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Advance Data

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Characteristics of Persons Dying From Cerebrovascular Diseases

Preliminary Data From the 1986 National Mortality Followback Survey

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Introduction

Cerebrovascular diseases have a major impact on mortality and morbidity in the United States, and the identification of the characteristics of persons dying from these chronic diseases is of great interest. This report uses preliminary data from the 1986 National Mortality Followback Survey (NMFS) to compare the characteristics of adult decedents who died from Cerebrovascular diseases (ICD–9 nos. 430–438) with those who died from all other causes. In this report, the terms "cerebrovascular diseases" and "stroke" are used interchangeably for editorial convenience.

Cerebrovascular diseases, the third leading cause of death in the United States, accounted for 7 percent of all deaths in 1986 (1). Although stroke mortality declined during the past several decades, it remains a major contributor to years of potential life lost each year. Stroke resulted in an estimated 246,000 years of potential life lost before age 65 in 1986, representing 1.2 years lost per 1,000 persons under 65 years of age (2).

In addition to causing many deaths, stroke has a major impact on morbidity. An estimated 11.9 persons per 1,000 population reported having cerebrovascular disease in 1986. Nearly 40 percent of persons with this disease reported that it limited their activities. Cerebrovascular disease resulted in an average of 36 days of restricted activity per person with the condition (3).

Data from the 1986 NMFS provide detailed information on the lifestyle, care in the last year of life, and antecedents of and circumstances surrounding death for a nationally representative sample of adults dying from cerebrovascular diseases and other causes in 1986.

The data

The 1986 NMFS is a stratified random sample consisting of 18,733 deaths in 1986 of U.S. residents 25 years of age and over. These deaths constitute approximately 1 percent of all resident deaths in the United States. The next of kin or others familiar with the decedent's lifestyle were asked to provide the following information: use of medical and other care facilities in the decedent's last year of life, sources of medical care payment, impairments in daily activities, medical conditions, health practices and behaviors, social and economic characteristics, and the identity of all health facilities in which the decedent stayed overnight during the last year of life.

The 1986 NMFS includes data on 1,121 persons who died from cerebrovascular diseases and 17,612 who died from other causes. The sample deaths represent an estimated 149,699 deaths from stroke and an estimated 1,837,168 deaths from all other causes. All estimates in this report are national estimates for deaths in 1986 of adults 25 years of age and over. Brief descriptions of the study and the analytic methods used are in the technical notes.

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Public Health Service
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Social, demographic, and economic characteristics

Age, sex, and race

Most people who died from stroke were over the age of 75 (table 1). Only 13 percent of stroke deaths were to persons under 65 years of age, while approximately 69 percent were to persons aged 75 years and over. This contrasts sharply with deaths from all other causes: Approximately 27 percent of other deaths, or about two times the proportion for cerebrovascular deaths, were to persons under 65 years of age. An estimated 48 percent of deaths due to other causes involved persons 75 years of age and over.

Women accounted for a larger proportion of deaths from stroke than men did: an estimated 89,996 (60 percent) for cerebrovascular deaths and 867,124 (47 percent) for deaths from other causes. The differences in age distribution by cause of death noted above apply to both males and females, however.

More than 80 percent of all deaths were to persons of races other than black. An estimated 16,694 (11.2 percent) of the cerebrovascular deaths were to persons who were black, in addition to 211,309 of the deaths from other causes (11.5 percent). Comparison of the age distribution of deaths by cause of death shows that the distributions for decedents of races other than black are similar to those for all persons combined; that is, larger proportions of cerebrovascular than of other deaths involved older persons. For deaths of black persons, however, the only significant differences in age distribution by cause of death were at ages 25–54 years and at ages 85 and over. Compared with all other causes of death, a smaller proportion of stroke deaths involved persons aged 25–54, while a larger proportion of stroke deaths involved persons aged 85 and over.

Marital status

Regardless of cause of death, more than 90 percent of adults dying in 1986 had been married at some point in their life (figure 1). However, there were differences in current marital status by cause of death. The largest proportion of persons who died from stroke were widowed at the time of death, but the largest proportion of persons who died from other causes were married (47 percent and 46 percent, respectively). A somewhat smaller proportion of persons who died from stroke than from other causes had never been married, but there was no significant difference by cause of death in the proportion of decedents who were divorced or separated (table 2).

Regardless of cause of death, female decedents were about three times more likely to be widowed at the time of death than were their male counterparts, and they were only about one-third as likely to be currently married. For persons dying from stroke, there were no significant differences by sex in the proportion of decedents who were divorced, separated, or never married. The proportion of men divorced, separated, or never married at the time of death was slightly larger than that for women for persons dying from all other causes.

Compared with women dying of other causes, female decedents who died of stroke were somewhat less likely to be married at the time of death, but there were no significant differences in other marital status categories for women. Compared with men who died from other causes, males who died of cerebrovascular diseases were somewhat less likely to have never been married.

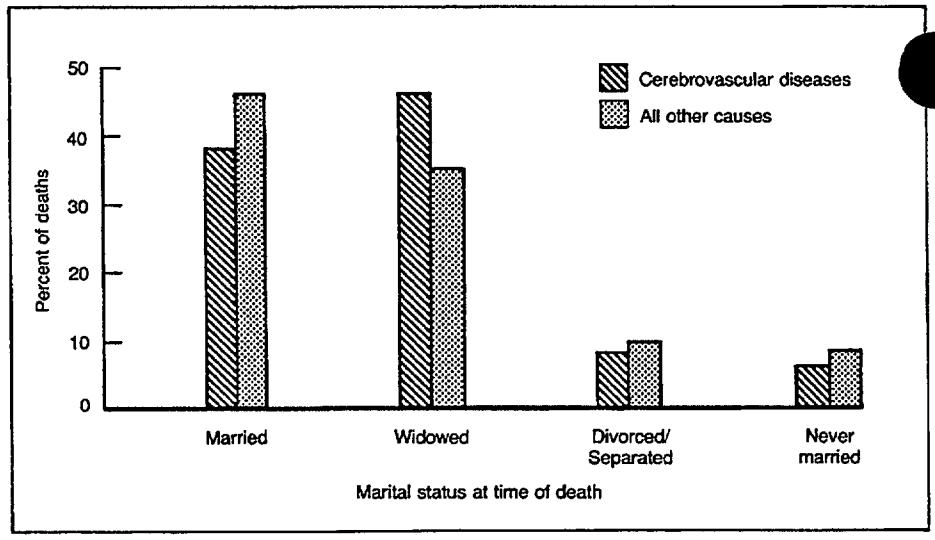

Figure 1. Percent distribution of deaths from cerebrovascular diseases and all other causes, by marital status: United States, 1986

Education

Most adults who died in 1986 were reported to have less than a high school education (table 3). There were no significant differences in level of education by cause of death—with one exception: A slightly larger proportion of persons dying from stroke than of other causes had completed 4 years or more of college.

There were no differences in educational attainment between men and women dying of cerebrovascular diseases. Of persons dying from other causes, men were somewhat less likely (62 percent) to have completed high school than were women (54 percent). Females who died from other causes were slightly more likely to have finished high school or to have completed 1 to 3 years of college than were men, but they were somewhat less likely to have completed 4 years or more of college.

Occupation

Information on longest-held occupation was available for approximately 93 percent of male and

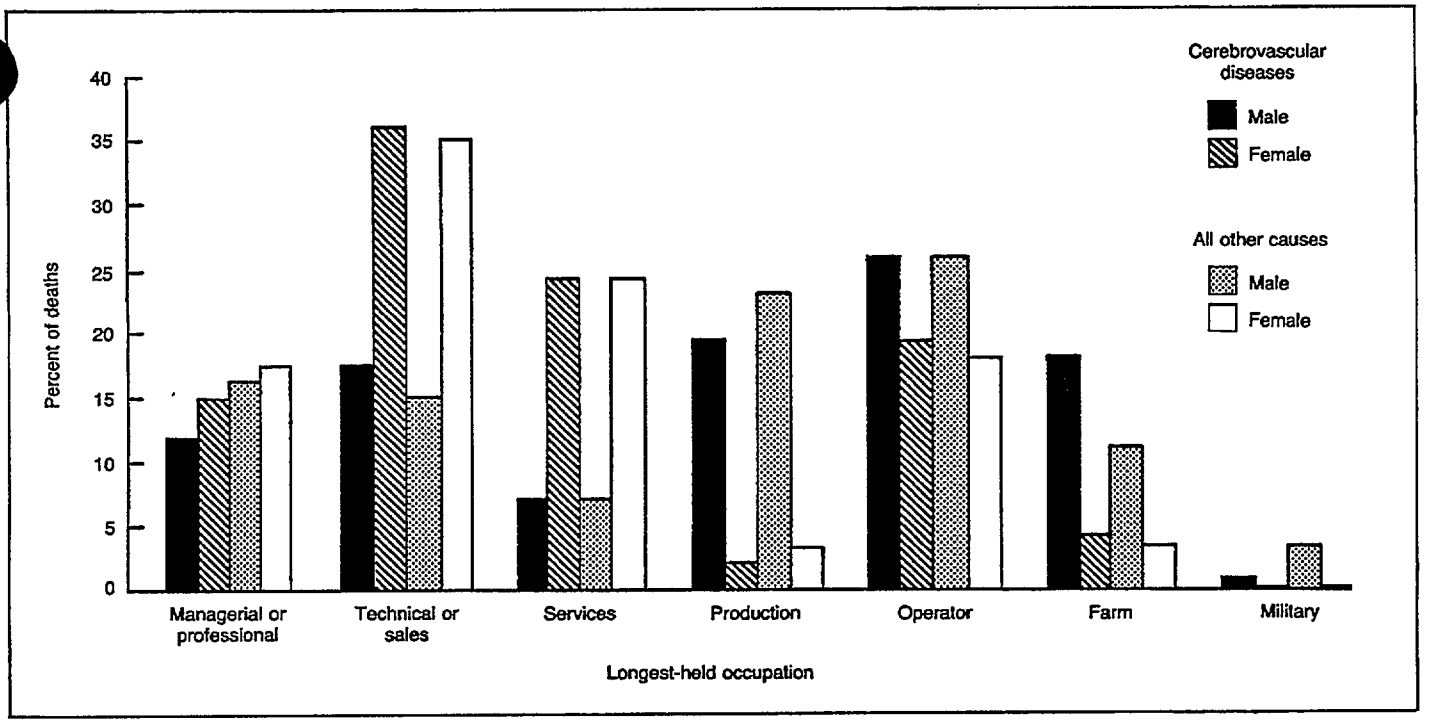

Figure 2. Percent distribution of deaths from cerebrovascular diseases and all other causes by longest-held occupation, according to sex: United States, 1986

75 percent of female decedents. For decedents reporting occupation, the largest proportions had worked in technical or sales and in operator occupations (figure 2). Persons who died of stroke were slightly less likely to be in a precision production or military occupation and were slightly more likely to be in a farming, fishery, or forestry occupation. Regardless of cause of death, women who had worked in a paid occupation were somewhat more likely to have been in a technical and sales or in a service occupation than were males. Women were less likely than men to have been in a precision production, operator, farm, or armed forces occupation.

Living arrangements

Regardless of cause of death, most adults dying in 1986 had lived with relatives during the 1985 calendar year. However, there were differences by cause of death in living arrangements during 1985 (figure 3). Compared with persons dying from other causes, a somewhat larger proportion of persons who died from stroke had resided in an institution in 1985. For females, a smaller proportion dying from stroke than from other causes had lived with one or more relatives. Regardless of cause of death, females were at least twice as likely as males to have resided in an institution during 1985. Females were much less likely than their male counterparts to have lived with relatives. There were no significant differences by cause of death in the living arrangements of male decedents. Compared with women dying from other causes, those dying of stroke were nearly two times as likely to have resided in an institution during 1985. Female decedents dying of stroke were somewhat less likely than other female decedents to have resided with relatives during this same period.

Income and assets

Most decedents in the NMFS had family incomes of less than $25,000 in 1985 (figure 4). There was no significant difference by cause of death in the distribution of decedents' income. Regardless of cause of death, larger proportions of female than of male decedents had family incomes under $5,000. There were no other significant differences by sex in income for decedents dying of stroke. For decedents dying from other causes, a larger proportion of males than of females had 1985 incomes of $9,000 or more.

There were no differences by cause of death in assets, but there were differences by sex within each cause group (figure 5). For persons dying of stroke, a larger proportion of male than of female decedents had assets of $25,000–$49,999 at death. For those dying from other causes, a larger proportion of male than of female decedents had assets of $5,000 or more.

Health care use and source of payment

Most adults who died in 1986 had seen a physician five times or more in the year prior to death (table 4). Persons dying from stroke were more likely than were persons dying from other causes to have no physician visits or 1–4 visits. There were no differences in the number of physician visits between male and female decedents who died from stroke. For those dying from other causes, female decedents were less likely than male

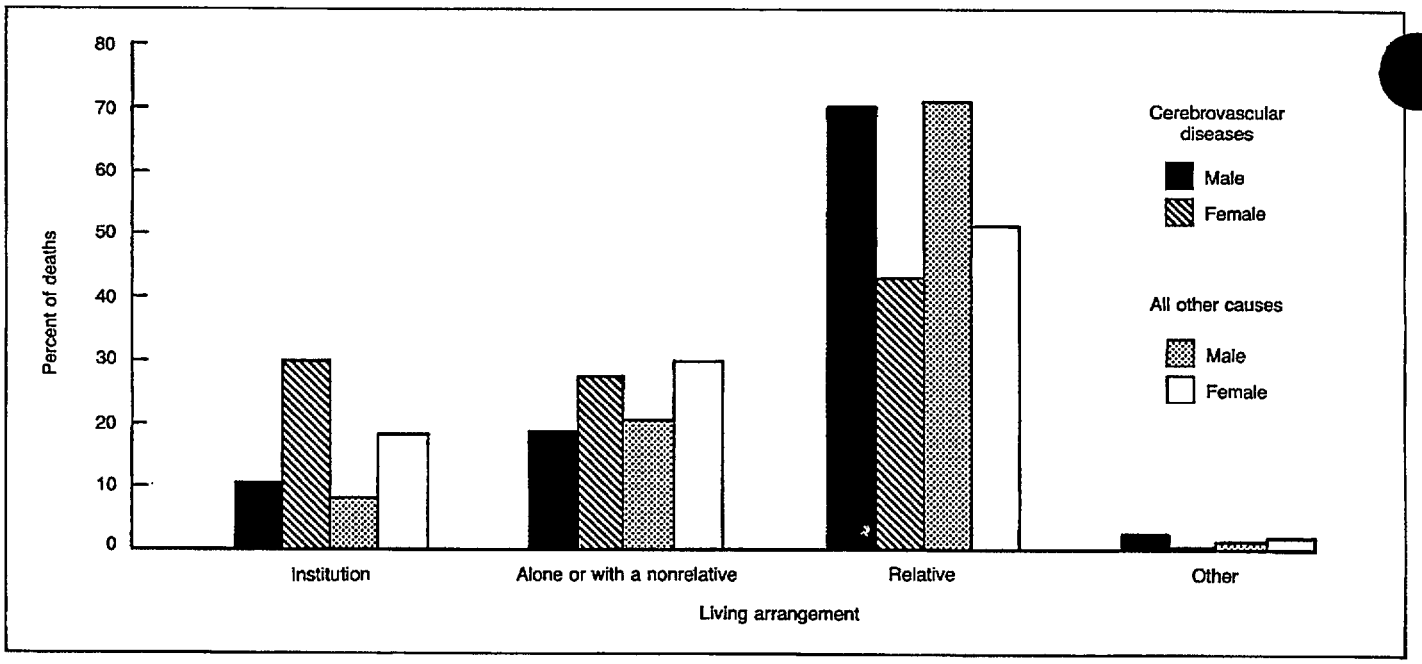

Figure 3. Percent distribution of deaths from cerebrovascular diseases and all other causes by living arrangements in 1985, according to sex: United States, 1986

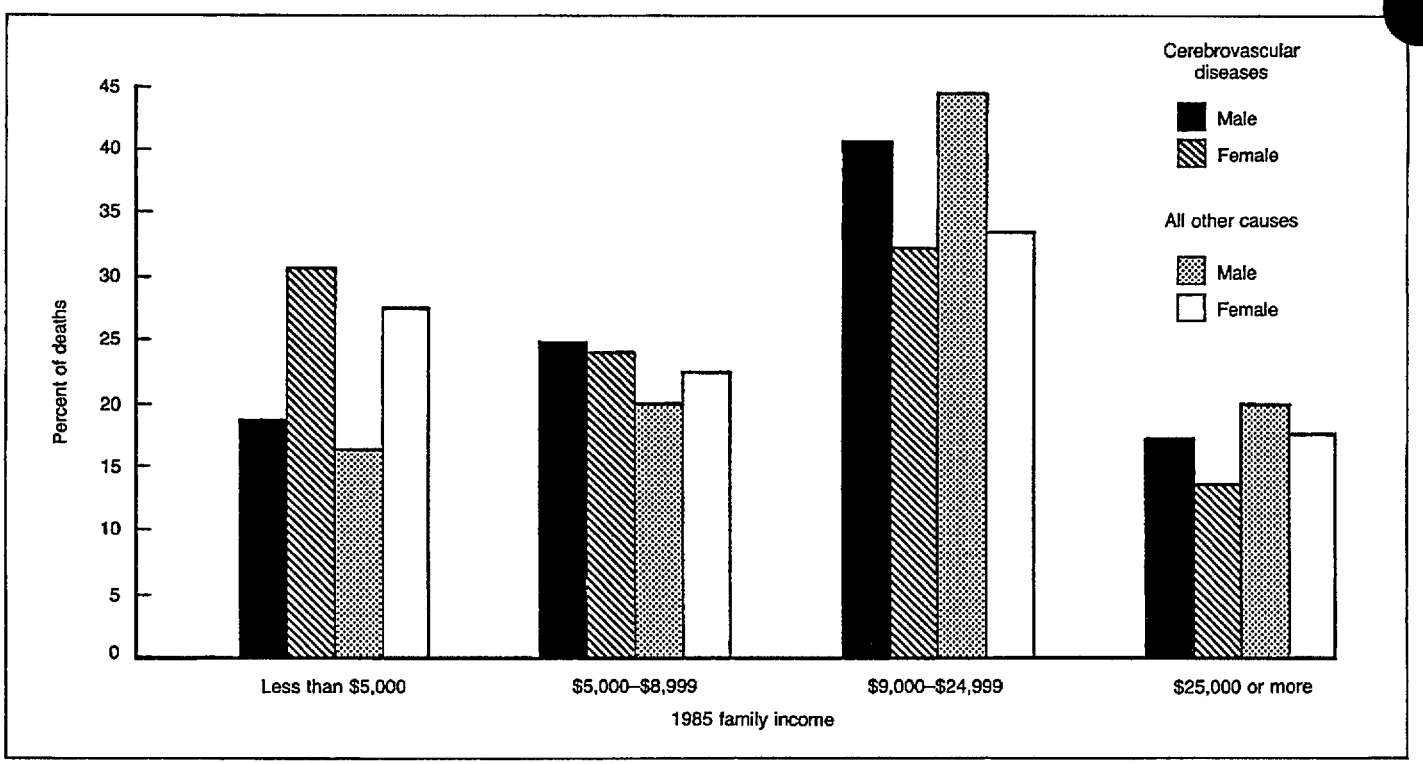

Figure 4. Percent distribution of deaths from cerebrovascular diseases and all other causes by 1985 family income, according to sex: United States, 1986

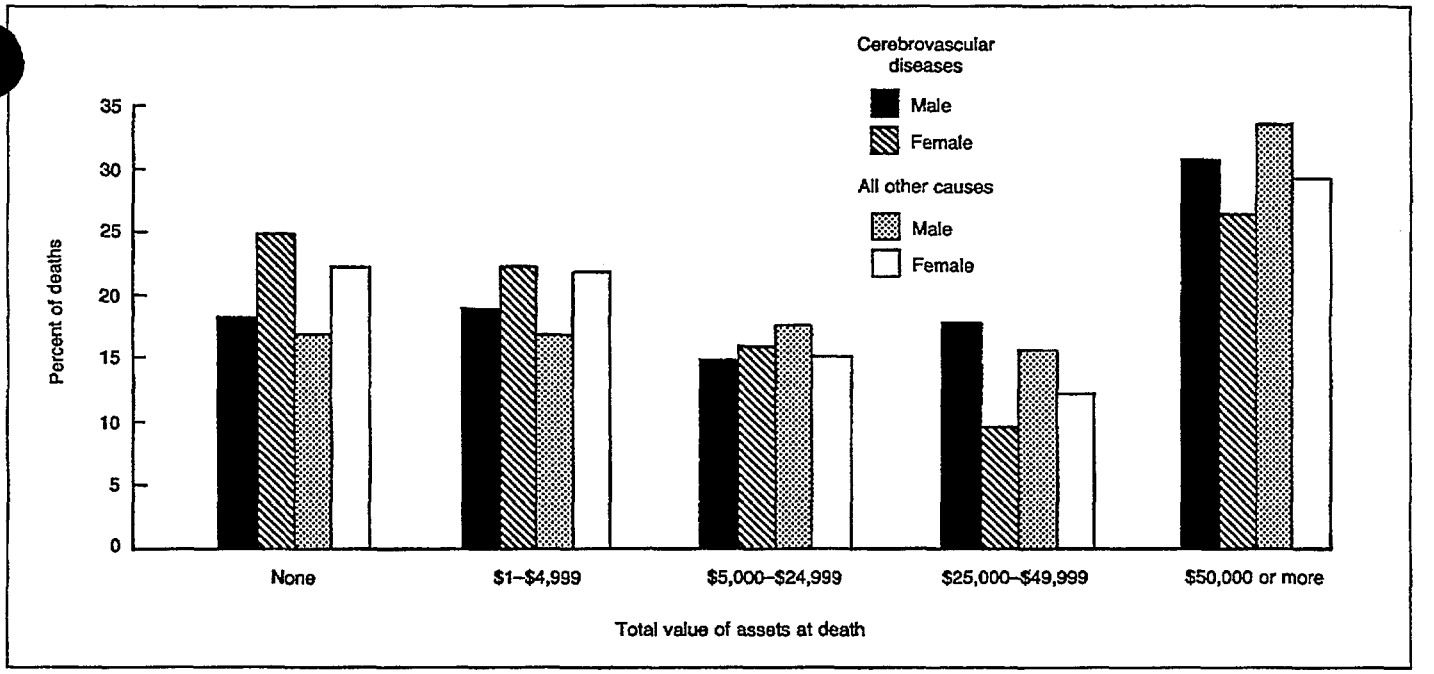

Figure 5. Percent distribution of deaths from cerebrovascular diseases and all other causes by total value of assets at death, according to sex: United States, 1986

decedents to have had fewer than five visits to a physician during the last year of life.

Medicare was reported as the primary source of payment for health care in the last year of life for the largest proportion of decedents, regardless of the cause of death (table 5). Self or family was reported as the primary source of health care payment for a somewhat larger proportion of persons dying from stroke than from other causes. Coverage by a health maintenance organization (HMO) or private insurance was reported more often for those dying from other causes than for those dying of stroke. There were few differences in primary source of payment by cause of death within each of the sex categories. Males who died from stroke were somewhat more likely than those dying from other causes to have had Medicare as their primary source of health care payment, and they were less likely to have had an HMO or private insurance as their primary payment source. Females who died from stroke were somewhat less likely than were other female decedents to have had an HMO or private insurance as their primary source of health care payment.

Most adults who died in 1986 had spent less than $2,000 of their own money for health care in the last year of life, but approximately one-fifth had spent $5,000 or more (table 6). There was little difference by cause of death in the amount of the decedents' own money spent for care. Persons dying from stroke were somewhat more likely than other decedents to have spent $5,000 or more of their own money for care. Regardless of cause of death, female decedents were somewhat more likely than male decedents to have spent $5,000 or more of their own funds for health care.

Health status and risk factors for cerebrovascular diseases

Assistance in activities of daily living or in home medical care was not received by a majority of persons who died in 1986 (table 7). Of those who received help, larger numbers were assisted by family only than by unrelated persons or by a combination of relatives and nonrelatives. For both sexes combined, there were no significant differences by cause of death in the proportion who received help in daily activities or medical care. There were few differences by sex in the proportion of those dying from stroke who received help, and there were also few differences between the sexes in the relationship of the caregiver(s) to the decedent. For persons dying from other causes, males were somewhat less likely than females to receive help in daily activities or home medical care.

In addition to cerebrovascular diseases, many of the decedents had other serious health problems (figure 6). Compared with all other causes of death, a larger proportion of persons dying from stroke had high blood pressure. Persons dying from other causes were more likely to have had one or more heart attacks, asthma, or other lung conditions.

There was little difference by sex in the type of other health problems for persons dying of stroke. However, males dying from cerebrovascular diseases were more than twice as likely as females to have had other lung conditions. There were no significant differences in other health conditions by sex for decedents who

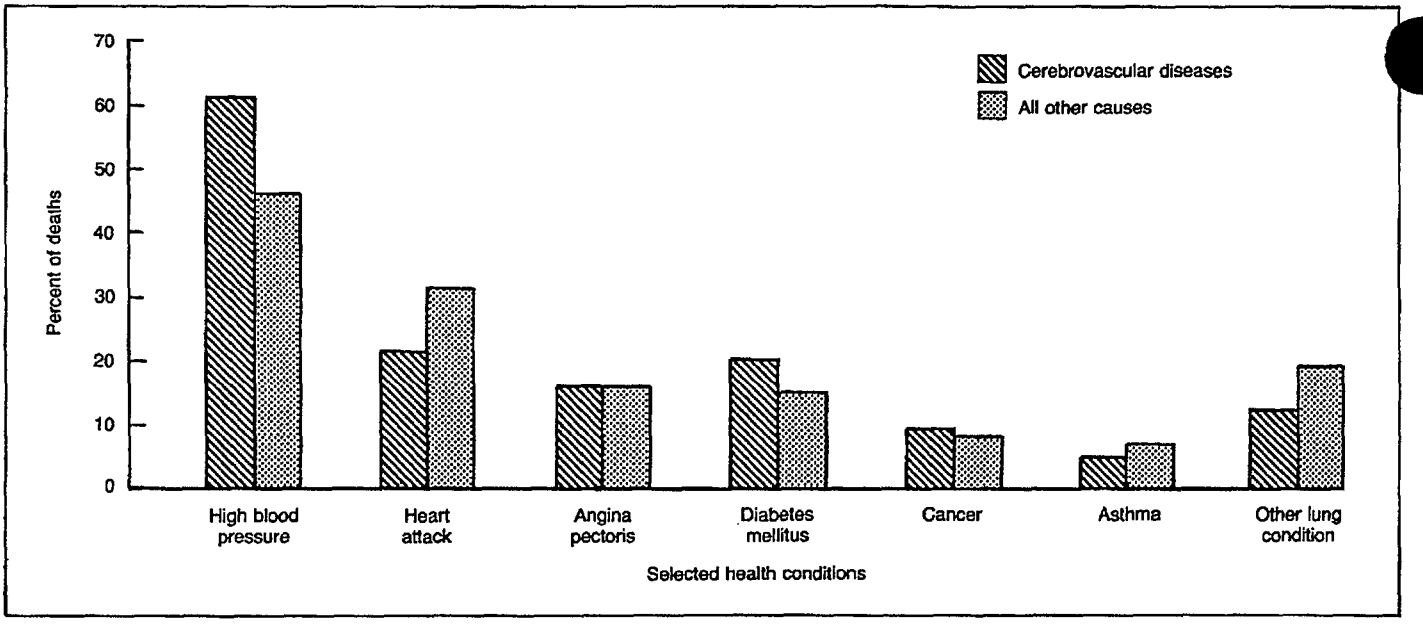

Figure 6. Percent distribution of deaths from cerebrovascular diseases and all other causes, by presence of selected health conditions: United States, 1986

were black, but decedents who were not black showed the same pattern of a higher proportion of males than of females with other lung conditions.

For persons dying from other causes, a larger proportion of females than of males had high blood pressure, diabetes, or cancer. Smaller proportions of male than of female decedents had experienced one or more heart attacks or had lung conditions other than asthma. This pattern generally applied to black decedents as well as to those who were not black.

Cigarette smoking is another known risk factor for cerebrovascular diseases. Use of cigarettes and length of time the decedent smoked are shown in table 8. An estimated 827,899 (45 percent) of the decedents were reported never to have smoked cigarettes. The majority of decedents 25 years of age and over who were reported to have smoked cigarettes had done so for 20 years or more. For all decedents 25 years of age and over, there were differences in smoking status between those dying from stroke and those dying from other causes. Persons dying from stroke were somewhat less likely than those dying from all other causes to have smoked cigarettes. Of those who smoked, slightly smaller proportions of decedents dying from stroke than from all other causes had smoked for 20 years or more. When the decedent's age was held constant, there were no significant differences in smoking behavior by cause of death for those aged 25–74 years. At age 75 and over a somewhat smaller proportion of persons dying from stroke than from all other causes had smoked for 20 years or more.

Summary

The 1,121 persons sampled in the NMFS who died of cerebrovascular diseases represent an estimated 149,699 such deaths, or approximately 7 percent of all persons 25 years of age and over who died in the United States during 1986. Persons who died of stroke tended to be older than those dying of all other causes, and more of them were female. Partly because of their age and sex, adults dying from stroke were more likely than others to be widowed at the time of death and to have resided in an institution during the year prior to death. A larger proportion of decedents dying from stroke than from all other causes were reported to have hypertension, a known risk factor for cerebrovascular disease.

More detailed information from the 1986 NMFS and comparisons of other major causes of death will be found in subsequent publications from the National Center for Health Statistics (NCHS).

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Table 1. Estimated number and percent distribution of deaths from cerebrovascular diseases and all other causes by age, according to sex and race: United States, 1986

Cause of death, race, and age	Both sexes	Male	Female	Both sexes	Male	Female
Cerebrovascular diseases	Estimated number			Percent distribution		
All races:						
25 years and over	149,699	59,703	89,996	100.0	100.0	100.0
25–54 years	7,909	3,953	3,956	5.3	6.6	4.4
55–64 years	11,892	6,344	5,548	7.9	10.6	6.2
65–74 years	26,993	14,544	12,448	18.0	24.4	13.8
75–84 years	52,046	21,248	30,798	34.8	35.6	34.2
85 years and over	50,860	13,614	37,246	34.0	22.8	41.4
Black:						
25 years and over	16,694	7,812	8,882	100.0	100.0	100.0
25–54 years	2,780	1,659	*1,121	16.7	21.2	*12.6
55–64 years	2,775	1,558	*1,217	16.6	19.9	*13.7
65–74 years	3,960	1,717	2,243	23.7	22.0	25.3
75–84 years	4,239	1,802	2,437	25.4	23.1	27.4
85 years and over	2,941	*1,077	1,864	17.6	*13.8	21.0
Races other than black:						
25 years and over	133,005	51,891	81,115	100.0	100.0	100.0
25–54 years	5,129	2,294	2,835	3.9	4.4	3.5
55–64 years	9,118	*4,786	*4,332	6.9	*9.2	*5.3
65–74 years	23,033	12,828	10,206	17.3	24.7	12.6
75–84 years	47,806	19,446	28,360	35.9	37.5	35.0
85 years and over	47,920	12,537	35,382	36.0	24.2	43.6
All other causes						
All races:						
25 years and over	1,837,168	970,044	867,124	100.0	100.0	100.0
25–54 years	231,839	154,991	76,848	12.6	16.0	8.9
55–64 years	264,358	164,241	100,117	14.4	16.9	11.5
65–74 years	453,032	265,178	187,854	24.7	27.3	21.7
75–84 years	516,568	258,140	258,428	28.1	26.6	29.8
85 years and over	371,371	127,494	243,877	20.2	13.1	28.1
Black:						
25 years and over	211,309	115,482	95,827	100.0	100.0	100.0
25–54 years	49,780	32,481	17,299	23.6	28.1	18.1
55–64 years	38,368	22,626	15,742	18.2	19.6	16.4
65–74 years	51,113	28,567	22,547	24.2	24.7	23.5
75–84 years	46,504	22,523	23,981	22.0	19.5	25.0
85 years and over	25,544	9,285	16,259	12.1	8.0	17.0
Races other than black:						
25 years and over	1,625,860	854,563	771,297	100.0	100.0	100.0
25–54 years	182,060	122,510	59,550	11.2	14.3	7.7
55–64 years	225,990	141,615	84,375	13.9	16.6	10.9
65–74 years	401,919	236,612	165,307	24.7	27.7	21.4
75–84 years	470,064	235,617	234,447	28.9	27.6	30.4
85 years and over	345,827	118,209	227,618	21.3	13.8	29.5

NOTE: Numbers and percents may not add to totals because of rounding. Oregon not included in the 1986 National Mortality Followback Survey.

Table 2. Estimated number and percent distribution of deaths from cerebrovascular diseases and all other causes by marital status, according to sex: United States, 1986

Cause of death and marital status	Both sexes	Male	Female	Both sexes	Male	Female
Cerebrovascular diseases	Estimated number			Percent distribution		
All marital statuses	146,662	58,184	88,478	100.0	100.0	100.0
Married	56,231	36,413	19,818	38.3	62.6	22.4
Widowed	68,226	12,934	55,292	46.5	22.2	62.5
Divorced or separated	13,246	5,657	7,589	9.0	9.7	8.6
Never married	8,959	3,180	5,779	6.1	5.5	6.5
All other causes						
All marital statuses	1,800,216	946,314	853,902	100.0	100.0	100.0
Married	834,919	593,158	241,761	46.4	62.7	28.3
Widowed	634,323	159,130	475,193	35.2	16.8	55.6
Divorced or separated	179,960	103,451	76,509	10.0	10.9	9.0
Never married	151,015	90,575	60,439	8.4	9.6	7.1

NOTE: Numbers and percents may not add to totals because of rounding. Oregon not included in the 1986 National Mortality Followback Survey.

Table 3. Estimated number and percent distribution of deaths from cerebrovascular diseases and all other causes by level of education, according to sex: United States, 1986

Cause of death and level of education	*Both sexes*	*Male*	*Female*	*Both sexes*	*Male*	*Female*
Cerebrovascular diseases	Estimated number			Percent distribution		
All levels of education	136,594	55,075	81,519	100.0	100.0	100.0
Less than high school	78,101	34,237	43,864	51.7	53.0	50.2
High school	35,566	11,704	23,862	29.0	26.4	31.8
1–3 years of college	14,078	4,891	9,187	10.7	10.4	11.1
4 years of college or more	8,849	4,243	4,606	8.7	10.2	7.0
All other causes						
All levels of education	1,698,582	900,363	798,219	100.0	100.0	100.0
Less than high school	877,422	477,070	400,352	57.2	62.2	53.8
High school	491,808	238,049	253,759	26.0	21.3	29.3
1–3 years of college	181,923	93,634	88,290	10.3	8.9	11.3
4 years of college or more	147,429	91,611	55,818	6.5	7.7	5.7

NOTE: Numbers and percents may not add to totals because of rounding. Oregon not included in the 1986 National Mortality Followback Survey.

Table 4. Estimated number and percent distribution of deaths from cerebrovascular diseases and all other causes by number of doctor visits, according to sex: United States, 1986

Cause of death and number of doctor visits	*Both sexes*	*Male*	*Female*	*Both sexes*	*Male*	*Female*
Cerebrovascular diseases	Estimated number			Percent distribution		
All doctor visits	137,986	54,607	83,379	100.0	100.0	100.0
No visits	23,708	8,149	15,559	17.2	14.9	18.7
1–4 visits	37,659	15,130	22,529	27.3	27.7	27.0
5–14 visits	48,297	20,759	27,538	35.0	38.0	33.0
15 visits or more	28,322	10,569	17,753	20.5	19.4	21.3
All other causes						
All doctor visits	1,694,793	891,862	802,931	100.0	100.0	100.0
No visits	216,560	108,556	108,004	12.8	12.2	13.5
1–4 visits	393,433	235,782	157,651	23.2	26.4	19.6
5–14 visits	580,191	295,676	284,515	34.2	33.2	35.4
15 visits or more	504,609	251,848	252,761	29.8	28.2	31.5

NOTE: Numbers and percents may not add to totals because of rounding. Oregon not included in the 1986 National Mortality Followback Survey.

Table 5. Estimated number and percent distribution of deaths from cerebrovascular diseases and all other causes by primary health care payment source, according to sex: United States, 1986

Cause of death and primary health care payment source	*Both sexes*	*Male*	*Female*	*Both sexes*	*Male*	*Female*
Cerebrovascular diseases	Estimated number			Percent distribution		
All sources of payment	118,034	46,303	71,731	100.0	100.0	100.0
Self or family	19,223	6,831	12,392	16.3	14.8	17.3
Medicare	60,322	25,849	34,473	51.1	55.8	48.1
Medicaid	12,770	*2,297	10,473	10.8	*5.0	14.6
HMO or insurance	17,855	7,168	10,687	15.1	15.5	14.9
Other sources	7,864	4,158	*3,706	6.7	9.0	*5.2
All other causes						
All sources of payment	1,483,881	778,824	705,057	100.0	100.0	100.0
Self or family	189,666	88,882	100,784	12.8	11.4	14.3
Medicare	698,940	355,796	343,144	47.1	45.7	48.7
Medicaid	132,549	50,598	81,951	8.9	6.5	11.6
HMO or insurance	330,864	189,274	141,590	22.3	24.3	20.1
Other sources	131,862	94,274	37,588	8.9	12.1	5.3

NOTE: Numbers and percents may not add to totals because of rounding. Oregon not included in the 1986 National Mortality Followback Survey. HMO is Health Maintenance Organization.

Table 6. Estimated number and percent distribution of deaths from cerebrovascular diseases and all other causes by own money spent for health care, according to sex: United States, 1986

Cause of death and own money spent	*Both sexes*	*Male*	*Female*	*Both sexes*	*Male*	*Female*
Cerebrovascular diseases	Estimated number			Percent distribution		
All amounts spent	120,802	47,004	73,798	100.0	100.0	100.0
Less than $500	45,320	19,320	26,000	37.5	41.1	35.2
$500–$999	13,211	5,953	7,258	10.9	12.7	9.8
$1,000–$1,999	15,679	6,348	9,331	13.0	13.5	12.6
$2,000–$4,999	20,269	7,679	12,590	16.8	16.3	17.1
$5,000 or more	26,323	7,704	18,619	21.8	16.4	25.2
All other causes						
All amounts spent	1,492,997	781,893	711,104	100.0	100.0	100.0
Less than $500	608,035	338,813	269,222	40.7	43.3	37.9
$500–$999	201,554	110,706	90,848	13.5	14.2	12.8
$1,000–$1,999	184,660	99,298	85,362	12.4	12.7	12.0
$2,000–$4,999	238,897	120,983	117,914	16.0	15.5	16.6
$5,000 or more	259,851	112,093	147,758	17.4	14.3	20.8

NOTE: Numbers and percents may not add to totals because of rounding. Oregon not included in the 1986 National Mortality Followback Survey.

Table 7. Estimated number and percent distribution of deaths from cerebrovascular diseases and all other causes by assistance received in daily living and medical care, according to age and sex: United States, 1986

Cause of death, age, and assistance received in daily living and medical care	*Both sexes*	*Male*	*Female*	*Both sexes*	*Male*	*Female*
Cerebrovascular diseases	Estimated number			Percent distribution		
25 years and over:						
Assistance in daily living	107,682	47,741	59,941	100.0	100.0	100.0
No help received	59,267	27,357	31,910	55.0	57.3	53.2
Family helped only	24,281	11,298	12,983	22.5	23.7	21.7
Nonrelatives helped only	*5,189	*1,512	*3,677	*4.8	*3.2	*6.1
Family and nonrelatives helped	18,945	7,574	11,371	17.6	15.9	19.0
25–54 years:						
Assistance in daily living	7,445	3,629	3,816	100.0	100.0	100.0
No help received	6,550	3,155	3,395	88.0	87.0	89.0
Family helped only	*475	*273	*201	*6.4	*7.5	*5.3
Nonrelatives helped only	*61	*0	*61	*0.8	*0.0	*1.6
Family and nonrelatives helped	*358	*200	*158	*4.8	*5.5	*4.1
55–74 years:						
Assistance in daily living	34,072	17,803	16,270	100.0	100.0	100.0
No help received	20,653	10,854	9,799	60.6	61.0	60.2
Family helped only	7,093	*3,877	3,216	20.8	*21.8	19.8
Nonrelatives helped only	*1,268	*854	*414	*3.7	*4.8	*2.5
Family and nonrelatives helped	5,058	*2,217	*2,841	14.8	*12.5	*17.5
75 years and over:						
Assistance in daily living	66,166	26,310	39,856	100.0	100.0	100.0
No help received	32,064	13,348	18,716	48.5	50.7	47.0
Family helped only	16,713	7,147	9,566	25.3	27.2	24.0
Nonrelatives helped only	*3,859	*658	*3,202	*5.8	*2.5	*8.0
Family and nonrelatives helped	13,530	5,157	8,373	20.4	19.6	21.0
25 years and over:						
Assistance in medical care	107,764	48,265	59,499	100.0	100.0	100.0
No help received	59,267	26,601	32,666	55.0	55.1	54.9
Family helped only	24,912	12,580	12,332	23.1	26.1	20.7
Nonrelatives helped only	*5,119	*1,643	*3,476	*4.8	*3.4	*5.8
Family and nonrelatives helped	18,466	7,441	11,025	17.1	15.4	18.5
25–54 years:						
Assistance in medical care	7,533	3,717	3,816	100.0	100.0	100.0
No help received	6,282	3,179	3,103	83.4	85.5	81.3
Family helped only	*734	*338	*396	*9.7	*9.1	*10.4
Nonrelatives helped only	*61	*0	*61	*0.8	*0.0	*1.6
Family and nonrelatives helped	*455	*200	*256	*6.0	*5.4	*6.7
55–74 years:						
Assistance in medical care	34,170	18,237	15,934	100.0	100.0	100.0
No help received	20,401	10,487	9,914	59.7	57.5	62.2
Family helped only	7,221	4,338	*2,883	21.1	23.8	*18.1
Nonrelatives helped only	*1,388	*974	*414	*4.1	*5.3	*2.6
Family and nonrelatives helped	5,160	*2,438	*2,722	15.1	*13.4	*17.1
75 years and over:						
Assistance in medical care	66,061	26,312	39,749	100.0	100.0	100.0
No help received	32,583	12,934	19,649	49.3	49.2	49.4
Family helped only	16,958	7,905	9,053	25.7	30.0	22.8
Nonrelatives helped only	*3,670	*669	*3,001	*5.6	*2.5	*7.5
Family and nonrelatives helped	12,850	4,803	8,047	19.5	18.3	20.2
All other causes						
25 years and over:						
Assistance in daily living	1,511,461	846,250	665,211	100.0	100.0	100.0
No help received	821,932	513,610	308,322	54.4	60.7	46.3
Family helped only	345,386	184,869	160,517	22.9	21.8	24.1
Nonrelatives helped only	60,298	21,757	38,541	4.0	2.6	5.8
Family and nonrelatives helped	283,845	126,014	157,831	18.8	14.9	23.7
25–54 years:						
Assistance in daily living	218,613	146,487	72,125	100.0	100.0	100.0
No help received	157,984	116,346	41,638	72.3	79.4	57.7
Family helped only	30,364	16,291	14,073	13.9	11.1	19.5
Nonrelatives helped only	4,822	3,276	1,546	2.2	2.2	2.1
Family and nonrelatives helped	25,443	10,575	14,868	11.6	7.2	20.6
55–74 years:						
Assistance in daily living	652,329	392,456	259,874	100.0	100.0	100.0
No help received	366,143	241,970	124,173	56.1	61.7	47.8
Family helped only	152,315	89,705	62,610	23.3	22.9	24.1
Nonrelatives helped only	18,144	7,807	10,336	2.8	2.0	4.0
Family and nonrelatives helped	115,728	52,974	62,754	17.7	13.5	24.1

Table 7. Estimated number and percent distribution of deaths from cerebrovascular diseases and all other causes by assistance received in daily living and medical care, according to age and sex: United States, 1986—Con.

Cause of death, age, and assistance received in daily living and medical care	*Both sexes*	*Male*	*Female*	*Both sexes*	*Male*	*Female*
All other causes—Con.	Estimated number			Percent distribution		
75 years and over:						
Assistance in daily living	640,519	307,307	333,212	100.0	100.0	100.0
No help received	297,805	155,294	142,511	46.5	50.5	42.8
Family helped only	162,708	78,874	83,834	25.4	25.7	25.2
Nonrelatives helped only	37,333	10,674	26,659	5.8	3.5	8.0
Family and nonrelatives helped	142,674	62,465	80,209	22.3	20.3	24.1
25 years and over:						
Assistance in medical care	1,509,129	844,877	664,251	100.0	100.0	100.0
No help received	796,561	475,397	321,164	52.8	56.3	48.3
Family helped only	370,087	215,744	154,343	24.5	25.5	23.2
Nonrelatives helped only	61,330	23,733	37,596	4.1	2.8	5.7
Family and nonrelatives helped	281,151	130,003	151,148	18.6	15.4	22.8
25–54 years:						
Assistance in medical care	218,187	146,048	72,139	100.0	100.0	100.0
No help received	152,974	110,690	42,284	70.1	75.8	58.6
Family helped only	34,922	20,577	14,344	16.0	14.1	19.9
Nonrelatives helped only	5,194	3,526	1,667	2.4	2.4	2.3
Family and nonrelatives helped	25,098	11,254	13,844	11.5	7.7	19.2
55–74 years:						
Assistance in medical care	652,648	393,075	259,573	100.0	100.0	100.0
No help received	352,044	222,574	129,470	53.9	56.6	49.9
Family helped only	166,660	107,906	58,754	25.5	27.5	22.6
Nonrelatives helped only	19,005	8,597	10,408	2.9	2.2	4.0
Family and nonrelatives helped	114,939	53,998	60,941	17.6	13.7	23.5
75 years and over:						
Assistance in medical care	638,295	305,756	332,539	100.0	100.0	100.0
No help received	291,544	142,134	149,410	45.7	46.5	44.9
Family helped only	168,505	87,261	81,245	26.4	28.5	24.4
Nonrelatives helped only	37,131	11,610	25,521	5.8	3.8	7.7
Family and nonrelatives helped	141,115	64,752	76,364	22.1	21.2	23.0

NOTE: Numbers and percents may not add to totals because of rounding. Oregon not included in the 1986 National Mortality Followback Survey.

Table 8. Estimated number and percent distribution of deaths from cerebrovascular diseases and all other causes by smoking status, according to age: United States, 1986

Cause of death and smoking status	Age							
	25 years and over	25–54 years	55–74 years	75 years and over	25 years and over	25–54 years	55–74 years	75 years and over
Cerebrovascular diseases	Estimated number				Percent distribution			
All smoking statuses	137,538	7,267	34,936	95,334	100.0	100.0	100.0	100.0
Never smoked cigarettes	78,665	2,043	12,796	63,825	57.2	28.1	36.6	66.9
Smoked 0–4 years	7,184	*642	*1,746	4,796	5.2	*8.8	*5.0	5.0
Smoked 5–9 years	*2,849	*279	*481	*2,088	*2.1	*3.8	*1.4	*2.2
Smoked 10–14 years	*2,326	*443	*319	*1,565	*1.7	*6.1	*0.9	*1.6
Smoked 15–19 years	*2,829	*539	*335	*1,955	*2.1	*7.4	*1.0	*2.1
Smoked 20 years or more	43,686	3,322	19,259	21,104	31.8	45.7	55.1	22.1
All other causes								
All smoking statuses	1,694,713	213,520	659,950	821,243	100.0	100.0	100.0	100.0
Never smoked cigarettes	749,234	59,736	189,550	499,948	44.2	28.0	28.7	60.9
Smoked 1–4 years	87,520	15,287	30,977	41,256	5.2	7.2	4.7	5.0
Smoked 5–9 years	28,520	10,598	10,709	7,212	1.7	5.0	1.6	0.9
Smoked 10–14 years	57,980	21,457	20,165	16,359	3.4	10.0	3.1	2.0
Smoked 15–19 years	43,785	19,857	15,148	8,781	2.6	9.3	2.3	1.1
Smoked 20 years or more	727,674	86,585	393,402	247,687	42.9	40.6	59.6	30.2

NOTE: Numbers and percents may not add to totals because of rounding. Oregon not included in the 1986 National Mortality Followback Survey.

Symbols	
- - -	Data not available
. . .	Category not applicable
-	Quantity zero
0.0	Quantity more than zero but less than 0.05
Z	Quantity more than zero but less than 500 where numbers are rounded to thousands
*	Estimate based on fewer than 30 sample deaths and does not meet standards of reliability or precision
#	Figure suppressed to comply with confidentiality requirements

Technical notes

Sources of data and sample design

The NMFS sample was selected from the Current Mortality Sample (CMS). The CMS is a systematic 10-percent sample of death certificates received each month in the vital statistics offices of the 50 States, the District of Columbia, and the independent registration area of New York City (4). Although part of the CMS, Oregon was not included in the 1986 NMFS because of respondent consent requirements. Thus, the estimates in this report are representative of deaths in the United States excluding Oregon. Oregon accounts for about 1 percent of all deaths in the United States.

Oversampling of death certificates by race and age permitted the study of race differentials in mortality and yielded the characteristics of persons who died at younger ages. Deaths for persons under 55 years of age were oversampled 3.1 times and deaths for black persons were oversampled 2.9 times. In addition, approximately 2,500 deaths were selected with certainty to permit special studies of certain causes of death or populations. Deaths selected with certainty from the CMS included all women 25–54 years of age and all men 35–64 years of age who died from ischemic heart disease; all deaths of American Indians, Aleuts, and Eskimos; all deaths from asthma; and all deaths from certain rare cancers (nasopharynx, liver, male breast, lip and oral, nasal, small intestine, and other endocrine cancers). Death certificates in the CMS that were eligible for the 1986 NMFS were sequentially assigned to one of 18 sampling strata. The strata formation was based on the decedents' age, sex, race, and cause of death.

The 1986 NMFS data were obtained through questionnaires mailed to the next of kin or other person listed on the death certificate as providing the personal information on the decedent's death certificate. Questionnaires were mailed by the U.S. Bureau of the Census about 6 months after death occurred. A reminder letter was mailed 10 days after the first mailing, followed by a second mailing 1 month after the initial mailing. Telephone or personal visits were made by Census Bureau interviewers to nonrespondents 1 month after the second mailing.

The overall response rate for the survey was 89 percent, yielding 16,589 completed questionnaires. Eighty-two percent of the respondents who completed the NMFS questionnaire were close relatives of the decedent—spouses, parents, siblings, or adult children—and another 12 percent were more distant relatives. Only 6 percent of the respondents were unrelated to the decedent.

Information for each decedent on the underlying cause of death and all other causes contributing to the death was obtained from the Mortality Vital Statistics Multiple Cause-of-Death Statistical File compiled by NCHS. Records from this multiple cause-of-death file were matched to the data from the NMFS informant questionnaire for each decedent in the survey. The overall match rate was 99.9 percent.

Estimation procedures

Statistics produced from the NMFS are derived by a complex estimating procedure. The estimating procedure used to produce essentially unbiased national estimates from the NMFS has three principal components: inflation by reciprocals of the probabilities of sample selection, adjustment for nonresponse, and a ratio adjustment to fixed totals. The ratio adjustment factors make NMFS estimates of decedents in 18 age-race-sex categories equal to the number of resident deaths in 1986 for the United States, excluding Oregon. Although the final weights applied to the NMFS adjust for differential sampling by race, sex, and age, no adjustment was made for cause of death. Hence, NMFS counts of death by cause will not necessarily equal counts obtained from the vital statistics file.

Sampling errors

Because the estimates for this report are based on a sample, they may differ from figures that would have been obtained had a complete census been taken using the same schedules, instructions, and procedures. The standard error is primarily a measure of the variability that occurs by chance because only a sample, rather than the entire population, is surveyed. The standard error also reflects part of the measurement error, but it does not measure any systematic biases in the data. The chances are 95 in 100 that an estimate from the sample differs by less than twice the standard error from the value that would be obtained from a complete census.

The standard errors used in this report were approximated using the balanced-repeated-replication procedure. This method yields the overall variability through observation of variability among random subsamples of the total sample. A description of the development and evaluation of the replication technique for error estimation has been published (5).

It would be impracticable to present exact standard error estimates for all statistics used in this report. Thus, a generalized variance function was produced for aggregated estimates by fitting the data into 18 curves corresponding to the strata using the empirically determined relationship between the size of an estimate X and its relative variance (rel var X). This relationship is expressed as

$$\text{rel var } X = \frac{S_x^2}{X^2} = a + \frac{b}{x}$$

where a and b are regression estimates determined by an iterative procedure. These regression estimates are presented in table I.

Table I. Parameters used to approximate the relative standard errors for estimates based on the 1986 National Mortality Followback Survey, by domain of study

Domain of study	Parameters	
	A	B
All decedents	−0.000088	173.472799
Decedents 25–34 years of age	−0.000725	40.250787
Decedents 35–54 years of age	−0.000306	57.187500
Decedents 55–69 years of age	−0.000325	189.139047
Decedents 70–84 years of age	−0.000219	200.749692
Decedents 85 years of age and over	−0.000430	181.208646
All black decedents	−0.000250	57.315899
Decedents 25–34 years of age	−0.002721	36.923295
Decedents 35–54 years of age	−0.001278	48.883512
Decedents 55–69 years of age	−0.000863	64.860422
Decedents 70–84 years of age	−0.000688	59.820841
Decedents 85 years of age and over	−0.001911	54.630073
All other decedents	−0.000106	184.663690
Decedents 25–34 years of age	−0.000948	39.640859
Decedents 35–54 years of age	−0.000419	62.024668
Decedents 55–69 years of age	−0.000411	214.015461
Decedents 70–84 years of age	−0.000253	211.433987
Decedents 85 years of age and over	−0.000484	190.261795

In this report, the determination of statistical inference is based on testing differences between two statistics. The standard error of a difference between two statistics is approximately the square root of the sum of the squares of the standard errors of the individual statistics. This formulation of the standard error of the difference of two statistics quite accurately approximates the standard error for the difference between two uncorrelated statistics; however, it only roughly approximates the standard error in most other cases.

Although the exact number of degrees of freedom in the NMFS sampling variance is not known, the number of degrees of freedom may be approximated by the number of pseudostrata used in the balanced-repeated-replication procedure (6). Accordingly, hypotheses about differences between estimates are tested using 18 degrees of freedom for the two-tailed *t*-tests. Terms relating to differences such as "higher" and "less" indicate that the differences are statistically significant at the 0.05 level. Terms such as "similar" and "no difference" mean that no statistically significant difference exists between the estimates being compared. A lack of comment on the difference between any two estimates does not mean that the difference was tested and found to be not significant.

Rounding of numbers and percents

Numbers and percents within the tables and text were rounded to the nearest whole number or tenth of a percent. Therefore, the estimates may not add to the totals. In addition, the total estimated number of decedents varies from one table to another because of the exclusion of decedents with "no answer" responses.

NOTE: Nine other Federal agencies signed interagency agreements with NCHS to cosponsor the 1986 NMFS. These agencies are the National Heart, Lung, and Blood Institute; the National Institute of Child Health and Human Development; the National Cancer Institute; the National Institute of Aging; the National Institute of Mental Health; the Health Care Financing Administration; the U.S. Department of Veterans Affairs; the Indian Health Service; and the Office of the Secretary for Planning and Evaluation in the Department of Health and Human Services.

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