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Stroke Survivors Among the Noninstitutionalized Population 20 Years of Age and Over: United States, 1977

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Findings from a special stroke supplement to the 1977 National Health Interview Survey questionnaire are presented in this report from the National Center for Health Statistics. The supplement was developed in response to a request from officials at the National Institute of Neurological and Communicative Disorders and Stroke, National Institutes of Health. Their particular data needs centered around three major areas: (1) estimating the number of adults among the noninstitutionalized population who have survived a stroke, (2) gaining information on the relationship between selected chronic conditions and a history of stroke, and (3) describing the characteristics of persons who have had symptoms associated with stroke. This report addresses each of these objectives and presents related stroke data by three demographic variables—age, sex, and race.

According to data from the National Health Interview Survey (NHIS), in 1977 an estimated 2,692,000 persons 20 years of age and over in the U.S. civilian noninstitutionalized population had experienced a cerebrovascular accident—a stroke—and survived (table 1).

Some persons reported stroke in response to questions on the NHIS questionnaire concerning doctor visits or restricted activity in the past 2 weeks, chronic limitation of activity, or selected chronic conditions. However, the question that is the primary source of information on the prevalence of stroke survivors, asked of all persons who had not reported stroke in response to earlier questions, was "Has -- EVER had a stroke?"

Both self-respondents and proxy respondents were asked the stroke questions. Because of the characteristic manifestations of stroke, the use of proxy respondents probably produced little underreporting of this condition. At the same time, proxy respondents and self-respondents alike probably contributed to some overreporting of this condition.

Users of these data should remember that NHIS stroke estimates are representative only of the civilian noninstitutionalized population living at the time of interview. Excluded from the estimates are persons who had experienced a stroke but were not living at the time of the interview as well as those residing in long-term care facilities. (About one-fourth of all residents in nursing homes have cerebrovascular disease.¹)

Furthermore, the above estimate of about 2.7 million stroke survivors is based on respondents' perceptions of a stroke's occurrence; that is, it is based on self-diagnosed as well as medically diagnosed strokes. A stroke is classified as medically diagnosed whenever there was a positive response to the question: "Has a doctor EVER told -- he had a stroke?" While an estimate based only on medically confirmed strokes might be more precise than one based on both self-diagnosed and medically confirmed strokes, no significant differences were noted between medically confirmed and non-medically confirmed strokes by sex, age, or race to warrant separate treatment of the data. Limiting the data presented to medically confirmed strokes was considered, but there is evidence to suggest that some strokes are not actually medically diagnosed. Excluding all persons without a medical diagnosis would probably result in an undercount. No doubt the estimate in this report does include persons who would not have been medically diagnosed as having had a stroke had they been examined by a medical doctor. All NHIS data are subject to this kind of reporting error. Therefore, the fact that some persons might be misclassified is not sufficient reason to exclude *all* persons without a medical confirmation.

Specifically, medically confirmed strokes were reported for 92 percent of the stroke population (table 2). (Persons who did not know whether the stroke was medically confirmed were excluded from

Table 1. Number and percent distribution of persons 20 years of age and over by stroke status, according to race, sex, and age: United States, 1977
 [Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Race, sex, and age	Total ¹	Ever had a stroke		Total ²	Ever had a stroke	
		Never had a stroke	Ever had a stroke		Never had a stroke	Ever had a stroke
All races ³						
	Number in thousands			Percent distribution		
Both sexes 20 years and over	139,965	2,692	134,487	100.0	2.0	98.0
20-44 years	74,341	287	72,639	100.0	0.4	99.6
45-64 years	43,357	881	41,605	100.0	2.1	97.9
65 years and over	22,266	1,524	20,243	100.0	7.0	93.0
Male 20 years and over	65,801	1,316	63,234	100.0	2.0	98.0
20-44 years	35,904	125	35,136	100.0	0.4	99.6
45-64 years	20,700	484	19,812	100.0	2.4	97.6
65 years and over	9,197	708	8,286	100.0	7.9	92.1
Female 20 years and over	74,164	1,376	71,253	100.0	1.9	98.1
20-44 years	38,437	163	37,503	100.0	0.4	99.6
45-64 years	22,657	397	21,793	100.0	1.8	98.2
65 years and over	13,070	817	11,957	100.0	6.4	93.6
White						
20 years and over	123,626	2,314	118,928	100.0	1.9	98.1
20-44 years	64,671	220	63,268	100.0	0.3	99.7
45-64 years	38,792	751	37,266	100.0	2.0	98.0
65 years and over	20,163	1,344	18,394	100.0	6.8	93.2
Male	58,519	1,162	56,277	100.0	2.0	98.0
Female	65,106	1,152	62,651	100.0	1.8	98.2
Black						
20 years and over	14,420	362	13,672	100.0	2.6	97.4
20-44 years	8,372	56	8,091	100.0	0.7	99.3
45-64 years	4,098	130	3,878	100.0	3.2	96.8
65 years and over	1,950	176	1,702	100.0	9.4	90.6
Male	6,339	148	6,031	100.0	2.4	97.6
Female	8,081	215	7,641	100.0	2.7	97.3

¹Includes unknowns.

²Excludes unknowns.

³Includes all races not shown separately.

the population base used to calculate this percent.) Men and women stroke victims had similar proportions of medically confirmed strokes. At first glance, it would appear that there are differences among the three age groups shown in table 2 and between black and white persons in the percent for whom medical attention was reported. In this sample, however, these variations were not statistically significant.^a

As a measure of the approximate number of adult stroke survivors currently in the noninstitutionalized population, the figure of 2.7 million^b is probably a fairly complete estimate when compared with estimates of certain other chronic conditions that are derived from household interview surveys. Chronic

conditions are generally underreported in health interviews. A number of methodological studies have shown that respondents report only conditions that they know of and are willing to discuss. The conditions that are best reported in health interviews are those—such as stroke—with the most impact on a person, limiting participation in one's usual activities, resulting in costly treatment, or requiring medical care or days in bed.²

For further details on the survey design and procedures used to obtain data shown in this report, see the technical notes.

Age, sex, and race

An estimated 2 percent of the 1977 civilian noninstitutionalized population 20 years of age and over had suffered a stroke and survived. The prevalence rates for the youngest and oldest age groups differed markedly, from a low of 4 persons per 1,000 population aged 20-44 years to a high of

^aThe *t*-test with a critical value of 1.96 (0.05 level of significance) was used to test all comparisons discussed in this report.

^bFor comparative purposes, the stroke prevalence estimate derived from data collected by NHIS was 1.5 million persons in 1972, and in 1978 it was 1.7 million persons. During these years a checklist of chronic conditions which included stroke was read to the household respondent.

Table 2. Percent of persons with stroke for whom medical confirmation of stroke was reported, by age, sex, and race: United States, 1977

[Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Age, sex, and race	Percent medically confirmed
All persons 20 years and over	92.0
Age	
20-44 years	87.0
45-64 years	91.4
65 years and over	92.9
Sex	
Male	92.5
Female	91.4
Race	
White	92.5
Black	88.6

NOTE: Denominator of percent excludes unknown medical confirmation.

70 persons per 1,000 population 65 years of age or older. In fact, over one-half of the stroke victims surveyed were at least 65 years of age; this reflects the fact that stroke is a disease of the aged.³

The stroke prevalence rate was similar for men and women under 45 years of age. For ages 45 and over, however, the reported prevalence for men was somewhat higher—40 per 1,000 population compared to 34 per 1,000 population. National Health Interview Survey results further show black persons to have slightly higher stroke prevalence estimates than white persons have (2.6 and 1.9 percent, respectively). Similarly, when these data have been age adjusted to the U.S. adult population, the age-standardized estimates of stroke are higher for black persons (2.9 percent) than for white persons (1.9 percent).^c These racial differences, for the most part, occurred regardless of age. Statistically different stroke estimates by sex and color, however, were observed only between black women (2.7 percent) and white women (1.8 percent).

Age at time of first stroke

All respondents who reported stroke were asked: "How old was - - at the time he had his first stroke?" Data derived from this question are shown in table 3. A higher proportion of male than female stroke sur-

vivors experienced their initial attack before they were 65 years old—64.7 percent compared with 57.1 percent.

Data for black and white stroke victims seem to suggest that black persons are more likely than white persons to have their first stroke at an early age. However, the apparent black-white differences seen in table 3 are not statistically significant.

Further examination of table 3 suggests that the data shown there may partly reflect the disproportionate age distribution of black and white persons in the population. For 1977, the U.S. Bureau of the Census estimated that 11.4 percent of the white population and 7.7 percent of the black population were 65 years of age or older.⁴

Table 3. Number and percent distribution of persons 20 years of age and over with stroke by age at time of first stroke, according to race and sex: United States, 1977

[Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Race and sex	All persons 20 years and over with stroke	Age at time of first stroke		
		Under 45 years	45-64 years	65 years and over
		Number in thousands		
All races ¹				
Both sexes	2,692	476	991	945
Male	1,316	196	571	418
Female	1,376	280	420	527
White				
Both sexes	2,314	390	863	829
Male	1,162	165	505	385
Female	1,152	224	358	445
Black				
Both sexes	362	84	129	111
Male	148	*29	67	*34
Female	215	55	62	77
		Percent distribution ²		
All races ¹				
Both sexes	100.0	19.7	41.1	39.2
Male	100.0	16.5	48.2	35.3
Female	100.0	22.8	34.3	43.0
White				
Both sexes	100.0	18.7	41.5	39.8
Male	100.0	15.6	47.9	36.5
Female	100.0	21.8	34.9	43.3
Black				
Both sexes	100.0	25.9	39.8	34.3
Male	100.0	*22.5	51.9	*26.4
Female	100.0	28.2	31.8	39.5

¹Includes all races not shown separately.

²Excludes unknowns.

NOTE: When a figure is shown with an asterisk, it is presented only for the purpose of combining with other cells. An estimate has a relative standard error of less than 30 percent when the aggregate is at least 35,000.

^cData were adjusted to the age distribution of the 1977 U.S. civilian noninstitutionalized population 20 years of age and over. The reader should use the age-adjusted rates only for examination of the relationships within a given variable. Any quotation of percents and age-specific rates should be of the crude rates rather than the age-adjusted data.

Table 4, which presents the percent of stroke survivors aged 65 years and over by age at time of first stroke, shows no appreciable difference between white and black persons with respect to age at first stroke.

Table 4. Number of persons 65 years of age and over with stroke and percent distribution by age at time of first stroke, according to sex and race: United States, 1977

[Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Sex and race	Number of persons 65 years and over with stroke in thousands	Total ¹	Age at time of first stroke		
			Under 45 years	45-64 years	65 years and over
Percent distribution					
Total ²	1,524	100.0	4.8	28.5	66.8
Sex					
Male	708	100.0	*4.4	31.9	63.7
Female	817	100.0	5.0	25.6	69.4
Race					
White	1,344	100.0	4.5	29.4	66.2
Black	176	100.0	*7.0	22.3	70.7

¹Excludes unknowns.

²Includes all races not shown separately.

NOTE: When a figure is shown with an asterisk, it is presented only for the purpose of combining with other cells. An estimate has a relative standard error of less than 30 percent when the aggregate is at least 35,000.

Hospitalization for stroke

During the NHIS interview, respondents were asked whether stroke survivors were hospitalized for their first stroke. Responses to this item indicate that about 62 percent of the stroke survivors were hospitalized for their first stroke (table 5). A hospitalization was reported for proportionately more men than women (66.5 compared with 58.3 percent).

Moreover, a higher percent of males under 65 than 65 years of age or older were hospitalized for their initial stroke (73.4 compared with 61.3 percent). In contrast, the proportion of females hospitalized for stroke did not vary appreciably among specific age groups.

The overall percents of white and black persons hospitalized for initial strokes are similar. When these data are compared for males and for females, it appears that a substantially greater proportion of black males than white males were hospitalized (74.6 compared with 65.6 percent). The difference between these estimates, however, could be due to sampling variability.

Chronic activity limitation

Besides the frequent loss of life associated with stroke, a high proportion of stroke victims who survive are left with permanent disabilities. As an illustration, table 6 contrasts the percent of persons with and without stroke by the kind of activity limitation they had at the time of interview. These data are derived from a series of NHIS questions that enable sample persons to be classified into one of four broad limitation categories—unable to perform major activity, limited in amount or kind of major activity, limited in other activities, and not limited in any activities. Major activities include working, keeping house, and going to school. In NHIS, only activity limitations caused by at least one chronic condition are classified.

In 1977, an estimated 72 percent of the stroke population were limited in performance of their major or other activities in some way because of either a stroke or some other chronic condition.^d In contrast, 17.4 percent of adults without stroke were limited in some way. As expected, with each succeeding age group there was an increase in reported activity limitation for both the stroke and nonstroke populations. Among stroke victims, 39 percent of those 20-44 years of age reported some limitation, compared with 78.5 percent of persons 65 years of age or older.

Over 40 percent of the stroke population surveyed were unable to perform their major activity at all (compared with less than 5 percent of other adults in the population). While this estimate varied appreciably between males and females (58.1 and 25.1 percent, respectively), the dissimilarity may primarily reflect a sex difference in the NHIS definition of usual activity roles. For example, women who had to leave the work force because of a stroke and now consider their usual activity as "keeping house" are asked about any limitations associated with housework and classified accordingly. Men in the same situation are classified according to their ability to work outside the home.

All limitations combined were reported for a higher proportion of males with stroke (75.8 percent) than females (68.1 percent). The pattern is consistent with activity limitation estimates for males and females in the general population.

Some of the difference in the limitation-of-activity estimates for persons with and without stroke is attributable to the disproportionate number of older persons in the stroke population. When making comparisons between population groups with varying

^dFor this analysis, no data were available on whether a stroke survivor's activity limitation was related to the stroke.

Table 5. Number and percent distribution of persons 20 years of age and over with stroke by whether hospitalized for first stroke, according to race, sex, and age: United States, 1977

[Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

<i>Race, sex, and age</i>	<i>All persons 20 years and over with stroke</i>	<i>Hospitalized for first stroke</i>	<i>Not hospitalized for first stroke</i>	<i>All persons 20 years and over with stroke¹</i>	<i>Hospitalized for first stroke</i>	<i>Not hospitalized for first stroke</i>	
All races ²		Number in thousands			Percent distribution		
Both sexes 20 years and over	2,692	1,526	921	100.0	62.4	37.6	
20-44 years	287	132	76	100.0	63.5	36.5	
45-64 years	881	530	271	100.0	66.2	33.8	
65 years and over	1,524	864	574	100.0	60.1	39.9	
Male 20 years and over	1,316	797	401	100.0	66.5	33.5	
20-44 years	125	59	*26	100.0	69.4	30.6	
45-64 years	484	329	116	100.0	73.9	26.1	
65 years and over	708	409	259	100.0	61.3	38.8	
Female 20 years and over	1,376	728	521	100.0	58.3	41.7	
20-44 years	163	72	50	100.0	58.5	40.7	
45-64 years	397	200	155	100.0	56.2	43.5	
65 years and over	817	456	315	100.0	59.1	40.9	
White							
20 years and over	2,314	1,308	798	100.0	62.1	37.9	
20-44 years	220	103	50	100.0	67.8	32.9	
45-64 years	751	447	236	100.0	65.4	34.6	
65 years and over	1,344	758	512	100.0	59.7	40.3	
Male	1,162	695	365	100.0	65.6	34.4	
Female	1,152	613	433	100.0	58.6	41.4	
Black							
20 years and over	362	213	119	100.0	64.2	35.8	
20-44 years	56	*27	*25	100.0	*52.9	*49.0	
45-64 years	130	83	35	100.0	70.3	29.7	
65 years and over	176	104	59	100.0	63.8	36.2	
Male	148	100	*34	100.0	74.6	25.4	
Female	215	113	85	100.0	56.8	42.7	

¹Excludes unknowns.

²Includes all races not shown separately.

NOTE: When a figure is shown with an asterisk, it is presented only for the purpose of combining with other cells. An estimate has a relative standard error of less than 30 percent when the aggregate is at least 35,000.

age distributions, it is helpful to take these differences into account. Comparisons can be made within age groups or by using age-standardized percents.

Table 7 shows limitation-of-activity data with and without age adjustment. Age adjustment reduces the estimate of the proportion of the stroke population comprising the most severe limitation-of-activity category from 41.2 to 26.1 percent. However, the difference between the estimates of the most severe limitation for persons with and without stroke remained substantial (26.1 compared with 4.7 percent). Age adjustment had little or no effect on the estimates for the two remaining limitation-of-activity categories. (see footnote c.)

Chronic conditions associated with stroke

Four health conditions associated with stroke were listed on the 1977 NHIS questionnaire: (1) diabetes or sugar diabetes, (2) high blood pressure or hypertension, (3) heart disease or heart trouble, and (4) blood clots in arms, legs, or lungs. Data obtained from responses to questions as to whether sample persons had any of these conditions in the 12-month period preceding the interview are shown in tables 8 and 9.

The methodology employed for obtaining data on these conditions was not intended to produce prevalence figures similar to the estimates of chronic

Table 6. Number of persons 20 years of age and over and percent distribution by degree of activity limitation, according to stroke status, age, sex, and race: United States, 1977

[Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Stroke status, age, sex, and race	Number of persons in thousands	Total	Activity limitation status				
			All degrees of limitation	Unable to perform major activity	Limited in amount or kind of major activity	Limited in other activities	No activity limitation
With stroke			Percent distribution				
Age							
20 years and over	2,692	100.0	71.8	41.2	25.0	5.6	28.2
20-44 years	287	100.0	39.0	12.5	20.9	*5.6	61.0
45-64 years	881	100.0	70.9	37.9	27.6	5.4	29.1
65 years and over	1,524	100.0	78.5	48.6	24.3	5.7	21.5
Sex							
Male	1,316	100.0	75.8	58.1	13.9	3.8	24.2
Female	1,376	100.0	68.1	25.1	35.6	7.3	31.9
Race							
White	2,314	100.0	71.4	40.8	24.6	6.0	28.6
Black	362	100.0	77.3	45.6	27.9	*3.6	22.9
Without stroke							
Age							
20 years and over	134,487	100.0	17.4	4.6	9.0	3.8	82.6
20-44 years	72,639	100.0	8.5	1.2	4.4	2.8	91.5
45-64 years	41,605	100.0	22.0	5.6	12.0	4.5	78.0
65 years and over	20,243	100.0	40.3	14.8	19.7	5.8	59.7
Sex							
Male	63,234	100.0	18.2	7.6	7.0	3.6	81.8
Female	71,253	100.0	16.7	2.0	10.8	3.9	83.3
Race							
White	118,928	100.0	17.2	4.4	9.0	3.9	82.8
Black	13,672	100.0	20.3	7.1	10.5	2.8	79.6

NOTE: When a figure is shown with an asterisk, it is presented only for the purpose of combining with other cells. An estimate has a relative standard error of less than 30 percent when the aggregate is at least 35,000.

conditions routinely produced from NHIS. Rather, the items were viewed as providing gross measures for observing any differences in the rates between stroke victims and the rest of the population. These qualifications should be considered when using the data shown in these tables.

For each condition included in table 8, the age-specific rates were markedly higher among stroke victims than among other persons. The most pronounced difference is for heart conditions, reported for almost one-third of the stroke population compared with only one-twentieth of other adults surveyed. A similar comparison of estimates for the three remaining condition groups reveals the following differences: diabetes—14.6 compared with 3.1 percent, hypertension—48.1 compared with 12.5 percent, and blood clots—4.4 compared with 0.8 percent.

When data in table 9 are compared for diabetics and nondiabetics, hypertensives and nonhypertensives, and persons with and without heart disease, similar patterns are found. Specifically, there were proportionately more stroke victims among the groups with either diabetes, hypertension, or heart disease than among the group without these conditions. Furthermore, persons with all three of these conditions were considerably more likely than others to have had a stroke. Approximately 1 out of 5 persons (22.6 percent) with diabetes, hypertension, and heart disease was also reported to have had a stroke. Similarly, the rate of persons with all of these conditions was almost 15 times higher among the group of persons who had had a stroke than among those who had not (49.0 compared with 3.4 per 1,000 persons). Even after age adjustment, the variation between the estimates of stroke survivors

Table 7. Unadjusted and age-adjusted percent distributions of persons 20 years of age and over by limitation of activity status, according to stroke status: United States, 1977

[Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Activity limitation status	Unadjusted		Age-adjusted ¹	
	With stroke	Without stroke	With stroke	Without stroke
	Percent distribution			
All persons 20 years and over	100.0	100.0	100.0	100.0
All degrees of limitation . . .	71.8	17.4	55.2	17.7
Unable to perform major activity	41.2	4.6	26.1	4.7
Limited in amount or kind of major activity	25.0	9.0	23.5	9.2
Limited in other activities . . .	5.6	3.8	5.6	3.8
No activity limitation.	28.2	82.6	44.8	82.3

¹Adjusted by the direct method to the age distribution of the total civilian noninstitutionalized population of the United States.

with and without these conditions remains substantial. These data are consistent with findings from several epidemiological studies in which high blood pressure, heart disease, and diabetes have been identified as cardinal risk factors for stroke.^{5,6}

Symptoms associated with stroke and transient ischemic attack (TIA)

There is general agreement among researchers and the medical profession that the risk of stroke is substantially increased among persons who have experienced transient ischemic attack (TIA).⁵ TIA is most often described as a history of a neurological deficit that clears in a defined period of time, but there is less consensus in the criteria for its diagnosis. Diagnosis of TIA is difficult for several reasons: the transience of symptoms, the similarity of TIA symptoms to those of other diseases, the absence of residual disability, and the lack of a diagnostic test.

The symptom data contained in this report were derived from responses to a checklist of some of the symptoms associated with cerebrovascular disease and TIA. The specific symptoms chosen are those determined to be caused least often by conditions other than cerebrovascular disease and TIA.^e The following symptom checklist was read to household

^eIn this survey, no attempt was made to limit reporting of symptoms to those caused by certain conditions, such as stroke or TIA. However, symptoms were excluded if the respondent volunteered the information that they occurred over a gradual period of time or resulted from an accident or injury (e.g., loss of vision due to old age or a blow to the head).

respondents: (1) sudden paralysis or weakness of an arm and leg on the same side of the body, (2) sudden numbness on one side of the body, (3) sudden loss of vision, and (4) sudden loss of speech. The reference period for this checklist was the 12 months immediately preceding the interview.

The duration of symptoms used to define TIA or to distinguish it from stroke is not standardized.⁷ Symptoms characteristic of TIA generally last from 5 to 30 minutes, but intervals of up to 24 hours also occur. Stroke diagnosis is linked to symptoms lasting more than 24 hours.

For this report, symptoms were classified according to whether they lasted for more than 24 hours or 24 hours or less. Because of the problems associated with identifying persons with TIA even in a clinical setting, however, symptom data in this report are not presented as prevalence estimates of TIA. Furthermore, the estimated number of persons with symptoms is small, further limiting analysis of data shown in the remaining tables of this report.

Only about 2 percent of the adult population surveyed were reported to have had one or more symptoms during the year preceding the interview (table 10). As expected, however, a considerably higher proportion of persons with a history of stroke were reported to have had symptoms. Approximately 1 out of 5 persons with stroke experienced symptoms during the year preceding the interview (17.9 percent compared with 1.7 percent of persons without a stroke). The population having suffered a stroke can also be classified by whether the stroke was suffered recently—within 12 months of the interview date. Of recent stroke victims, 48.1 percent had one or more symptoms, compared with 10.7 percent of the residual stroke population. Unfortunately, the number of sample persons with recent strokes is too small for detailed tabulation of the data.

When the population with one or more stroke-like symptoms is examined, it can be seen that approximately two-thirds (64.3 percent) of the population with no stroke, compared with less than one-half (47.5 percent) of the stroke population, had their symptoms completely disappear within 24 hours. For both population subgroups, the differences observed for duration of symptoms by age, sex, or race were not statistically significant.

The group of persons without a stroke who had symptoms lasting more than 1 day is also sizable (35.7 percent). As TIA symptoms usually disappear in less than 1 day, it appears that many of the persons surveyed reported symptoms that were associated with some other health condition.

About one-half of the stroke population experiencing stroke-like symptoms in the past year were 65 years of age and over, whereas almost one-half (46.8 percent) of persons without a stroke who had these

Table 8. Number of persons 20 years of age and over and percent by selected conditions, stroke status, sex, and age: United States, 1977
 [Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Stroke status, sex, and age	Condition				
	Number of persons in thousands	Diabetes	Hypertension	Heart disease	Blood clots in arms, legs, or lungs
With stroke		Percent of persons			
Both sexes 20 years and over	2,692	14.6	48.1	31.8	4.4
20-44 years	287	*6.6	27.5	17.4	*3.1
45-64 years	881	13.4	52.7	29.7	5.3
65 years and over	1,524	16.8	49.4	35.6	4.1
Male 20 years and over	1,316	14.5	42.9	33.6	3.8
20-44 years	125	*8.0	*27.2	*20.0	*1.6
45-64 years	484	13.2	54.1	32.9	*4.3
65 years and over	708	16.4	38.0	36.6	*4.0
Female 20 years and over	1,376	14.7	53.2	30.0	4.9
20-44 years	163	*5.5	27.6	*16.0	*4.3
45-64 years	397	13.6	50.9	25.9	*6.5
65 years and over	817	17.1	59.4	34.8	4.3
Without stroke					
Both sexes 20 years and over	134,487	3.1	12.5	4.9	0.8
20-44 years	72,639	1.0	5.0	1.2	0.4
45-64 years	41,605	4.6	18.2	6.4	1.0
65 years and over	20,243	7.4	27.8	15.2	1.6
Male 20 years and over	63,234	2.8	10.4	5.0	0.5
20-44 years	35,136	0.9	4.9	1.1	0.2
45-64 years	19,812	4.4	16.1	7.4	0.8
65 years and over	8,286	7.4	19.9	16.1	1.1
Female 20 years and over	71,253	3.3	14.4	4.8	1.0
20-44 years	37,503	1.2	5.0	1.3	0.5
45-64 years	21,793	4.8	20.1	5.4	1.2
65 years and over	11,957	7.4	33.3	14.6	1.8

NOTE: When a figure is shown with an asterisk, it is presented only for the purpose of combining with other cells. An estimate has a relative standard error of less than 30 percent when the aggregate is at least 35,000.

symptoms were aged 20-44 years (table 11). Men and women with stroke were equally likely to have experienced stroke-like symptoms within the year. Among the population without a stroke, however, there were proportionately more women than men with symptoms.

About three-fourths of the persons with symptoms had only one of the symptoms listed on the questionnaire (table 12). About one-half of the stroke population, compared with only about 15 percent of persons without a stroke, had two symptoms or more during the year preceding the interview. Paralysis was the symptom most frequently reported for persons having had a stroke (65.8 percent), while numbness was experienced by the greatest number of persons who had never had a stroke (66.9 percent).

One or two additional questions were asked of persons reporting symptoms:

“Did -- see a doctor for his (*symptoms*) (at that time)?” and, if a doctor was seen,

“Was -- hospitalized because of the (*symptoms*)?”

Table 13 contains data derived from answers to these questions. About 60 percent of persons with stroke-like symptoms during the year preceding the interview sought medical attention for the symptoms, and about 1 out of every 3 persons who saw a doctor was subsequently hospitalized. A greater proportion of persons with stroke than without stroke reported medical attention for the symptoms (78.3 percent compared with 56.4 percent). Of persons who saw a doctor for their symptoms, proportionately about 3 times as many persons with stroke as without stroke were hospitalized (62.8 percent compared with 22.0 percent).

Table 9. Number of persons 20 years of age and over and percent distribution and rate per 1,000 population by stroke status, according to selected groups of conditions: United States, 1977

[Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Condition group	Number of persons in thousands	Total ¹	Percent distribution		Rate per 1,000 population	
			With stroke	Without stroke	With stroke	Without stroke
Diabetes	4,593	100.0	8.6	91.4	146.0	30.9
No diabetes	135,314	100.0	1.7	98.3	851.8	968.8
Hypertension	18,269	100.0	7.2	92.8	481.4	125.0
No hypertension	121,508	100.0	1.2	98.8	514.5	873.8
Heart disease.	7,518	100.0	11.5	88.5	318.0	48.9
No heart disease.	132,332	100.0	1.4	98.6	680.2	950.4
Diabetes only	2,100	100.0	3.9	96.1	30.5	14.9
Hypertension only	13,235	100.0	4.8	95.2	234.8	92.9
Heart disease only.	3,513	100.0	7.1	93.0	91.0	24.0
Diabetes and hypertension.	1,348	100.0	7.9	92.1	39.4	9.2
Diabetes and heart disease	388	100.0	13.4	86.6	18.9	2.5
Hypertension and heart disease	2,608	100.0	14.0	86.0	134.5	16.5
Diabetes, hypertension, and heart disease	590	100.0	22.6	77.4	49.0	3.4

¹Excludes persons with unknown stroke status.

Table 10. Number of persons 20 years of age and over and percent distributions by whether stroke-like symptoms present in past year and duration of symptoms, according to stroke status, age, sex, and race: United States, 1977

[Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Stroke status, age, sex, and race	Number of persons in thousands	Total ¹	Symptoms in past year		Total with 1 symptom or more ¹	Duration of symptoms	
			None	1 or more		24 hours or less	More than 24 hours
Total							
Age							
20 years and over ²	139,965	100.0	97.9	2.1	100.0	61.6	38.4
20-44 years	74,341	100.0	98.5	1.5	100.0	64.2	35.8
45-64 years	43,357	100.0	97.5	2.5	100.0	60.3	39.7
65 years and over	22,266	100.0	97.1	2.9	100.0	59.0	41.0
Sex							
Male	65,801	100.0	98.1	1.9	100.0	57.1	42.9
Female	74,164	100.0	97.8	2.2	100.0	64.8	35.3
Race							
White	123,626	100.0	98.0	2.0	100.0	62.9	37.1
Black	14,420	100.0	96.9	3.1	100.0	53.5	46.3
With stroke							
Age							
20 years and over ²	2,692	100.0	82.1	17.9	100.0	47.5	52.5
20-44 years	287	100.0	84.7	15.3	100.0	*65.9	*34.1
45-64 years	881	100.0	78.1	21.9	100.0	44.9	55.1
65 years and over	1,524	100.0	83.9	16.1	100.0	46.4	53.6
Sex							
Male	1,316	100.0	80.6	19.4	100.0	45.0	55.0
Female	1,376	100.0	83.5	16.5	100.0	50.0	49.5
Race							
White	2,314	100.0	82.5	17.5	100.0	49.9	50.1
Black	362	100.0	78.5	21.5	100.0	*35.9	64.1
Without stroke							
Age							
20 years and over ²	134,487	100.0	98.3	1.7	100.0	64.3	35.7
20-44 years	72,639	100.0	98.5	1.5	100.0	63.7	36.3
45-64 years	41,605	100.0	98.0	2.0	100.0	63.8	36.1
65 years and over	20,243	100.0	98.1	1.9	100.0	67.0	33.0
Sex							
Male	63,234	100.0	98.5	1.5	100.0	60.5	39.5
Female	71,253	100.0	98.1	1.9	100.0	66.8	33.2
Race							
White	118,928	100.0	98.4	1.6	100.0	65.3	34.7
Black	13,672	100.0	97.4	2.6	100.0	57.8	42.2

¹Excludes unknowns.²Includes all races not shown separately.

NOTE: When a figure is shown with an asterisk, it is presented only for the purpose of combining with other cells. An estimate has a relative standard error of less than 30 percent when the aggregate is at least 35,000.

Table 11. Number and percent distributions of persons 20 years of age and over with stroke-like symptoms by age and sex, according to duration of symptoms and stroke status: United States, 1977

[Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Stroke status, age, and sex	Total with 1 symptom or more ¹	Duration of symptoms		Total with 1 symptom or more ¹	Duration of symptoms	
		24 hours or less	More than 24 hours		24 hours or less	More than 24 hours
Total						
Age						
20 years and over	2,877	1,671	1,043	100.0	100.0	100.0
20-44 years	1,151	709	396	40.0	42.4	38.0
45-64 years	1,076	605	399	37.4	36.2	38.3
65 years and over	650	357	248	22.6	21.4	23.8
Sex						
Male	1,220	647	486	42.4	38.7	46.6
Female	1,657	1,024	558	57.6	61.3	53.5
With stroke						
Age						
20 years and over	482	214	237	100.0	100.0	100.0
20-44 years	44	*29	*15	9.1	*13.6	*6.3
45-64 years	193	83	102	40.0	38.8	43.0
65 years and over	245	103	119	50.8	48.1	50.2
Sex						
Male	255	104	127	52.9	48.6	53.6
Female	227	110	109	47.1	51.4	46.0
Without stroke						
Age						
20 years and over	2,326	1,417	786	100.0	100.0	100.0
20-44 years	1,088	665	379	46.8	46.9	48.2
45-64 years	851	506	286	36.6	35.7	36.4
65 years and over	386	246	121	16.6	17.4	15.4
Sex						
Male	940	532	347	40.4	37.5	44.1
Female	1,385	885	440	59.5	62.5	56.0

¹Includes unknown duration.

NOTE: When a figure is shown with an asterisk, it is presented only for the purpose of combining with other cells. An estimate has a relative standard error of less than 30 percent when the aggregate is at least 35,000.

Table 12. Number and percent of persons 20 years of age and over with stroke-like symptoms, by stroke status, number of symptoms, and kind of symptom: United States, 1977

[Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Number and kind of symptoms	Total with 1 symptom or more ¹	With stroke	Without stroke	Total with 1 symptom or more ¹	With stroke	Without stroke
	Number in thousands			Percent distribution		
Number of symptoms						
Total	2,877	482	2,326	100.0	100.0	100.0
1	2,236	236	1,962	77.7	49.0	84.4
2	474	160	293	16.5	33.2	12.6
3	116	60	50	4.0	12.4	2.1
4	52	*26	*20	1.8	*5.4	*0.9
Kind of symptom ²						
Paralysis	978	317	629	34.0	65.8	27.0
Numbness	1,861	260	1,555	64.7	53.9	66.9
Vision loss	593	110	462	20.6	22.8	19.9
Speech loss	305	152	132	10.6	31.5	5.7

¹Includes unknown stroke status.²Percents by kind of symptom add to more than 100 as categories are not mutually exclusive.

NOTE: When a figure is shown with an asterisk, it is presented only for the purpose of combining with other cells. An estimate has a relative standard error of less than 30 percent when the aggregate is at least 35,000.

Table 13. Number and percent distributions of persons 20 years and over with stroke-like symptoms by whether doctor seen and, if so, whether hospitalized, according to stroke status: United States, 1977

[Data are based on household interviews of the civilian noninstitutionalized population. The source of data, sampling, and limitations and qualifications of data are given in the technical notes]

Doctor visit and hospitalization status	Total with 1 symptom or more ¹	With stroke	Without stroke	Total with 1 symptom or more ¹	With stroke	Without stroke
	Number in thousands			Percent distributions		
Doctor visit status						
Total ²	2,877	482	2,326	100.0	100.0	100.0
Doctor seen	1,492	329	1,121	60.4	78.3	56.4
Doctor not seen	978	91	866	39.6	21.7	43.6
Hospitalization status ³						
Total ⁴	1,492	329	1,121	100.0	100.0	100.0
Hospitalized	458	203	247	30.8	62.8	22.0
Not hospitalized	1,027	121	874	69.2	37.5	78.0

¹Includes unknown stroke status.²Numbers include unknown if doctor seen; percents exclude unknown if doctor seen.³Excludes persons who did not see a doctor.⁴Numbers include unknown if hospitalized; percents exclude unknown if hospitalized.

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Technical notes

The information from the National Health Interview Survey presented in this report is based on data collected during 1977 in a continuing nationwide survey by household interview. Each week a probability sample of households was interviewed by personnel of the U.S. Bureau of the Census to obtain information about the health and other characteristics of each member of the household in the civilian non-institutionalized population of the United States.

During 1977, there were about 41,000 interviewed households including about 111,000 persons. The total noninterview rate was about 3.3 percent, of which 1.9 percent was due to respondent refusal, and the remainder was primarily due to the failure to find an eligible respondent at home after repeated calls. Stroke data were obtained for each household member 20 years of age and over. This sample included approximately 73,000 persons.

Since the estimates shown in this report are based on a sample of the population rather than on the entire population, they are subject to sampling error. Many tables in this report contain cells in which the estimate of a given characteristic is small. When an estimate or the numerator or denominator of a percent is small, the sampling error may be relatively high. Therefore, differences observed in many of the tables between figures for specific population groups may be due to sampling variability.

Cells containing estimates of questionable statistical reliability are noted by an asterisk (*) and are provided solely to allow readers to recombine cells into useful groupings with greater reliability.

Standard errors appropriate for estimates of the number of persons are shown in table I; standard errors appropriate for estimated percents are shown in table II.

To better understand the limitations of the estimates presented in this report, data users are encouraged to familiarize themselves with the survey design, methods used in estimation, and general qualifications of the data, which are described in appendix I of the 1977 Current Estimates report (Series 10, No. 126, in the *Vital and Health Statistics* series).

Definitions of certain terms used in this report and the questionnaire used during 1977 appear in appendixes II and III of the 1977 Current Estimates report.

Whenever possible, data users should seek other data sources to provide comparative statistics derived from a variety of data-collection mechanisms.

Table I. Standard errors of estimates of aggregates

<i>Size of estimate in thousands</i>	<i>Standard error in thousands</i>
35	11
50	13
70	15
100	18
200	26
300	31
500	40
700	48
1,000	57
3,000	98
5,000	125
10,000	174
30,000	278
50,000	325
70,000	340

Table II. Standard errors, expressed in percentage points, of estimated percents

<i>Base of percent in thousands</i>	<i>Estimated percent</i>				
	<i>2 or 98</i>	<i>5 or 95</i>	<i>10 or 90</i>	<i>20 or 80</i>	<i>50</i>
50	3.6	5.6	7.7	10.2	12.8
70	3.0	4.7	6.5	8.6	10.8
100	2.5	3.9	5.4	7.2	9.0
200	1.8	2.8	3.8	5.1	6.4
300	1.5	2.3	3.1	4.2	5.2
500	1.1	1.8	2.4	3.2	4.0
700	1.0	1.5	2.0	2.7	3.4
1,000	0.8	1.2	1.7	2.3	2.9
3,000	0.5	0.7	1.0	1.3	1.6
5,000	0.4	0.6	0.8	1.0	1.3
10,000	0.3	0.4	0.5	0.7	0.9
30,000	0.1	0.2	0.3	0.4	0.5
50,000	0.1	0.2	0.2	0.3	0.4
70,000	0.1	0.1	0.2	0.3	0.3

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Symbols

- Data not available
 - ... Category not applicable
 - Quantity zero
 - 0.0 Quantity more than 0 but less than 0.05
 - * Figure does not meet standards of reliability or precision
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