

The Longevity and Mortality of American Physicians, 1969–1973

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This paper analyzes the mortality experience of male and female physicians during the five-year period 1969 through 1973 in terms of age, sex, geographic location, and medical specialty. Physician mortality and longevity are then compared with the experience prevailing among the U.S. white population of the same age and sex.

Relationships between socioeconomic status and mortality suggest that physicians should have a better mortality experience than the general population and as such have a greater overall expectation of life. Previous studies of physician mortality in the United States using data from the records of the American Medical Association, have examined physician mortality relative to comparable groups of white males. No studies of physician mortality utilizing a population-based approach have been reported since that of the 1949 to 1951 population of physicians, and previous studies may have been subject to certain limitations in the data.

Empirical findings are presented which demonstrate the improvement in physician longevity since 1925. The relationship between age- and sex-specific mortality and geographic location and medical specialization is also discussed.

The men and women of the medical profession comprise a relatively small yet important segment of the American population. Educational and training requirements to enter the profession are rigorous and take many years of concentrated study. Attainment of the title of physician affords the recipient prestige, high income, and the respect and admiration of the community or institution in which he serves. Physicians thus are in a high socioeconomic stratum of the U.S. population. Relationships between socioeconomic status and mortality (Spiegelman, 1968) suggest that physicians should have a better mortality experience than the general population and as such have a greater overall expectation of life.

Since the medical profession is dedicated to protecting the health of others, it is particularly interesting to assess how well they may have protected their own health. Do physicians as a group indeed have a better mortality record than others of the same ages in the U.S. population? Does the mortality experience of physicians vary by specialty or geographic location? Information derived by answering questions such as these may also be useful in

projecting future requirements for physician manpower and in ascertaining replacement needs.

Studies of Physician Mortality and Life Expectancy

Previous studies of physician mortality in the United States, using data from the files of the American Medical Association, have examined physician deaths in relation to comparable groups of white males. Emerson and Hughes (1926) reported that death rates for male white physicians in 1925 were lower than those of all employed males in 1920.

Dublin and Spiegelman (1947) studied the mortality and longevity of American physicians for the period 1938 to 1942. They found that physicians experienced almost the same longevity and mortality as white males of the same ages in the general population.

In a follow-up study the same authors (Dublin and Spiegelman, 1948) analyzed the mortality experience of medical specialists. The mortality of specialists, as a group, was found to be 70 percent of non-specialists. Pathologists had the most favorable experience; their mortality was less than three-fifths that of non-specialists. The poorest record among the specialists was experienced by dermatologists and tuberculosis specialists, whose rate of mortality was closest to that of non-specialists.

Dickinson and Martin (1956) reviewed the mortality experience of physicians for the three-year period, 1949–1951. Medical specialty and sex could not be disaggregated from the available data, but age-specific death rates and life expectancy were calculated and then compared with the white male general population. They found that physician mortality was only 93.3 percent of the number of deaths that would have been expected if physicians had experienced the prevailing age-specific mortality rates of white males of the same ages.

A cohort analysis of physician mortality was reported by Williams et al. (1971). This comparison of the mortality experience of medical school graduates with that of cohorts of the U.S. white male population revealed that the cumulative mortalities of graduates were significantly lower than those of all white males.

No studies of physician mortality utilizing a population-based

approach have been reported since that of the 1949 to 1951 population of physicians, and previous studies may have been subject to certain inaccuracies in the content and coverage of the data. These studies may have undercounted or overcounted the number of physicians and their deaths as a result of the poor quality of record keeping and data collection. In addition, women could not be disaggregated from the available data even though the proportion of female physicians was rather small. A study is needed at this time to investigate trends in physician mortality in light of the conflicting results of previous studies.

The present study is based on records of the 1971 physician population of 344,823 and on the deaths of 19,086 physicians during the five-year period 1969 through 1973 on file with the American Medical Association. These data are examined by age, sex, and geographic location. The mortality experience of American physicians is then compared with the mortality experience prevailing among the U.S. white population of the same ages and sex (see Monroe, 1971).¹ The mortality experience of these physicians is also examined according to specialty group.

Methods

Physician deaths were compiled through the use of AMA files based on death certificates obtained from state and city departments of health and health services. In addition, three national clipping services, state medical societies, and county medical societies provide the Association with information from local newspapers about physicians. All information concerning physician deaths are verified by the death certificates before being entered into the file. Comparative information on the number of physician deaths during this five-year period were sought in the statistical compilations made by state departments of health and the National Center for Health Statistics. The few health departments that did keep a reliable count of the number of physician deaths corresponded with our tabulations for each year. The National Center, however, informed us that mortality by occupation had not been coded into their re-

¹In 1969-1970, 97.8 percent of the U.S. physicians were white, as were 97.2 percent of the enrollment in U.S. medical schools.

cords since 1950 (National Center for Health Statistics, 1962), and it would not be done in the near future.

The living population of physicians enumerated in 1971 was obtained from tabulations compiled for the *Distribution of Physicians in the U.S.*, which comprised 344,823 male and female physicians (Roback, 1971). This distribution, according to age and sex, is presented in Table 1. Slightly fewer than one-half of the physicians were 45 years of age or over. The average age of the male physicians (including those who were retired) was 46.4 years, and that of female physicians, who comprise 7.8 percent of the population, was 44.2 years. Of the total population of physicians, 325,435 were classified as being currently active in the profession; the remaining 19,388 physicians were classified as inactive, for the most part as a result of retirement. The average age of physicians actively engaged in the medical profession in 1971 was 44.8 years. In the general white population, the average age of those employed was 39.3 years, five and one-half years younger than the average age of a physician.

For comparative purposes, the mortality experience of white males and females in the general population was adjusted on the basis of the age distribution of physicians in 1971. Age-specific death rates for the U.S. white population in 1971 then were multiplied by the age distribution of physicians in 1971 to obtain the number of expected deaths had the physician population experienced the same age-specific death rates prevailing in the U.S. white population. These results were summed to the total for all ages and divided by the total population of physicians, yielding the age-adjusted death rate. These age-adjusted death rates show the expected mortality of physicians if they had experienced the same age-specific death rates prevailing in the white general population. In addition, a standardized mortality ratio of the actual number of physician deaths to the expected number of physician deaths relative to a defined standard was computed for each comparison of physician mortality. Life tables were constructed for male and female physicians utilizing the Reed-Merrell method (Shyrock et al., 1971).²

²In the Reed-Merrell method, the mortality rates are obtained from a standard conversion table which contains the mortality rates associated with various observed central death rates.

TABLE 1

Distribution of Living Physicians in 1971^a and the Deaths of Physicians from 1969 to 1973 by Age and Sex

AGE GROUP	LIVING PHYSICIAN POPULATION (1971)						PHYSICIAN DEATHS (1969-1973)					
	Total		Male		Female		Total		Male		Female	
	N	%	N	%	N	%	N	%	N	%	N	%
All ages	344,823	100.0	317,789	100.0	27,034	100.0	19,086	100.0	18,142	100.0	944	100.0
20-24	899	0.3	727	0.2	172	0.6	4	-	4	-	-	-
25-29	39,646	11.5	35,219	11.1	4,427	16.4	128	0.7	117	0.6	11	1.2
30-34	48,045	13.9	43,323	13.6	4,722	17.5	171	0.9	153	0.8	18	1.9
35-39	44,753	13.0	41,483	13.1	3,270	12.1	308	1.6	287	1.6	21	2.2
40-44	42,348	12.3	39,476	12.4	2,872	10.6	463	2.4	430	2.4	33	3.5
45-49	41,010	11.9	37,860	11.9	3,150	11.7	853	4.5	809	4.5	44	4.7
50-54	32,926	9.5	30,772	9.7	2,154	8.0	1,063	5.6	1,017	5.6	46	4.9
55-59	27,922	8.1	26,148	8.2	1,774	6.6	1,503	7.9	1,446	8.0	57	6.0
60-64	24,254	7.0	22,926	7.2	1,328	4.9	2,214	11.6	2,149	11.8	65	6.9
65-69	17,461	5.1	16,472	5.2	989	3.7	2,494	13.1	2,419	13.3	75	7.9
70-74	11,472	3.3	10,527	3.3	945	3.5	2,563	13.4	2,445	13.5	118	12.5
75-79	7,177	2.1	6,525	2.1	652	2.4	2,437	12.8	2,306	12.7	131	13.9
80-84	4,043	1.2	3,720	1.2	323	1.2	2,185	11.5	2,068	11.4	120	12.7
85-89	1,945	0.6	1,796	0.6	149	0.6	1,588	8.3	1,475	8.1	113	12.0
90-94	697	0.2	621	0.2	76	0.3	806	4.2	743	4.1	63	6.7
95 and over	225	0.1	194	0.1	31	0.1	303	1.6	274	1.5	29	3.1

^aExcludes temporary foreign, 4,436.

Age-Specific Mortality

The mortality experience by age of male and female physicians was calculated for five-year age groups corresponding to the data available for the U.S. white population. The physician death rates during the five years 1969–1973, shown by age groups in Table 2, present the average number of deaths per thousand over the period. The number of deaths per thousand in the U.S. white population are also presented for 1971, the midpoint of the period under observation. The last three columns of Table 2 present a standardized mortality ratio (SMR) based on the ratio of actual physician deaths to the number of deaths that would have been expected if the physician population in each age group had experienced the age-specific mortality rates prevailing in the U.S. white population in 1971. The standardized mortality ratio thus computed represents the percentage of actual to expected deaths. A standardized mortality ratio of less than 100 percent indicates that physicians experience a lower death rate than the U.S. white population at large and a value of greater than 100 percent represents a higher mortality.

Physicians as a group experienced a significantly lower mortality rate than the U.S. white population to ages 60–64, where the standardized mortality ratio increased to a value of 97.3 percent. At age 65–69 the standardized mortality ratio of 103 shows that physicians experienced 3 percent more deaths than would have been expected on the basis of prevailing age-specific death rates in the U.S. white population.

The standardized mortality ratio is lower in almost every age group for male than for female physicians, reaching 94.4 percent at ages 80–84 years and 93.5 percent at 85 years of age and over. The mortality experience of male physicians was less than three-fourths of the expected number of deaths of white males to ages 60–64 years. The white female population experiences a lower mortality in each age group than do the men. In the physician population, the age-specific mortality rate of females is lower than the men in each age group except 30–34 years in which it is .056 deaths per thousand greater than the men. Although this discrepancy is non-significant and probably an aberration in the data due to the small number of females, it may be explained, in part, by certain causes of death which we have been unable to code and tabulate.

TABLE 2
Age-Specific Death Rates of Physicians (1969-1973)
and of U.S. White Population (1971^a and Standardized
Mortality Ratio (SMR))

Age Group	Physician Deaths per Thousand (1969-1973)			U.S. White Population Deaths per Thousand (1971)			Standardized Mortality Ratio (%)		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
All ages ^b	11.070	11.418	6.894	11.525	15.280	8.309	96.0	74.7	84.1
20-24	0.890	1.10	-	1.249	1.885	0.631	71.4	58.0	-
25-29	0.646	0.664	0.497	1.204	1.681	0.733	56.6	39.5	68.8
30-34	0.712	0.706	0.762	1.377	1.819	0.944	51.7	43.4	80.7
35-39	1.376	1.384	1.284	1.989	2.570	1.425	69.2	57.8	90.1
40-44	2.187	2.178	2.298	3.187	4.070	2.334	69.7	58.5	98.5
45-49	4.160	4.274	2.794	5.109	6.680	3.632	81.4	67.5	76.9
50-54	6.457	6.610	4.271	7.953	10.652	5.430	81.2	64.9	78.6
55-59	10.766	11.060	6.426	12.531	17.274	8.170	85.9	66.6	78.6
60-64	18.257	18.747	9.789	18.757	26.346	12.114	97.3	73.3	80.8
65-69	28.566	29.371	15.167	27.744	39.255	18.461	103.0	77.0	82.1
70-74	44.683	46.452	24.973	41.859	57.500	30.512	106.7	84.7	81.8
75-79	67.911	70.682	40.184	66.170	86.542	52.502	102.6	86.3	76.5
80-84	108.236	111.183	74.303	100.415	124.506	86.120	107.8	94.4	86.3
85 and over	188.141	190.885	160.156	179.122	204.204	166.292	105.0	93.5	96.3

^aNational Center for Health Statistics. Unpublished revisions of U.S. Life Tables, 1971. December 19, 1974.

^bU.S. white population all ages adjusted to age distribution of physicians.

Female physicians in comparison to the U.S. white female population have a lower mortality experience in all age groups. The SMR ranged from a low of 68.8 percent at 25–29 years to a high of 98.5 percent at 40–44 years of age.

In order to compare the mortality experience of physicians at all ages to the U.S. white population, the death rates for males and females in this population were adjusted on the basis of age distribution of physicians by sex in 1971, Table 2. The age-adjusted death rate for male physicians was 11.418 deaths per thousand during 1969–1973, and the SMR was the 74.7 percent. The SMR for females of all ages was 84.1 percent during this period. Thus, female physicians experienced 15.9 percent fewer deaths than the number that white females of the same ages would have experienced, and white male physicians experienced 25.3 percent fewer deaths than the number that white males of the same ages would have experienced. We may therefore conclude that physician mortality during this five-year period was definitely lower than that of all white males and of all white females in the U.S. population.

Several studies of male physicians in the U.S. have made comparisons to previous findings in order to ascertain changes in mortality over time. Comparison of findings with these previous studies of physician mortality is also made here, although the inherent limitations of comparing these diverse groups raises questions relating to the interpretation of such changes over time. As indicated in Table 3, male physicians 25 years of age and over experienced a 60.8 percent decrease in mortality from 1925 to 1969–1973. Except for ages 55–64, in which the SMR increased from 165.2 percent in 1925 to 183.6 percent in 1938–1942, and for ages 75 and over, in which the SMR increased from 115.3 percent in 1925 to 120.9 percent in 1938–1942, the mortality experience of physicians has been shown to improve consistently over time. The greatest improvement in physician mortality has occurred in the youngest age groups (25–34 and 35–44) and the least amount of improvement within the age groups 65–74 and 75 and over.

As noted previously, the age-specific mortality rates for male physicians were lower than those for white males in 1925, practically the same as for white males in 1938–1942, and 6.7 percent lower than the number of white male deaths of the same ages that would have been expected in 1949–1951. During the 1969–1973

TABLE 3
 Age-Specific Death Rates of Male Physicians in the U.S.,
 1969-1973, 1949-1951^a 1938-1942^b and 1925^c
 by 10-Year Age Intervals and Standardized Mortality Ratio (SMR)

Age Interval	1969-1973		1949-1951		1938-1942		1925	
	Death Rate	SMR	Death Rate	SMR	Death Rate	SMR	Death Rate	SMR
25 and over ^d	11.4	100.0	15.3	133.7	17.7	154.7	18.4	160.8
25-34	0.7	100.0	1.3	189.1	1.7	247.3	2.7	392.7
35-44	1.8	100.0	3.0	169.4	4.0	225.8	6.4	361.3
45-54	5.3	100.0	9.1	171.0	10.8	203.0	11.9	223.6
55-64	14.7	100.0	22.9	156.3	26.9	183.6	24.2	165.2
65-74	36.0	100.0	50.0	138.8	53.0	147.1	56.3	156.3
75 and over	106.8	100.0	108.3	101.4	129.1	120.9	123.2	115.3

^aDickinson and Martin (1956).

^bDublin and Spiegelman (1947).

^cEmerson and Hughes (1926).

^dAdjusted to age distribution of male physicians, 1971.

period, male physicians experienced 74.7 percent of the number of deaths that would have been expected on the basis of the prevailing age-specific death rates of the white male population.

Expectation of Life

A life table for physicians separately for men and for women shows the average number of years of life remaining at each present age. More specifically, the first column of Table 4 records the expectation of life for male or female physicians at various ages according to their 1969-1973 mortality experience. Corresponding values of expectation of life for white men and women in the U.S. population for 1971 have been included for purposes of comparison.

Men entering the medical profession at age 25 have an average of 49.5 years of life remaining before them. At age 40, male physicians still have an average of 35.3 years of life remaining, and 14.7 years of life remaining at age 65. Women physicians begin their

TABLE 4
Expectation of Life for Physicians (1969-1973) and for
U.S. White Population (1971)^a; Males and Females

AGE INTERVAL (EXACT AGES, X TO X + N)	EXPECTATION OF LIFE IN YEARS			
	Male		Female	
	Physicians	U.S. White Population	Physicians	U.S. White Population
25-30	49.7	45.9	54.7	52.7
30-35	44.9	41.3	49.8	47.9
35-40	40.0	36.6	44.9	43.1
40-45	35.3	32.1	40.2	38.4
45-50	30.7	27.7	35.8	33.8
50-55	26.3	23.5	31.2	29.4
55-60	22.1	19.7	26.8	25.1
60-65	18.2	16.2	22.6	21.1
65-70	14.7	13.2	18.6	17.2
70-75	11.6	10.5	14.8	13.6
75-80	9.0	8.1	11.4	10.4
80-85	6.8	6.3	8.4	7.8
85-90	5.1	—	5.9	—
90-95	3.7	—	5.1	—

^aNational Center for Health Statistics, Unpublished revisions of U.S. Life Tables, 1971. December 19, 1974.

careers with an expectation of life at age 25 of half a decade greater than the men. This advantage over the men is maintained throughout life, but is reduced to less than one year at age 85.

Male physicians have a greater expectation of life than white males of the same ages in the U.S. population. At 45 years of age, male physicians can expect to live three years longer than white males of that age. Female physicians, too, have the better outlook at all ages than white females of the same ages in the U.S. population. Nevertheless, the difference in average remaining life years of female physicians and white females in the U.S. population is not so great as that of the men. At age 45, female physician's expectation of remaining life is two years more than white females of the same age.

Expectation of life for male physicians has improved substantially in comparison to the life table estimates of 1925 (Dublin and Lotka, 1936), 1938-1942 (Dublin and Spiegelman, 1947) and 1949-1951 (Dickinson and Martin, 1956). In 1925, a physician at age 30 had an average of 38 years of life remaining; 39 years in 1938-1942; 41 years in 1949-1951; and almost 45 years of life remaining in 1969-1973. White males of the same age in the U.S. population, however, experienced slightly less of an improvement in life years gained. The average number of years of life remaining to the white male population at age 30 was 37.5 years in 1925; 38.8 years in 1938-1942; 40.3 years in 1949-1951; and 41.3 years in 1971.

The working-life expectancies to age 65 and to age 70 for physicians and for the U.S. white population are shown in Table 5. The values represent the average number of working years of life remaining at the beginning of each successive age interval to retirement at age 65 or 70 years. At age 25, male physicians have a working-life expectancy of 38.1 years, 1.4 years greater than white males of the same age. On the other hand, female physicians and white females have practically the same experience; there is less than a one-year difference at each age interval.

Examination of the values shown in Table 4 corresponding at each age to the working-life-expectancy values in Table 5, permits us to ascertain the average number of life years remaining at retirement. This computation requires the subtraction of the working-life-expectancy values given in Table 5 from the corresponding life-expectancy values shown in Table 4 (see Li, 1968). For example, at age 40, male physicians who will retire at 65 years of age can ex-

TABLE 5
 Working-Life Expectancies^a, by Age Group for Physicians (1969-1973)
 and U.S. White Population^b (1971) by Sex

AGE INTERVAL ^c (EXACT AGES, X TO $X + N$) (1)	WORKING LIFE EXPECTANCY									
	Physicians					U.S. White Population				
	Age 65		Age 70		Age 70		Age 65		Age 70	
	Male (2)	Female (3)	Male (4)	Female (5)	Male (6)	Female (7)	Male (8)	Female (9)	Male (8)	Female (9)
25-30	38.1	38.5	41.7	42.7	36.7	38.2	39.9	42.3	39.9	42.3
30-35	33.2	33.6	36.9	37.8	32.0	33.4	35.2	37.4	35.2	37.4
35-40	28.3	28.7	32.0	33.0	27.3	28.5	30.5	32.6	30.5	32.6
40-45	23.5	23.9	27.2	28.1	22.6	23.7	25.9	27.8	25.9	27.8
45-50	18.7	19.2	22.5	23.5	18.0	19.0	21.4	23.1	21.4	23.1
50-55	14.0	14.4	17.9	18.8	13.5	14.3	17.0	18.5	17.0	18.5
55-60	9.4	9.7	13.4	14.1	9.1	9.6	12.8	13.9	12.8	13.9
60-65	4.8	4.9	9.0	9.5	4.7	4.9	8.7	9.4	8.7	9.4
65-70	—	—	4.7	4.8	—	—	4.7	4.8	—	—

^aComputation of working-life expectancy requires the use of the life table values T_x and l_x . According to the formula, working-life expectancy equals $(T_x - T_{65}/l_x)$ and $(T_x - T_{70}/l_x)$. (For further explanation of this measure see: Dickinson and Welker, 1948.)

^bNational Center for Health Statistics. Unpublished revisions of U.S. Life Tables, 1971. December 19, 1974.

^cAverage number of working years of life remaining refers to year of age at beginning of age interval.

pect 11.8 years of retirement ($35.3 - 23.5 = 11.8$). White males of the same age can expect 8.2 years of retirement. These differences between physicians and the U.S. white population are, in part, a function of the greater life expectancy of physicians. This advantage is retained in the later years of life into retirement. Another proposition may be that physicians do not retire in the sense that one's working life is over. Indeed, physicians as well as other professionals, such as lawyers and clergy, may remain active or semi-active throughout their entire lives (Buzek and McNamara, 1968).³ The quantity and intensity of work may be reduced, but professional activity in the later years of life, together with the previously mentioned socioeconomic factors, may be linked to the greater longevity of physicians.

Geographic Variations in Physician Mortality

Table 6 presents the distribution of living male and female physicians in 1971, according to geographic division and age. The greatest concentration of physicians is found in the Middle Atlantic division, and the smallest number of physicians in the Mountain division. The percentage age distribution across divisions exhibits only slight variation. The most striking difference is found in the comparison between the age distribution of male and female physicians. In the geographic tier stretching from New England to the West North Central states, the largest proportion of female physicians is in the youngest age group. Moreover, the proportion of female physicians in the youngest age group is greater than for the men in all geographic divisions, probably because of the greater rate of increase of the female physician population compared with the male.

The age-specific death rates of male physicians⁴ according to geographic division are shown in Table 7. The age-specific death

³The AMA Classification of "inactive" is based on the physician's own self-designation as to his activity status. Inactive physicians include retirees as well as those whose medical practice has been temporarily interrupted because of pregnancy or family reasons, chronic illness or disability, other health conditions, and other reasons.

⁴The mortality experience of female physicians in this and in subsequent comparisons was excluded from further analysis, since the number of deaths across all categories was too small for study.

TABLE 6
Distribution of Living Physicians According to Geographic Division by Age and Sex, 1971

Age Group	New England ^d		Middle Atlantic		East North Central		West North Central		South Atlantic		East South Central		West South Central		Mountain		Pacific	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
MALES ^a																		
All ages ^c	22,238	100.0	67,852	100.0	50,619	100.0	20,798	100.0	47,489	100.0	13,649	100.0	23,909	100.0	12,839	100.0	49,728	100.0
Under 35	5,701	25.6	16,597	24.5	11,814	23.3	5,277	25.4	12,570	26.5	3,208	23.5	5,969	25.0	3,113	24.2	11,071	22.3
35-49	7,155	31.9	23,711	34.7	18,886	37.3	7,771	37.4	17,093	35.9	5,436	39.8	9,463	39.6	5,150	40.1	19,875	40.0
50-64	5,715	25.7	17,806	26.2	13,583	26.8	5,065	24.4	10,881	22.9	3,500	25.6	5,950	24.9	3,128	24.4	13,340	26.8
65-79	2,492	11.7	8,684	12.8	5,629	11.1	2,147	10.3	4,926	10.4	1,193	8.7	2,052	8.6	1,217	9.5	4,589	9.2
80 and over	475	2.1	1,284	1.9	907	1.8	538	2.6	1,117	2.4	312	2.3	475	2.0	231	1.8	853	1.7
FEMALES ^b																		
All ages	2,090	100.0	8,305	100.0	4,430	100.0	1,219	100.0	3,415	100.0	722	100.0	1,395	100.0	691	100.0	3,944	100.0
Under 35	780	37.3	3,154	38.0	1,731	39.1	460	37.7	1,088	31.9	221	30.6	405	29.0	209	30.2	1,004	25.5
35-49	634	30.3	2,693	32.4	1,446	32.6	408	33.5	1,246	36.5	296	41.0	539	38.6	241	34.9	1,428	36.2
50-64	380	18.2	1,510	18.2	823	18.6	203	16.7	711	20.8	143	19.8	313	22.4	146	21.1	922	23.4
65-79	243	11.6	802	9.7	359	8.1	108	8.9	306	9.0	52	7.2	118	8.5	75	10.9	465	11.8
80 and over	53	2.5	146	1.8	71	1.6	40	3.3	64	1.9	10	1.4	20	1.4	20	2.9	125	3.2

^aAddress unknown for 8,668 male physicians in 1971.

^bAddress unknown for 823 female physicians in 1971.

^cPercentages may not add to 100.0 percent due to rounding.

^dGeographic Division — New England: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island.

Middle Atlantic: New York, New Jersey, and Pennsylvania.

East North Central: Ohio, Illinois, Indiana, Wisconsin, and Michigan.

West North Central: Iowa, Minnesota, Missouri, North Dakota, South Dakota, Kansas, Nebraska.

South Atlantic: Maryland, Delaware, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida.

East South Central: Kentucky, Tennessee, Alabama, and Mississippi.

West South Central: Arkansas, Louisiana, Texas, and Oklahoma.

Pacific: Montana, Wyoming, Idaho, Colorado, New Mexico, Arizona, Utah, and Nevada.

Pacific: Washington, Oregon, California, Hawaii, and Alaska.

TABLE 7
 Death Rates per 1,000 Male Physicians According to Geographic Division and Age, 1969-1973

Age Group	New England	Middle Atlantic	East		West		East		West		Mountain	Pacific
			North Central	Central	North Central	Central	South Central	Central	South Central	Central		
Under 35	0.81	0.53	0.64	0.49	0.49	0.65	0.56	0.64	0.96	0.98		
35-49	1.75	2.37	2.43	2.44	2.44	2.58	3.53	3.13	2.41	2.91		
50-64	10.81	12.30	11.51	11.69	11.69	11.71	14.23	12.61	9.91	9.94		
65-79	40.82	42.43	45.66	43.22	43.22	44.13	45.60	44.15	42.89	38.44		
80 and over	131.79	138.16	166.04	151.67	151.67	138.76	182.05	146.53	137.66	129.89		

rates at ages under 49 years are generally highest in the South Central states and in the Pacific area. At ages 65 and over, death rates were highest in the North and South Central states and lowest in New England and on the West Coast.

A comparison is made in Table 8 of the actual deaths to the expected number of physician deaths according to geographic division. Computation of the standardized mortality ratio followed the same procedure as before, except for one difference; the age-specific death rates for all male physicians were used as the standards upon which the number of expected deaths were calculated. The expected number of deaths within each geographic division were then summed for all ages and compared to the actual number of deaths for these same ages.

The SMR is in excess of the standard (100.0 percent) in the central states and less than 100 percent in the eastern and western states. In particular, New England and the Pacific states had an 8 percent lower mortality than would have been expected on the basis of prevailing age-specific death rates of all male physicians, i.e., the standard. The worst record was found in the East South Central states, where the mortality of male physicians was 118.9 percent of the standard. The advantage of the New England states is somewhat greater for those below age 50, for whom the SMR is 75.6 percent, than for those over that age, where the ratio is 93.7

TABLE 8

Number of Deaths and Standardized Mortality Ratio (SMR)
According to Geographic Division, Male Physicians, 1969-1973

<i>Geographic Division</i>	<i>SMR^a %</i>	<i>Actual Deaths 1969-1973</i>
All physicians	100.00	18,142
New England	92.0	1,242
Middle Atlantic	99.2	4,141
East North Central	105.3	3,075
West North Central	101.2	1,276
South Atlantic	100.1	2,772
East South Central	118.9	910
West South Central	105.7	1,343
Mountain	95.0	652
Pacific	91.9	2,451
Address unknown	b	280

^aStandardized mortality ratio represents comparison of actual to expected deaths according to geographic division, expressed as a percentage.

^bIncludes 8,668 living physicians with address unknown in 1971.

percent. In the Pacific division, however, male physicians above age 50 have the more favorable experience, with an SMR of 88.5 percent and an SMR of over 100 percent for those below age 50.

Mortality of Medical Specialists

The distribution of living male physicians in 1971 according to specialty and age is shown in Table 9. Of the 317,787 male physicians making up this population, 260,033, or 81.1 percent, were engaged in specialty practice in 1971. One-third (31.3 percent, or 102,765) of the physicians were in medical specialties, 28.9 percent, or 91,914, in surgical specialties, 17.9 percent, or 56,996, in other specialties, and 18.2 percent, or 57,754, of the physicians were general practitioners. The specialty of 8,360, or 2.6 percent, of the male physician population in 1971 was not specified on the records on file with the American Medical Association.⁵

The largest group of specialists was listed in the field of internal medicine followed by general surgery and psychiatry/neurology. This accounted for 32.3 percent of all physicians and 39.4 of all physicians when general practice is excluded. For purposes of comparison, several specialties were combined into single groupings. For example, "other medicine" includes the specialties of allergy, cardiovascular medicine, and gastroenterology, accounting for 9,748 physicians and 3 percent of the total population.

With respect to the age distribution of the male physician population in 1971, fewer than 10 percent of the general practitioners were under age 35, while 29.6 percent of the medical specialists, 25.9 percent of the surgical specialists, and 22.3 percent of the physicians engaged in other specialties were in that age category. This contrast reflects the growth of specialization over the past several decades and the choice of a particular specialty other than general practice early in the professional career of young physicians. Public health and pulmonary medicine exhibit a similar age distribution to that of general practitioners with less than 13 percent under 35 years of age. On the other hand, the largest proportions of physicians in the practice of internal

⁵The specialty of a physician is designated on the basis of his response to AMA surveys of physician professional activities.

TABLE 9
Distribution of Living Male Physicians in 1971 by Specialty and Age

	All Specialties ^a		Percentage Distribution by Age (All ages = 100.0%)						
	N	%	Under 35	35-44	45-54	55-64	65-74	75 and over	
All physicians	317,787	100.0	24.9	25.5	21.6	15.4	8.5	4.0	
Medical	102,765	32.3	29.6	28.0	21.1	12.8	6.3	2.2	
Internal medicine	45,073	14.2	35.8	25.2	19.6	12.1	5.4	1.8	
Pediatrics	16,291	5.1	32.7	29.1	21.7	9.6	4.8	2.1	
Psychiatry/Neurology	25,368	8.0	24.7	31.0	23.4	13.0	6.0	1.8	
Dermatology	4,081	1.3	24.3	26.2	17.9	17.5	10.1	4.0	
Pulmonary	2,204	0.7	12.5	24.0	20.1	21.3	17.0	5.1	
Other medicine ^b	9,748	3.0	14.1	33.4	22.6	16.4	9.9	3.6	
Surgical	91,914	28.9	25.9	27.7	21.2	15.1	7.4	2.7	
General surgery	32,120	10.1	30.7	22.3	21.8	15.6	7.3	2.2	
Obstetrics/Gynecology	19,064	6.0	21.5	31.2	24.2	14.6	6.5	2.0	
Orthopedic surgery	10,489	3.3	29.3	32.4	19.1	12.1	5.6	1.5	
Ophthalmology/Otolaryngology	16,517	5.2	23.3	26.7	16.1	17.7	10.8	5.5	
Other surgery ^c	13,724	4.3	21.4	33.4	23.2	13.4	6.3	2.3	
General practice	57,754	18.2	9.3	19.6	25.8	23.8	14.8	6.7	
Other specialty	56,996	17.9	22.3	26.0	21.5	14.2	8.6	7.4	
Anesthesiology	10,262	3.2	20.5	33.7	28.7	13.5	3.1	0.5	
Radiology	14,177	4.5	30.0	30.5	21.8	11.5	4.6	1.6	
Pathology	10,067	3.2	26.4	35.6	22.4	10.5	3.7	1.4	
Public Health	3,575	1.1	12.6	15.4	20.0	27.1	18.4	6.5	
Other specialties ^d	18,915	5.9	17.3	15.2	17.2	16.2	15.3	18.8	

^aIncludes 8,360, or 2.6 percent physicians of unspecified specialty.

^bIncludes allergy, cardiovascular, and gastroenterology.

^cIncludes colon and rectal surgery, neurosurgery, plastic surgery, thoracic surgery, and urology.

^dIncludes physical medicine and rehabilitation, aerospace medicine, occupational medicine, legal medicine, clinical pharmacology, inhalation therapy, metabolism, sports medicine, immunology, mental health and retardation, and otorhinolaryngology.

medicine (35.8 percent), pediatrics (32.7 percent), and general surgery (30.7 percent) were under age 35.

At the upper end of the age distribution, 18.8 percent of the physicians engaged in "other specialties," which includes physical medicine and rehabilitation, occupational medicine, aerospace medicine, and others,⁶ were at age 75 and over in 1971. General practice was represented by 6.7 percent and the medical and surgical specialties each had less than 3 percent of their numbers in this terminal age group.

As a basis of comparing the mortality among the specialties, a standardized mortality ratio was again computed separately for each age group. The distribution of living male physicians according to specialty was tabulated by these age groups and the number exposed to risk of dying was multiplied by the age-specific death rate for all male physicians in that age group. This computation yields the expected number of deaths within each age group according to specialty. The expected deaths were then summed for all ages and compared to the actual number of deaths for these same ages. This ratio of actual to expected deaths yields the mortality ratio and is expressed as a percentage in Table 10. Since the number of expected deaths of all specialties combined is equivalent to the number of actual deaths, the ratio of total actual to total expected deaths equals 100 percent and serves as a standard of comparison. A mortality ratio below this standard indicates lower mortality for that specialty than for all male physicians, and a mortality ratio in excess of 100 percent represents a higher mortality than expected on the basis of age-specific death rates prevailing for all male physicians in 1969-1973.

Physician specialties were grouped into four broad categories. The group of all medical specialties experienced 86.6 percent of the standard and that of surgical specialties 85 percent of the standard. The advantage of the "other specialty" group, for whom the mortality ratio is 73.1 percent, is greatest. General practice had the worst record with a mortality ratio of 114.3 percent. In their studies of the 1938-1942 mortality experience of physicians, Dublin and Spiegelman (1948) also found an excess in the mortality of non-specialists in comparison to specialists. They attributed the more favorable situation of the specialists to a certain amount of self-

⁶See Note d of Table 9.

TABLE 10

Number of Deaths and Standardized Mortality Ratio (SMR)
According to Specialty; Male Physicians, 1969-1973

<i>Medical Specialty</i>	<i>SMR^a</i>	<i>Actual Deaths (1969-1973)</i>
All physicians	100.0	18,142
Medical	86.6	3,689
Internal medicine	83.4	1,387
Pediatrics	72.5	430
Psychiatry/Neurology	96.0	971
Dermatology	89.0	219
Pulmonary	103.1	185
Other medical ^b	87.4	497
Surgical	85.0	3,723
General surgery	89.1	1,292
Obstetrics/Gynecology	85.3	696
Orthopedic surgery	80.7	305
Ophthalmology/Otolaryngology	79.9	912
Other surgery ^c	86.7	518
General practice	114.3	5,864
Other specialty	73.1	3,087
Anesthesiology	87.9	266
Radiology	92.2	453
Pathology	80.9	259
Public Health	93.3	316
Other specialties ^d	64.8	1,793
Unspecified specialties	^e	1,779

^aMortality ratio represents comparison of actual to expected deaths of physicians according to specialty expressed as a percentage.

^bIncludes allergy, cardiovascular, and gastroenterology.

^cIncludes colon/rectal surgery, neurosurgery, plastic surgery, thoracic surgery, and urology.

^dIncludes occupational medicine, aerospace medicine, physical medicine/rehabilitation, legal medicine, clinical pharmacology, inhalation therapy, metabolism, sports medicine, immunology, mental health/retardation, and otorhinolaryngology.

^eIncludes 9,433 living physicians of unspecified specialty in 1971.

selection on the part of those entering a specialty. Access to medical care and income differentials were attributed to this better experience of specialists as well.

In the present study, the differential mortality experience of general practitioners may also be attributed to the distribution of their ages relative to the other specialties. Over 70 percent of the general practitioners were age 45 or over. The SMR for general

practitioners below age 55 was 140.4 percent of the standard and 111.4 percent of the standard at age 55 and over. Physicians of these same ages engaged in specialty practice had a markedly different mortality experience. That is, specialists below age 55 had an SMR of 89.1 percent of the standard and only 80 percent of the standard for those specialists at age 55 and over.

It would therefore appear that physicians electing to practice in a particular specialty may be better prepared to undergo the increased rigor and stress of advanced training than those physicians choosing a career in general practice. Alternatively, specialists may begin their careers later in life than general practitioners and may not be subject to the stress of practice for as long a period of time.

Summary

This study of the longevity and mortality of 19,083 physicians who died between 1969 and 1973 in relation to the living physician population in 1971 demonstrates that the number of physician deaths was much lower than the number of deaths that would have been expected if physicians had been subject to the age-specific mortality rates of the U.S. white population. The number of male physician deaths was 74.7 percent of expected deaths of white males and the number of female physician deaths was 84.1 percent of expected deaths of white females. Physician mortality experience was better than that of the U.S. white population at all ages. Physician expectation of life is substantially greater than that of the U.S. white population at all ages as is their working life expectancy. The mortality experience of physicians residing in New England and on the West Coast was more favorable than physicians living in other geographic divisions of the United States. Specialists experienced a better mortality record than that of general practitioners, who had the highest age-specific mortality rates of all physicians. Unfortunately, we were unable to code and tabulate the causes of physician deaths during this period.

As has been suggested elsewhere (Dublin et al., 1949; King, 1970; Seltser and Sartwell, 1965), occupation plays an important role in life expectancy and mortality experience at each stage of life. Physicians represent a special group that differ from the general population in several important respects. Physicians enjoy

a highly favorable economic position in society and benefit from the prestige, social status, quality of working conditions, and readily accessible medical care afforded to them. All of these factors may influence their longevity and mortality experience.

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