taking U.S. academic positions was 503 in fall 2002, down 7 from fall 2001 and down 48 from fall 2000.
- Among the 266 new doctoral recipients hired by U.S. doctoral-granting departments, 44% are U.S. citizens. Among the 237 having other academic positions in the U.S., 58% are U.S. citizens.
- Of the 948 new doctoral recipients, 290 (31%) are females, down just 2 from fall 2001. Of the 418 U.S. citizen new doctoral recipients, 127 (30%) are females, down 24 from fall 2001. The all-time high was 187 in fall 1998.
- Among the 418 U.S. citizen new doctoral recipients, 18 are Asians, 12 are Blacks or African Americans, 8 are Hispanics or Latinos, 370 are Whites, and 10 are other.
- Group IV produced 222 new doctorates, of which 92 (41%) are females, compared to all other groups combined, where 198 (27%) are females.
- Two hundred eighty-eight new doctorates had a dissertation in statistics/biostatistics (253) and probability (35). The next highest number was in algebra and number theory with 126. Those with dissertations in statistics/biostatistics and probability accounted for 30.4% of the new doctorates in 2001-02.

**Table 3: Full-Time Graduate Students in Groups I, II, III, & Va by Citizenship, Fall 1992 to Fall 2001**  
 (\* Data Reprinted from Table 6B in Fall 2001 Third Report)

GRADUATE STUDENTS	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total full-time*	10595	10525	10185	9761	9476	9003	8791	8838	9637	9361
First-year full-time*	2906	2762	2668	2601	2443	2386	2510	2664	2839	2875
U.S. citizen full-time*	6020	5865	5945	5623	5445	4947	4831	4668	5085	4631
First-year U.S. citizen full-time	1801	1700	1664	1551	1465	1316	1349	1401	1527	1517

recipients not reported by departments in time for publication in the First Report. These results are published in the Second Report in Augusteach year.

**Doctoral Degrees Granted in 2001-2002**

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 948 new doctorates granted by these departments in 2001-02 is a decrease of 60 from the fall count for 2000-01. Figure 1 presents the trends in doctorates granted across the combined Groups I (Pu), I (Pr), and II and Groups I (Pu), I (Pr), II, III, and Va.

Group I (Pr) was up 10, Group Va stayed the same, while all other groups had a decrease in new doctoral recipients. The decrease of 39 in Group II is the largest. The response rates were above 90% for every group except Group IV, which historically has had slightly lower response rates than the other groups. Eight more departments responded in time for the First Report this year than responded by this time last year. Otherwise the drops probably would have been even larger.

The 948 new doctoral recipients is a preliminary count. A final count will appear in the Second Re-

port in the August 2003 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 break 1,000. The final count for last year was 1,065. It is clear that there will be another substantial drop in new doctoral recipients for 2001-02.

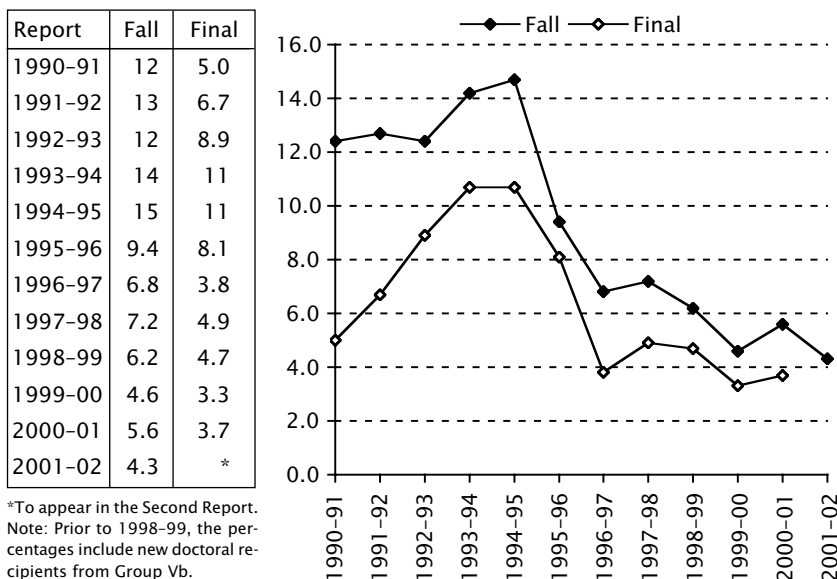
Table 2 shows that most groups had a peak or near peak in new doctorates in 1997-98. Group IV had a peak in 1999-00. From 1997-98 to 2001-02, the number of new doctorates in Groups I (Pu), I (Pr), and II dropped from 744 to 521, a decrease of 30%. If Groups I (Pu), I (Pr), II, and III are considered, the drop was from 873 to 645, a decrease of 26% from 1997-98 to 2001-02. Figure 1 shows these trends.

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 2001 Departmental Profile survey, are reprinted from Table 6B of the Third Report of the 2001 Annual Survey (*Notices of the AMS*, September 2002). It sheds some light on the downward trend in number of new doctorates given in the last four years as shown in

Table 2 and Figure 1. The total number of full-time graduate students fell from 10,595 in 1992 to 8,791 in 1998, and was 9,361 in fall 2001. The number of first-year full-time graduate students fell from 2,906 in 1992 to 2,386 in 1997 and was 2,875 in fall 2001. Full-time first-year U.S. citizen graduate students fell from 1,801 in 1992 to 1,316 in 1997 and was 1,517 in fall 2001. Using six or seven years as the typical number of years to complete a doctorate, it appears likely that the total number of new doctoral recipients and the number of U.S. citizen new doctoral recipients will continue to decline for two or three more years. The decline may be at a slower rate than it has been for the past four years.

The 2001-02 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 948 new doctoral recipients are found on pages 264-280 of this issue of the *Notices*.

**Figure 2: Percentage of New Doctoral Recipients Unemployed**  
 (as reported in the respective Annual Survey Reports 1991-2002)



**Table 4A: Employment Status of 2001-02 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/Approximations	Linear Nonlinear Optim./Control	Differential, Integral, & Difference Equations	Math. Educ.	Other/Unknown		
Group I (Public)	16	12	12	8	4	0	3	4	0	10	0	0	69	
Group I (Private)	11	9	13	3	0	1	7	5	0	7	0	0	56	
Group II	16	12	8	4	4	3	7	6	1	4	2	0	67	
Group III	4	0	2	2	0	4	1	3	1	2	2	0	21	
Group IV	0	0	0	0	2	43	1	0	0	0	0	0	46	
Group Va	0	0	0	0	2	1	3	0	0	1	0	0	7	
Master's	5	3	5	8	2	6	5	2	1	0	2	2	41	
Bachelor's	27	17	8	11	1	7	7	2	2	10	5	0	97	
Two-Year College	2	0	5	0	0	1	1	0	0	0	1	0	10	
Other Academic Dept.	4	3	1	5	1	30	11	6	1	5	3	1	71	
Research Institute/Other Nonprofit	3	1	1	0	0	7	1	3	0	2	0	0	18	
Government	1	1	3	5	0	11	10	5	0	2	0	0	38	
Business and Industry	6	2	6	6	8	63	20	6	1	3	1	1	123	
Non-U.S. Academic	13	8	12	7	3	13	11	3	3	8	0	0	81	
Non-U.S. Nonacademic	0	3	1	0	0	4	2	0	1	0	0	0	11	
Not Seeking Employment	2	0	2	1	1	4	0	0	0	0	0	0	10	
Still Seeking Employment	2	4	1	3	0	13	6	2	1	2	0	0	34	
Unknown (U.S.)	10	9	12	6	4	32	12	10	0	7	2	1	105	
Unknown (non-U.S.)*	4	2	7	3	3	10	5	3	2	3	0	1	43	
<b>TOTAL</b>	<b>126</b>	<b>86</b>	<b>99</b>	<b>72</b>	<b>35</b>	<b>253</b>	<b>113</b>	<b>60</b>	<b>14</b>	<b>66</b>	<b>18</b>	<b>6</b>	<b>948</b>	
<b>Column Subtotals</b>	Male	98	63	74	48	28	147	89	47	13	40	8	3	658
	Female	28	23	25	24	7	106	24	13	1	26	10	3	290

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

**Table 4B: Employment Status of 2001-02 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)	34	19	11	0	0	5	69	55	14	
Group I (Private)	16	29	4	4	0	3	56	41	15	
Group II	27	11	16	10	1	2	67	47	20	
Group III	5	3	2	9	2	0	21	11	10	
Group IV	0	1	0	3	40	2	46	31	15	
Group Va	0	0	0	1	1	5	7	6	1	
Master's	7	1	14	9	6	4	41	24	17	
Bachelor's	17	7	30	34	6	3	97	62	35	
Two-Year College	2	0	3	4	1	0	10	8	2	
Other Academic Dept.	10	7	9	11	28	6	71	44	27	
Research Institute/Other Nonprofit	2	5	2	1	7	1	18	11	7	
Government	5	8	6	4	8	7	38	26	12	
Business and Industry	15	12	19	6	56	15	123	88	35	
Non-U.S. Academic	28	19	8	10	11	5	81	61	20	
Non-U.S. Nonacademic	2	3	1	1	2	2	11	9	2	
Not Seeking Employment	1	1	2	2	4	0	10	6	4	
Still Seeking Employment	3	2	6	4	11	8	34	24	10	
Unknown (U.S.)	29	7	26	9	27	7	105	73	32	
Unknown (non-U.S.)*	15	4	5	2	11	6	43	31	12	
<b>TOTAL</b>	<b>218</b>	<b>139</b>	<b>164</b>	<b>124</b>	<b>222</b>	<b>81</b>	<b>948</b>	<b>658</b>	<b>290</b>	
<b>Column Subtotals</b>	Male	171	100	114	78	130	65	658		
	Female	47	39	50	46	92	16	290		

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

**Table 4C: Field of Thesis of 2001-02 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)	46	30	42	18	10	3	25	18	2	22	2	0	218
Group I (Private)	30	14	35	14	5	8	17	2	2	10	0	2	139
Group II	33	28	12	11	7	8	22	19	3	15	4	2	164
Group III	15	14	9	21	2	16	18	7	1	9	12	0	124
Group IV	0	0	0	1	6	215	0	0	0	0	0	0	222
Group Va	2	0	1	7	5	3	31	14	6	10	0	2	81
<b>Column Total</b>	<b>126</b>	<b>86</b>	<b>99</b>	<b>72</b>	<b>35</b>	<b>253</b>	<b>113</b>	<b>60</b>	<b>14</b>	<b>66</b>	<b>18</b>	<b>6</b>	<b>948</b>

**Table 5A: U.S. Employed 2001-02 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	82	63	33	27	44	17	266
Master's, Bachelor's, and 2-Year Colleges	26	8	47	47	13	7	148
Other Academic and Research Institutes	12	12	11	12	35	7	89
Government	5	8	6	4	8	7	38
Business and Industry	15	12	19	6	56	15	123
<b>Total</b>	<b>140</b>	<b>103</b>	<b>116</b>	<b>96</b>	<b>156</b>	<b>53</b>	<b>664</b>

**Employment Status of 2001-02 New Doctoral Recipients**

Table 4A gives a cross-tabulation of the 948 new doctoral recipients in the mathematical sciences: Type of Employer by Field of Thesis. Table 4B gives a cross-tabulation of the same data: Type of Employer by Type of Degree-Granting Department (Group). Table 4C gives a cross-tabulation of these same data: Type of Degree-Granting Department (Group) by Field of Thesis. This table gives a picture of the type of doctoral students being trained in the various groups. 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 also give a breakdown by sex for type of employer, type of degree-granting department, and field of thesis. Keep in mind

**Table 5B: Number of New Doctoral Recipients Taking Positions in Business and Industry in the U.S. by Type of Degree-Granting Department, Fall 1998 to Fall 2002**

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Fall 1998	29	27	41	27	70	25	219
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

that the results in this report come 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 2002 Second Report in August 2003.

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

**Table 5C: Number of New Doctoral Recipients Taking U.S. Academic Positions by Type of Degree-Granting Department, Fall 1998 to Fall 2002**

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Fall 1998	117	97	122	49	84	32	501
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

number still seeking employment divided by the total number of individuals left after the "Unknowns" are removed. The overall unemployment rate for these data is 4.3%. This figure will be updated later with information gathered from the individual new doctoral recipients. The figure for fall 2001 was 5.6%. 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 12% for Group Va and lows of 1.6% and 1.7% for Groups I (Private) and I (Public), respectively.

There are 664 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 664 new doctoral recipients. Of these, 503 (76%) hold academic positions, 38 (5.7%) are employed by government, and 123 (19%) hold positions

**Table 5D: U.S. Academic Positions Filled by New Doctoral Recipients by Type of Hiring Department, Fall 1998 to Fall 2002**

Group	I-III	IV	Va	M&B	Other	TOTAL
Fall 1998	177	35	7	177	105	501
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

in business and industry. In the First Report for 2000–01, there were 717 new doctoral recipients employed in the U.S., of which 510 (71%) held academic positions, 39 (5.4%) were in government, and 168 (23%) were in business and industry.

Table 5B shows the number of new doctoral recipients who took positions in business and in-

**Table 5E: Females as a Percentage of 2001–02 New Doctoral Recipients Produced by and Hired by Doctoral-Granting Groups**

%	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Produced	22	28	31	37	41	20	31
Hired	20	27	30	48	33	14	28

dustry by the type of department granting their degree for fall 1998 to fall 2002. 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 of 38 in fall 2001 and 45 in fall 2002. Among the 664 new doctoral recipients known to have employment in the U.S. in fall 2002, Group III has

the smallest percentage taking jobs in business and industry at 6.3% and Group IV the highest at 36%.

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 1998 to fall 2002. Among the 664 new doctoral recipients employed in the U.S. in fall 2002, 76% have academic positions. This percentage is highest for Group III at 90% and lowest for Groups IV at 59% and Va at 58%.

**Table 5G: 2001–02 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	150	266
Academic, Other	138	99	237
Nonacademic	67	94	161
Total	321	343	664

Table 5D shows how many positions were filled with new doctoral recipients for each type of academic employer. The number taking academic positions in the U.S. dropped in 2001 after being relatively high for the previous two years. The 2002 figure was down only slightly from last year, especially considering this year's substantial decrease in new doctoral recipients.

In fall 2002, 61 new doctoral recipients hold positions in the institution that granted their degree, although not necessarily in the same department. This represents 8.1% of new doctoral re-

**Table 5F: Employment Status of 2001–02 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	321	35	293	15	664
U.S. Academic	254	18	218	13	503
Groups I, II, III, and Va	100	8	109	3	220
Group IV	16	1	25	4	46
Non-Ph.D. Department	133	9	72	5	219
Research Institute/Other Nonprofit	5	0	12	1	18
U.S. Nonacademic	67	17	75	2	161
Non-U.S. Employer	11	2	76	3	92
Non-U.S. Academic	11	2	65	3	81
Non-U.S. Nonacademic	0	0	11	0	11
Not Seeking Employment	4	0	6	0	10
Still Seeking Employment	17	2	15	0	34
SUBTOTAL	353	39	390	18	800
Unknown (U.S.)	65	6	31	3	105
Unknown (non-U.S.)*	0	2	35	6	43
<b>TOTAL</b>	<b>418</b>	<b>47</b>	<b>456</b>	<b>27</b>	<b>948</b>

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

Table 6: Sex, Race/Ethnicity, and Citizenship of 2001-02 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	2	0	2	0	40	0	0	0	0	0	4
Asian	14	10	159	9	192	4	7	79	4	94	286
Black or African American	6	4	6	0	16	6	1	1	0	8	24
Hispanic or Latino	6	1	17	0	24	2	0	5	1	8	32
Native Hawaiian or Other Pacific Islander	3	0	0	0	3	0	0	0	0	0	3
White	258	12	133	6	409	112	10	48	3	173	582
Unknown	2	0	5	3	10	3	2	1	1	7	17
<b>TOTAL</b>	<b>291</b>	<b>27</b>	<b>322</b>	<b>18</b>	<b>658</b>	<b>127</b>	<b>20</b>	<b>134</b>	<b>9</b>	<b>290</b>	<b>948</b>

recipients who are currently employed and 12% of the U.S. academic positions held by new doctoral recipients. In fall 2001 there were 58 such individuals making up 7.1% of the new doctoral recipients who were employed at the time of the First Report. Nine new doctoral recipients have taken part-time positions in fall 2002.

#### Information about 2001-02 Female New Doctoral Recipients

Tables 4A and 4B give male and female breakdowns of the new doctoral recipients in 2001-02 by Field of Thesis, by Type of Degree-Granting Department, and by Type of Employer.

Overall, 290 (31%) of the 948 new doctoral recipients in 2001-02 are female. In 2000-01, 292 (29%) 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. Following the same trend as in recent years, the percentage is highest for Group IV, statistics/biostatistics departments, at 41%. While the lowest percentage last year was for Group I (Pr) at 17%, this year it is for Group Va, at 20%.

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, 42% of the new doctoral recipients hired in Group M, master's departments, are female; 36% of the new doctoral recipients hired in Group B, bachelor's departments, are female; and 29% of new doctoral recipients hired in business and industry are female.

The unemployment rate for female new doctoral recipients is 4.1% compared to 4.3% for males and 4.3% overall.

The percentage of female new doctoral recipients within fields of thesis ranged from 7.1% in optimization/control to 42% 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 2001-02 New Doctoral Recipients by Citizenship and Type of Employer

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

The unemployment rate for the 418 U.S. citizens is 4.8% compared to 6.4% in fall 2001. The unemployment rate for non-U.S. citizens is 3.8%. This varies by type of visa. The unemployment rate for non-U.S. citizens with a permanent visa is 5.1%, while that for non-U.S. citizens with a temporary visa is 3.8%.

Among U.S. citizens whose employment status is known, 91% are employed in the U.S. Among non-U.S. citizens with a permanent visa whose employment status is known, 90% have jobs in the U.S., while the percentage for non-U.S. citizens with a temporary visa is 75%.

Table 5G is a cross-tabulation of the 664 new doctoral recipients who have employment in the U.S. by citizenship and broad employment categories, using numbers from Table 5F. Of the 664 new doctoral recipients having jobs in the U.S., 48% are U.S. citizens. Of the 266 new doctoral recipients who took jobs in U.S. doctoral-granting departments, 44% are U.S. citizens. Of the 237 who took other academic positions, 58% are U.S. citizens. Of the 161 who took nonacademic positions, 42% are U.S. citizens.

Of the 321 U.S. citizens employed in the U.S., 36% have jobs in a doctoral-granting department, 43% are in other academic positions, and 21% are in nonacademic positions. For the 343 non-U.S. citizens employed in the U.S., the analogous percentages are 44%, 29%, and 27% respectively.

**Table 7: U.S. Citizen Doctoral Recipients**

Year	Total Doctorates Granted by U.S. Institutions	Total U.S. Citizen Doctoral Recipients	%
1975-76	965	722	75
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

\*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.

**Sex, Race/Ethnicity, and Citizenship Status of 2001-02 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 418 (44%) U.S. citizens among the 948 new doctoral recipients in 2001-02. Among U.S. citizens, 18 are Asians (14 male and 4 female), 12 are Blacks or African Americans (6 male and 6 female), 8 are Hispanics or Latinos (6 male and 2 female), 370 are Whites (258 male and 112 female), and 10 are other. Among non-U.S. citizens, there are 268 Asians, 24 Hispanics or Latinos, 212 Whites, and 26 other.

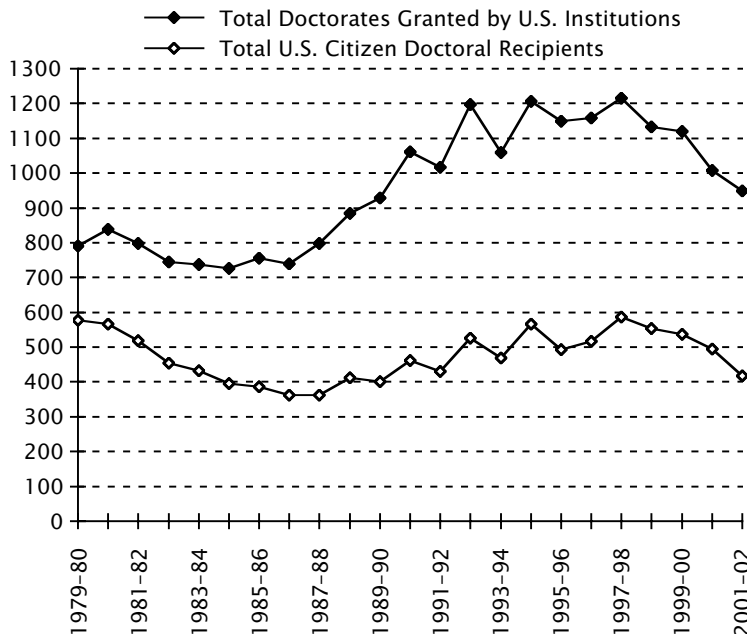
Table 7 and Figure 3 give the number of new U.S. doctoral recipients and the number of U.S. citizens back to 1975-76. The 418 U.S. citizen new

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

Year	Total U.S. Citizen Doctoral Recipients	Male	Female	% Female
1975-76	722	636	86	12
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

\*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.

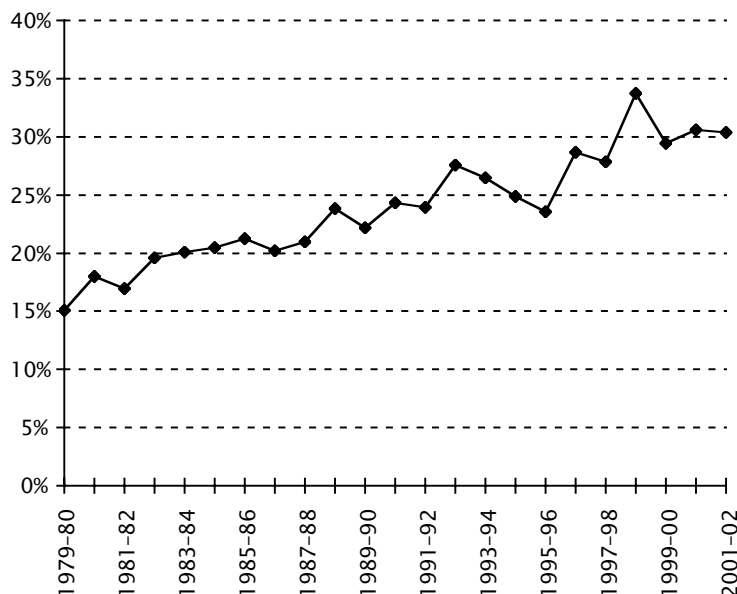
**Figure 3: U.S. Citizen Doctoral Recipients**



doctoral recipients is down by 168 (29%) since 1997-98. The percentage of U.S. citizens, which had remained steady over the last four years at 48%-49%, decreased to 44% this year, close to the all-time low of 42% in 1991-92.

Females make up 30% of the 418 U.S. citizens receiving doctoral degrees in the mathematical sciences in 2001-02. This is nearly the same as last year but down from 34% in 1998-99, the highest percentage of females among U.S. citizen new doctoral recipients ever reported by the Annual Survey. Among the 530 non-U.S. citizen new doctoral

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



**Table 9: Sex and Citizenship of 2001–02 New Doctoral Recipients by Granting Department**

CITIZENSHIP	GROUP												TOTAL	
	I (Pu)		I (Pr)		II		III		IV		Va			
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
U.S.	82	19	40	17	62	28	31	25	46	31	30	7	291	127
Non-U.S.	89	28	60	22	52	22	47	21	84	61	35	9	367	163
<b>TOTAL</b>	<b>171</b>	<b>47</b>	<b>100</b>	<b>39</b>	<b>114</b>	<b>50</b>	<b>78</b>	<b>46</b>	<b>130</b>	<b>92</b>	<b>65</b>	<b>16</b>	<b>658</b>	<b>290</b>

recipients, 163 (31%) are female, up from last year's 27%.

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 1975–76. The number of male U.S. citizen new doctoral recipients decreased by 52 from 2000–01 and is down by 132 (31%) from 1997–98. In fact, the 423 male U.S. citizen new doctoral recipients in 1997–98 is more than the total number of U.S. citizen new doctoral recipients for 2001–02. The number of female U.S. citizen new doctoral recipients is down 60 (32%) 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 948 new doctoral recipients, 44% of the males and 44% of the females are U.S. citizens. The percentage of the new doctoral recipients who are U.S. citizens within the groups is lowest in Group IV at 35% and highest in Group II at 55%. Group II is the only group to have more U.S. citizen than non-U.S. citizen new doctoral recipients in 2001–02.

#### 2001–02 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 67 new doctoral recipients with dissertations in statistics/biostatistics and probability in 2001–02 and have averaged 83 per year over the past seven years. Information about these 67 new doctoral recipients and the 222 new doctoral recipients in Group IV is found in this section of the report.

For seven 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 2001–02 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 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 2001–02, 13 more than the next largest doctoral group. It contains 30% of all doctoral departments surveyed, and

**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	Females (percent)	Jobs in Bus & Ind	Percentage Unemployed	Total	Group IV	Other Groups	Percentage Unemployed	Male	Female
1995–96	80	54 (68)	172	46 (27)	55	3.9	266	171	95	4.8	24	6
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	5.4	31	15
Statistics	55	47 (86)	147	50 (34)	42	6.2					17	8
Biostatistics	31	25 (81)	75	42 (56)	14	5.5					14	7

\* Of 221, there were 215 in statistics/biostatistics and 6 in probability. For complete details, see Table 4C.

\*\* Of 67, there were 38 in statistics/biostatistics and 29 in probability. For complete details, see Table 4C.

the 72 Group IV departments responding to the Annual Survey reported 222 new doctoral recipients, 23% of all new doctoral recipients in 2001–02. The number of new doctoral recipients in Group IV is down 15 from the number reported at this time last year, even though the number of departments responding is 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 overall 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, 92 of 222 (41%) are female, while 198 of 726 (27%) are female in the other doctoral groups. Among U.S. citizens, females accounted for 31 of the 77 (40%) Group IV new doctoral recipients, while for the other groups, 96 of 341 (28%) were female. Overall, 127 of 418 (30%) U.S. citizen new doctoral recipients were female.

In Group IV, 77 of 222 (35%) new doctoral recipients are U.S. citizens, while in other groups 341 of 726 (47%) are U.S. citizens.

Of the 156 new doctoral recipients from Group IV who found employment in the U.S., 56 (36%) took jobs in business or industry. From the other groups, 508 new doctoral recipients found employment in the U.S., of which 67 (13%) took jobs in business or industry.

The employment status for 184 Group IV new doctoral recipients is known, and 11 (6.0%) are unemployed. For the other groups, the employment status of 616 is known, and 23 (3.7%) are unemployed. Fifteen of 46 (33%) new doctoral recipients hired by Group IV departments were female, down from last year's 34% and down significantly from the 48% reported in 1999–2000. The other doctoral groups reported that 60 of 220 (27%) new doctoral recipients hired were female, up from last year's 23% and significantly more than the 16% reported in 1999–00.

Group IV had 221 new doctoral recipients with fields of thesis in statistics/biostatistics (215) and probability (6), and the other doctoral departments had 67 with field of thesis in statistics/biostatistics (38) and probability (29). The distribution of these 67 degrees among the various groups can be found in Table 4C. The number of new doctoral recipients with theses in statistics/biostatistics and probability (288) is larger than any other field, with algebra and number theory next with 126.

## 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 2002 Faculty Salary Survey. Departments were asked to report for each rank the number of tenured and tenure-track faculty whose 2002–03 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. What can be determined is the salary interval in which the quartiles occur. The endpoints of these intervals are in thousands of dollars.

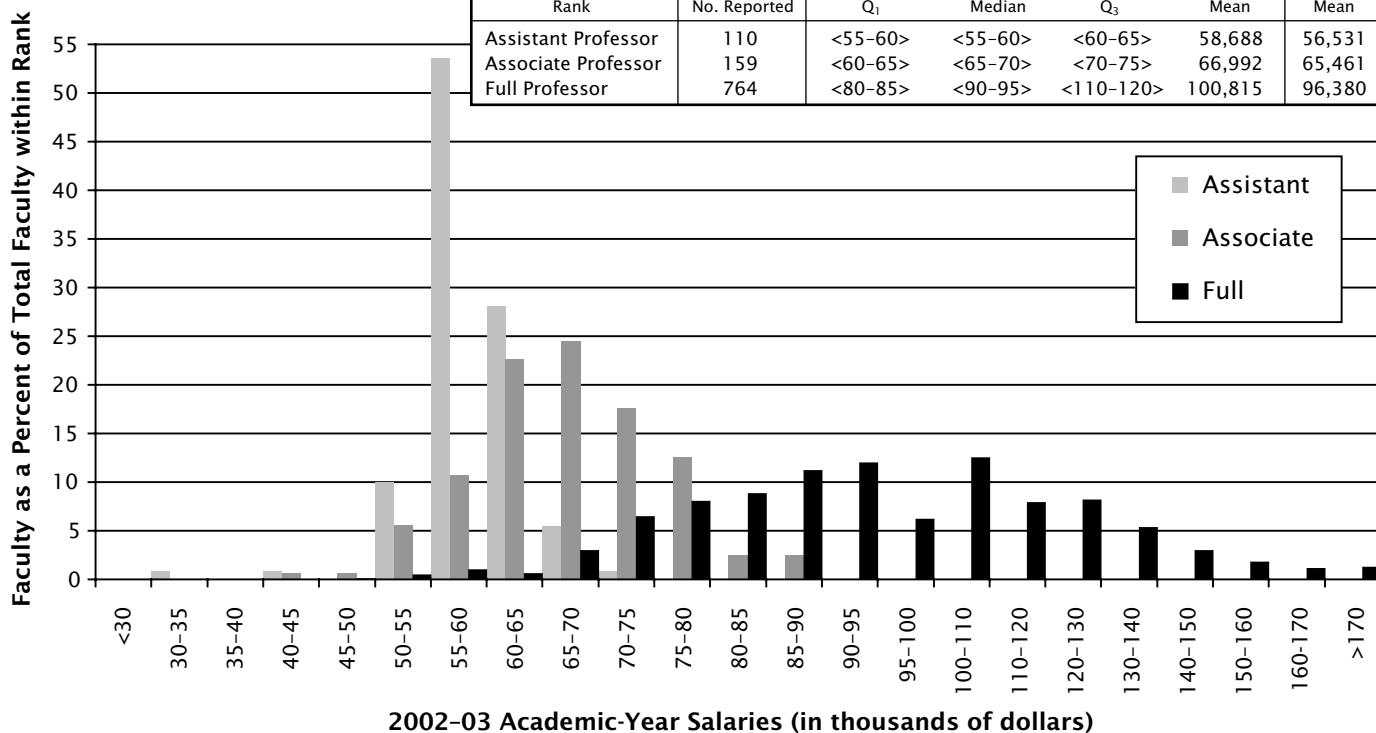
Since departments in Group I, II, and III were changed in 1995–96 (see definitions of the groups on page 253), comparisons are possible only to the last six years' data. In addition, prior to the 1998 survey Groups Va and Vb were reported together as Group V.

**Table 11: Faculty Salary Response Rates**

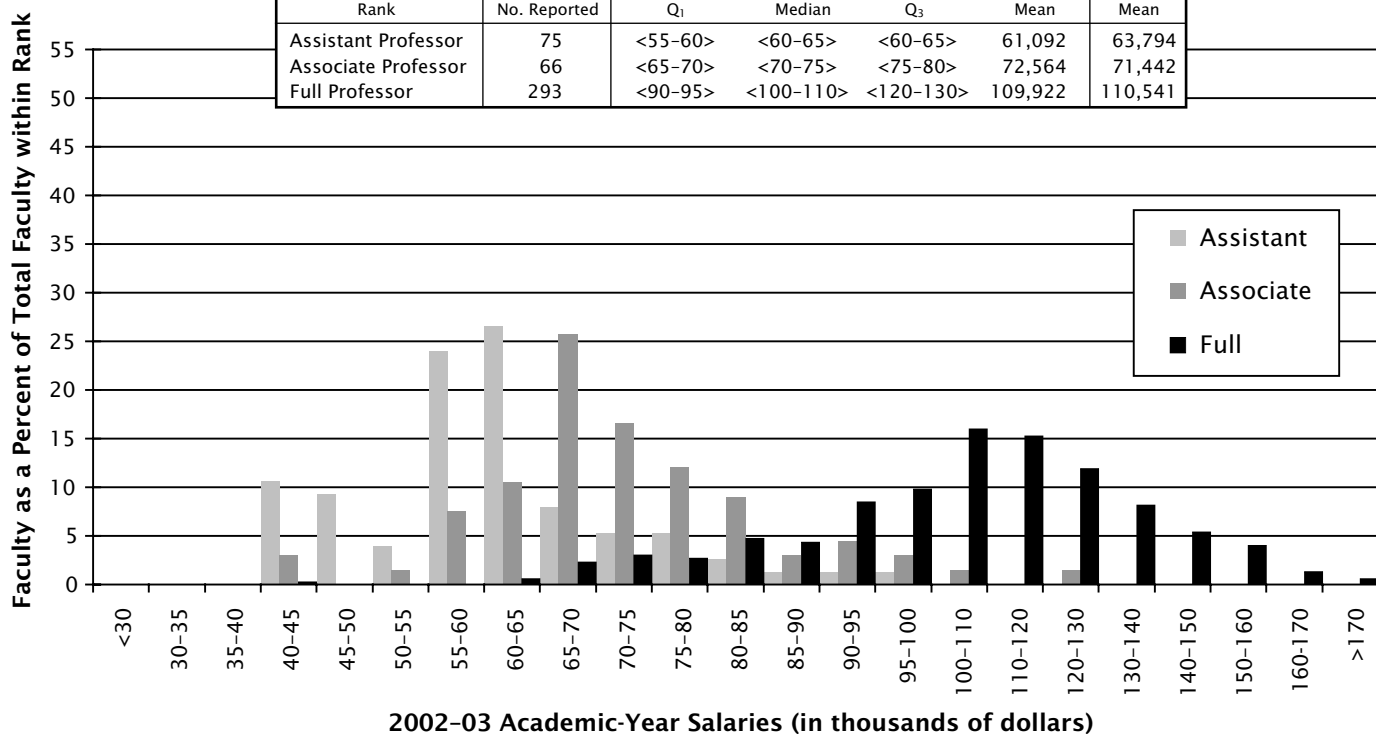
Department	Number	Percent
<b>Group I (Public)</b>	20 of 25	80
<b>Group I (Private)</b>	18 of 23	78
<b>Group II</b>	45 of 56	80
<b>Group III</b>	59 of 73	81
<b>Group IV (Statistics)</b>	37 of 55	67
<b>Group IV (Biostatistics)</b>	16 of 31	52
<b>Group Va</b>	13 of 18*	72
<b>Group M</b>	101 of 192	53
<b>Group B</b>	348 of 1030	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.

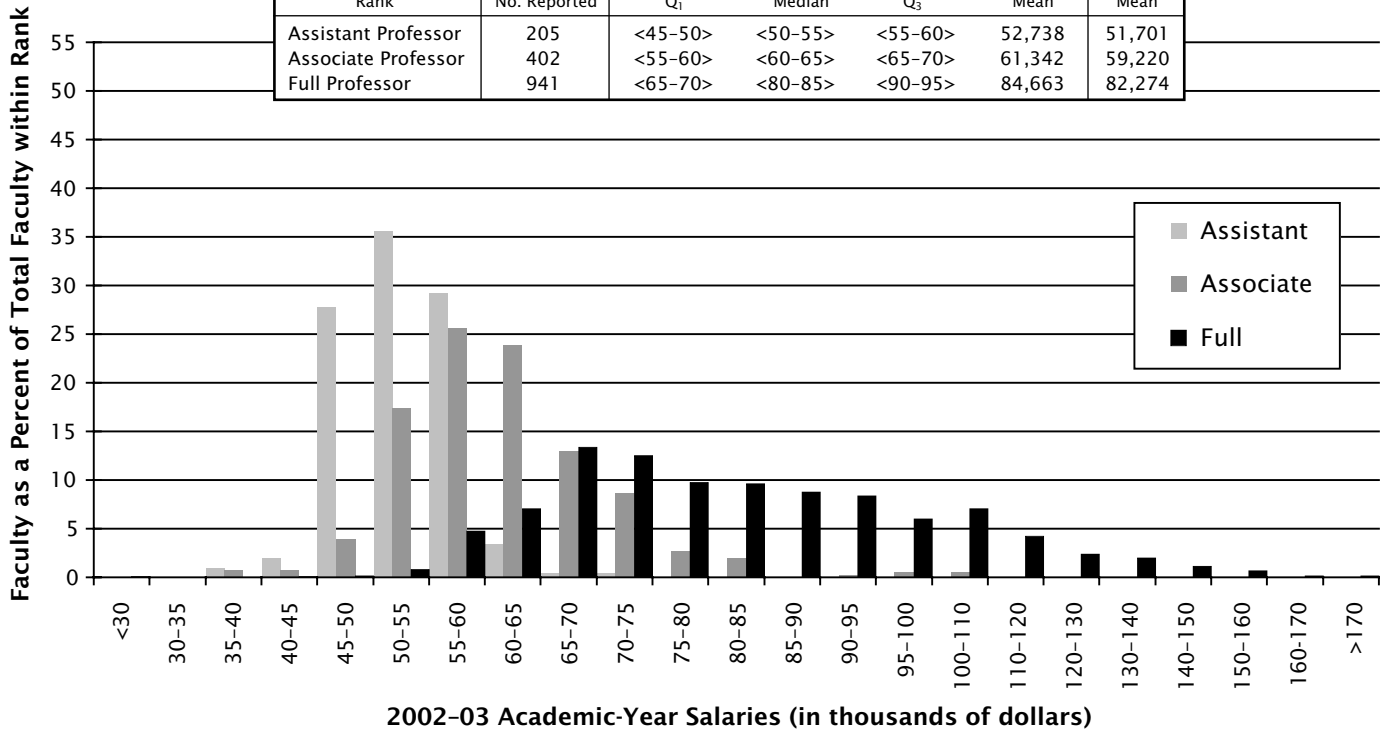
Group I (Public) Faculty Salaries						
Doctoral degree-granting departments of mathematics (25)						
20 responses (80%)						
Rank	2002-03					2001-02
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	110	<55-60>	<55-60>	<60-65>	58,688	56,531
Associate Professor	159	<60-65>	<65-70>	<70-75>	66,992	65,461
Full Professor	764	<80-85>	<90-95>	<110-120>	100,815	96,380



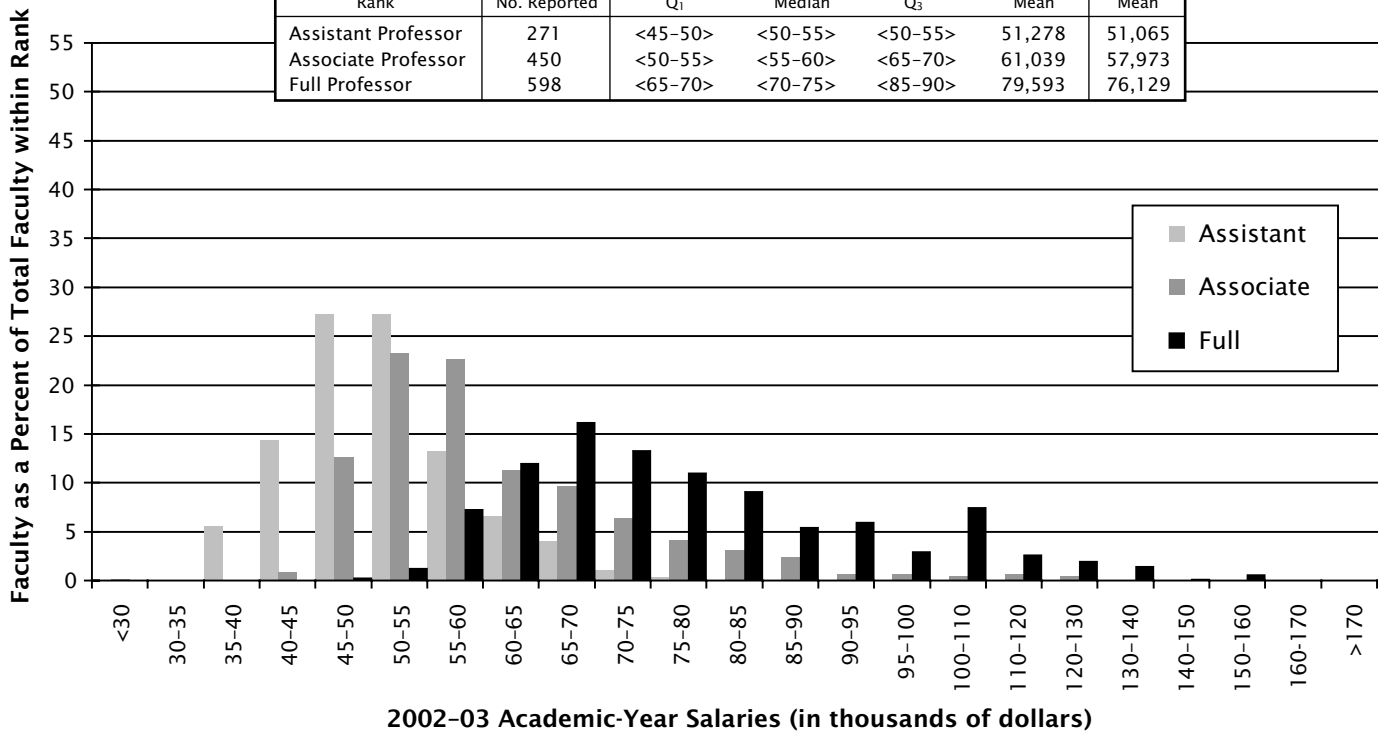
Group I (Private) Faculty Salaries						
Doctoral degree-granting departments of mathematics (23)						
18 responses (78%)						
Rank	2002-03					2001-02
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	75	<55-60>	<60-65>	<60-65>	61,092	63,794
Associate Professor	66	<65-70>	<70-75>	<75-80>	72,564	71,442
Full Professor	293	<90-95>	<100-110>	<120-130>	109,922	110,541



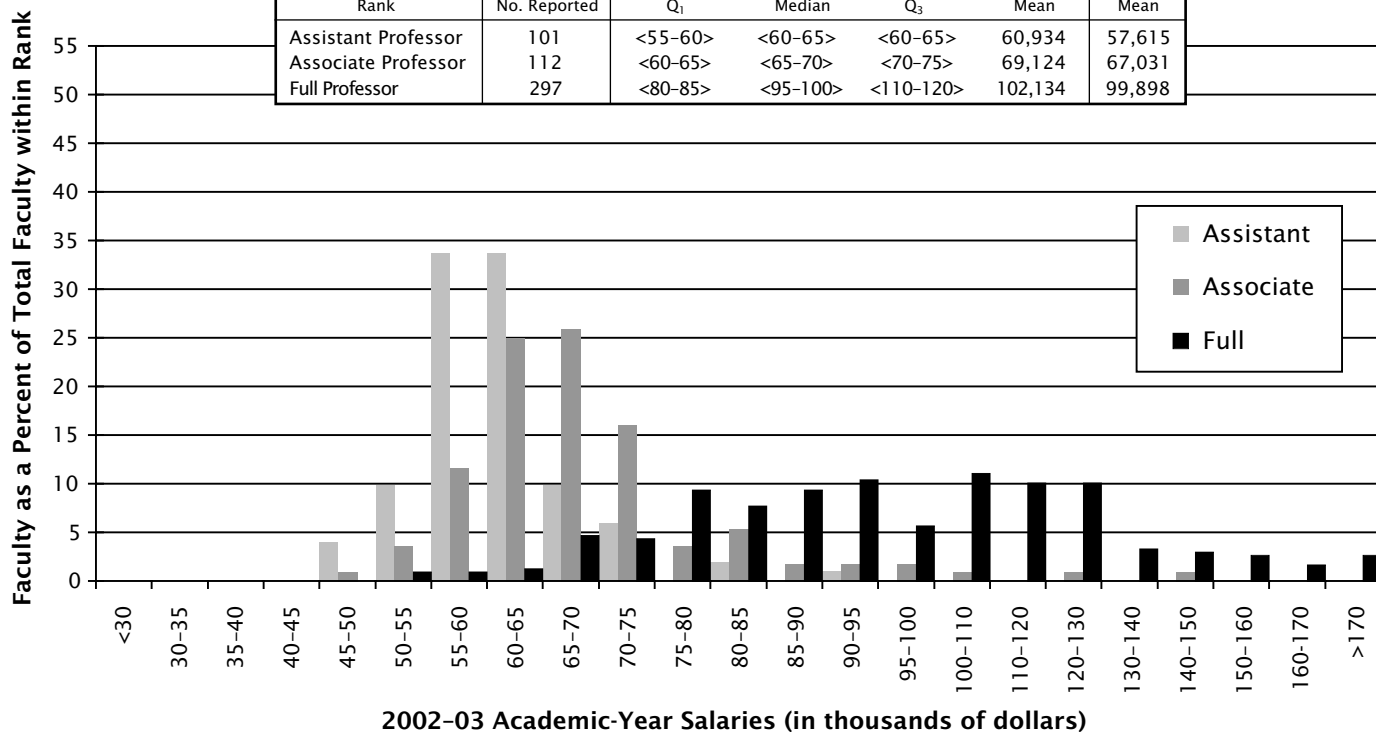
Group II Faculty Salaries						
Doctoral degree-granting departments of mathematics (56)						
45 responses (80%)						
Rank	2002-03					2001-02
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	205	<45-50>	<50-55>	<55-60>	52,738	51,701
Associate Professor	402	<55-60>	<60-65>	<65-70>	61,342	59,220
Full Professor	941	<65-70>	<80-85>	<90-95>	84,663	82,274



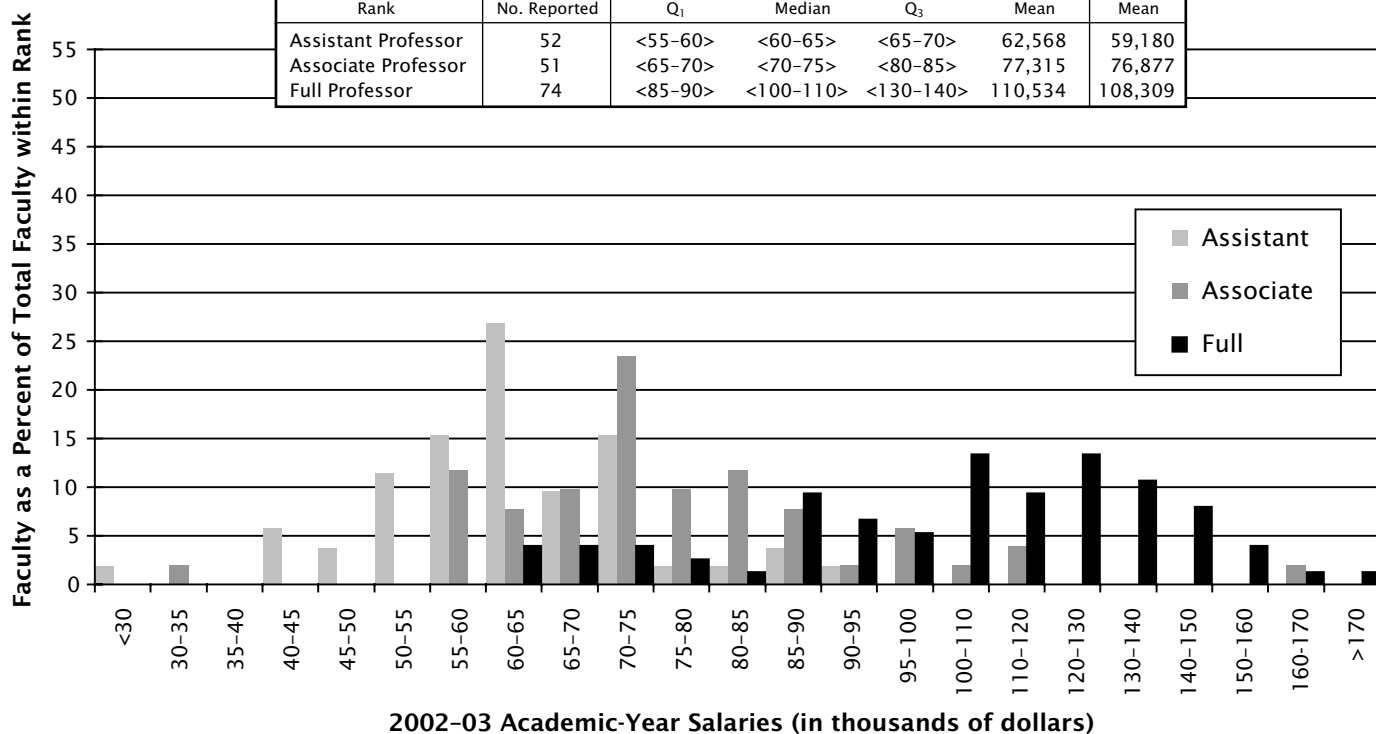
Group III Faculty Salaries						
Doctoral degree-granting departments of mathematics (73)						
59 responses (81%)						
Rank	2002-03					2001-02
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	271	<45-50>	<50-55>	<50-55>	51,278	51,065
Associate Professor	450	<50-55>	<55-60>	<65-70>	61,039	57,973
Full Professor	598	<65-70>	<70-75>	<85-90>	79,593	76,129



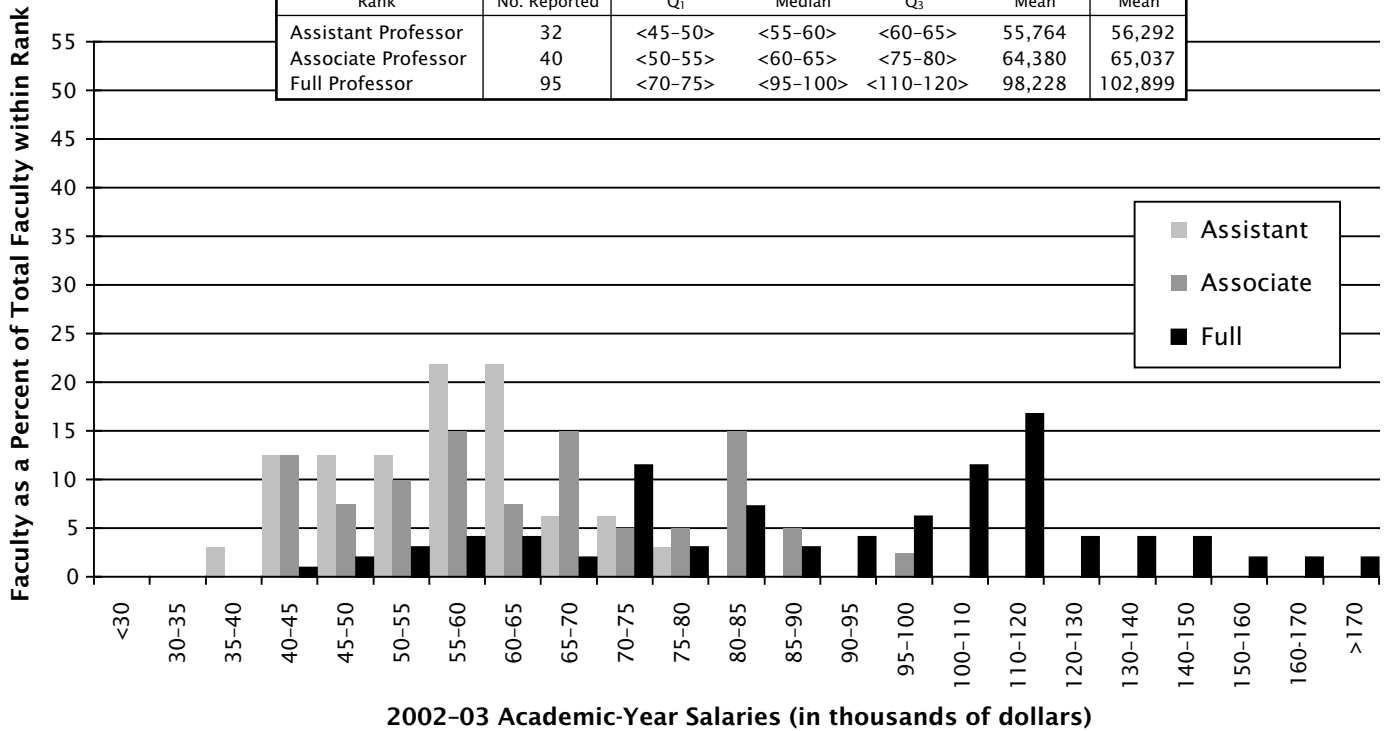
Group IV (Statistics) Faculty Salaries						
Doctoral degree-granting departments of statistics (55)						
37 responses (67%)						
Rank	2002-03					2001-02
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	101	<55-60>	<60-65>	<60-65>	60,934	57,615
Associate Professor	112	<60-65>	<65-70>	<70-75>	69,124	67,031
Full Professor	297	<80-85>	<95-100>	<110-120>	102,134	99,898



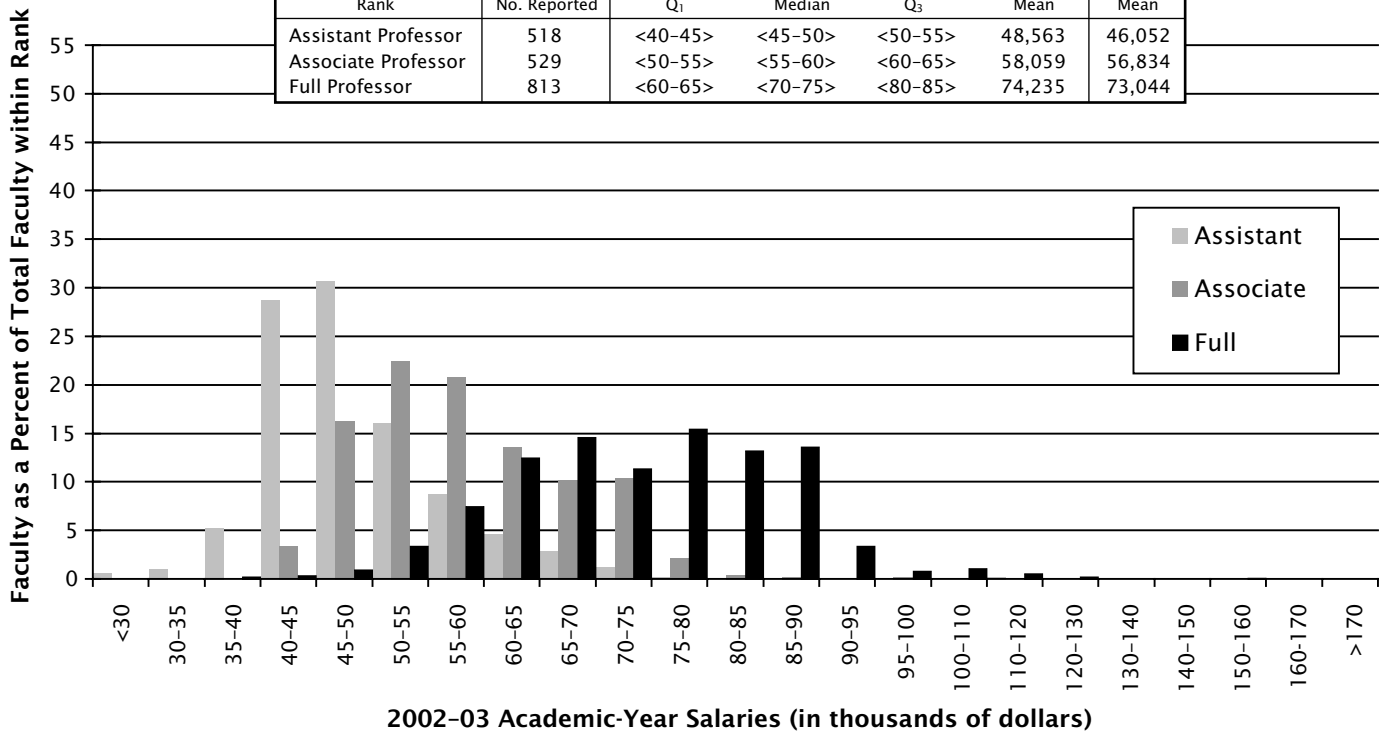
Group IV (Biostatistics) Faculty Salaries						
Doctoral degree-granting departments of biostatistics and biometrics (31)						
16 responses (52%)						
Rank	2002-03					2001-02
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	52	<55-60>	<60-65>	<65-70>	62,568	59,180
Associate Professor	51	<65-70>	<70-75>	<80-85>	77,315	76,877
Full Professor	74	<85-90>	<100-110>	<130-140>	110,534	108,309

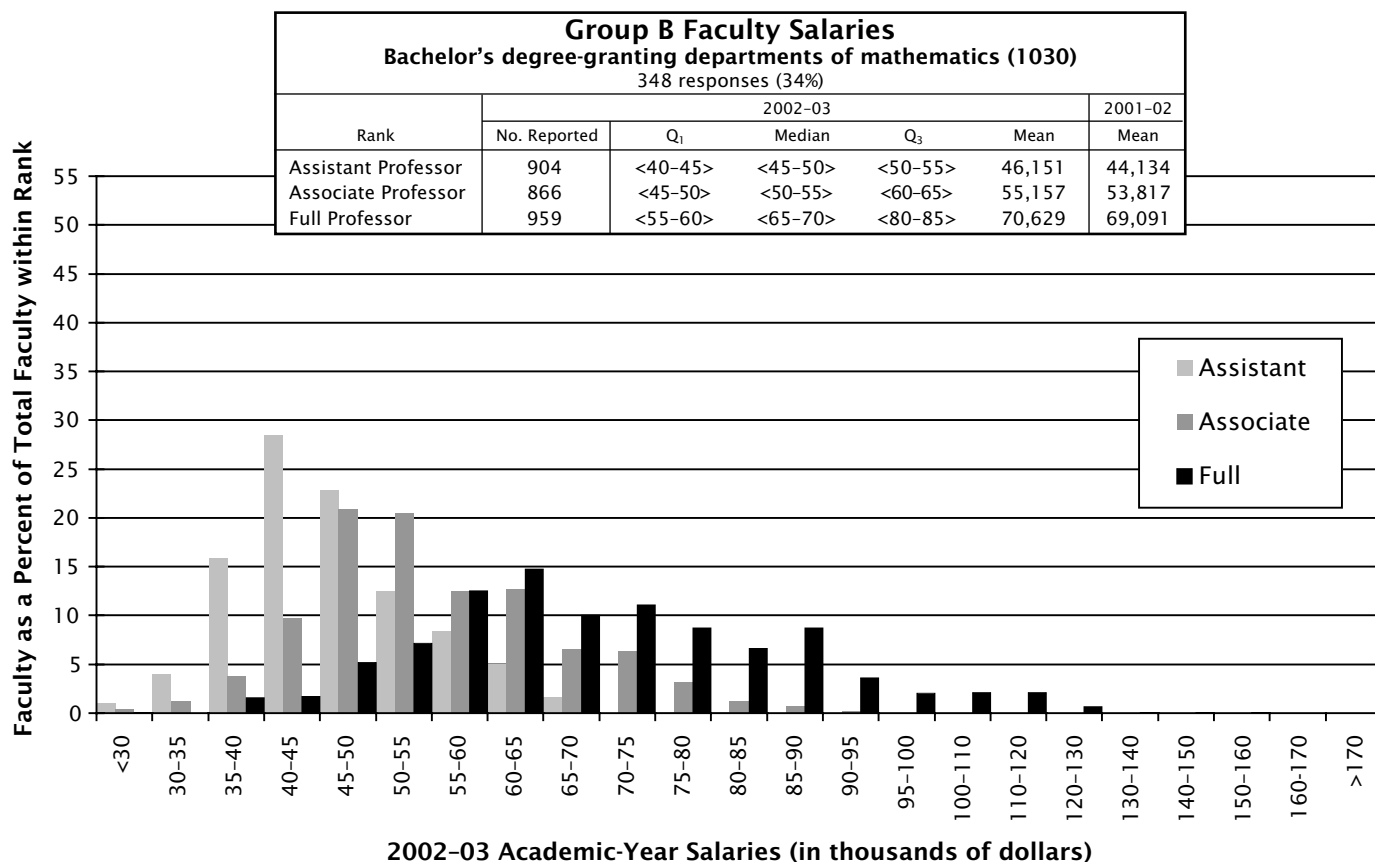


Group Va Faculty Salaries						
Doctoral degree-granting departments of applied mathematics (18)						
13 responses (72%)						
Rank	2002-03					2001-02
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	32	<45-50>	<55-60>	<60-65>	55,764	56,292
Associate Professor	40	<50-55>	<60-65>	<75-80>	64,380	65,037
Full Professor	95	<70-75>	<95-100>	<110-120>	98,228	102,899



Group M Faculty Salaries						
Master's degree-granting departments of mathematics (192)						
101 responses (53%)						
Rank	2002-03					2001-02
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	518	<40-45>	<45-50>	<50-55>	48,563	46,052
Associate Professor	529	<50-55>	<55-60>	<60-65>	58,059	56,834
Full Professor	813	<60-65>	<70-75>	<80-85>	74,235	73,044





### Previous Annual Survey Reports

The 2001 First, Second, and Third Annual Survey Reports were published in the *Notices of the AMS* in the February, August, and September 2002 issues, respectively. These reports and earlier reports, as well as a wealth of other information from these surveys, are available on the AMS website at [www.ams.org/employment/surveyreports.html](http://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.

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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*.<sup>1</sup> These rankings update those reported in a previous study published in 1982.<sup>2</sup> 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/](http://www.ams.org/employment/).*

<sup>1</sup>Research-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.

<sup>2</sup>These 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, pages 257–67, and an analysis of the classifications was given in the June 1983 Notices, pages 392–3.