Business, Industry, & Government 2003 Salary Survey

In the spring of 1999, the SPAIG Committee of the ASA conducted its first salary survey of statisticians employed in Business, Industry, & Government (B/I/G). The survey objectives were to:

- Provide current salary information on statisticians employed in B/I/G
- Provide students with better information on starting salaries by academic degree achieved
- Provide students and employed statisticians with information on future salary potential
- Provide employers with salary reference points for statisticians
- Characterize statisticians by type of employer and geographic region

In June 2003 the survey was repeated. A survey questionnaire was sent to 579 randomly selected organizations out of 1,732 B/I/G organizations identified in the ASA membership directory. The stratified sampling scheme employed was based on the number of members in the ASA membership data base for a given B/I/G organization.

# of ASA Members	# of B/I/G Organizations	# (%) of Organizations Included in Sample
1	1,303	259 (19.9)
2	177	68 (38.4)
3+	252	252 (100.0)
	1,732	579

Each organization was asked to provide information on full-time statistician employees. In addition to a mailed survey, a secure web-based application was provided for those preferring to enter data using the web. The operational definition of "statistician" used in each of these two surveys was:

- University or college degree (BS, MS, PhD) in Statistics, Biostatistics, or Mathematical Statistics, ***or***
- Equivalent of one-year graduate coursework of academic statistics courses (including those in Federal Government who meet the educational requirements for a Mathematical Statistician)
- ***and*** is using statistical reasoning or performing statistical analyses (including supervision of statisticians) as part of their job.

Of the 579 B/I/G organizations included in the sample, 553 were deemed eligible to be included in the survey; the other 26 organizations included 5 duplicate organizations, 11 organizations that did not employ statisticians, and 10 organizations that were not in business, industry, or government. Of the 553 eligible organizations, 130 responded to the survey, for an overall response rate of 23.5%. Some data were provided on 1,486 individual statisticians of the 1,746 employed.

# of ASA Members	Eligible B/I/G Organizations	
	# In Sample	# (%) Responding
1	243	48 (19.8)
2	67	14 (20.9)
3+	243	68 (28.0)
	553	130 (23.5)

The type of organizations employing the statisticians included in the respondent organizations is summarized in the following table:

Type of Organization	Organizations #	Statisticians #	Statisticians %
Government	28	733	42.0
• Federal	16	584	33.4
• State	11	148	8.5
• County	1	1	0.0
Pharmaceutical/Medical Device/Diagnostics	26	275	15.8
Medical Clinic/Hospital/PPO	17	199	11.4
Survey/Market Research	6	132	7.6
Other*	53	407	23.3
• *Technical, Survey, & Health & Safety Research*	3	106	6.1
• *Health & Safety Research*	6	66	3.8
• Energy	3	47	2.7
• Consulting	12	44	2.5
• Computer Software	2	19	1.1
• Computer Products or Services	3	18	1.0
• Photographic Products	1	15	0.9
• Food Products	1	12	0.7
• Chemicals	1	10	0.6
• Investments & Lending	1	10	0.6
• Communications	3	8	0.5
• Environmental Services or Products	2	7	0.4
• Paper Products	2	7	0.4
• *Technical Consulting*	2	7	0.4
• Professional Society Services	3	5	0.3
• Plastic Products	1	4	0.2
• Farm & Lawn Equipment or Products	1	3	0.2
• Insurance	3	3	0.2
• Conglomerate of many listed	3	16	0.9
Total	130	1,746	

**Italicized entries were not prespecified on the questionnaire*

The geographic location of the statisticians employed by the respondent organizations is summarized in the following table (information was not provided for 260 statisticians):

Geographic Region	Statisticians #	Statisticians %
East Coast	1,099	74.0
IL, IN, MI, OH, WI	187	12.6
Other	200	13.5
Total	1,486	

The highest academic degree of the statisticians employed by the respondent organizations is summarized in the following table (information was not provided for 300 statisticians):

Highest Degree	Statisticians #	Statisticians %
PhD	496	34.3
Masters	703	48.6
Bachelors	247	17.1
Total	1,446	

The total years employed as a full-time statistician, from beginning of career, for the statisticians employed by the respondent organizations is summarized in the following table (information was not provided for 344 statisticians). This computation is based on the the first date a statistician was ever employed full-time as a statistician, regardless of whether that employment was with the current employer or a different employer. An unknown number of responses were based on the starting date within the current organization, which if not the original employer would produce an incorrect smaller duration of employment. This date of first employment was compared to 1 July 2003, which is roughly the midpoint of the active portion of the survey. When month of first employment was unspecified, June was used. The years of employment could not be determined for 342 statisticians.

	Statisticians	
Years Employed	**#**	**%**
0 – 1.9	187	13.2
2 – 3.9	219	15.6
4 – 5.9	194	13.8
6 – 7.9	116	8.3
8 – 11.9	150	10.7
12 – 19.9	276	19.7
20 +	262	18.7
Total	1,404	

The managerial status of the statisticians employed by the respondent organizations is summarized in the following table (information was not provided for 305 statisticians):

Managerial	**Statisticians**	
Responsibility	**#**	**%**
No	930	64.5
Yes	511	35.5
Total	1,441	

The gender of the statisticians employed by the respondent organizations is summarized in the following table (information was not provided for 324 statisticians). The ratio of males to females in the data provided is approximately 3:2.

	Statisticians	
Gender	**#**	**%**
Female	573	40.3
Male	849	59.7
Total	1,422	

The highest academic degree by gender of the statisticians employed by the respondent organizations is summarized in the following table (information was not provided for 337 statisticians). Males had a higher percentage of higher academic degrees than females.

		Highest Academic Degree			
		Bachelors	**Masters**	**PhD**	**Total**
Gender	**Male**	121 (14.3%)	383 (45.4%)	340 (40.3%)	844
	Female	126 (22.3%)	320 (56.6%)	119 (21.1%)	565

The duration of employment by gender of the statisticians employed by the respondent organizations is summarized in the following table (information was not provided for 360 statisticians). Males had a greater length of employment than females (median length of employment was 9.0 years for males and 6.0 years for females).

	Gender			
	Female		Male	
Years Employed	**#**	**%**	**#**	**%**
0 – 1.9	84	14.8	101	12.3
2 – 3.9	106	18.8	111	13.5
4 – 5.9	89	15.8	102	12.4
6 – 7.9	53	9.4	63	7.7
8 – 11.9	58	10.3	90	10.9
12 – 19.9	108	19.2	166	20.2
20 +	65	11.6	190	23.1
Total	563		823	

The managerial responsibility by gender of the statisticians employed by the respondent organizations is summarized in the following table (information was not provided for 324 statisticians). Males had a higher percentage of managerial responsibility than females, which may be partially explained by the relatively longer length of employment and higher academic degrees of males mentioned above.

		Managerial Responsibility		
		No	**Yes**	**Total**
Gender	**Male**	484 (57.0%)	365 (43.0%)	849
	Female	432 (75.4%)	141 (24.6%)	573

The managerial responsibility by highest academic degree of the statisticians employed by the respondent organizations is summarized in the following table (information was not provided for 335 statisticians). PhDs had a higher percentage of managerial responsibility than Masters or Bachelors statisticians.

		Managerial Responsibility		
		No	**Yes**	**Total**
Highest	**Bachelors**	173 (70.0%)	74 (30.0%)	247
Academic	**Masters**	498 (70.1%)	205 (29.9%)	703
Degree	**PhD**	237 (51.4%)	224 (48.6%)	461

Salary Statistics

Salary statistics were categorized by organization type (Fed. Gov., Pharma, Other), managerial status, highest academic degree attained (BS, MS, PhD), and total years of experience.

Salary data shown in the following tables are based on base salaries excluding bonuses, stock awards, stock options, and other forms of incentives. The statistics shown are based on adjusting for the stratified nature of the sampling scheme used in the survey. To adjust for the different sampling rates across strata, the data were replicated 10 times for organizations in Stratum 1 (1 ASA member), 5 times for organizations in Stratum 2 (2 ASA members), and 2 times for organizations in Stratum 3 (3+ ASA members), which yields approximately 200% representation for each stratum. This expanded data file was used to generate the sample quartiles; the number of observations N that are displayed are based on the unexpanded data file. To preserve confidentiality, no statistics are presented if the number of observations, N, is 6 or fewer, the median is presented if N is 7 or greater, and the 1st and 3rd quartiles (Q1 and Q3) are presented if N is 10 or greater.

The following table provides information on the current starting salaries of statisticians with no prior work-related experience.

Table 1. Annual Starting Salaries ($000) of Statisticians With No Prior Work-Related Experience

Type of Employer	Highest Degree	N	Q1	Median	Q3
All	BS	77	34.0	**40.0**	45.0
	MS	102	45.0	**50.0**	59.0
	PhD	99	60.0	**65.0**	75.0
Federal Government	BS	7		**35.0**	
	MS	8		**45.0**	
	PhD	9		**53.0**	
State Government	BS	7		**34.0**	
	MS	7		**47.0**	
	PhD	7		**49.0**	
Pharmaceutical/ Medical Devices/ Diagnostic	BS	13	45.0	**45.0**	50.0
	MS	23	55.0	**60.0**	67.0
	PhD	23	61.0	**72.0**	85.0
Medical Clinic/ Hospital/PPO	BS	10	40.0	**42.0**	45.0
	MS	15	50.0	**55.0**	57.0
	PhD	15	63.0	**65.0**	70.0
Consulting	BS	8		**40.0**	
	MS	8		**55.0**	
	PhD	6			
Other	BS	32	30.0	**40.0**	45.0
	MS	41	41.0	**50.0**	56.0
	PhD	39	50.0	**60.0**	75.0

The next two tables provide information on annual salaries by years of experience based on managerial status.

Table 2. Annual Salaries ($000) of Statisticians With No Managerial Responsibility

Years of Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	BS	43	38.0	**45.0**	48.0
	MS	83	47.0	**54.0**	60.0
	PhD	34	71.0	**80.0**	87.0
2 – 3.9	BS	45	46.0	**52.0**	56.0
	MS	92	52.0	**59.0**	67.0
	PhD	49	67.0	**77.0**	92.0
4 – 7.9	BS	40	53.5	**67.0**	67.0
	MS	121	59.0	**67.0**	79.0
	PhD	60	83.0	**91.0**	103.0
8 – 11.9	BS	10	45.0	**53.0**	71.0
	MS	55	64.0	**76.0**	90.0
	PhD	28	82.0	**93.5**	99.5
12 – 19.9	BS	17	55.0	**62.0**	67.0
	MS	78	72.0	**82.0**	92.0
	PhD	33	83.0	**98.0**	113.0
20+	BS	9		**67.0**	
	MS	53	78.0	**89.0**	105.0
	PhD	24	91.0	**105.0**	130.0

Table 3. Annual Salaries ($000) of Statisticians With Managerial Responsibility

Yearsof Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	BS	2			
	MS	8		**76.0**	
	PhD	14	70.0	**80.5**	117.0
2 – 3.9	BS	7		**70.0**	
	MS	7		**76.0**	
	PhD	13	76.0	**118.0**	120.0
4 – 7.9	BS	14	61.0	**68.5**	76.0
	MS	34	76.0	**76.0**	88.0
	PhD	32	76.0	**86.0**	107.0
8 – 11.9	BS	6			
	MS	20	89.0	**97.0**	102.0
	PhD	29	87.5	**101.0**	125.0
12 – 19.9	BS	17	76.0	**76.0**	76.0
	MS	61	78.0	**93.0**	109.5
	PhD	65	95.0	**125.0**	150.0
20+	BS	28	76.0	**92.0**	97.0
	MS	72	92.0	**105.0**	115.0
	PhD	66	113.0	**143.5**	170.0

The next two tables provide information on annual salaries for Federal Government statisticians by years of experience based on managerial status.

Table 4. Annual Salaries ($000) of Statisticians With No Managerial Responsibility

Federal Government Responses (16 organizations)

Years of Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	BS	18	38.0	**42.0**	46.0
	MS	15	46.0	**58.0**	67.0
	PhD	5			
2 – 3.9	BS	19	54.0	**54.0**	67.0
	MS	27	54.0	**67.0**	67.0
	PhD	9		**67.0**	
4 – 7.9	BS	27	67.0	**67.0**	67.0
	MS	32	67.0	**67.0**	77.0
	PhD	6	67.0	**67.0**	73.0
8 – 11.9	BS	7		**76.0**	
	MS	15	74.0	**76.0**	81.0
	PhD	4			
12 – 19.9	BS	12	67.0	**69.0**	77.0
	MS	33	67.0	**78.0**	85.0
	PhD	5			
20+	BS	8		**70.0**	
	MS	27	86.0	**89.0**	99.0
	PhD	9		**112.0**	

Table 5. Annual Salaries ($000) of Statisticians With Managerial Responsibility

Federal Government Respondents (16 organizations)

Years of Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	MS	4			
	PhD	2			
2 – 3.9	MS	2			
	PhD	4			
4 – 7.9	BS	4			
	MS	19	76.0	**76.0**	76.0
	PhD	12	76.0	**76.0**	112.0
8 – 11.9	BS	5			
	MS	5			
	PhD	2			
12 – 19.9	BS	15	76.0	**76.0**	76.0
	MS	38	76.0	**88.5**	125.0
	PhD	14	76.0	**125.0**	143.0
20+	BS	23	76.0	**92.0**	103.0
	MS	52	92.0	**101.0**	111.0
	PhD	17	92.0	**142.0**	143.0

The next two tables provide information on annual salaries for Pharma statisticians by years of experience based on managerial status.

Table 6. Annual Salaries ($000) of Statisticians With No Managerial Responsibility

Pharmaceutical/Medical Devices/Diagnostic Respondents (26 organizations)

Years of Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	MS	12	60.0	**70.0**	75.0
	PhD	13	75.0	**81.0**	82.0
2 – 3.9	MS	13	66.0	**70.0**	85.0
	PhD	23	80.0	**91.0**	100.0
4 – 7.9	MS	22	70.0	**75.0**	86.0
	PhD	29	85.0	**91.0**	103.0
8 – 11.9	MS	20	90.0	**92.5**	101.0
	PhD	10	95.0	**95.0**	102.0
12 – 19.9	MS	21	86.0	**98.0**	101.5
	PhD	13	95.0	**116.0**	118.0
20+	MS	13	104.0	**109.0**	114.0
	PhD	4			

Table 7. Annual Salaries ($000) of Statisticians With Managerial Responsibility

Pharmaceutical/Medical Devices/Diagnostic Respondents (26 organizations)

Years of Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	PhD	3			
4 – 7.9	MS	1			
	PhD	4			
8 – 11.9	MS	5			
	PhD	9		**128.0**	
12 – 19.9	MS	9		**117.0**	
	PhD	17	130.0	**142.0**	160.0
20+	MS	8		**126.5**	
	PhD	18	140.0	**169.5**	170.0

The next two tables provide information on annual salaries for Other statisticians by years of experience based on managerial status. In these tables, all organization types are included except for Federal Government and Pharmaceutical/Medical Device/Diagnostics.

Table 8. Annual Salaries ($000) of Statisticians With No Managerial Responsibility

Other Respondents (88 organizations)

Years of Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	BS	25	41.0	**45.0**	51.0
	MS	56	47.0	**52.5**	55.0
	PhD	16	69.0	**74.5**	88.5
2 – 3.9	BS	26	45.0	**51.0**	55.0
	MS	52	49.0	**56.0**	65.0
	PhD	17	45.0	**73.0**	95.0
4 – 7.9	BS	13	50.0	**53.0**	59.0
	MS	67	57.0	**64.0**	75.0
	PhD	25	80.0	**92.0**	103.0
8 – 11.9	BS	3			
	MS	20	62.0	**64.0**	68.0
	PhD	14	78.0	**90.5**	99.0
12 – 19.9	BS	5			
	MS	24	70.0	**80.0**	85.0
	PhD	15	81.0	**83.0**	100.0
20+	BS	1			
	MS	13	60.0	**75.0**	85.0
	PhD	11	81.0	**91.0**	104.0

Table 9. Annual Salaries ($000) of Statisticians With Managerial Responsibility

Other Respondents (88 organizations)

Years of Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	BS	2			
	MS	4			
	PhD	9		**70.0**	
2 – 3.9	BS	7		**70.0**	
	MS	5			
	PhD	9		**118.0**	
4 – 7.9	BS	10	60.0	**62.0**	75.0
	MS	14	66.0	**76.5**	77.0
	PhD	16	72.0	**86.0**	100.0
8 – 11.9	BS	1			
	MS	10	89.0	**100.0**	100.0
	PhD	18	86.0	**101.0**	119.0
12 – 19.9	BS	2			
	MS	14	78.0	**97.0**	122.0
	PhD	34	95.0	**120.0**	146.0
20+	BS	5			
	MS	12	86.0	**105.0**	112.0
	PhD	31	112.0	**151.0**	236.0

The next two tables provide information on annual salaries for Medical Clinic/Hospital/PPO statisticians by years of experience based on managerial status.

Table 10. Annual Salaries ($000) of Statisticians With No Managerial Responsibility

Medical Clinic/Hospital/PPO (17 organizations)

Years of Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	BS	1			
	MS	20	50.0	**51.5**	55.5
	PhD	8		**82.5**	
2 – 3.9	BS	1			
	MS	22	52.0	**54.5**	64.0
	PhD	3			
4 – 7.9	BS	3			
	MS	15	58.0	**61.0**	71.0
	PhD	7		**98.0**	
8 – 11.9	BS				
	MS	4			
	PhD	7		**96.0**	
12 – 19.9	BS	2			
	MS	3			
	PhD	4			
20+	BS				
	MS	1			
	PhD	2			

Table 11. Annual Salaries ($000) of Statisticians With Managerial Responsibility

Medical Clinic/Hospital/PPO (17 organizations)

Years of Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	BS				
	MS	1			
	PhD	8			
2 – 3.9	BS				
	MS	2			
	PhD	4			
4 – 7.9	BS				
	MS	2			
	PhD	7		**85.0**	
8 – 11.9	BS				
	MS	1			
	PhD	3			
12 – 19.9	BS				
	MS	5			
	PhD	13	124.0	**130.0**	135.0
20+	BS				
	MS				
	PhD	4			

The next two tables provide information on annual salaries for Survey/Market Research statisticians by years of experience based on managerial status.

Table 12. Annual Salaries ($000) of Statisticians With No Managerial Responsibility

Survey/Market Research (6 organizations)

Years of Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	BS	13	44.0	**46.0**	48.0
	MS	4			
	PhD	2			
2 – 3.9	BS	11	45.0	**47.0**	52.0
	MS	3			
	PhD	1			
4 – 7.9	BS	2			
	MS	4			
	PhD	3			
8 – 11.9	BS	1			
	MS				
	PhD				
12 – 19.9	BS				
	MS	1			
	PhD	1			
20+	BS				
	MS				
	PhD	1			

Table 13. Annual Salaries ($000) of Statisticians With Managerial Responsibility

Survey/Market Research (6 organizations)

Years of Experience	Highest Degree	N	Q1	Median	Q3
0 – 1.9	BS	2			
	MS	2			
	PhD	1			
2 – 3.9	BS	7		**70.0**	
	MS	1			
	PhD	2			
4 – 7.9	BS	10	60.0	**62.0**	75.0
	MS	1			
	PhD	2			
8 – 11.9	BS				
	MS	3			
	PhD	1			
12 – 19.9	BS	2			
	MS				
	PhD	1			
20+	BS	3			
	MS	4			
	PhD	3			

The next table provides information on annual salaries by gender and years of experience.

Table 14. Annual Salaries ($000) of Statisticians By Gender & Years of Experience

		Female		Male	
Years of Experience	**Highest Degree**	**N**	**Median**	**N**	**Median**
0 – 1.9	BS	25	**46.0**	20	**38.0**
	MS	44	**55.0**	47	**54.0**
	PhD	15	**81.0**	33	**81.0**
2 – 3.9	BS	30	**52.0**	22	**54.0**
	MS	58	**59.0**	41	**59.0**
	PhD	16	**84.5**	46	**82.0**
4 – 7.9	BS	25	**64.0**	29	**67.0**
	MS	85	**70.0**	70	**69.0**
	PhD	28	**91.0**	64	**87.0**
8 – 11.9	BS	9	**53.0**	7	**76.0**
	MS	34	**76.0**	41	**90.0**
	PhD	15	**89.0**	42	**100.0**
12 – 19.9	BS	24	**67.0**	10	**76.0**
	MS	51	**81.0**	88	**85.0**
	PhD	31	**115.0**	67	**120.0**
20+	BS	12	**74.0**	25	**92.0**
	MS	40	**92.0**	85	**99.0**
	PhD	11	**107.0**	79	**138.0**

Table 15. Annual Salaries ($000) of Statisticians By Region

Geographic Region	**Highest Degree**	**N**	**Q1**	**Median**	**Q3**
New England[a]	MS	54	65.0	**89.5**	103.0
	PhD	55	97.0	**118.0**	157.0
Middle Atlantic[b]	BS	13	57.0	**61.0**	61.0
	MS	104	67.0	**83.0**	98.0
	PhD	126	85.0	**102.0**	127.0
South Atlantic[c]	BS	153	52.0	**67.0**	76.0
	MS	350	61.0	**76.0**	92.0
	PhD	194	76.0	**93.0**	115.0
East North Central[d]	BS	57	47.0	**56.0**	64.0
	MS	83	63.0	**76.0**	85.0
	PhD	46	83.0	**101.0**	128.0
Other	BS	23	55.0	**84.0**	91.0
	MS	104	53.0	**63.0**	97.0
	PhD	68	73.0	**90.0**	118.0

a: CT, MA, ME, NH, RI, VT
b: NJ, NY, PA
c: DE, DC, GA, FL, MD, NC, SC, VA, WV
d: IL, IN, MI, OH, WI

Additional Details
The survey questionnaire can be viewed on the SPAIG web site at http://web.utk.edu/~wparr/spaig.html.

Future Surveys
It is anticipated that a B/I/G salary survey will be conducted and reported on every 2-3 years, and that future surveys will achieve an increasingly higher response rate. Valid current salary information is critical to understanding the value placed on statisticians by our society, and to recruiting future students into the profession of statistics.

Survey Limitations
Some limitations of the survey are worth noting:
1. In interpreting the results of this survey, the reader should keep in mind the overall response rate of 23.5%.
2. Some salaries may represent more than the annual base salary due to failure of a respondent to follow the survey questionnaire directions. If this occurred frequently enough, the salary quantiles would be inflated.
3. Some dates of first employment are based on the current employer instead of the first employer, which was the intention of the survey and the instructions on the survey questionnaire. If this occurred frequently enough, the salary quantiles would tend to be inflated for the earlier intervals for years of experience.

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