

Demographic Characteristics of Disability Applicants: Relationship to Allowances

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This article highlights some of the causes underlying differences in disability allowances by sex and race. Among the causes are differences in the labor-force patterns, the educational background, and the age distributions of the insured and applicant populations. More than half of the differences between the black and white applicants in the proportion of claims allowed is explained by differences in their age distributions. The lower proportion of claims allowed for black applicants may reflect the greater tendency of the black insured population to apply for disability insurance benefits.

AN INSURED WORKER who is determined under the provisions of the Social Security Act to be disabled is eligible to receive monthly cash disability benefits. Insured status for the purpose of qualifying for disability benefits is defined as 20 quarters of coverage out of the last 40 quarters. Workers disabled before age 31, however, must have coverage in one-half the calendar quarters between age 21 and the date of disability, workers disabled before age 24 need one-half the quarters in the 3 years ending with the quarter of disability.

Disability is defined under the Social Security Act as the "inability to engage in substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months." The disability determination is based on medical facts, but takes into account the person's remaining capacity for work considering his age, education, and work experience. The determination is generally made by a State agency and reviewed by the Social Security Administration to assure consistency and conformity with national policy.

During fiscal year 1975 disability insurance benefits were awarded to 587,000 disabled workers.

In September 1975, the benefits of 24 million disabled workers were in current-payment status—that is, these workers were actually receiving benefits. In addition, the benefits of 18 million dependents of disabled workers were in current-payment status. The average benefit to disabled workers was \$224.89, for the 54,000 workers who received awards in September 1975 the average benefit was \$241.37.

The effects of age, sex, and race on the relative volume of applications for disability insurance benefits are examined here. The proportion of applicants whose disability was allowed in each age-sex-race group also is studied. Consideration is given to the influence of the level of education on the likelihood that an individual will apply for disability insurance benefits.

The data show that white applicants are more likely than black applicants to be awarded disability insurance benefits. In part, this difference occurs because application rates are higher for the black population than for the white. Apparently, relatively more applications are filed by black claimants who are marginally disabled. Much of the difference in the overall percentages of claims allowed is due to the fact that black disability applicants tend to be younger than white applicants, and younger persons' claims are denied more frequently since the vocational factors used in disability determination tend to favor older persons who have less education and whose skills may be less transferable.

The data (obtained from the disability applicant records) contain information for a stratified sample of all disability decisions made during calendar year 1971. Only claims by disabled workers whose applications were ruled on initially during 1971 are reported on here. Disabled workers who received decisions on reconsideration or at the hearings and appeals levels are omitted, as are disabled widows and disabled children.¹

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¹ See Technical Note, page 21, for discussion of this source and its limitations.

White applicants have for a long time been observed to have a higher proportion of disability allowances than black applicants. An earlier study showed that in 1969, of all determinations involving white disabled workers, 46.8 percent resulted in an allowance, compared with 35.5 percent for black claimants. The study showed similar differences existed in earlier years.² For 1971 the proportion of claims allowed for white male applicants was 51.3 percent; for black men it was 44.0 percent. The proportion allowed for white women was also higher than that for black women though the difference was much smaller (tables 1 and 2).

Another well-documented finding is that the proportion of claimants whose disability was allowed increased with age—that is, the older the applicant, the greater the probability of an allowance. In 1970, workers under age 35 represented 8.9 percent of all allowances and 14.8 percent of all denials. Workers aged 55 and over represented 54.7 percent of all those with allowances, compared with 37.9 percent of all those whose claims were denied.³ As can be seen in table 2, this relationship held within race-sex groups as well as for the entire population. It can also be observed that in most cases, within each age-sex category, white applicants had higher percentages of allowed claims than black applicants.

The differences between white men and black men for all the age groups shown in table 2 in the proportion of allowed claims are all significant at the .005 level. For women, the differences for those aged 40–44 and 55–59 do not appear significant; the difference for those aged 50–54 is significant at the .05 level, for the 60–64 age group at the .01 level, and for the remainder at the .005 level. Only for women aged 60–64 is the proportion of allowed claims for black applicants higher than for white applicants at a statistically significant level. In all other age groups the reverse is true, except for two classes where the differences are not significant.

² *Service to the Public*, vol. 3, Social Security Administration, Office of Administration, 1971, tables 51, 54, and 55 (These tables include results of reconsideration, hearings, and appeals, tables 54 and 55 omit denials based on lack of insured status.)

³ *Social Security Disability Applicant Statistics—1970*, Social Security Administration, Office of Research and Statistics, 1974, tables 2 and 44.

An explanatory factor that is not usually examined is the differing age distributions of black and white applicants. As table 3 shows, black applicants tended to be much younger than white applicants. 26.5 percent of the black men applying were under age 40, compared with 18.6 percent of the white applicants. Workers aged 50 or older comprised 62.4 percent of white men filing claims but only 50 percent of the black men. Similar but smaller differences between women of different races were recorded.

One way to separate the effect of differences in the age distribution for applicants of different races on the proportion of allowed claims is to standardize—that is, to use one age distribution for both groups.⁴ The age distribution of white applicants was used here individually for men and women to standardize the allowance rate.

The results of the age standardization are presented in the following tabulation. The adjust-

Sex and race	Percent allowed	Percent allowed, standardized by age distribution of white applicants
Men		
White ¹	51.3	51.3
Black	44.0	48.1
Other	49.1	51.4
Women		
White ¹	41.9	41.9
Black	39.1	40.6
Other	48.7	49.6

¹ Includes those with race unreported.

² Includes those with sex unreported.

ment increases the proportion of allowed claims for black men from 44.0 percent to 48.1 percent. More than half of the observed racial differences in the proportion of allowed claims is due to differences in the age distribution of the two groups. For women, too, more than half the differences between the races can be explained by differences in the age distribution. In both cases the standardized proportion of the black population differs significantly from both the unstandardized black proportion and the white proportion. To summarize, more than half the difference in the proportion of claims allowed appears to be due

⁴ For discussions of the standardization methodology used, see W. A. Wallis and H. V. Roberts, *Statistics*, The Free Press, 1956, pp. 290–302, and John H. Mueller, Karl F. Schuessler, and Herbert L. Costner, *Statistical Reasoning in Sociology* (2d edition), Houghton, Mifflin Co., 1970, chapter 7.

TABLE 1—Initial disabled-worker applications, by sex, age, race, and type of determination, 1971

Sex and age	All races			White			Black			Other		
	Total applications	Allowances	Denials	Total applications	Allowances	Denials	Total applications	Allowances	Denials	Total applications	Allowances	Denials
Total.....	740 650	352,442	388,208	618,210	299 830	318,380	113,336	48,150	65,186	9,104	4,462	4,642
Under 30	69 242	19 773	39 469	47 165	16,411	30,754	10 927	2,992	7,935	1,150	270	780
30-39	71,958	23 724	48,234	56 210	18 983	37,227	14 835	4 334	10 501	913	407	806
40-44	88 170	20,353	37,617	46 364	16 388	29,976	11,023	3,639	7,384	783	326	457
45-49	88 503	33,919	64 684	71 677	27 806	43,871	15,567	5,626	9,941	1,269	487	772
50-54	120 632	53,351	67,281	100 269	44 842	55 427	19,067	7,953	11 114	1,296	556	740
55-59	160,288	84,847	75 441	136,840	72,861	63 979	21 661	10,988	10,663	1,797	998	799
60-64	168 371	107 094	61,277	147 602	94 169	53,433	19,038	11,762	7,276	1,731	1,163	868
65 and over	13,486	9,381	4 105	12,083	8,370	3,713	1,228	856	872	176	155	20
Men	521,128	261 341	259,787	436,044	229 534	212 510	77 885	34,272	43 613	7,199	3,535	3,664
Under 30	48 261	15,631	32 630	38 165	12,894	25,271	9,116	2,477	6,639	960	260	720
30-39	64 964	18,294	36 660	42 692	14,648	28,144	11,519	3,428	8 091	743	318	425
40-44	42,095	15,153	26 942	33 744	12,372	21 372	7,755	2,651	5,204	596	230	366
45-49	60,815	24 391	36 424	49,308	20 027	29 281	10 536	3 992	6 543	972	372	600
50-54	79 446	38,256	41 190	66 267	32,275	33,982	12,249	5 630	6,719	940	451	489
55-59	104,810	60 708	44 102	90,288	52 662	37,706	13 204	7,385	5 819	1,338	761	577
60-64	120,177	81 301	38,876	106,068	72 055	34,013	12 637	8,251	4 386	1,472	893	477
65 and over	10,570	7 607	2,963	9,542	6 801	2 741	870	658	212	158	148	10
Women	219,522	91,101	128,421	182 166	76,296	105,870	35,451	13,878	21 573	1,905	927	978
Under 30	10,981	4 142	6,839	9,000	3 517	5 483	1 811	516	1,296	170	110	60
30-39	17,004	5,430	11,574	13 518	4 435	9,083	3,316	906	2,410	170	89	81
40-44	16 075	5,200	10 875	12 620	4,016	8,604	3,268	1 088	2,180	187	96	91
45-49	27,688	9,528	18,160	22,369	7,779	14 590	5 032	1,634	3 398	287	115	172
50-54	41 186	15 095	26,091	34 012	12 567	21 445	6 818	2,423	4,395	356	105	251
55-59	55 478	24,139	31,339	46 572	20 299	26 273	8,447	3,603	4,844	469	237	222
60-64	48,194	25,793	22 401	41,534	22,114	19,420	6,401	3,511	2,890	259	168	91
65 and over	2 916	1 774	1,142	2,541	1,569	972	368	198	160	17	7	10

to the fact that black applicants tend to be younger than white applicants and advancing age is an important factor in the determination of disability under the social security program

Racial differences in age distribution exist not only in the applicant population but also in the insured population. Estimates have been made by age, race, and sex of the average number of workers insured for disability during 1971 (table 4).⁵ Some 62.1 percent of the black men were under age 40, compared with 55.6 percent of the white men. Workers aged 50 or over accounted

for 23.2 percent of the insured white men, but only 18.6 percent of the black men. Similar differences are observed among the women. The lack of insured status on the part of many older black workers may reflect in part the fact that many of them were heavily represented in occupations not originally covered by the program.

One exception to the general trend should be noted. 39.8 percent of the insured white women were under age 30, compared with 37.4 percent of the black women. Differing patterns of employment among these young women, with white women working more frequently in covered employment than black women, may be partly responsible for this exception. More white women

⁵ Tables 4-6 exclude persons aged 65 or older since disability benefits are payable only to those under age 65.

TABLE 2—Percent of disabled-worker applications allowed, by sex, race, and age, 1971

Sex and race	Total	Age at application							
		Under 30	30-39	40-44	45-49	50-54	55-59	60-64	65 and over
Men ¹	60 1	32 4	33 3	36 0	40 1	48 2	57 9	67 7	72 0
White ¹	51 3	33 8	34 1	36 7	40 6	48 7	58 2	67 9	71 3
Black	44 0	27 2	29 8	32 9	37 9	45 1	55 9	65 3	75 6
Other	49 1	26 5	42 8	38 6	38 3	48 0	56 9	67 6	93 7
Women	41 5	37 8	31 9	32 3	34 4	36 7	43 5	53 5	60 8
White ¹	41 9	39 1	32 8	31 8	34 8	36 9	43 6	53 2	61 7
Black	39 1	28 4	27 3	33 3	32 5	35 5	42 7	54 9	55 3
Other	48 7	64 7	52 4	51 3	40 1	29 5	51 6	64 9	41 2

¹ Includes those with sex unreported

² Includes those with race unreported

TABLE 3—Age distribution of disabled-worker applicants, by age, race, and sex, 1971

Age	White ¹		Black		Other	
	Men ²	Women	Men ²	Women	Men ²	Women
Total number	438,044	182,166	77,885	35,451	7,199	1,905
Total percent	100.0	100.0	100.0	100.0	100.0	100.0
Under 30	8.8	4.9	11.7	5.1	13.6	8.9
30-39	9.8	7.4	14.8	9.4	10.3	8.9
40-44	7.7	6.9	10.0	9.2	8.3	9.8
45-49	11.3	12.3	13.5	14.2	13.5	15.1
50-54	15.2	18.7	15.7	19.2	13.1	18.7
55-59	20.7	25.6	17.0	23.8	18.6	24.1
60-64	24.3	22.8	16.2	18.1	20.4	13.6
65 and over	2.2	1.4	1.1	1.0	2.2	.9
Median age	54	55	50	53	52	52

¹ Includes those with race unreported
² Includes those with sex unreported

aged 30-44 may be likely to lose their insured status as they withdraw from the labor force in the childbearing and childrearing years. Of the insured black women, 31.7 percent were in this age group, compared with 23.7 percent of the white women. This withdrawal by white women tends to increase the relative weight for women under age 30 and over age 44. To some extent, this greater withdrawal from the labor force for white women is seen in the data for March 1970 when 55.1 percent of the black women with children under age 18 were in the labor force, compared with 40.4 percent for white women.⁶ An-

⁶ Bureau of Labor Statistics, "Children of Working Mothers, March 1975," *Summary—Special Labor Force Report*, 1975, table 2

TABLE 4—Percentage distribution of workers aged 64 and under insured for disability, by race and sex, 1971

Age	White ¹		Black		Other	
	Men ²	Women	Men ²	Women	Men ²	Women
Total number (in thousands)	42,000	19,887	4,377	2,595	758	347
Total percent	100.0	100.0	100.0	100.0	100.0	100.0
Under 30	24.4	39.8	30.2	37.4	42.1	44.9
30-39	21.2	14.7	22.9	21.2	22.3	19.2
40-44	10.6	9.0	9.8	10.5	9.5	10.9
45-49	10.6	10.7	9.5	10.6	8.9	10.6
50-54	9.6	10.7	8.0	9.4	6.9	7.2
55-59	8.3	9.4	6.8	7.1	5.9	5.1
60-64	5.3	5.7	3.8	3.7	4.3	2.1
Median age	37	37	35	36	34	33

¹ Includes those with race unreported
² Includes those with sex unreported

Source: Estimates from the Continuous Work History Sample (CWHHS) of the population insured for disability as of Jan. 1, 1971, and Jan. 1, 1972. Percentage distribution based on average of the two estimates. For a description of the sampling design of the CWHHS see *Earnings Distributions in the United States, 1969*, Social Security Administration, 1975, pages 316-319 and 330.

other interesting facet of these figures is that the participation rate for white women with young children in husband-wife families is only three-fifths that of women who are heads of families. This difference is to be expected because of the greater economic burden borne by female heads of households. In the case of black women, however, the participation rate of those in husband-wife families is even higher than that of women who are heads of households.

It would be wrong, however, to conclude that the differing age distribution of applicants, by race, is caused solely by differences in the age distribution of the insured population. Table 5 gives for each age-race group the number of applications per 100,000 insured workers. As can be seen, the rate for black men is more than double that for white men except among men aged 55-59 and 60-64, where the rates for black men are 171.4 percent and 161.8 percent of the rates for white men. The black women's rate also exceeds the comparable rate for white women but not by such a large margin.

In 1971, applications were received from 1,760 black men per 100,000 insured, compared with 1,015 white men. In this instance, however, standardizing by the age distribution of the insured white men brings the application rate for black men up to 1,997. This increase reflects the heavier concentration of the white population in the older age brackets where application rates tend to be highest. Unlike the situation discussed earlier for the proportion of allowed claims where standardizing by the white men's age distribution reduced the difference by race, this standardizing by the white men's age distribution increased the difference.

Another method of separating the diverse effects is to standardize by multiplying the age-specific application rates for white men by the relative age distribution of the different races. This method provides an answer to the question "If black men applied as frequently as white men in the same group, what effect would there be as a result of differences in the age distribution of their insured population?" As expected, the black men's application rate is reduced to 880 per 100,000. The effect of the black men's high proclivity to apply for benefits, therefore, doubles the number of applicants from 880 per 100,000 insured to 1,760 per 100,000.

One can speculate on reasons for this tendency of black men to apply for disability benefits more frequently than white men. One reason may simply be that black men have a higher probability of being disabled. In the 1970 Decennial Census, 14.2 percent of the black men aged 18-64, compared with 11.5 percent of the white men, were identified as having a "health or physical condition which limits the kind or amount of work he can do at a job."⁷ More relevant here, 6.4 percent of the black men and 3.4 percent of the white men reported that their health or physical condition kept them from holding any job at all. When the Census data on complete disability were standardized by the age distribution of the white population, the proportion of black men rose to 7.1 percent.⁸ Black men thus appear to report complete work disability more than twice as frequently as white men, a difference similar to that found when application rates were compared. In the 1970 Census, 8.2 percent of the black women and 4.7 percent of the white women reported complete inability to work. Here the disparity in the proportion disabled is greater than in the 1971 application rates presented in table 5.

As the following tabulation shows, weekly earnings in May 1971 for both black men and women

Race	Weekly earnings		
	White	Black and other races	Blacks' as percent of whites'
Total	\$142	\$107	75.4
Men	168	123	73.2
Women	102	87	85.2

Source: *Statistical Abstract of the United States, 1974*, table 570.

were much lower than they were for the white population.⁹ The 1971 unemployment rate for

black men was 9.1 percent, compared with 4.9 percent for white men. For women the rates were 10.8 percent and 6.3 percent, respectively.¹⁰ As a result of their lower earnings and higher unemployment rates, black men and women may apply more frequently since the relative value of their disability benefit is greater for them than it is for the white population.

An earlier study showed that differences in educational attainment explain much of the observed racial disparity in the proportion of the population that is disabled.¹¹ The higher proportion of disabled persons among black men and women was correlated with their lower educational attainment (Standardizing for educational level accounted for 81 percent of the racial differences for men and 43 percent of the differences for women). As table 6 shows, black disability applicants in 1971 had fewer years of schooling than did white applicants. Economic theory indicates that an important variable in the decision to leave the labor force and collect social insurance benefits is the "opportunity cost" represented by the worker's market wage—that is, the amount of earnings the worker would have received had he remained in the labor market and not applied for disability benefits. This theory also assumes that market wage and education are directly correlated. A person with more education should, therefore, have a high wage and thus a lower probability—other things being equal—of applying for disability benefits.

Support for this hypothesis can be found in table 6 where mean number of years of schooling for those whose schooling was reported—is seen to decrease with age. This correlation may help to explain why older persons apply more frequently for benefits than younger persons. In addition, white men and women—who applied less frequently than black men and women—had more schooling than black applicants. These phenomena—educational attainment negatively correlated with age and lower-age-specific educational attainment for black persons—are not an artifact of the disability applicant population but are present in the overall population as well. In March 1971 for white men the median number

⁷ Bureau of the Census, "Persons With Work Disability," *Census of Population 1970* (Final Report PC(2)-6C), 1973. The 1970 Census was conducted primarily through self-enumeration using a mail questionnaire. Whether a person was identified as disabled depended on the self-perception of that person or of the family member completing the form. The disability question was only asked of the 5-percent sample.

⁸ Mordechai E. Lando, "The Interaction Between Health and Education," *Social Security Bulletin*, December 1975.

⁹ The data are medians of usual weekly earnings for May 1971 and based on the Current Population Survey of the Bureau of the Census for May 1971.

¹⁰ *Manpower Report of the President—1975*, 1975, table A-18. The rates are for persons aged 16 and over; the data for black workers include other nonwhites.

¹¹ Mordechai E. Lando, *op cit*.

TABLE 5—Number of applications per 100,000 insured for disability, by age, sex, and race, 1971¹

Age	Men ²				Women			
	All races	White ³	Black	Other	All races	White ³	Black	Other
Total..	1,083	1 015	1,760	928	949	903	1 352	949
Under 30.....	293	264	531	307	122	114	186	109
30-39	546	480	1,149	439	480	462	603	255
40-44	850	758	1 800	824	768	708	1 196	494
45-49	1 233	1 108	2,545	1 433	1 130	1,047	1,826	778
50-54.....	1 789	1 641	3,496	1,794	1,723	1,602	2,802	1,430
55-59.....	2,731	2 583	4,426	3,000	2 677	2,490	4,568	2,615
60-64.....	4 949	4,753	7,691	4,536	3 881	3,651	6,609	3,524

¹ Represents initial worker applications only, includes technical denials
² Includes those with sex unreported

³ Includes those with race unreported

of school years completed was 12.2 years, compared with 10.2 years for black men.¹² It should also be stressed that the educational differences between the races are important in explaining the lower earnings and higher unemployment of the black population. A recent study showed that "education factors alone accounted for between three-fifths and three-quarters of the excess black male and female unemployment in both 1960 and 1970."¹³

One interesting aspect of the data in table 5 is the similarity in application rates for white men and women aged 30-59. This similarity is in sharp contrast with the experience of the black population, where the rate for women is lower than that for men in the corresponding age groups and increases with age up to the group

aged 55-59 where the rate for women is slightly higher than that for men. As table 7 reveals, the data available from the surveys of the disabled show a higher proportion of women with severe disabilities. On the basis of these data a higher application rate for women would be anticipated.

When one eliminates technical denials (those based on lack of insured status) and computes the number of "substantive" applications (all applications minus technical denials)¹⁴ per 100,000

¹⁴ Technical denials and substantive applications are defined more extensively in the Technical Note on page 21.

¹² Bureau of the Census, "Educational Attainment March 1971," *Current Population Reports*, Series P-20, No 229, 1971, table 1.

¹³ Curtis L. Gilroy, "Investment in Human Capital and Black-White Unemployment," *Monthly Labor Review*, July 1975, pages 13-21.

TABLE 6—Mean years of schooling of disabled-worker applicants, by sex, race, and age, 1971¹

Sex and race	Total	Age at application							
		Under 30	30-39	40-44	45-49	50-54	55-59	60-64	65 and over
Total.....	9.2	11.0	10.1	9.4	9.3	9.1	8.9	8.8	8.9
Men ²									
All races.....	9.0	10.9	9.8	9.1	9.0	8.8	8.6	8.5	8.8
White ³	9.3	11.0	9.9	9.4	9.3	9.2	9.0	8.9	9.1
Black.....	7.7	10.8	9.5	8.3	7.6	7.1	6.2	5.8	5.8
Other.....	7.4	10.6	9.1	8.9	7.6	6.7	6.6	6.1	5.9
Women									
All races.....	9.7	11.3	10.8	10.1	9.9	9.5	9.3	9.4	9.6
White ³	10.0	11.3	10.8	10.2	10.2	9.9	9.7	9.7	10.1
Black.....	8.5	11.2	10.8	9.8	9.0	8.0	7.5	7.5	6.4
Other.....	8.1	11.6	10.6	10.5	7.4	6.7	7.7	6.5	5.2

¹ For those reporting on schooling
² Includes those with sex unreported
³ Includes those with race unreported

TABLE 7—Percent of total population severely disabled, by race and sex, 1966, 1970, and 1972

Year and race ¹	Severely disabled ¹ as percent of total population		
	Total	Men	Women
1966			
Total.....	5.9	4.7	7.0
White.....	5.3	4.3	6.2
Black.....	11.2	8.1	13.9
1970			
Total.....	4.4	3.7	5.0
White.....	4.1	3.4	4.7
Black.....	7.4	6.4	8.2
1972			
Total.....	7.1	5.7	8.3
White.....	6.6	5.5	7.7
Black.....	11.0	7.9	13.6

¹ "Severely disabled" defined for 1966 and 1972 Social Security Administration Surveys of the Disabled as unable to work at all or able to work only intermittently, for 1970 Decennial Census, defined as those unable to work at all.

² For 1966 and 1972, "black" includes those of other races, for 1970, excludes those of other races.

Source: For 1966, Lawrence D. Haber, *Disability, Work, and Income Maintenance: Prevalence of Disability, 1966*, Social Security Administration, May 1969, table 2, for 1970, Bureau of the Census, "Persons With Work Disability," *Census of Population 1970* (Final Report PC(2)-6C) 1973, and for 1972, unpublished tables from the 1972 Survey of the Disabled.

in the relevant population, the rates for women drop in relation to those for men. This drop results from the higher rate of technical denials among women (especially white women) than among men. For white women there are 108 technical denials per 100,000 insured population, compared with 52 for white men, and 151 for black women, compared with 135 for black men. The greater prevalence of the lack of insured status among women is expected because of their looser attachment to the labor force.

The relative application rate for white women aged 30-39 went from an unadjusted rate for all applications of 96.2 percent of the men in that age range to 87.0 percent with technical denials excluded (table 8). This drop of 10 percent most probably results from the fact that many women in this age category withdrew from the labor force during their childbearing years and hence cannot meet the requirements of 20 quarters of coverage in the 10 years immediately preceding disability.

In summary, among the significant causes for the observed differences by race in the proportion of disability claims allowed are (a) differences in the age distribution of the insured population and of applicants, (b) disparate labor-force patterns—particularly among younger women—affecting insured-for-disability status, (c) unequal tendency to apply for benefits, (d) lower earnings and higher unemployment rates for black applicants, and (e) lower educational attainment of the black population.

Technical Note*

DEFINITIONS

Technical denials refer to denials based on lack of insured status—that is, failure to have sufficient quarters of covered employment. For purposes of this article, technical denials are defined as denials for one of the following adjudicative reasons: (1) Applicant not insured at established onset of disability, (2) applicant not disabled when last insured, or (3) applicant not

TABLE 8—Application rates of women workers in relation to men's rates, by age and race, 1971

Age	All applications		Substantive ² applications	
	White ¹	Black	White ¹	Black
Total	89.0	76.8	82.6	73.9
Under 30	43.2	35.0	40.7	32.6
30-39	96.2	52.5	87.0	50.3
40-44	93.4	66.4	87.6	66.4
45-49	94.5	71.7	89.2	68.8
50-54	97.6	80.1	91.6	77.2
55-59	96.4	103.2	88.4	97.8
60-64	76.8	85.9	71.4	83.2

¹ Includes those with race unreported.

² Represents total applications minus technical denials.

insured at alleged onset of disability. *Substantive applications* equal the total number of applications minus technical denials.

STATISTICAL METHODS

The statistical program for disability applicants reflects disability decisions made during the year. Three categories of applicants for benefits (disabled workers, adults with childhood disabilities, and disabled widows and widowers) and two types of decisions (allowances and denials) are involved.

The source of the data is the disability determination form. Selected characteristics from the determination form such as age, sex, race, education, and occupation of the applicant, as well as medical information underlying the disability and other relevant items, are coded. All of this information is processed to produce the desired tabulations.

Data on disabled-worker allowances and denials in this study were based on information derived from samples of decisions made during the year. The sampling rate for denials was a uniform 10 percent, the sampling rate for disabled-worker allowances varied by State and depended on the number of allowance decisions in the State for the preceding year.¹⁵ The relationship between the number of worker allowances and the sampling rate was as follows:

¹⁵ All disabled-worker allowances were used for the following States: Alaska, Delaware, Hawaii, Idaho, Montana, Nevada, New Hampshire, North Dakota, South Dakota, Utah, Vermont, and Wyoming.

* The section on statistical methods was compiled by Robert H. Finch, Jr. and Salvatore Gallicchio, Division of OASDI Statistics.

Number of worker allowances	Sampling rate (percent)
Less than 1,000 -----	100
1,000-3,499 -----	50
3,500-5,999 -----	25
6,000-9,999 -----	20
10,000 or more -----	10

Estimation Procedure

Since much of the data in the tables was obtained from a sample of the records, it was necessary to inflate the sample figures to produce estimates of the totals. The first step of the estimation procedure involved inflating the sample results by the reciprocals of the probabilities of selection. The next step was the use of a ratio estimate for all sample cases (including the 100-percent strata), to make the estimated totals agree with previously published award totals. The ratio estimates for awards were done separately for each State for workers. For denials, the ratio estimates were on a national basis.

Sampling Variability

Due to sampling variability, estimates based on samples can be expected to differ from figures that would be obtained if, under the same conditions as the actual sample survey, the entire population of the data had been used for tabulations. The particular sample selected for this study of disability applicants is one of a large number of similar probability samples of the same size that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results. The deviation of a sample estimate from the average of all possible samples is called the sampling error. The standard error of an estimate is a measure of the variation among the estimates from the possible samples and thus is a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples.

In conjunction with its associated estimate, the standard error may be used to define confidence intervals or ranges that would have a specified probability of including the average result of all possible samples. To illustrate, if all possible samples were selected—each of them

surveyed under essentially the same conditions—and an estimate and its estimated standard error were calculated from each sample, then—

- 1 Approximately 68 percent of the intervals from one standard error below to one standard error above the derived estimate would include the average value of all possible samples
- 2 Approximately 95 percent of the intervals from two standard errors below to two standard errors above the derived estimate would include the average value of all possible samples
- 3 Approximately 99 percent of the intervals from $2\frac{1}{2}$ standard errors below to $2\frac{1}{2}$ standard errors above the derived estimate would include the average value of all possible samples

Thus, for a particular sample, one can say with specified confidence that the average of all possible samples is included in the constructed interval.

Suppose, for example, that the estimated number of disability applications allowed for white applicants under age 30 is 16,400 and the standard error is 110. Then, the 68-percent confidence interval for the estimated number allowed for white workers under age 30 is from 16,290 to 16,510, the 95-percent confidence interval for the estimated number allowed for white applicants under age 30 is from 16,180 to 16,620, and the 99-percent confidence interval is from 16,125 to 16,675.

Estimated number of persons—Table I provides approximate standard errors for estimates of the number of disability applicants with given characteristics on a national basis. The estimates and approximate sampling variability shown are for the inflated sample data. Linear interpolation may be used for estimated numbers not shown in the table.

TABLE I—Approximate standard errors of estimated number of applicants for disability benefits

Estimated number	Standard error
100	10
250	15
500	20
750	25
1,000	30
5,000	65
7,500	80
10,000	90
25,000	140
50,000	200
75,000	240
100,000	270
250,000	380
500,000	400

Initial disability applications in 1971 indicate that 14,600 white females between 45 and 49 years of age were denied initial application. Table I shows that an estimated number of 10,000 has a standard error of 90. Similarly an estimate of 25,000 has a standard error of 140. Interpolating between these values, the approximate standard error of the estimated 14,600 white female applicants between ages 45 and 49 denied initial application is about 105. Consequently, the 68-percent confidence interval is 14,495 to 14,705 and the 95-percent confidence interval is 14,380 to 14,820.

Estimated percentage of persons—The reliability of an estimated percentage depends on both the size of the percentage and the size of the total upon which the percentage is based. Table II provides the approximate standard error for percentages of persons with given characteristics for disability applicants on a national basis. The body of the table is expressed in percentage points. The bases shown are expressed in terms of the inflated sample data. Linear interpolation may be used for percentages and base figures not shown in these tables.

Table 1 (on the percent of disability insurance applicants allowed, by sex, age, and race) indicates that 55.3 percent of the 358 applications of black females over age 64 were allowed. Table II indicates that an inflated sample base of 250 with an estimate of 75 percent has a standard error of 2.5 percentage points and an estimate of 50 percent has a standard error of 2.9 percentage points. Interpolating, an estimate of 55.3 percent with respect to a base of 250 yields a sampling variability of 3.8 percentage points. A similar calculation with respect to a base of 500 produces a

TABLE II—Approximate standard errors of estimated percentages of applicants for disability benefits

Base of percentage (inflated sample)	Estimated percentages				
	2 or 98	5 or 95	10 or 90	25 or 75	50
250	0.8	1.3	1.8	2.5	2.9
500	0.6	0.9	1.2	1.8	2.1
750	0.5	0.7	1.0	1.6	1.7
1 000	0.4	0.6	0.9	1.3	1.5
5 000	0.2	0.3	0.4	0.6	0.7
7 500	0.2	0.2	0.3	0.5	0.6
10 000	0.1	0.2	0.3	0.4	0.5
25 000	0.1	0.1	0.2	0.3	0.4
50,000	0.1	0.1	0.1	0.2	0.3
75 000	0.1	0.1	0.1	0.2	0.2
100 000	(1)	1	1	1	1
250 000	(1)	(1)	1	1	1
500 000	(1)	(1)	(1)	1	1

¹ Less than 0.05 percent

standard error of 2.0 percentage points. A final interpolation, using a base of 358, yields a standard error of 2.5 percentage points. Consequently, the 68-percent confidence interval is 52.8–57.8 percent and the 95-percent confidence interval is 50.3–60.3 percent.

Nonsampling Variability

In addition to sampling errors, the estimates are subject to various response and operational errors—of collection, response, coding, transcription, imputation for nonresponse, etc. These errors of response and operations would also occur if a complete study were to be conducted under the same conditions as the survey. Explicit measures of their effects are not generally available. Many of the response and operational errors were, however, detected and corrected in the editing of the data for reasonableness and consistency.