

DOCUMENT RESUME

ED 082 971

SE 016 480

AUTHOR Kincannon, Charles L.; Schneider, Paula J.
TITLE Persons in Engineering, Scientific, and Technical
Occupations: 1970 and 1972. Current Population
Reports, Series P-23, No. 45.
INSTITUTION Bureau of the Census (DOC), Suitland, Md. Population
Div.
REPORT NO Ser-P-23-45
PUB DATE Jul 73
NOTE 132p.; Current Population Reports Special Studies
AVAILABLE FROM Superintendent of Documents, Government Printing
Office, Washington, D.C. 20402 (\$0.55)
EDRS PRICE MF-\$0.65 HC-\$6.58
DESCRIPTORS Census Figures; Engineering Technicians; *Engineers;
Manpower Utilization; *Occupational Surveys;
*Scientific Manpower; Scientists; *Statistical Data;
*Technical Occupations
IDENTIFIERS Research Reports

ABSTRACT

This is the first of a series of reports based on the 1972 Professional, Technical, and Scientific Manpower Survey, which was sponsored by the National Science Foundation and conducted by the Bureau of the Census. Included in this report are preliminary data highlighting selected information on employment status, age, sex, and education of persons identified in the 1970 Census of Population as working in engineering, scientific, and technical occupations in the United States. The occupation groupings included in the universe of this report are as follows: computer specialists, operations and systems researchers and analysts, engineers, mathematical specialists, life scientists, physical scientists, social scientists, and engineering and science technicians. More detailed statistics for these persons, covering such topics as fields of study, membership in professional societies, and other characteristics, cross-classified by age and highest degree held, will appear in a later report in the Technical Paper series. (Author/JR)

FILMED FROM BEST AVAILABLE COPY

56

A UNITED STATES
DEPARTMENT OF
COMMERCE
PUBLICATION



CURRENT POPULATION REPORTS
Special Studies

Series P-23, No. 45
July 1973

ED 082971

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRO-
DUCED EXACTLY AS RECEIVED FROM
THE PERSON OR ORGANIZATION ORIGIN-
ATING IT. POINTS OF VIEW OR OPINIONS
STATED DO NOT NECESSARILY REPRESENT
OFFICIAL NATIONAL INSTITUTE OF
EDUCATION POSITION OR POLICY

**PERSONS IN
ENGINEERING,
SCIENTIFIC, AND
TECHNICAL
OCCUPATIONS:
1970 AND 1972**

U.S. DEPARTMENT
OF COMMERCE
Social and Economic
Statistics Administration

BUREAU OF
THE CENSUS

SE 016 480

U. S. DEPARTMENT OF COMMERCE

Frederick B. Dent, Secretary

Social and Economic Statistics Administration

Edward D. Failor, Administrator

BUREAU OF THE CENSUS

Vincent P. Barabba, Acting Director

Robert L. Hagan, Deputy Director

Daniel B. Levine, Associate Director
for Demographic Operations

POPULATION DIVISION

Meyer Zitter, Chief

ACKNOWLEDGMENTS

The 1972 Professional, Technical, and Scientific Manpower Survey was sponsored by the National Science Foundation and conducted by the Bureau of the Census. This report was planned and its content developed by Charles L. Kincannon and Paula J. Schneider of the Labor Force Statistics Branch. Systems and processing procedures and programs were developed by Mary K. Friday. Overall direction was provided by Murray S. Weitzman, Assistant Division Chief (Socioeconomic Statistics Programs), Population Division.

SUGGESTED CITATION

U.S. Bureau of the Census, Current Population Reports, P-23, No. 45, "Persons in Engineering, Scientific, and Technical Occupations: 1970 and 1972," U.S. Government Printing Office, Washington, D.C. 1973.

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, 55 cents
Current Population Reports issued in Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and
P-65 are sold as a single consolidated subscription at \$30.50 per year, \$7.75 additional for foreign mail.

CONTENTS

	Page
Introduction	1
Summary of results	1
Definitions and explanations	4
Source and reliability of the estimates	5

TEXT TABLES

Table	Page
A. Unemployment rates in 1970 and 1972 for the 1970 experienced civilian labor force by sex and occupation	1
B. Percent of 1970 experienced civilian labor force in the 1972 experienced civilian labor force by sex and occupation in 1970	2
C. Percent distribution by sex of the 1970 experienced civilian labor force by occupation in 1970	2
D. Percent of 1970 experienced civilian labor force in the 1972 experienced civilian labor force by age in 1972 and occupation in 1970	3
E. Median age in 1972 by sex and occupation	3
F. Selected educational characteristics in 1972 by occupation in 1970	3
G. Selected educational characteristics by occupation in 1970 and sex	4
H. Summary of response in the 1972 professional, technical, and scientific manpower survey by occupation	6
I.1. Standard errors of totals and percentages for computer specialists	8
I.2. Standard errors of totals and percentages for all engineers or engineering and science technicians	9
I.3. Standard errors of totals and percentages for mathematical specialists	10
I.4. Standard errors of totals and percentages for life and physical scientists	11
I.5. Standard errors of totals and percentages for operations and systems researchers and analysts	12
I.6. Standard errors of totals and percentages for social scientists	13
J.1. Standard errors of totals and percentages for computer programmers, civil engineers, industrial engineers, mechanical engineers, electrical and electronic engineering technicians, mathematical technicians, and engineering and science technicians, n.e.c. . . .	14
J.2. Standard errors of totals and percentages for engineers, n.e.c., and engineering teachers . .	15
J.3. Standard errors of totals and percentages for computer systems analysts; aeronautical and astronautical engineers; operations and systems researchers and analysts; economists and economics teachers; agricultural, biological and chemical technicians, except health; and surveyors	16
J.4. Standard errors of totals and percentages for chemists and chemistry teachers	17
J.5. Standard errors of totals and percentages for electrical and electronic engineers, and draftsmen	18
J.6. Standard errors of totals and percentages for all other individual occupations	19

DETAILED TABLES

	Page
1. Employment status in 1970 and labor force status in 1972 for persons in engineering, scientific, and technical occupations in the 1970 experienced civilian labor force	21
2. Employment status in 1970 and labor force status in 1972 for persons in engineering, scientific, and technical occupations in the 1970 experienced civilian labor force by age in 1972 and sex	22
3. Labor force status in 1972 by employment status in 1970 for persons in engineering, scientific, and technical occupations in the 1970 experienced civilian labor force	24
4. Age and highest degree held in 1972 for persons in engineering, scientific, and technical occupations in the 1970 experienced civilian labor force by sex	25

APPENDIX

Table	Page
A-1. Analysis of response in the 1972 professional, technical, and scientific manpower survey by occupation and education in 1970, and age in 1972	27

PERSONS IN ENGINEERING, SCIENTIFIC, AND TECHNICAL OCCUPATIONS: 1970 AND 1972

INTRODUCTION

This is the first in a series of reports based on the 1972 Professional, Technical, and Scientific Manpower Survey, which was sponsored by the National Science Foundation and conducted by the Bureau of the Census.¹ Included in this report are preliminary data highlighting selected information on employment status, age, sex, and education of persons identified in the 1970 Census of Population as working in engineering, scientific, and technical occupations in the United States. The occupation groupings included in the universe of this report are as follows:²

- Computer specialists
- Operations and systems researchers and analysts
- Engineers
- Mathematical specialists
- Life scientists
- Physical scientists
- Social scientists
- Engineering and science technicians

More detailed statistics for these persons, covering such topics as fields of study, membership in professional societies, and other characteristics, cross-classified by age and highest degree held, will appear in a later report in the Technical Paper series.

¹A detailed discussion of this survey is presented in American Statistical Association, Proceedings of the Social Statistics Section, 1972, Chapter XII.

²Specific occupation titles included in these groupings are given in the section on Definitions and Explanations.

SUMMARY OF RESULTS

Labor force and employment status. The universe for this report was restricted to persons identified in the 1970 Census of Population as scientists, engineers, technicians, or in related occupation fields in the experienced civilian labor force. Among those persons who responded in the 1972 survey, the vast majority in each of the occupation groups were also in the experienced civilian labor force in 1972. The proportion ranged from approximately 91 percent for mathematical specialists to over 95 percent for computer specialists, operations and systems researchers and analysts, and engineers. The degree of consistency in labor force participation over time seems to have been partially dependent on the person's employment status in 1970 for some of the occupation groups (see table 3). For persons who were employed in 1970, over 90 percent for each occupation group reported being in the experienced civilian labor force in 1972. Of these persons, about 98 percent for each occupation group were also employed in 1972 and about 2 percent had become unemployed. When the universe is restricted to those persons who were unemployed in 1970, however, a substantially smaller proportion in about half of the occupation groups reported that they were in the labor force in 1972. For instance, of the 700 mathematical specialists and the 2,500 physical scientists who were unemployed in 1970, about 65 percent were still in the labor force in 1972. On the other hand, among computer specialists and operations and systems researchers and analysts who were unemployed in 1970, over 90 percent were still in the labor force in 1972.

Table A. UNEMPLOYMENT RATES IN 1970 AND 1972 FOR THE 1970 EXPERIENCED CIVILIAN LABOR FORCE BY SEX AND OCCUPATION

Occupation in 1970	Unemployment rate in 1970			Unemployment rate in 1972		
	Total	Male	Female	Total	Male	Female
Computer specialists.....	1.3	1.1	2.1	2.3	2.1	3.3
Operations and systems researchers and analysts.....	2.0	1.9	3.2	2.2	2.0	3.9
Engineers.....	1.5	1.4	5.2	2.5	2.5	7.4
Mathematical specialists.....	1.2	1.0	1.6	1.7	1.8	1.6
Life scientists.....	0.8	0.6	1.2	1.4	1.0	3.5
Physical scientists.....	1.3	1.0	4.4	2.0	1.9	3.0
Social scientists.....	0.9	0.8	1.4	1.5	1.3	2.5
Engineering and science technicians..	2.5	2.2	4.7	3.3	3.0	6.8

Source: Table 2.

About 75 percent to 80 percent of these persons were employed by 1972, whereas 20 to 25 percent were unemployed at both dates.

The net result of changes in employment status between 1970 and 1972 was that a slightly higher proportion of persons in over half of the occupation groups were unemployed in 1972 than in 1970 (see table 1). However, within the eight occupation groups only 12 of the 31 individual occupations also showed an increase in the percent unemployed between 1970 and 1972 with aeronautical and aerospace engineers having the highest unemployment rate in both years (3.8 percent in 1970 and 6.1 percent in 1972). For the occupation groups engineers, social scientists, and engineering and science technicians, women had a higher unemployment rate than men in both periods.

The degree of consistency in labor force participation between 1970 and 1972 varies somewhat according to the sex composition in the particular occupation group. For instance, table B below shows that, for all occupation groups, a higher proportion of men than women were in the experienced civilian labor force in 1972. The major reason for the difference in labor force participation between men and women is, most likely, that women tend to leave the labor force, either temporarily or permanently, to attend to family responsibilities.

Table B. PERCENT OF 1970 EXPERIENCED CIVILIAN LABOR FORCE IN THE 1972 EXPERIENCED CIVILIAN LABOR FORCE BY SEX AND OCCUPATION IN 1970

Occupation in 1970	Total	Male	Female
Computer specialists.....	95.5	97.9	85.6
Operations and systems researchers and analysts	95.3	96.1	88.1
Engineers.....	95.3	95.4	87.7
Mathematical specialists.....	90.6	94.0	81.5
Life scientists.....	92.3	94.4	82.8
Physical scientists.....	94.1	94.7	88.1
Social scientists.....	92.8	94.7	84.9
Engineering and science technicians.....	93.0	94.2	83.1

Source: Table 2.

In general, those occupation groups with a relatively large proportion of female workers show larger differences between men and women with regard to percent in the 1972 labor force. Although this relationship does not hold for all occupation groups, it does suggest that women

working in the predominantly male occupations included in this study exhibit a greater consistency in labor force participation.

Table C. PERCENT DISTRIBUTION BY SEX OF THE 1970 EXPERIENCED CIVILIAN LABOR FORCE BY OCCUPATION IN 1970

Occupation in 1970	Total	Male	Female
Computer specialists....	100.0	80.8	19.2
Operations and systems researchers and analysts	100.0	90.7	9.3
Engineers.....	100.0	98.7	1.3
Mathematical specialists	100.0	72.6	27.4
Life scientists.....	100.0	81.5	18.5
Physical scientists.....	100.0	91.0	9.0
Social scientists.....	100.0	80.3	19.7
Engineering and science technicians.....	100.0	89.4	10.6

Source: Table 2.

The level of consistency in labor force status between 1970 and 1972 also varies within and between occupation groups according to the age of the persons considered. In the age groups covering the prime working years, i.e. between 30 and 54 years old, the percent in the 1972 experienced civilian labor force varied only between 94 and 99 percent across all the occupation groups. In the peripheral age groups, however, much more variation occurred. Among persons under 25 years of age the range of labor force participation rates was from 78 percent for mathematical specialists to 95 percent for operations and systems researchers and analysts. For the majority of occupation groups, the percent remaining in the labor force in 1972 increased gradually up to the age groups 40 to 54 years, and dropped sharply at 60 to 64 years or 65 years and over. There are, however, two notable exceptions to this general pattern. Among the operations and systems researchers and analysts, the decline in the proportion remaining in the labor force in 1972 began at an earlier age than for the other occupation groups. Specifically, between the age groups 50 to 54 years old and 55 to 59 years old the percent in the labor force dropped from 98 percent to about 88 percent, and in the age group 65 years and over less than 30 percent remained in the labor force. The other exception to the general pattern of working life described above relates to computer specialists. Significantly more computer specialists in the age category 65 years and over remained in the labor force in 1972. For most groups only about half of the persons 65 years old and over were in the 1972 labor force, whereas among computer specialists the proportion was approximately 84 percent. This can possibly be attributed to the increased demand over the past few decades for persons trained in the computer field.

Table D. PERCENT OF 1970 EXPERIENCED CIVILIAN LABOR FORCE IN THE 1972 EXPERIENCED CIVILIAN LABOR FORCE BY AGE IN 1972 AND OCCUPATION IN 1970

Occupation in 1970	Percent in 1972 experienced civilian labor force							
	Under 25 years	25 to 29 years	30 to 39 years	40 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over
Computer specialists.....	89.0	94.1	97.4	98.8	96.6	86.1	86.9	84.0
Operations and systems researchers and analysts.....	94.4	95.9	97.7	99.1	98.1	88.3	76.7	28.8
Engineers.....	90.2	96.6	98.7	98.4	97.3	93.7	82.2	50.6
Mathematical specialists.....	77.9	90.0	94.9	97.0	94.7	93.2	79.5	48.7
Life scientists.....	83.5	89.1	94.8	97.1	97.7	92.6	80.5	54.7
Physical scientists.....	81.0	93.0	97.3	98.3	97.1	94.2	74.7	59.3
Social scientists.....	88.4	90.8	95.0	97.6	96.8	94.5	79.7	55.0
Engineering and science technicians.....	87.6	94.1	96.7	97.0	94.7	91.5	80.4	44.7

Source: Table 2.

Age and education. The median age of persons in the specified occupation groups varied from a low of about 33 years for computer specialists to a high of about 42 years for engineers, with all other groups having a median age between 36 and 40 years. Women working as computer specialists, life scientists, and physical scientists were slightly younger than their male counterparts (see table E).

degree or Ph.D.) was less than 20 percent for four occupation groups--computer specialists, operations and systems researchers and analysts, engineers, and engineering and science technicians--but was over 40 percent for the remaining four groups (see table F).

Table E. MEDIAN AGE IN 1972 BY SEX AND OCCUPATION

Occupation in 1970	Total	Male	Female
Computer specialists.....	32.8	33.5	29.3
Operations and systems researchers and analysts	40.1	40.1	40.4
Engineers.....	42.1	42.1	43.0
Mathematical specialists.....	37.8	37.6	38.7
Life scientists.....	39.6	40.3	36.3
Physical scientists.....	40.0	40.3	37.0
Social scientists.....	39.2	39.2	38.9
Engineering and science technicians.....	35.7	35.6	37.6

Source: Table 4.

The various occupation groups differed considerably with regard to educational attainment. For instance, the proportion with no college training varied from less than 10 percent for mathematical specialists, life scientists, physical scientists, and social scientists to nearly 40 percent for engineering and science technicians. The percent with graduate degrees (Master's

Table F. SELECTED EDUCATIONAL CHARACTERISTICS IN 1972 BY OCCUPATION IN 1970

Occupation in 1970	1970 experienced civilian labor force		
	Percent with no college in 1972 ¹	Percent with a degree in 1972 ²	Percent with graduate degree in 1972 ³
Computer specialists..	15.4	49.8	10.6
Operations and systems researchers and analysts.....	25.5	43.0	11.8
Engineers.....	12.8	61.7	15.1
Mathematical specialists.....	9.4	77.0	49.3
Life scientists.....	6.0	85.9	46.8
Physical scientists...	6.0	81.1	43.2
Social scientists.....	3.9	86.3	58.2
Engineering and science technicians..	38.4	14.4	2.4

¹Includes persons who reported having no degree and having completed no years of college.

²Includes persons who reported having a bachelor's, master's, Ph.D., or other degree.

³Includes persons who reported having a master's degree or Ph.D.

Source: Table 4.

Within some occupation groups, there are pronounced differences between the educational attainment of men and women. For instance, a significantly larger proportion of women classified as engineers or mathematical specialists reported that they had no academic degree in 1972 than was true for men (see table G). This could be partly because of differences between the specific jobs held by women and those held by men classified in the same general occupation group. Similarly the percentage of female mathematical specialists and physical scientists who had a graduate degree was much lower than for men in these occupation groups. However, the proportion of women with graduate degrees was the same as or slightly higher than for men in four groups--engineers, operations and systems researchers and analysts, social scientists, and engineering and science technicians.

More detailed distributions of the subject population by employment status in 1970 and 1972, age, sex, and education can be found in the tables at the end of this report. Table 1 is based on all persons selected in the sample, weighted up to census control totals, and presents information on employment status in 1970, level of response in the 1972 survey, and labor force status in 1972 for persons who responded in 1972. Tables 2, 3, and 4, which are based on persons who returned completed questionnaires in the 1972 survey, adjusted for nonresponse and weighted up to census control totals, present data on the sex, age, education, and employment status of this group. All figures and comparisons in this report are preliminary; final data, including a wide variety of detailed statistics, will appear in a report in the Technical Paper series.

Table G. SELECTED EDUCATIONAL CHARACTERISTICS BY OCCUPATION IN 1970 AND SEX

Occupation in 1970	Male		Female	
	Percent with no degree in 1972	Percent with graduate degree in 1972 ¹	Percent with no degree in 1972	Percent with graduate degree in 1972 ¹
Computer specialists.....	45.7	11.4	45.0	7.2
Operations and systems researchers and analysts.....	53.6	11.7	52.9	12.5
Engineers.....	34.4	15.2	48.6	12.6
Mathematical specialists.....	14.0	58.1	42.3	25.8
Life scientists.....	12.0	48.3	19.0	39.9
Physical scientists.....	17.1	44.6	21.7	29.5
Social scientists.....	12.8	57.5	14.3	60.9
Engineering and science technicians....	78.2	2.2	77.1	3.4

¹ Includes persons who reported having a master's degree or Ph.D.

Source: Table 4.

DEFINITIONS AND EXPLANATIONS

Population coverage. The universe examined in this report includes persons who were enumerated in the 1970 Census of Population as being 16 years old and over, in the experienced civilian labor force, and who were classified in one of the specified target occupation groups.

Experienced civilian labor force. This category comprises persons employed at the time of enumeration and unemployed persons with previous work experience, according to the defi-

nitions of the 1970 census.³ All other persons are classified as "not in labor force" or "labor force status not reported."

Occupation. The occupation in 1970 refers to the job reported in the 1970 Census of Population. For employed persons, the information reflects the primary job held during the reference period. For the experienced unemployed and persons not in the labor force, the occupation reflects the

³For more detailed definitions of the employment status categories, refer to 1970 Census of Population, Volume I, Characteristics of the Population, Part 1, United States Summary.

last job held. The occupation groupings are based on the classification structure from the 1970 Census of Population.⁴ The detailed occupation titles for which data are presented in this report are as follows:

- Computer specialists
 - Computer programmers
 - Computer systems analysts
 - Computer specialists, not elsewhere classified
- Operations and systems researchers and analysts
- Engineers
 - Aeronautical and astronautical engineers
 - Chemical engineers
 - Civil engineers
 - Electrical and electronic engineers
 - Industrial engineers
 - Mechanical engineers
 - Metallurgical and materials engineers
 - Mining and petroleum engineers
 - Sales engineers
 - Engineers, not elsewhere classified, and engineering teachers⁵
- Mathematical specialists
 - Actuaries and statisticians
 - Mathematicians and mathematics teachers⁵
- Life scientists
 - Agricultural scientists and teachers⁵
 - Foresters and conservationists⁶
 - Biological scientists and teachers⁵
- Physical scientists
 - Atmospheric and marine scientists and geologists and teachers⁵
 - Chemists and chemistry teachers⁵
 - Physicists and physics teachers⁵
- Social scientists
 - Economists and economics teachers⁵
 - Psychologists and psychology teachers⁵
 - Other social scientists and social science teachers⁵
- Engineering and science technicians
 - Agricultural, biological, and chemical technicians, except health
 - Draftsmen
 - Electrical and electronic engineering technicians

⁴Detailed information on the composition of the occupation categories is given in the publication, 1970 Census of Population, Classified Index of Industries and Occupations, U.S. Government Printing Office, Washington, D.C., 1971.

⁵Excludes teachers below the college or university level.

⁶Excludes persons who reported in the 1970 census having completed less than 4 years of college.

Engineering and science technicians--Continued
 Industrial and mechanical engineering technicians
 Surveyors
 Mathematical technicians and science and engineering technicians, not elsewhere classified

Age and sex. The age and sex classifications are based on responses in the 1972 survey.

Years of school completed. The years of school completed reflect the highest year completed, as reported in the 1972 survey, and is shown in this report only for persons who did not report having an academic degree.

Highest degree held. The highest degree refers to the highest academic degree reported in the 1972 survey. The types of degrees for which data were tabulated include associate degree, bachelor's degree, master's degree, and Ph.D. The residual "other" category includes such degrees as nursing, first professional, and M.D.

SOURCE AND RELIABILITY OF THE ESTIMATES

Source of data. The estimates shown for 1972 are based on data obtained in the 1972 Professional, Technical, and Scientific Manpower Survey.⁷ The nationwide sample for this survey was selected from persons recorded in the 1970 Census of Population as being in the experienced civilian labor force and reported in engineering, scientific, and related occupations or as having completed 4 or more years of college. After the sample was selected, the census questionnaire for each sample case had to be located and the name and address transcribed to create a mailing list. Questionnaires, requesting detailed information on employment, education, and demographic characteristics, were mailed to approximately 102,000 persons in the sample population during February 1972. The final result of all data collection activities, which extended to July 1972, was that completed questionnaires were obtained for 73.1 percent of the sample, approximately 74,000 persons. The 26.9 percent for whom a completed questionnaire was not obtained include persons who refused to participate, the deceased, and persons who returned questionnaires with insufficient information to permit processing. Table H presents a summary of response by occupation group. Appendix A-1 presents a detailed distribution of response categories by occupation group, age, and education.

⁷See footnote 1.

Table H. SUMMARY OF RESPONSE IN THE 1972 PROFESSIONAL, TECHNICAL, AND SCIENTIFIC MANPOWER SURVEY BY OCCUPATION

Occupation	Number in universe	Number in sample	Percent, no address found	Cases mailed				
				Total		Completed questionnaire obtained	Other return ²	No return
				Number ¹	Percent			
Computer specialists....	257,064	7,044	5.1	6,685	100.0	72.1	14.3	13.7
Operations and systems researchers and analysts.....	80,868	3,184	3.5	3,073	100.0	72.9	14.9	12.0
Engineers.....	1,242,518	26,681	5.2	25,294	100.0	74.7	14.3	11.1
Mathematical specialists	61,680	3,180	6.3	2,980	100.0	74.0	14.3	11.7
Life scientists.....	83,511	4,306	5.2	4,082	100.0	79.3	12.0	8.5
Physical scientists.....	196,351	6,842	5.0	6,500	100.0	79.5	10.9	9.6
Social scientists.....	151,296	7,018	5.0	6,667	100.0	73.1	13.4	13.6
Engineering and science technicians.....	827,033	18,412	5.4	17,418	100.0	68.6	16.6	14.7

¹Figures exclude that portion of the sample which was not classified in one of the target occupations.

²Includes incomplete returns, deceased, and refusals.

Source: Appendix A-1.

For each sample case in which a completed questionnaire was obtained, the information from the 1972 survey was matched with the census data for the same persons. The resultant matched data file was then weighted by means of a ratio adjustment to the 1970 census age, sex, and race totals by occupation group and used in the creation of the tables.

Reliability of the estimates. The sample used for this survey is only one of a large number of possible samples of the same size that could have been selected using the same sample design, sample selection, and measurement procedures. Estimates derived from these samples would differ from each other. The standard error of a survey estimate is a measure of the variation among the estimates from all possible samples and is, therefore, a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples. The estimate and its associated standard error may be used to construct a confidence interval, that is, an interval having a prescribed probability that it would include the average result of all possible samples. The chances are about two out of three (about 68 percent) that the survey estimate will differ from the average result of all possible samples by less than one standard error (plus or minus). Similarly, the chances are about 19 out of 20 that the difference would be less than twice the standard error and 99 out of 100 that it would be less than 2-1/2 times the standard error.

Table I.1 through I.6 present estimates of standard errors for the summary groups of occupation categories, as defined in the tabulations. For example, table I.1 presents standard errors for Computer Specialists which comprises Computer Programmers, Computer Systems Analysts, and Computer Specialists, n.e.c. However, if a standard error is desired for a specific category, e.g., Computer Programmers, tables J.1 through J.6 should be used.

Tables I.1 through I.6 were constructed using several approximations and tend to be conservative estimates of the magnitude of the standard errors for the summary groups. If a more precise estimate of the standard error is required for a specified item of the summary group, the following procedure should be employed:

a. Determine from the tabulations the number of persons in each specific occupation category within the summary occupation group for the specified item.

b. From the appropriate tables J.1 through J.6, determine the standard error for each of the component estimates of the specific occupation categories.

c. The standard error for the specified item of the summary occupation group is the square root of the sum of the squares of the individual standard errors.

Tables J.1 through J.6 present estimates of standard errors for specific occupation categories. A given table may be applicable to more than one specific occupation category. Thus, table J.5 should be used for standard errors of either electrical and electronic engineers or draftsmen. The standard errors for estimated numbers or percents not shown in either set of tables may be approximated by linear interpolation.

The figures in these tables are not directly applicable to standard errors of differences between two sample estimates. The standard

error of an estimated difference between two figures may be approximated by the square root of the sum of the squares of the standard error of each estimate. This formula will accurately represent the actual standard error for the difference between separate and uncorrelated characteristics in the same area. If, however, there is a high positive correlation between the two characteristics, the formula will overestimate the true standard error. For a difference between two sample estimates, one of which represents a subclass of the other, the tables can be used directly with the difference considered as the sample estimate.

Standard Errors of Totals and Percentages for Computer Specialists

6

Table I.1a. Standard Errors of Totals

Size of estimate	Estimated standard error
1,000.....	260
5,000.....	590
10,000.....	820
20,000.....	1,140
50,000.....	1,680
75,000.....	1,930
100,000.....	2,070
150,000.....	2,090

Table I.1b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
1,000.....	3.7	5.8	7.9	10.6	11.5	13.2
5,000.....	1.7	2.6	3.5	4.7	5.1	5.9
10,000.....	1.2	1.8	2.5	3.3	3.6	4.2
20,000.....	0.8	1.3	1.8	2.4	2.6	3.0
50,000.....	0.5	0.8	1.1	1.5	1.6	1.9
75,000.....	0.4	0.7	0.9	1.2	1.3	1.5
100,000.....	0.4	0.6	0.8	1.1	1.1	1.3
150,000.....	0.3	0.5	0.6	0.9	0.9	1.1
180,000.....	0.3	0.4	0.6	0.8	0.9	1.0
200,000.....	0.3	0.4	0.6	0.7	0.8	0.9
220,000.....	0.2	0.4	0.5	0.7	0.8	0.9
257,000.....	0.2	0.4	0.5	0.7	0.7	0.8

Standard Errors of Totals and Percentages for all Engineers or Engineering and Science Technicians

Table 1.2a. Standard Errors of Totals

Size of estimate	Estimated standard error
1,000.....	360
5,000.....	810
10,000.....	1,140
25,000.....	1,800
50,000.....	2,510
100,000.....	3,480
300,000.....	5,470
500,000.....	6,270
700,000.....	6,340

Table 1.2b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
1,000.....	5.1	7.9	10.9	14.5	15.7	18.1
5,000.....	2.3	3.5	4.9	6.5	7.0	8.1
10,000.....	1.6	2.5	3.4	4.6	5.0	5.7
25,000.....	1.0	1.6	2.2	2.9	3.1	3.6
50,000.....	0.7	1.1	1.5	2.1	2.2	2.6
100,000.....	0.5	0.8	1.1	1.5	1.6	1.8
300,000.....	0.3	0.5	0.6	0.8	0.9	1.0
500,000.....	0.2	0.4	0.5	0.6	0.7	0.8
700,000.....	0.2	0.3	0.4	0.5	0.6	0.7
900,000.....	0.2	0.3	0.4	0.5	0.5	0.6
1,000,000.....	0.2	0.3	0.3	0.5	0.5	0.6
1,243,000.....	0.1	0.2	0.3	0.4	0.4	0.5

Standard Errors of Totals and Percentages for Mathematical Specialists

Table I.3a. Standard Errors of Totals

Size of estimate	Estimated standard error
1,000.....	150
2,000.....	210
3,000.....	250
5,000.....	320
10,000.....	430
20,000.....	550
40,000.....	560

Table I.3b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
1,000.....	2.1	3.2	4.5	6.0	6.5	7.5
2,000.....	1.5	2.3	3.2	4.2	4.6	5.3
3,000.....	1.2	1.9	2.6	3.4	3.7	4.3
5,000.....	0.9	1.5	2.0	2.7	2.9	3.3
10,000.....	0.7	1.0	1.4	1.9	2.0	2.4
20,000.....	0.5	0.7	1.0	1.3	1.4	1.7
40,000.....	0.3	0.5	0.7	0.9	1.0	1.2
50,000.....	0.3	0.5	0.6	0.8	0.9	1.1
62,000.....	0.3	0.4	0.6	0.8	0.8	0.9

Standard Errors of Totals and Percentages for Life and Physical Scientists

Table I.4a. Standard Errors of Totals

Size of estimate	Estimated standard error
1,000.....	200
5,000.....	450
10,000.....	630
25,000.....	970
50,000.....	1,300
75,000.....	1,500
100,000.....	1,620
150,000.....	1,690

Table I.4b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
1,000.....	2.8	4.4	6.1	8.1	8.8	10.1
5,000.....	1.3	2.0	2.7	3.6	3.9	4.5
10,000.....	0.9	1.4	1.9	2.6	2.8	3.2
25,000.....	0.6	0.9	1.2	1.6	1.8	2.0
50,000.....	0.4	0.6	0.9	1.1	1.2	1.4
75,000.....	0.3	0.5	0.7	0.9	1.0	1.2
100,000.....	0.3	0.4	0.6	0.8	0.9	1.0
150,000.....	0.2	0.4	0.5	0.7	0.7	0.8
180,000.....	0.2	0.3	0.5	0.6	0.7	0.8
220,000.....	0.2	0.3	0.4	0.5	0.6	0.7
250,000.....	0.2	0.3	0.4	0.5	0.6	0.6
280,000.....	0.2	0.3	0.4	0.5	0.5	0.6

**Standard Errors of Totals and Percentages for Operations and Systems
Researchers and Analysts**

Table I.5a. Standard Errors of Totals

Size of estimate	Estimated standard error
1,000.....	170
5,000.....	370
10,000.....	510
20,000.....	670
30,000.....	750
40,000.....	770

Table I.5b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
1,000.....	2.4	3.7	5.1	6.9	7.4	8.6
5,000.....	1.1	1.7	2.3	3.1	3.3	3.8
10,000.....	0.8	1.2	1.6	2.2	2.3	2.7
20,000.....	0.5	0.8	1.2	1.5	1.7	1.9
30,000.....	0.4	0.7	0.9	1.3	1.4	1.6
40,000.....	0.4	0.6	0.8	1.1	1.2	1.4
50,000.....	0.3	0.5	0.7	1.0	1.1	1.2
60,000.....	0.3	0.5	0.7	0.9	1.0	1.1
70,000.....	0.3	0.4	0.6	0.8	0.9	1.0
81,000.....	0.3	0.4	0.6	0.8	0.8	1.0

Standard Errors of Totals and Percentages for Social Scientists

Table I.6a. Standard Errors of Totals

Size of estimate	Estimated standard error
1,000.....	160
5,000.....	350
10,000.....	480
30,000.....	770
50,000.....	910
70,000.....	970

Table I.6b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
1,000.....	2.2	3.4	4.7	6.3	6.8	7.9
5,000.....	1.0	1.5	2.1	2.8	3.1	3.5
10,000.....	0.7	1.1	1.5	2.0	2.2	2.5
30,000.....	0.4	0.6	0.9	1.2	1.2	1.4
50,000.....	0.3	0.5	0.7	0.9	1.0	1.1
70,000.....	0.3	0.4	0.6	0.8	0.8	0.9
90,000.....	0.2	0.4	0.5	0.7	0.7	0.8
100,000.....	0.2	0.3	0.5	0.6	0.7	0.8
130,000.....	0.2	0.3	0.4	0.6	0.6	0.7
151,000.....	0.2	0.3	0.4	0.5	0.6	0.6

Standard Errors of Totals and Percentages for Computer Programmers, Civil Engineers, Industrial Engineers, Mechanical Engineers, Electrical and Electronic Engineering Technicians, Mathematical Technicians, and Engineering and Science Technicians, N.e.c.

Table J.1a. Standard Errors of Totals

Size of estimate	Estimated standard error
1,000.....	260
5,000.....	570
10,000.....	790
30,000.....	1,290
60,000.....	1,640
90,000.....	1,730

Table J.1b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
1,000.....	3.6	5.6	7.8	10.3	11.2	12.9
5,000.....	1.6	2.5	3.5	4.6	5.0	5.8
10,000.....	1.1	1.8	2.5	3.3	3.5	4.1
30,000.....	0.7	1.0	1.4	1.9	2.0	2.4
60,000.....	0.5	0.7	1.0	1.3	1.4	1.7
90,000.....	0.4	0.6	0.8	1.1	1.2	1.4
120,000.....	0.3	0.5	0.7	0.9	1.0	1.2
140,000.....	0.3	0.5	0.7	0.9	0.9	1.1
160,000.....	0.3	0.4	0.6	0.8	0.9	1.0
180,000.....	0.3	0.4	0.6	0.8	0.8	1.0

**Standard Errors of Totals and Percentages for Engineers, N.e.c.,
and Engineering Teachers**

Table J.2a. Standard Errors of Totals

Size of estimate	Estimated standard error
1,000.....	280
5,000.....	620
10,000.....	860
30,000.....	1,410
70,000.....	1,900
110,000.....	2,010

Table J.2b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
1,000.....	3.9	6.1	8.4	11.2	12.1	13.9
5,000.....	1.7	2.7	3.7	5.0	5.4	6.2
10,000.....	1.2	1.9	2.6	3.5	3.8	4.4
30,000.....	0.7	1.1	1.5	2.0	2.2	2.5
70,000.....	0.5	0.7	1.0	1.3	1.4	1.7
110,000.....	0.4	0.6	0.8	1.1	1.2	1.3
140,000.....	0.3	0.5	0.7	0.9	1.0	1.2
170,000.....	0.3	0.5	0.6	0.9	0.9	1.1
200,000.....	0.3	0.4	0.6	0.8	0.9	1.0
209,000.....	0.3	0.4	0.6	0.8	0.8	1.0

Standard Errors of Totals and Percentages for Computer Systems Analysts; Aeronautical and Astronautical Engineers, Operations and Systems Researchers and Analysts; Economists and Economics Teachers; Agricultural, Biological and Chemical Technicians, Except Health; and Surveyors

Table J.3a. Standard Errors of Totals

Size of estimate	Estimated standard error
1,000.....	170
2,000.....	240
5,000.....	370
10,000.....	510
20,000.....	670
30,000.....	750
40,000.....	770

Table J.3b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
1,000.....	2.4	3.7	5.1	6.9	7.4	8.6
2,000.....	1.7	2.6	3.6	4.9	5.3	6.1
5,000.....	1.1	1.7	2.3	3.1	3.3	3.8
10,000.....	0.8	1.2	1.6	2.2	2.3	2.7
20,000.....	0.5	0.8	1.2	1.5	1.7	1.9
30,000.....	0.4	0.7	0.9	1.3	1.4	1.6
40,000.....	0.4	0.6	0.8	1.1	1.2	1.4
50,000.....	0.3	0.5	0.7	1.0	1.1	1.2
60,000.....	0.3	0.5	0.7	0.9	1.0	1.1
70,000.....	0.3	0.4	0.6	0.8	0.9	1.0
81,000.....	0.3	0.4	0.6	0.8	0.8	1.0

Standard Errors of Totals and Percentages for Chemists and Chemistry Teachers

Table J.4a. Standard Errors of Total

Size of estimate	Estimated standard error
1,000.....	210
5,000.....	460
10,000.....	640
15,000.....	770
30,000.....	1,000
50,000.....	1,140
70,000.....	1,150

Table J.4b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
1,000.....	3.0	4.6	6.3	8.4	9.1	10.6
5,000.....	1.3	2.1	2.8	3.8	4.1	4.7
10,000.....	0.9	1.5	2.0	2.7	2.9	3.3
15,000.....	0.8	1.2	1.6	2.2	2.4	2.7
30,000.....	0.5	0.8	1.2	1.5	1.7	1.9
50,000.....	0.4	0.7	0.9	1.2	1.3	1.5
70,000.....	0.4	0.5	0.8	1.0	1.1	1.3
90,000.....	0.3	0.5	0.7	0.9	1.0	1.1
110,000.....	0.3	0.4	0.6	0.8	0.9	1.0
121,000.....	0.3	0.4	0.6	0.8	0.8	1.0

Standard Errors of Totals and Percentages for Electrical and Electronic Engineers, and Draftsmen

Table J.5a. Standard Errors of Totals

Size of estimate	Estimated standard error
1,000.....	300
5,000.....	660
10,000.....	950
50,000.....	1,950
90,000.....	2,400
120,000.....	2,550
160,000.....	2,590
200,000.....	3,670
300,000.....	4,060
400,000.....	4,110

Table J.5b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
1,000.....	4.2	6.0	8.9	11.9	12.8	14.8
5,000.....	1.9	2.9	4.0	5.3	5.7	6.6
10,000.....	1.3	2.1	2.9	3.8	4.2	4.8
50,000.....	0.6	0.9	1.3	1.7	1.9	2.1
90,000.....	0.4	0.7	1.0	1.3	1.4	1.6
120,000.....	0.4	0.6	0.8	1.1	1.2	1.4
160,000.....	0.3	0.5	0.7	1.0	1.0	1.2
200,000.....	0.3	0.5	0.6	0.9	0.9	1.1
300,000.....	0.2	0.4	0.5	0.7	0.8	0.9
400,000.....	0.2	0.3	0.5	0.6	0.7	0.8
500,000.....	0.2	0.3	0.4	0.5	0.6	0.7
600,000.....	0.2	0.3	0.4	0.5	0.5	0.6
700,000.....	0.2	0.2	0.3	0.4	0.5	0.6

Standard Errors of Totals and Percentages for all Other Individual Occupations

Table J.6a. Standard Errors of Totals

Size of estimate	Estimated standard error
1,000.....	150
2,500.....	220
5,000.....	310
10,000.....	420
15,000.....	475
20,000.....	510
25,000.....	550

Table J.6b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2	5	10	20	25	50
	or 98	or 95	or 90	or 80	or 75	
1,000.....	2.1	3.3	4.5	6.0	6.6	7.6
2,500.....	1.3	2.1	2.9	3.8	4.2	4.8
5,000.....	0.9	1.5	2.0	2.7	2.9	3.4
10,000.....	0.7	1.0	1.4	1.9	2.1	2.4
15,000.....	0.5	0.8	1.2	1.6	1.7	1.9
20,000.....	0.5	0.7	1.0	1.3	1.5	1.7
25,000.....	0.4	0.7	0.9	1.2	1.3	1.5
30,000.....	0.4	0.6	0.8	1.1	1.2	1.4
39,000.....	0.3	0.5	0.7	1.0	1.0	1.2
45,000.....	0.3	0.5	0.7	0.9	1.0	1.1
55,000.....	0.3	0.4	0.6	0.8	0.9	1.0

Table 1. Employment Status in 1970 and Labor Force Status in 1972 for Persons in Engineering, Scientific, and Technical Occupations in the 1970 Experienced Civilian Labor Force

Occupation in 1970	1970 experienced civilian labor force						Reporting in 1972						Not reporting in 1972		
	Number	Percent			1970 experienced civilian labor force			Total	1972 labor force status			Labor force not reported			
		Total	Employed	Unem- ployed	Total	Em- ployed	Unem- ployed		Experienced civilian labor force		Not in labor force				
									Total	Percent					
							Total	Employed	Unem- ployed						
Computer specialists.....	257,061	100.0	98.7	1.3	175,308	100.0	98.7	1.3	100.0	95.6	100.0	97.7	2.3	4.0	81,756
Computer programmers.....	163,212	100.0	98.5	1.5	110,307	100.0	98.6	1.4	100.0	95.2	100.0	97.6	2.4	4.5	52,905
Computer systems analysts.....	80,560	100.0	98.0	2.0	55,613	100.0	99.1	0.9	100.0	96.1	100.0	97.7	2.3	3.0	24,947
Computer specialists, n.e.c.....	13,261	100.0	98.7	1.3	9,158	100.0	98.8	1.2	100.0	96.6	100.0	98.5	1.5	3.4	4,104
Operations and systems researchers and analysts.....	80,868	100.0	97.7	2.3	57,005	100.0	98.0	2.0	100.0	95.3	100.0	97.8	2.2	4.2	23,863
Engineers.....	1,212,518	100.0	98.1	1.9	872,303	100.0	98.6	1.4	100.0	95.4	100.0	97.5	2.5	3.8	370,214
Aeronautical and astronomical.....	68,529	100.0	95.6	4.4	48,325	100.0	96.2	3.8	100.0	96.0	100.0	93.9	6.1	3.3	20,204
Chemical.....	32,443	100.0	99.2	0.8	39,932	100.0	99.5	0.5	100.0	97.2	100.0	98.6	1.4	2.4	12,511
Civil.....	171,412	100.0	98.6	1.4	129,328	100.0	98.0	2.0	100.0	91.4	100.0	98.6	1.4	4.8	45,113
Electrical and electronic.....	285,012	100.0	98.3	1.7	200,025	100.0	98.8	1.2	100.0	95.9	100.0	97.8	2.2	3.2	84,987
Industrial.....	187,368	100.0	98.2	1.8	132,116	100.0	98.6	1.4	100.0	95.6	100.0	97.1	2.9	7.7	55,252
Mechanical.....	180,480	100.0	97.8	2.2	130,408	100.0	98.4	1.6	100.0	94.9	100.0	97.6	2.4	1.3	50,072
Metalurgical and materials.....	15,436	100.0	98.0	2.0	11,368	100.0	98.9	1.1	100.0	96.8	100.0	97.8	2.2	2.9	4,068
Mining and petroleum.....	15,632	100.0	98.7	1.3	10,826	100.0	99.4	0.6	100.0	94.8	100.0	98.9	1.1	4.1	4,806
Salvage, n.e.c., and engineering teachers ¹	51,648	100.0	99.2	0.8	37,694	100.0	99.5	0.5	100.0	96.2	100.0	98.1	1.9	3.2	16,954
Teachers ¹	208,517	100.0	97.9	2.1	132,031	100.0	98.2	1.8	100.0	95.2	100.0	97.2	2.8	4.2	76,487
Mathematical specialists.....	61,680	100.0	98.5	1.5	42,685	100.0	98.8	1.2	100.0	90.9	100.0	98.2	1.7	8.0	18,994
Actuaries and statisticians.....	27,912	100.0	98.3	1.7	19,072	100.0	98.8	1.2	100.0	90.0	100.0	98.5	1.5	8.9	8,840
Mathematicians and mathematics teachers.....	33,768	100.0	98.8	1.2	23,614	100.0	98.8	1.2	100.0	91.6	100.0	98.0	2.0	7.2	10,154
Life scientists.....	83,511	100.0	99.0	1.0	62,862	100.0	99.3	0.7	100.0	92.7	100.0	98.6	1.4	6.5	20,649
Agricultural scientists and teachers.....	17,331	100.0	98.5	1.5	12,710	100.0	99.3	0.7	100.0	92.7	100.0	98.3	1.7	6.1	4,622
Foresters and conservationists ²	15,958	100.0	99.1	0.9	13,116	100.0	99.4	0.6	100.0	94.3	100.0	99.1	0.9	5.4	2,842
Biological scientists and teachers.....	50,222	100.0	99.2	0.8	37,037	100.0	99.2	0.8	100.0	92.1	100.0	98.2	1.8	7.0	13,186
Physical scientists.....	196,351	100.0	98.5	1.5	117,407	100.0	98.8	1.2	100.0	94.3	100.0	98.1	1.9	4.8	78,944
Chemists and chemistry teachers.....	125,117	100.0	98.4	1.6	93,368	100.0	98.6	1.4	100.0	93.7	100.0	97.9	2.1	6.9	32,039
Physicists and physics teachers.....	36,208	100.0	98.5	1.5	27,101	100.0	98.6	1.4	100.0	95.4	100.0	97.9	2.1	3.5	8,807
Other physical scientists and teachers.....	34,726	100.0	98.7	1.3	26,638	100.0	99.2	0.8	100.0	94.9	100.0	98.8	1.2	4.0	8,088
Social scientists.....	151,296	100.0	98.9	1.1	104,811	100.0	98.1	1.9	100.0	93.0	100.0	98.3	1.5	6.0	46,485
Economists and economics teachers.....	76,682	100.0	98.6	1.4	52,330	100.0	98.9	1.1	100.0	94.2	100.0	98.1	1.9	5.0	24,353
Psychologists and psychology teachers.....	40,822	100.0	99.0	1.0	28,163	100.0	99.0	1.0	100.0	92.8	100.0	99.2	0.8	6.2	12,659
Other social scientists and social science teachers ¹	33,792	100.0	99.3	0.7	24,012	100.0	99.7	0.3	100.0	90.3	100.0	96.8	3.2	8.0	9,780
Engineering and science technicians.....	827,032	100.0	96.9	3.1	535,124	100.0	97.6	2.4	100.0	93.2	100.0	96.7	3.3	5.6	291,909
Agricultural, biological, and chemical technicians, exc. health.....	93,988	100.0	97.2	2.8	62,215	100.0	98.1	1.9	100.0	90.9	100.0	97.5	2.5	7.8	31,773
Draftsmen.....	233,301	100.0	96.6	3.4	180,017	100.0	97.1	2.9	100.0	93.7	100.0	95.8	4.2	5.9	101,284
Electrical and electronic engineering technicians.....	158,228	100.0	97.3	2.7	101,081	100.0	97.7	2.3	100.0	95.2	100.0	96.8	3.2	3.7	57,147
Industrial and mechanical engineering technicians.....	37,470	100.0	98.0	2.0	25,770	100.0	98.1	1.9	100.0	94.2	100.0	96.1	3.6	1.3	11,701
Surveyors.....	61,348	100.0	96.3	3.7	39,011	100.0	96.9	3.1	100.0	93.0	100.0	97.3	2.7	5.7	22,338
Mathematical technicians, and engineering and science technicians, n.e.c.....	182,697	100.0	97.1	2.9	118,030	100.0	97.9	2.1	100.0	91.7	100.0	97.6	2.4	6.7	64,667

¹ Represents zero.

² Excludes teachers below the college or university level.

³ Excludes persons who reported having completed less than 4 years of college in the 1970 census.

Table 2. Employment Status in 1970 and Labor Force Status in 1972 for Persons in Engineering, Scientific, and Technical Occupations in the 1970 Experienced Civilian Labor Force by Age in 1972 and Sex

Occupation in 1970, age in 1972, and sex	Reporting in 1972										
	Total	1970 experienced civilian labor force			1972 labor force status						
		Total	Employed	Unem- ployed	Total	Experienced civilian labor force			Not in labor force	Labor force status not reported	
						Total	Percent				
Total	Total	Employed	Unem- ployed	Total	Total	Employed	Unem- ployed				
Computer specialists.....	257,066	100.0	98.7	1.3	100.0	95.5	100.0	97.7	2.3	4.1	0.4
Male.....	207,793	100.0	98.9	1.1	100.0	97.9	100.0	97.9	2.1	1.7	0.4
Female.....	49,273	100.0	97.9	2.1	100.0	85.6	100.0	96.7	3.3	14.0	0.5
Under 25 years.....	23,227	100.0	97.9	2.1	100.0	89.0	100.0	97.9	2.1	10.4	0.7
25 to 29 years.....	77,695	100.0	98.9	1.1	100.0	94.1	100.0	97.7	2.3	5.6	0.3
30 to 39 years.....	97,215	100.0	98.6	1.4	100.0	97.4	100.0	97.7	2.3	2.2	0.4
40 to 49 years.....	42,119	100.0	99.1	0.9	100.0	98.8	100.0	97.3	2.7	0.8	0.4
50 to 54 years.....	9,926	100.0	98.6	1.4	100.0	96.6	100.0	97.3	2.7	3.0	0.4
55 to 59 years.....	3,827	100.0	100.0	-	100.0	86.1	100.0	97.5	2.5	13.9	-
60 to 64 years.....	1,661	100.0	100.0	-	100.0	86.9	100.0	98.3	1.7	13.1	-
65 years and over.....	1,397	100.0	96.2	3.8	100.0	84.0	100.0	100.0	-	16.0	-
Operations and systems researchers and analysts.....	80,867	100.0	98.0	2.0	100.0	95.3	100.0	97.8	2.2	4.1	0.6
Male.....	73,346	100.0	98.1	1.9	100.0	96.1	100.0	98.0	2.0	3.4	0.6
Female.....	7,520	100.0	96.8	3.2	100.0	88.1	100.0	96.1	3.9	11.4	0.5
Under 25 years.....	2,100	100.0	98.1	1.9	100.0	94.4	100.0	93.9	6.1	5.6	-
25 to 29 years.....	13,249	100.0	99.1	0.9	100.0	95.9	100.0	98.2	1.8	3.3	0.8
30 to 39 years.....	24,874	100.0	98.4	1.6	100.0	97.7	100.0	98.2	1.8	1.5	0.7
40 to 49 years.....	20,561	100.0	98.2	1.8	100.0	99.1	100.0	98.2	1.8	0.5	0.4
50 to 54 years.....	9,999	100.0	95.7	4.3	100.0	98.1	100.0	97.9	2.1	1.6	0.4
55 to 59 years.....	5,826	100.0	96.9	3.1	100.0	88.3	100.0	96.3	3.7	11.7	-
60 to 64 years.....	3,173	100.0	96.8	3.2	100.0	76.7	100.0	94.5	5.5	22.3	1.1
65 years and over.....	1,084	100.0	100.0	-	100.0	28.8	100.0	100.0	-	68.1	3.1
Engineers.....	1,242,519	100.0	98.5	1.5	100.0	95.3	100.0	97.5	2.5	3.9	0.8
Male.....	1,226,626	100.0	98.6	1.4	100.0	95.4	100.0	97.5	2.5	3.8	0.8
Female.....	15,894	100.0	94.8	5.2	100.0	87.7	100.0	92.6	7.4	11.8	0.5
Under 25 years.....	26,180	100.0	98.2	1.8	100.0	90.2	100.0	97.5	2.5	9.5	0.2
25 to 29 years.....	151,793	100.0	98.5	1.5	100.0	96.6	100.0	98.1	1.9	3.2	0.3
30 to 39 years.....	365,011	100.0	99.0	1.0	100.0	98.7	100.0	98.2	1.8	0.7	0.6
40 to 49 years.....	368,407	100.0	98.5	1.5	100.0	98.4	100.0	97.5	2.5	0.9	0.7
50 to 54 years.....	136,746	100.0	98.8	1.2	100.0	97.3	100.0	96.9	3.1	1.8	0.9
55 to 59 years.....	95,784	100.0	98.5	1.5	100.0	93.7	100.0	96.3	3.7	4.7	1.6
60 to 64 years.....	58,859	100.0	97.6	2.4	100.0	82.2	100.0	94.6	5.4	16.9	0.9
65 years and over.....	39,740	100.0	95.9	4.1	100.0	50.6	100.0	94.9	5.1	47.3	2.1
Mathematical specialists.....	61,679	100.0	98.8	1.2	100.0	90.6	100.0	98.3	1.7	8.2	1.2
Male.....	44,782	100.0	99.0	1.0	100.0	94.0	100.0	98.2	1.8	4.9	1.1
Female.....	16,897	100.0	98.4	1.6	100.0	81.5	100.0	98.4	1.6	17.1	1.5
Under 25 years.....	3,913	100.0	98.4	1.6	100.0	77.9	100.0	94.6	5.4	17.1	5.0
25 to 29 years.....	11,985	100.0	98.4	1.6	100.0	90.0	100.0	97.9	2.1	9.5	0.5
30 to 39 years.....	19,184	100.0	99.0	1.0	100.0	94.9	100.0	98.2	1.8	4.3	0.9
40 to 49 years.....	12,703	100.0	99.5	0.5	100.0	97.0	100.0	99.5	0.5	1.7	1.3
50 to 54 years.....	4,670	100.0	98.3	1.7	100.0	94.7	100.0	98.9	1.1	4.7	0.6
55 to 59 years.....	3,921	100.0	100.0	-	100.0	93.2	100.0	98.3	1.7	6.1	0.7
60 to 64 years.....	2,791	100.0	97.9	2.1	100.0	79.5	100.0	97.6	2.4	18.4	2.1
65 years and over.....	2,508	100.0	97.0	3.0	100.0	48.7	100.0	97.8	2.2	50.1	1.2
Life scientists.....	83,509	100.0	99.2	0.8	100.0	92.3	100.0	98.6	1.4	6.9	0.9
Male.....	68,097	100.0	99.4	0.6	100.0	94.4	100.0	99.0	1.0	4.7	0.9
Female.....	15,411	100.0	98.8	1.2	100.0	82.8	100.0	96.5	3.5	16.5	0.6
Under 25 years.....	3,512	100.0	98.2	1.8	100.0	83.5	100.0	97.0	3.0	15.8	0.7
25 to 29 years.....	12,685	100.0	98.7	1.3	100.0	89.1	100.0	95.9	4.1	10.5	0.4
30 to 39 years.....	26,487	100.0	99.7	0.3	100.0	94.8	100.0	99.1	0.9	4.3	0.9
40 to 49 years.....	20,415	100.0	99.2	0.8	100.0	97.1	100.0	99.5	0.5	1.9	1.0
50 to 54 years.....	8,289	100.0	99.6	0.4	100.0	97.7	100.0	98.2	1.2	1.7	0.6
55 to 59 years.....	5,580	100.0	100.0	-	100.0	92.6	100.0	99.1	0.9	6.9	0.5
60 to 64 years.....	4,035	100.0	97.5	2.5	100.0	80.5	100.0	98.4	1.6	17.1	2.3
65 years and over.....	2,505	100.0	99.1	0.9	100.0	54.7	100.0	98.1	1.9	44.4	0.9

- Represents zero.

Table 2. Employment Status in 1970 and Labor Force Status in 1972 for Persons in Engineering, Scientific, and Technical Occupations in the 1970 Experienced Civilian Labor Force by Age in 1972 and Sex—Continued

Occupation in 1970, age in 1972, and sex	Reporting in 1972										
	Total	1970 experienced civilian labor force			1972 labor force status						
		Total	Employed	Unem- ployed	Total	Experienced civilian labor force			Not in labor force	Labor force status not reported	
						Total	Percent				
Total	Employed	Unem- ployed	Total	Total	Employed	Unem- ployed					
Physical scientists.....	196,353	100.0	98.7	1.3	100.0	94.1	100.0	98.0	2.0	4.9	1.0
Male.....	178,624	100.0	99.0	1.0	100.0	94.7	100.0	98.1	1.9	1.3	0.9
Female.....	17,729	100.0	95.6	4.4	100.0	88.1	100.0	97.0	3.0	10.7	1.2
Under 25 years.....	7,329	100.0	96.3	3.7	100.0	81.0	100.0	92.3	7.7	17.9	1.2
25 to 29 years.....	28,812	100.0	99.1	0.9	100.0	93.0	100.0	97.3	2.7	6.4	0.6
30 to 39 years.....	62,227	100.0	98.9	1.1	100.0	97.3	100.0	98.4	1.6	2.1	0.6
40 to 49 years.....	52,623	100.0	98.8	1.2	100.0	98.3	100.0	98.1	1.9	0.9	0.9
50 to 54 years.....	18,754	100.0	98.4	1.6	100.0	97.1	100.0	98.7	1.3	2.4	0.5
55 to 59 years.....	12,949	100.0	99.6	0.4	100.0	94.2	100.0	98.7	1.3	2.6	3.2
60 to 64 years.....	8,998	100.0	97.9	2.1	100.0	74.7	100.0	99.2	0.8	23.8	1.5
65 years and over.....	4,660	100.0	97.8	2.2	100.0	59.3	100.0	98.1	1.9	37.9	2.9
Social scientists.....	151,299	100.0	99.1	0.9	100.0	92.8	100.0	98.5	1.5	6.1	1.0
Male.....	121,459	100.0	99.2	0.8	100.0	94.7	100.0	98.7	1.3	4.3	0.9
Female.....	29,841	100.0	98.6	1.4	100.0	84.9	100.0	97.5	2.5	13.6	1.5
Under 25 years.....	3,361	100.0	98.4	1.6	100.0	88.4	100.0	93.9	6.7	11.6	-
25 to 29 years.....	27,477	100.0	98.7	1.3	100.0	90.8	100.0	98.0	2.0	8.5	0.7
30 to 39 years.....	48,920	100.0	99.2	0.8	100.0	95.0	100.0	98.9	1.1	4.0	1.0
40 to 49 years.....	37,285	100.0	99.2	0.8	100.0	97.6	100.0	98.3	1.7	1.8	0.6
50 to 54 years.....	13,731	100.0	99.4	0.6	100.0	96.8	100.0	99.5	0.5	2.3	0.9
55 to 59 years.....	8,895	100.0	99.0	1.0	100.0	94.5	100.0	98.6	1.4	4.5	1.0
60 to 64 years.....	6,279	100.0	98.6	1.4	100.0	79.7	100.0	100.0	-	15.8	4.5
65 years and over.....	5,350	100.0	99.0	1.0	100.0	55.0	100.0	97.2	2.8	41.5	3.5
Engineering and science technicians..	827,047	100.0	97.5	2.5	100.0	93.0	100.0	96.7	3.3	5.8	1.2
Male.....	739,065	100.0	97.8	2.2	100.0	94.2	100.0	97.0	3.0	4.6	1.2
Female.....	87,982	100.0	95.3	4.7	100.0	83.1	100.0	93.2	6.8	15.5	1.3
Under 25 years.....	112,457	100.0	96.8	3.2	100.0	87.6	100.0	95.7	4.3	11.1	1.3
25 to 29 years.....	175,871	100.0	96.8	3.2	100.0	94.1	100.0	96.7	3.3	5.1	0.8
30 to 39 years.....	219,321	100.0	98.4	1.6	100.0	96.7	100.0	97.4	2.5	2.4	0.8
40 to 49 years.....	166,338	100.0	98.0	2.0	100.0	97.0	100.0	97.2	2.8	1.6	1.4
50 to 54 years.....	64,549	100.0	97.6	2.4	100.0	94.7	100.0	97.0	3.0	3.6	1.7
55 to 59 years.....	44,484	100.0	97.7	2.3	100.0	91.5	100.0	95.2	4.8	6.7	1.8
60 to 64 years.....	28,732	100.0	96.7	3.3	100.0	80.4	100.0	94.0	6.0	17.3	2.3
65 years and over.....	15,294	100.0	92.6	7.4	100.0	44.7	100.0	90.1	9.9	53.0	2.3

- Represents zero.

Table 3. Labor Force Status in 1972 by Employment Status in 1970 for Persons in Engineering, Scientific, and Technical Occupations in the 1970 Experienced Civilian Labor Force

Occupation and employment status in 1970	Reporting in 1972							Net in labor force	Labor force status not reported	
	Total		1972 experienced civilian labor force			Total	Employed			Unemployed
	Number	Percent	Total	Percent of experienced civilian labor force						
				Total	Employed					
Computer specialists.....	257,066	100.0	95.5	100.0	97.7	2.3	4.1	0.4		
Employed in 1970.....	253,806	100.0	95.6	100.0	97.9	2.1	4.0	0.4		
Unemployed in 1970.....	3,260	100.0	91.3	100.0	75.1	24.9	7.7	1.1		
Operations and systems researchers and analysts.....	80,867	100.0	95.3	100.0	97.8	2.2	4.1	0.6		
Employed in 1970.....	79,248	100.0	95.3	100.0	98.2	1.8	4.1	0.6		
Unemployed in 1970.....	1,618	100.0	95.9	100.0	80.5	19.5	4.1	-		
Engineers.....	1,242,519	100.0	95.3	100.0	97.5	2.5	3.9	0.8		
Employed in 1970.....	1,224,486	100.0	95.5	100.0	97.7	2.3	3.8	0.7		
Unemployed in 1970.....	18,033	100.0	81.1	100.0	76.8	23.2	12.1	3.5		
Mathematical specialists.....	61,679	100.0	90.6	100.0	98.3	1.7	8.2	1.2		
Employed in 1970.....	60,961	100.0	90.9	100.0	98.4	1.6	8.0	1.2		
Unemployed in 1970.....	717	100.0	66.3	100.0	83.7	16.3	29.4	4.3		
Life scientists.....	83,509	100.0	92.3	100.0	98.6	1.4	6.9	0.9		
Employed in 1970.....	82,878	100.0	92.4	100.0	98.7	1.3	6.8	0.8		
Unemployed in 1970.....	630	100.0	80.9	100.0	85.4	14.6	15.4	3.7		
Physical scientists.....	196,353	100.0	94.1	100.0	98.0	2.0	4.9	1.0		
Employed in 1970.....	193,863	100.0	94.5	100.0	98.2	1.8	4.6	0.9		
Unemployed in 1970.....	2,490	100.0	61.6	100.0	79.3	20.7	30.1	6.3		
Social scientists.....	151,299	100.0	92.8	100.0	98.5	1.5	6.1	1.0		
Employed in 1970.....	149,914	100.0	92.9	100.0	98.6	1.4	6.1	1.0		
Unemployed in 1970.....	1,386	100.0	81.4	100.0	88.6	11.4	16.5	2.1		
Engineering and science technicians.....	827,047	100.0	93.0	100.0	96.7	3.3	5.8	1.2		
Employed in 1970.....	806,383	100.0	93.4	100.0	97.0	3.0	5.4	1.2		
Unemployed in 1970.....	20,664	100.0	76.2	100.0	81.7	18.3	20.5	3.3		

- Represents zero.

Table 4. Age and Highest Degree Held in 1972 for Persons in Engineering, Scientific, and Technical Occupations in the 1970 Experienced Civilian Labor Force by Sex

Sex, age, and highest degree held in 1972	Reporting in 1972															
	Computer specialists		Operations and systems researchers and analysts		Engineers		Mathematical specialists		Life scientists		Physical scientists		Social scientists		Engineering and science technicians	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Both sexes	257,066	100.0	80,867	100.0	1,242,519	100.0	61,679	100.0	83,509	100.0	196,353	100.0	151,299	100.0	827,047	100.0
Age in 1972																
Under 25 years	23,227	9.0	2,100	2.6	26,180	2.1	3,913	6.3	3,512	4.2	7,329	3.7	3,361	2.2	112,457	13.6
25 to 29 years	77,655	30.2	13,249	16.4	151,793	12.2	11,985	19.4	12,685	15.2	28,812	14.7	27,377	18.2	175,871	21.3
30 to 39 years	97,213	37.8	24,874	30.8	368,011	29.7	12,703	20.6	26,487	31.7	62,227	31.7	48,920	32.3	219,321	26.5
40 to 49 years	42,119	16.4	20,561	25.4	368,407	29.7	12,703	20.6	20,415	24.4	52,623	26.8	37,285	24.6	166,338	20.1
50 to 54 years	9,926	3.9	9,999	12.4	136,746	11.0	4,670	7.6	8,289	9.9	18,754	9.6	13,731	9.1	64,549	7.8
55 to 59 years	3,827	1.5	5,826	7.2	95,784	7.7	3,924	6.4	5,580	6.7	12,919	6.6	8,895	5.9	44,484	5.4
60 to 64 years	1,661	0.6	3,173	3.9	58,859	4.7	2,791	4.5	4,035	4.8	8,998	4.6	6,279	4.2	28,732	3.5
65 years and over	1,397	0.5	1,084	1.3	39,740	3.2	2,508	4.1	2,405	3.0	4,660	2.4	5,350	3.5	15,294	1.8
Highest Degree Held in 1972																
No degree	117,114	45.6	43,320	53.6	430,210	34.6	13,420	21.8	11,006	13.3	31,436	17.5	19,768	13.1	645,482	78.0
No college	39,559	15.4	20,591	25.5	159,074	12.8	5,781	9.4	5,012	6.0	11,846	6.0	5,889	3.9	317,652	38.4
1 to 3 years of college	69,083	26.9	19,841	24.5	215,235	17.3	3,864	6.3	3,943	4.7	16,849	8.6	9,200	6.1	294,749	35.6
4 or more years of college	8,472	3.3	2,888	3.6	55,901	4.5	1,775	2.9	2,111	2.5	5,747	2.9	4,679	3.1	33,041	4.0
Degree	139,951	54.4	37,549	46.4	812,310	65.4	48,259	78.2	72,412	86.7	161,916	82.5	131,532	86.9	181,566	22.0
Associate	11,907	4.6	2,741	3.4	46,256	3.7	791	1.3	686	0.8	2,762	1.4	905	0.6	62,358	7.5
Bachelor's	99,857	38.8	21,828	30.7	370,598	45.9	16,628	27.0	31,243	37.4	73,482	37.4	40,134	26.5	93,705	11.3
Master's	25,270	9.8	8,173	10.1	162,753	13.1	18,312	29.7	17,570	21.0	36,678	18.7	45,522	32.7	12,507	1.5
Ph. D.	1,963	0.8	1,352	1.7	25,092	2.0	12,065	19.6	21,497	25.7	48,179	24.5	38,504	25.4	6,984	0.8
Other	954	0.4	455	0.6	7,611	0.6	463	0.8	1,416	1.7	815	0.4	2,466	1.6	6,012	0.7
Male	207,793	100.0	73,346	100.0	1,226,626	100.0	41,782	100.0	65,097	100.0	178,624	100.0	121,459	100.0	729,065	100.0
Age in 1972																
Under 25 years	13,877	6.7	1,761	2.4	25,553	2.1	1,667	4.2	1,988	2.9	5,760	3.2	2,035	1.7	96,814	13.1
25 to 29 years	59,821	28.8	11,402	15.5	148,613	12.1	8,325	18.6	9,003	13.2	24,819	13.9	20,834	17.2	159,450	21.6
30 to 39 years	85,217	41.0	23,365	31.9	362,371	29.5	16,015	35.8	22,490	33.0	57,479	32.2	41,088	33.8	203,707	27.6
40 to 49 years	35,888	17.3	18,803	25.6	363,409	29.6	9,465	21.2	17,419	25.6	48,840	27.3	30,845	25.4	145,487	19.7
50 to 54 years	7,845	3.8	9,121	12.4	134,677	11.0	3,062	6.8	7,091	10.4	17,022	9.5	10,825	8.9	55,313	7.5
55 to 59 years	2,845	1.4	5,161	7.0	94,777	7.7	2,710	6.1	3,382	6.5	12,135	6.8	6,657	5.5	38,722	5.2
60 to 64 years	1,249	0.6	2,827	3.9	57,931	4.7	1,630	3.6	3,581	5.3	6,262	3.5	4,962	4.1	25,171	3.4
65 years and over	1,050	0.5	807	1.2	39,294	3.2	1,687	3.8	2,034	3.0	4,365	2.4	4,209	3.5	14,430	2.0
Highest Degree Held in 1972																
No degree	94,919	45.7	39,343	53.6	422,466	34.4	6,267	14.0	8,174	12.0	30,592	17.1	15,507	12.8	577,648	78.2
No college	29,608	14.2	16,417	21.5	154,960	12.6	2,318	5.2	3,924	5.8	10,630	6.0	4,242	3.5	273,995	37.1
1 to 3 years of college	58,037	27.9	18,112	24.7	312,036	17.3	2,834	6.3	2,519	3.7	14,739	8.3	7,434	6.1	272,541	36.9
4 or more years of college	7,274	3.5	2,814	3.8	55,490	4.5	1,115	2.5	1,731	2.5	5,223	2.9	3,831	3.2	31,112	4.2
Degree	112,874	54.3	34,003	46.4	804,140	65.6	38,515	86.0	59,924	88.0	148,032	82.9	105,951	87.2	161,417	21.8
Associate	10,044	4.8	2,620	3.6	45,876	3.7	547	1.2	321	0.5	2,577	1.4	756	0.6	59,678	8.1
Bachelor's	78,324	37.7	22,343	30.5	564,940	46.1	11,564	25.8	25,469	37.4	65,051	36.4	33,410	27.5	80,457	10.9
Master's	21,891	10.5	7,313	10.0	160,912	13.1	14,737	32.9	13,701	20.1	33,607	18.8	37,703	31.0	10,185	1.4
Ph. D.	1,815	0.9	1,272	1.7	24,934	2.0	11,275	25.2	19,215	28.2	46,019	25.8	32,150	26.5	6,327	0.9
Other	800	0.4	455	0.5	7,478	0.6	392	0.9	1,218	1.8	778	0.4	1,933	1.6	4,770	0.6

Table 4. Age and Highest Degree Held in 1972 for Persons in Engineering, Scientific, and Technical Occupations in the 1970 Experienced Civilian Labor Force by Sex—Continued

Sex, age, and highest degree held in 1972		Reporting in 1972															
		Computer specialists		Operations and systems researchers and analysts		Engineers		Mathematical specialists		Life scientists		Physical scientists		Social scientists		Engineering and science technicians	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Female.....		49,273	100.0	7,520	100.0	15,894	100.0	16,897	100.0	15,911	100.0	17,729	100.0	29,841	100.0	87,982	100.0
Age in 1972																	
Under 25 years.....		9,349	19.0	339	4.5	627	3.9	2,046	12.1	1,524	9.9	1,569	8.8	1,326	4.4	15,693	17.8
25 to 29 years.....		17,874	36.3	1,847	24.6	3,180	20.0	3,660	21.7	3,692	23.9	3,993	22.5	6,643	22.3	16,421	18.7
30 to 39 years.....		11,998	24.4	1,509	20.1	2,639	16.6	3,169	18.8	3,997	25.9	4,748	26.8	7,833	26.2	15,693	17.7
40 to 49 years.....		6,230	12.6	1,758	23.4	4,997	31.4	3,217	19.0	2,996	19.4	3,782	21.3	6,439	21.6	20,852	23.7
50 to 54 years.....		2,081	4.2	879	11.7	2,069	13.0	1,608	9.5	1,198	7.7	1,732	9.8	2,963	9.7	9,235	10.5
55 to 59 years.....		982	2.0	666	8.9	1,007	6.3	1,214	7.2	1,098	7.1	814	4.6	2,238	7.5	5,762	6.5
60 to 64 years.....		412	0.8	346	4.6	828	5.8	1,161	6.9	444	2.9	736	4.2	1,317	4.4	3,591	4.1
65 years and over.....		347	0.7	178	2.4	447	2.8	821	4.9	471	3.1	355	2.0	1,141	3.8	864	1.0
Highest Degree Held in 1972																	
No degree.....		22,196	45.0	3,977	52.9	7,723	48.6	7,151	42.3	2,922	19.0	3,844	21.7	4,259	14.3	67,834	77.1
No college.....		9,951	20.2	2,175	28.9	4,113	25.9	3,462	20.5	1,118	7.3	1,210	6.8	1,616	5.5	13,657	15.4
1 to 3 years of college.....		11,046	22.4	1,729	23.0	3,199	20.1	3,030	17.9	1,424	9.2	2,110	11.9	1,766	5.9	22,248	25.3
4 years or more of college.....		1,199	2.4	73	1.0	411	2.6	655	3.9	380	2.5	524	3.0	897	2.8	1,929	2.2
Degree.....		27,077	55.0	3,544	47.1	8,170	51.1	9,744	57.7	12,489	81.0	13,845	78.3	25,581	85.7	20,149	22.9
Associate.....		1,863	3.8	120	1.6	380	2.4	241	1.4	365	2.3	186	1.0	189	0.7	2,680	3.0
Bachelor's.....		21,533	43.7	2,484	33.0	5,659	35.6	5,064	30.0	5,774	37.5	8,431	47.6	6,724	22.5	13,248	15.1
Master's.....		3,379	6.9	860	11.4	1,841	11.6	3,575	21.2	3,869	25.1	3,071	17.3	11,820	39.6	3,322	3.8
Ph. D.....		148	0.3	80	1.1	158	1.0	790	4.7	2,283	14.8	2,160	12.2	6,357	21.3	657	0.7
Other.....		154	0.3	-	-	132	0.8	71	0.4	198	1.3	37	0.2	534	1.8	1,242	1.4

- Represents zero.

APPENDIX

Table A-1. Analysis of Response in the 1972 Professional, Technical, and Scientific Manpower Survey by Occupation and Education in 1970 and Age in 1972

Occupation and education in 1970, and age in 1972	Number in universe	Number in sample	No address found	Cases mailed				
				Total		Completed question- naire	Other return	No return
				Number	Percent			
Computer specialists.....	257,064	7,044	356	6,688	100.0	72.0	14.0	13.7
Under 25 years.....	24,102	570	71	499	100.0	66.1	18.4	15.4
Less than 4 years of college.....	19,022	451	63	388	100.0	66.2	17.6	16.3
4 or more years of college.....	5,080	119	8	111	100.0	65.7	21.7	12.6
25 to 29 years.....	77,579	1,970	83	1,887	100.0	69.7	15.6	14.8
Less than 4 years of college.....	38,991	967	43	924	100.0	65.5	17.8	16.7
4 or more years of college.....	38,587	1,003	39	964	100.0	73.7	13.4	13.6
30 to 49 years.....	138,981	3,978	176	3,803	100.0	73.7	12.9	13.3
Less than 4 years of college.....	75,105	2,059	86	1,973	100.0	71.0	13.8	15.3
4 or more years of college.....	63,876	1,919	90	1,829	100.0	76.9	12.0	11.1
50 to 64 years.....	15,523	498	23	475	100.0	74.1	15.6	10.3
Less than 4 years of college.....	10,357	333	17	316	100.0	71.9	15.8	12.3
4 or more years of college.....	5,167	165	6	159	100.0	78.7	15.0	6.3
65 years and over.....	879	28	3	25	100.0	64.0	28.0	8.0
Less than 4 years of college.....	488	14	1	13	100.0	61.5	38.4	-
4 or more years of college.....	391	14	2	12	100.0	66.6	16.7	16.7
Operations and systems researchers and analysts.....	80,868	3,184	113	3,071	100.0	73.0	14.9	12.0
Under 25 years.....	2,090	81	5	76	100.0	69.7	10.6	19.7
Less than 4 years of college.....	1,495	58	4	54	100.0	70.3	9.2	20.4
4 or more years of college.....	595	23	1	22	100.0	68.2	13.6	18.2
25 to 29 years.....	13,212	528	20	508	100.0	69.6	13.0	17.4
Less than 4 years of college.....	6,050	242	8	234	100.0	66.2	13.7	20.1
4 or more years of college.....	7,162	286	12	274	100.0	72.6	12.4	14.9
30 to 49 years.....	46,188	1,816	66	1,750	100.0	72.5	15.2	12.2
Less than 4 years of college.....	26,896	1,058	39	1,019	100.0	68.9	17.0	14.0
4 or more years of college.....	19,303	758	27	731	100.0	77.6	12.8	9.7
50 to 64 years.....	18,239	715	21	694	100.0	77.3	15.6	7.2
Less than 4 years of college.....	14,016	549	16	533	100.0	76.0	17.4	6.6
4 or more years of college.....	4,223	166	5	161	100.0	81.3	9.3	9.3
65 years and over.....	1,139	44	1	43	100.0	69.8	23.2	7.0
Less than 4 years of college.....	726	28	1	27	100.0	74.0	25.9	-
4 or more years of college.....	412	16	-	16	100.0	62.5	18.8	18.8
Engineers.....	1,242,518	26,681	1,387	25,294	100.0	74.7	14.3	11.1
Under 25 years.....	28,569	566	58	508	100.0	66.7	17.5	15.7
Less than 4 years of college.....	17,978	337	43	294	100.0	59.8	19.7	20.4
4 or more years of college.....	10,590	229	15	214	100.0	76.2	14.4	9.3
25 to 29 years.....	151,912	3,204	164	3,040	100.0	72.1	13.6	14.3
Less than 4 years of college.....	47,587	943	44	899	100.0	63.9	17.7	18.5
4 or more years of college.....	104,326	2,261	120	2,141	100.0	75.6	11.8	12.6
30 to 49 years.....	726,326	15,561	754	14,807	100.0	75.4	13.4	11.1
Less than 4 years of college.....	278,535	5,652	299	5,353	100.0	69.1	16.7	14.3
4 or more years of college.....	447,792	9,909	455	9,454	100.0	79.0	11.6	9.4
50 to 64 years.....	295,151	6,508	347	6,161	100.0	75.1	15.6	9.3
Less than 4 years of college.....	150,735	3,176	155	3,021	100.0	70.7	18.8	10.6
4 or more years of college.....	144,416	3,332	192	3,140	100.0	78.4	12.6	8.1
65 years and over.....	40,559	842	64	778	100.0	71.6	21.6	6.8
Less than 4 years of college.....	21,854	442	34	408	100.0	69.7	23.3	7.1
4 or more years of college.....	18,705	400	30	370	100.0	73.7	19.7	6.5
Mathematical specialists.....	61,680	3,180	201	2,979	100.0	74.0	14.3	11.7
Under 25 years.....	4,336	220	49	171	100.0	67.8	18.1	14.0
Less than 4 years of college.....	2,799	142	38	104	100.0	68.3	15.4	16.4
4 or more years of college.....	1,537	78	11	67	100.0	67.2	22.4	10.5
25 to 29 years.....	12,269	625	33	592	100.0	70.3	14.4	15.4
Less than 4 years of college.....	2,373	121	9	112	100.0	61.6	14.3	24.1
4 or more years of college.....	9,896	504	24	480	100.0	72.2	14.4	13.3
30 to 49 years.....	31,234	1,610	80	1,530	100.0	76.2	12.5	11.3
Less than 4 years of college.....	6,036	306	12	294	100.0	66.0	18.0	16.0
4 or more years of college.....	25,198	1,304	68	1,236	100.0	78.6	11.2	10.2
50 to 64 years.....	11,355	593	30	563	100.0	72.7	17.1	10.3
Less than 4 years of college.....	4,579	232	8	224	100.0	64.7	24.1	11.2
4 or more years of college.....	6,776	361	22	339	100.0	77.8	12.4	9.7
65 years and over.....	2,486	132	9	123	100.0	78.9	17.9	3.2
Less than 4 years of college.....	775	40	2	38	100.0	71.0	26.3	2.6
4 or more years of college.....	1,711	92	7	85	100.0	82.4	14.1	3.6

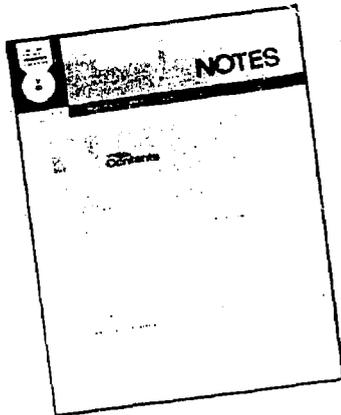
Table A-1. Analysis of Response in the 1972 Professional, Technical, and Scientific Manpower Survey by Occupation and Education in 1970 and Age in 1972—Continued

Occupation and education in 1970, and age in 1972	Number in universe	Number in sample	No address found	Cases mailed				
				Total		Completed question- naire	Other return	No return
				Number	Percent			
Life scientists.....	83,311	4,306	224	4,082	100.0	79.3	12.0	8.5
Under 25 years.....	1,051	215	33	182	100.0	61.9	20.3	14.9
Less than 4 years of college.....	2,418	128	24	104	100.0	59.6	20.2	20.2
4 or more years of college.....	1,632	87	9	78	100.0	71.8	20.5	7.7
25 to 29 years.....	12,729	656	37	619	100.0	75.4	13.8	10.8
Less than 4 years of college.....	1,972	101	6	95	100.0	71.5	13.7	14.8
4 or more years of college.....	10,757	555	31	524	100.0	76.1	13.8	10.1
30 to 49 years.....	46,996	2,406	104	2,302	100.0	79.9	11.3	8.8
Less than 4 years of college.....	5,209	267	14	253	100.0	61.8	18.6	16.6
4 or more years of college.....	41,787	2,139	90	2,049	100.0	81.8	10.1	7.8
50 to 64 years.....	16,990	878	41	837	100.0	84.8	9.8	5.5
Less than 4 years of college.....	2,943	155	6	149	100.0	76.5	13.1	10.1
4 or more years of college.....	14,047	723	35	688	100.0	86.5	9.0	4.5
65 years and over.....	2,746	151	9	142	100.0	73.9	20.4	5.6
Less than 4 years of college.....	822	46	3	43	100.0	69.7	23.2	7.0
4 or more years of college.....	1,924	105	6	99	100.0	75.7	19.2	5.1
Physical scientists.....	196,351	6,842	346	6,496	100.0	79.5	10.9	9.6
Under 25 years.....	8,185	273	24	249	100.0	64.2	20.1	15.7
Less than 4 years of college.....	4,668	152	16	136	100.0	62.5	19.9	17.7
4 or more years of college.....	3,517	121	8	113	100.0	66.4	20.3	13.3
25 to 29 years.....	28,578	940	58	882	100.0	74.3	12.6	13.1
Less than 4 years of college.....	6,452	191	6	185	100.0	61.8	13.0	22.2
4 or more years of college.....	22,127	749	52	697	100.0	76.7	12.5	10.7
30 to 49 years.....	114,482	4,068	181	3,887	100.0	80.8	10.0	9.2
Less than 4 years of college.....	20,255	649	34	615	100.0	72.8	13.5	13.6
4 or more years of college.....	94,227	3,419	147	3,272	100.0	82.3	9.4	8.4
50 to 64 years.....	39,907	1,381	71	1,310	100.0	82.4	10.0	7.6
Less than 4 years of college.....	9,866	307	14	293	100.0	77.1	13.0	9.8
4 or more years of college.....	30,040	1,074	57	1,017	100.0	84.0	9.2	6.9
65 years and over.....	5,200	180	12	168	100.0	76.8	16.7	6.5
Less than 4 years of college.....	1,265	42	3	39	100.0	56.1	30.8	12.8
4 or more years of college.....	3,935	138	9	129	100.0	82.9	12.4	4.6
Social scientists.....	151,296	7,018	352	6,666	100.0	73.1	13.1	13.6
Under 25 years.....	4,187	197	32	165	100.0	59.3	22.4	18.1
Less than 4 years of college.....	2,219	107	22	85	100.0	53.0	28.2	18.9
4 or more years of college.....	1,968	90	10	80	100.0	66.3	16.2	17.6
25 to 29 years.....	26,966	1,249	59	1,190	100.0	67.9	15.2	16.9
Less than 4 years of college.....	2,489	109	3	106	100.0	53.8	19.8	26.4
4 or more years of college.....	24,477	1,140	56	1,084	100.0	69.3	14.7	16.0
30 to 49 years.....	86,312	4,007	176	3,831	100.0	74.4	12.1	13.5
Less than 4 years of college.....	11,045	485	30	455	100.0	63.3	16.7	20.0
4 or more years of college.....	75,267	3,522	146	3,376	100.0	75.8	11.5	12.6
50 to 64 years.....	28,385	1,320	66	1,254	100.0	75.5	13.2	11.4
Less than 4 years of college.....	6,221	280	11	269	100.0	66.9	20.1	13.0
4 or more years of college.....	22,164	1,040	55	985	100.0	77.8	11.3	10.9
65 years and over.....	5,446	245	19	226	100.0	72.5	20.8	6.6
Less than 4 years of college.....	1,539	64	2	62	100.0	59.7	30.7	9.7
4 or more years of college.....	3,907	181	17	164	100.0	77.5	17.1	5.5
Engineering and science technicians.....	827,033	18,412	998	17,414	100.0	68.6	16.6	14.7
Under 25 years.....	119,173	2,538	297	2,241	100.0	63.0	18.5	18.6
Less than 4 years of college.....	114,067	2,428	289	2,139	100.0	62.8	18.4	18.7
4 or more years of college.....	5,106	110	8	102	100.0	66.6	18.7	14.7
25 to 29 years.....	175,571	3,790	160	3,630	100.0	65.4	16.6	18.0
Less than 4 years of college.....	154,142	3,300	132	3,168	100.0	64.8	16.6	18.6
4 or more years of college.....	21,429	490	28	462	100.0	69.7	17.1	13.2
30 to 49 years.....	381,292	8,620	364	8,256	100.0	69.7	15.9	14.4
Less than 4 years of college.....	339,249	7,616	319	7,297	100.0	69.0	16.5	14.6
4 or more years of college.....	42,043	1,004	45	959	100.0	75.6	11.5	13.0
50 to 64 years.....	133,897	3,064	145	2,919	100.0	74.2	16.7	9.1
Less than 4 years of college.....	117,495	2,697	127	2,570	100.0	73.8	17.1	9.2
4 or more years of college.....	16,403	367	18	349	100.0	77.9	13.5	8.6
65 years and over.....	17,100	400	32	368	100.0	66.8	21.2	12.0
Less than 4 years of college.....	14,717	343	27	316	100.0	66.8	21.5	11.7
4 or more years of college.....	2,383	57	5	52	100.0	67.3	19.2	13.5

- Represents zero.

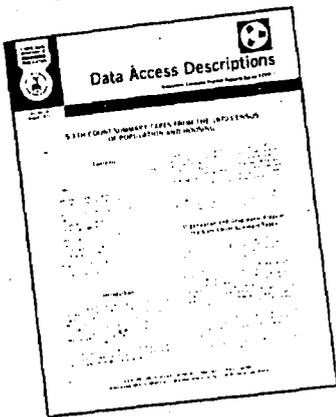
From the Bureau of the Census, U.S. Department of Commerce

Small-Area Data Notes and Data Access Descriptions



Small-Area Data Notes

Eight pages (and sometimes more) each month bring you news of activities, products, and services in the field of small-area census data. Information on new publications, the release of data in both printed reports and summary tapes, and plans for upcoming surveys and censuses are featured. A special section highlights the applications readers across the country have found for census data in their areas—publications, workshops, computer programs, and other uses. Articles by Bureau staff members—specialists in their fields—explain technical points of census activities, census methodology, and processing techniques.



Data Access Descriptions

In addition to 12 monthly issues of SAD Notes, subscribers will receive, as they are issued, copies of Data Access Descriptions. These reports (ranging from 10 to 30 pages) provide more detailed information on Census Bureau products and subjects than is generally furnished in other Bureau publications. Each of the four to six issues released during a year deals with a different topic of interest. Subjects include the economic censuses, census geography, the summary tape counts from the 1970 census, the availability of low-income data, and printed reports.

Both these publications are available to you in one subscription package for \$5.50 per year—informative, interesting, up-to-the-minute news coupled with in-depth discussion.

(please detach along this dotted line)

SUBSCRIPTION ORDER FORM

Enter Subscription(s)

___ Small-Area Data Notes and Data Access Descriptions at \$5.50

MAIL ORDER FORM WITH PAYMENT TO

Publications Distribution Section
Social and Economic
Statistics Administration
Washington, D.C. 20233

MAKE CHECK OR MONEY ORDER PAYABLE
TO SUPERINTENDENT OF DOCUMENTS

ease type or print)

Name _____

Company Name _____

Street Address _____

City, State, and ZIP Code _____

TOTAL AMOUNT \$ _____

Payment enclosed (Mark one)
 Check
 Money order
 GPO coupons

OR

Charge to:
Superintendent of
Documents Deposit
Account Number