

VITAL and HEALTH STATISTICS
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Mortality From Selected Causes by Marital Status

United States - Part B

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An analysis of mortality differentials by marital status
in two parts: Part A--For white women and men;
Part B--For women and men of other races.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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SYMBOLS	
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THIS REPORT presents mortality differentials for specified causes by marital status for 1959-61 and compares these differentials with corresponding ones for 1949-51 and, in some cases, for 1940. It is divided into four major sections, one for each of the four color-sex groups of the population. For each of these four groups the 1959-61 death rates were lower for the married group than for the single, widowed, or divorced, at every age in the span 20 years and over. Both divorced white men and women have higher death rates at almost every age than widowed white men and women. The exceptional age groups are 15-19 years and 20-24 years. At these ages both widowed white men and women have the highest death rates.

In contrast at almost every age the death rates for members of other races for both widowed men and women were higher than the corresponding rates for divorced men and women. Also, at almost every age the death rate for single women of other races was higher than the corresponding rate for divorced women.

For a number of causes of death the mortality level for single persons differed markedly from that for those who were ever-married (that is, married, widowed, or divorced). Some of the causes for which single persons have higher age-standardized mortality are tuberculosis and accidents, excluding motor vehicle accidents, both of which have higher mortality for single persons in each of the four color-sex groups and malignant neoplasm of breast, for which the death rate is higher for single white women after age 35 years. Single persons had lower mortality rates than ever-married persons for: malignant neoplasm of male genital organs, with lower mortality for both single white men and all other single men; diabetes mellitus, cirrhosis of liver, and motor vehicle accidents, all three of which have lower mortality for single white women; and homicide, with lower mortality for single white women, single white men, and single women of races other than white.

For races other than white the unfavorable mortality for widows compared with mortality for single, married, or divorced women results from higher mortality for a number of causes, including malignant neoplasm of digestive organs and peritoneum, vascular lesions affecting the central nervous system, arteriosclerotic heart disease, including coronary disease, accidents, excluding motor vehicle accidents, and suicide.

MORTALITY FROM SELECTED CAUSES BY MARITAL STATUS

PART III. DIFFERENTIAL MORTALITY BY MARITAL STATUS FOR WOMEN OF RACES OTHER THAN WHITE

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MORTALITY FOR ALL CAUSES

The changes in mortality trend by age for the female population of races other than white in the United States during 1954-63 are shown below:

Age in years	Rate of change in percent	95-percent confidence limits ¹	
		Upper	Lower
1-4	-2.05	-1.56	-2.53
5-14	-1.38	-0.75	-2.01
15-24	-0.30	+0.22	-0.81
25-34	-1.79	-1.68	-1.90
35-44	-1.32	-1.07	-1.57
45-54	-2.67	-2.48	-2.87
55-64	-0.52	-0.34	-0.69
65-74	+1.18	+1.35	+1.01
75-84	+0.18	+0.39	-0.04
85 and over	+2.45	+2.78	+2.13

¹The probability is 95 percent that the true rate of change (in percent) had a value between the upper and lower limits shown.

At ages 15-44 years these rates of decline in the death rate for these women during 1954-63 are much smaller than those for earlier years found by Moriyama, who reported rates of change for periods beginning with 1937.⁷⁵

Changes from 1940 in mortality for each marital class.—Within the population of women of races other than white the total death rate for single women 15 years of age and over was lower for 1959-61 than for 1949-51 and lower for 1949-51 than for 1940:

Period	Total death rate	Age-adjusted death rate
Rate per 100,000 population		
1959-61	405.4	405.4
1949-51	546.0	606.8
1940	796.7	960.8

Unlike the above-mentioned pattern for single white women, the substantial reduction in mortality between 1949-51 and 1959-61 is not attributable to any increases in the percent of these other single women at ages 15-19 years (50.1 percent for 1950 and 50.9 percent for 1960),⁵ the teen-age years of life when the death rate is relatively low. Rather this favorable change resulted from lower death rates for every age group of these other single women for 1959-61, compared with the corresponding rates for 1949-51:

Age in years	1959-61	1949-51	1940
Rate per 100,000 population			
15 and over	405.4	546.0	796.7
15-19	78.3	156.7	385.6
20-24	165.9	314.8	657.0
25-34	392.6	600.6	956.9
35-44	836.5	1,184.6	1,441.9
45-54	1,351.4	2,018.3	2,436.8
55-59	¹ 1,851.3	2,767.1	3,894.9
60-64	2,769.5	3,916.7	4,707.1
65-69	3,015.9	3,524.6	4,624.1
70-74	4,186.5	5,651.4	6,511.2
75 and over	7,243.2	6,603.6	12,648.1

¹Revised by removing 21,000 "mistallied Indians" from the denominator; reported death rate was only 1,407.0. For details of this revision see section in appendix entitled "1. 'Mistallied Indians' in the population of races other than white."

For every age group the death rate for married women of these other races was lower for 1949-51 than for 1940 and lower for 1959-61 than for 1949-51:

Age in years	1959-61	1949-51	1940
Rate per 100,000 population			
15 and over	684.4	799.8	1,130.6
15-19	100.3	205.4	530.0
20-24	118.4	222.0	514.1
25-34	212.5	328.0	646.3
35-44	451.5	638.5	1,034.5
45-54	909.2	1,258.3	1,738.9
55-59	1,439.6	2,003.3	2,541.7
60-64	2,122.3	2,630.0	2,963.4
65-69	2,436.4	2,626.2	3,266.3
70-74	3,237.7	4,262.4	4,980.2
75 and over	5,143.6	6,808.9	8,753.1

With the effect of the changing age composition held constant, the level of mortality for married women of these other races was about 31 percent lower for 1949-51 than for 1940 and about 26 percent lower for 1959-61 than for 1949-51:

Period	Total death rate	Age-adjusted death rate
Rate per 100,000 population		
1959-61	684.4	684.4
1949-51	799.8	930.4
1940	1,130.6	1,338.7

The total death rate for widows in the population of women of other races indicates an increase in mortality for this marital class for 1959-61 compared with corresponding mortality for 1949-51:

Period	Total death rate	Age-adjusted death rate
Rate per 100,000 population		
1959-61	3,893.1	3,893.1
1949-51	3,666.2	4,115.1
1940	3,760.5	4,804.4

But age-adjusted rates show a decline in mortality for these widows both for 1959-61 compared with 1949-51 and for the latter period compared with 1940. This

favorable change between 1959-61 and 1949-51 reflects lower death rates for every age group of these widows under 65 years of age, but not at older ages:

Age in years	1959-61	1949-51	1940
Rate per 100,000 population			
15 and over	3,893.1	3,666.2	3,760.5
15-19	245.9	606.1	795.1
20-24	329.0	506.1	960.4
25-34	531.0	776.3	1,160.3
35-44	934.9	1,229.6	1,585.9
45-54	1,795.8	2,291.6	2,810.6
55-59	2,666.4	3,526.0	4,115.8
60-64	3,879.7	4,434.5	4,800.9
65-69	4,147.1	3,633.6	4,182.2
70-74	5,315.3	5,294.6	5,978.1
75 and over	8,498.6	8,451.7	10,058.3

For divorced women of these other races both the total death rate and the age-adjusted death rate showed a decrease in mortality for 1959-61 compared with the corresponding mortality for 1949-51, and for the latter period compared with 1940:

Period	Total death rate	Age-adjusted death rate
Rate per 100,000 population		
1959-61	1,072.4	1,072.4
1949-51	1,132.3	1,447.3
1940	1,579.1	2,251.8

This improvement in mortality reflects lower death rates for every age group compared with 1949-51 and lower death rates for the latter period compared with those for 1940:

Age in years	1959-61	1949-51	1940
Rate per 100,000 population			
15 and over	1,072.4	1,132.3	1,579.1
15-19	121.8	338.7	793.7
20-24	192.3	326.0	529.8
25-34	323.5	489.8	793.6
35-44	710.4	881.8	1,328.0
45-54	1,245.9	1,678.5	2,394.3
55-59	1,934.5	2,727.8	4,233.4
60-64	2,740.3	3,949.9	5,319.1
65-69	3,413.6	3,622.5	6,230.0
70-74	4,322.0	6,574.5	11,294.1
75 and over	6,346.7	8,949.8	19,217.1

Standardized mortality ratios.—For the population of women other than white if the 1959-61 death rates for married women at ages 15 years and over had occurred in the female populations of each of the other three marital classes (single, widowed, and divorced), then the quotient of the observed number of deaths divided by the expected number, expressed as a percentage, would give the following standardized mortality ratios:

Marital status	Observed deaths	Expected deaths	SMR's
Single	16,272	11,939	136
Married	85,487	85,487	100
Widowed	110,822	64,043	173
Divorced	7,987	5,718	140

For these women the lowest mortality is still found for the married population, the next most favorable for the single group, and the highest for widowed and divorced persons.

A comparison of these 1959-61 SMR's with the corresponding SMR's for 1949-51 and for 1940 indicates that the rank of marital classes by mortality for these earlier years was the same as that for 1959-61, except for a reversal in rank for widowed and divorced for 1940:

Marital status	1959-61 SMR's	1949-51 SMR's	1940 SMR's
Single	136	131	115
Married	100	100	100
Widowed	173	145	137
Divorced	140	140	142

The following SMR's were obtained by dividing these women of other races into only the two groups, single and ever married:

Marital status	1959-61 SMR's	1949-51 SMR's	1940 SMR's
Single	112	116	107
Ever-married ...	100	100	100

The resulting SMR's show the single status as more favorable than the above SMR's obtained by a comparison of the death rate for single women with that for women who had married one or more times and were still married at the time of death.

Excess risk of death by age for the single, widowed, and divorced classes.—For single women of these other races there is in general a consistent increase in the excess risks with advance in age up to 65-69 years, for each of the three periods, 1959-61, 1949-51, and 1940. For every age group, the excess risks for 1959-61 are lower than for 1949-51:

Period and age in years	Single	Widowed	Divorced
1959-61			
20-24	47.6	210.8	74.0
25-34	180.5	319.2	111.2
35-44	386.7	485.6	260.1
45-54	448.8	894.7	339.8
55-59	1,417.7	1,244.7	502.1
60-64	661.2	1,795.5	631.4
65-69	594.0	1,753.4	1,001.6
70-74	980.5	2,147.1	1,120.6
1949-51			
20-24	93.0	284.7	104.2
25-34	273.5	449.8	162.3
35-44	549.6	594.9	244.9
45-54	769.7	1,046.5	425.6
55-59	779.4	1,553.8	739.3
60-64	1,321.5	1,853.2	1,355.6
65-69	922.6	1,034.6	1,023.2
70-74	1,430.0	1,078.2	2,415.0
1940			
20-24	143.6	448.6	15.8
25-34	312.6	517.3	148.3
35-44	411.7	557.2	296.6
45-54	710.3	1,090.7	667.0
55-59	1,388.5	1,615.2	1,735.8
60-64	1,797.0	1,893.6	2,427.6
65-69	1,403.6	946.8	3,063.8
70-74	1,611.2	1,050.2	6,644.8

¹Revised by removing 21,000 "mistallied Indians" from the denominator of the death rate. Before revision there was no excess risk for this age group, but a deficit of -33.1 deaths. For details of revision see appendix.

Within this population of women of races other than white when the excess risks of death per 100,000 for single women are calculated taking as the most favorable death rates those for the ever-married group (i.e., married, widowed, and divorced), the results show increased risks for single women only up to age 60 years:

Age in years	1959-61	1949-51	1940
20-24	43.3	85.3	129.3
25-34	165.9	251.0	272.7
35-44	335.3	478.7	311.7
45-54	275.4	506.0	383.5
55-59	¹ 18.3	191.9	727.3
60-64	-114.2	431.1	848.8
65-69	-363.3	300.0	800.5
70-74	-422.6	648.5	815.8

¹Revised by removing 21,000 "mistallied Indians" from the denominator of the death rate. Before revision there was no excess risk, but a deficit for this age group. For details of revision, see appendix.

MORTALITY FOR SPECIFIED CAUSES

Tuberculosis, all forms.—For most of the cohorts of women of races other than white born in successive 5-year periods during the present century, mortality from tuberculosis peaked at ages 20-24, and then declined throughout the remaining years of life (table 18). The death rate for this cause was 348.8 per 100,000 at ages 20-24 years for women born in 1900-04 compared with only 3.0 per 100,000 at these same ages for those born in 1940-44.

The reduction in mortality from tuberculosis between 1949-51 and 1959-61 was shared by each of the four marital groups of these women of other races (table 16). The greatest absolute reduction in mortality between these two periods was for widows at ages 25-34 years:

Age in years	Single		Married	
	1959-61	1949-51	1959-61	1949-51
	Rate per 100,000 population			
15-19	1.6	45.4	1.0	39.3
20-24	7.7	117.1	3.8	60.0
25-34	23.2	172.0	7.8	65.3
35-44	43.2	143.1	11.8	53.0
45-54	30.6	99.4	9.6	49.3
55-59	24.1	101.0	12.6	54.1
60-64	25.4	83.3	16.7	57.4
65-69	25.5	42.9	16.1	40.8
70-74	25.1	59.7	14.7	55.1
75 and over	25.8	85.5	21.3	66.1

Age in years	Widowed		Divorced	
	1959-61	1949-51	1959-61	1949-51
	Rate per 100,000 population			
15-19	27.3	146.3		89.1
20-24		161.8	16.7	96.3
25-34	20.2	172.9	15.0	119.6
35-44	22.3	103.0	25.7	97.1
45-54	20.3	80.3	19.2	59.2
55-59	19.5	65.6	9.1	63.2
60-64	22.8	75.6	32.4	148.4
65-69	24.0	49.3	33.7	54.6
70-74	25.1	43.6	45.0	215.1
75 and over	34.3	46.1	12.9	91.3

Within this population of women of other races at ages under 60 years the 1959-61 tuberculosis death rates for single women were higher than the corresponding age-specific rates for any other marital group. As measured by SMR's, these single women had an SMR of 257 compared with 198 for divorced women and 166 for widowed women (table 17).

Despite the fact that during this period the absolute decrease in the death rate for this cause for women of other races was about four times the corresponding decrease for white women, the 1959-61 death rates both for single and for ever-married women of these other races were more than three times the corresponding rates for single and for ever-married white women (table 3).

Differences between the married and the unmarried in mortality are large at younger ages (table 3). Especially high are the death rates for young widows within other races

Malignant neoplasm of digestive organs and peritoneum.—For each marital group the 1959-61 total death rate for this cause is considerably lower for women of other races than for white women (tables 1 and 16). But for each age group under 65 years the death rates are higher both for single and ever-married women of other races than the corresponding rates for single and ever-married white women (table 3).

Between 1949-51 and 1959-61 the age-adjusted death rate for this cause dropped substantially for each marital group of white women. In contrast, for widows of other races the age-adjusted death rate for these neoplasms increased, and for the other marital groups of women of these other races the decreases in the rate were smaller than the corresponding decreases for white women (table 16).

Differences in mortality for this cause between married and unmarried women of other races are larger than the corresponding differences for white women (tables 2 and 17). Within the population of women of other races widows have a higher mortality as measured by SMR's than women in the other marital groups.

Malignant Neoplasm of Breast.—The mortality experience for breast cancer for separate cohorts of women of races other than white (a group born during the same 5-year period) is shown at successive 5-year intervals for the period 1949-64 in table 20. Unlike the experience for white women (for whom more recently born cohorts are at lower risk than their predecessors of dying from breast cancer at ages 60-64 years and older), for these other women the risk of dying from this disease was higher for 1964 than for 1949 at every age in the span 35 years and over except for 75-79 years.

Despite these increases, breast cancer is one of the diseases for which, for each marital status group, the total death rate for 1959-61 was lower for women of other races than for white women (tables 1 and 16). This higher mortality for white women reflects their higher age-specific death rates for each marital status group, at

ages 45 years and over; except for the widowed, at ages 45-64; and for the divorced, at ages 45-54 and 60-64. At younger ages women of other races in each marital group have higher age-specific death rates for breast cancer than do white women (table 3).

A comparison of the 1959-61 age-specific death rates for breast cancer for each marital group with the corresponding rates for 1949-51 shows a somewhat irregular pattern of change for women of races other than white:

Age in years	Single		Married	
	1959-61	1949-51	1959-61	1949-51
	Rate per 100,000 population			
15-19	-	-	0.5	-
20-24	0.3	0.2	0.3	0.4
25-34	5.4	7.2	5.2	3.9
35-44	33.9	28.9	21.9	17.7
45-54	60.7	60.4	42.4	37.6
55-59	60.1	70.4	48.1	54.3
60-64	76.3	41.7	57.0	56.4
65-69	65.1	62.5	53.6	48.7
70-74	71.1	97.1	61.5	79.5
75 and over	84.8	117.0	67.5	50.8

Age in years	Widowed		Divorced	
	1959-61	1949-51	1959-61	1949-51
	Rate per 100,000 population			
15-19	-	-	-	-
20-24	6.6	4.1	2.8	-
25-34	7.4	10.5	5.0	14.1
35-44	30.0	27.4	31.9	36.1
45-54	66.5	61.7	51.9	48.5
55-59	67.5	78.0	69.5	63.2
60-64	82.7	76.0	100.4	55.6
65-69	71.0	54.6	57.7	130.9
70-74	78.9	60.6	108.0	61.4
75 and over	95.5	81.8	129.0	137.0

That the single and divorced among these women had the more favorable pattern of change is also suggested by the age-adjusted rates in table 16; for single women the death rate for breast cancer was lower for 1959-61 than for 1949-51; for divorced women, it was about the same

for the two periods; and for married and widowed women, it was higher for 1959-61 than for 1949-51.

In conformance with the pattern for white women, at ages 35 years and over the death rate for breast cancer is substantially higher for single than for married among these women (table 3). The fact that the single group of these women has a higher risk of breast cancer than the married group is also suggested by the SMR's in table 17—compared with an SMR of 100 for married women, the SMR for single women is 130.

Malignant neoplasm of female genital organs.—The following list titles of the *International Statistical Classification of Diseases*, issued in 1955 are included in this group of neoplasms:

Malignant neoplasm of cervix uteri (ICD No. 171)

Malignant neoplasm of corpus uteri (ICD No. 172)

Malignant neoplasm of other parts of uterus, including chorionepithelioma (ICD No. 173)

Malignant neoplasm of uterus, unspecified (ICD No. 174)

Malignant neoplasm of ovary, fallopian tube, and broad ligament (ICD No. 175)

Malignant neoplasm of other and unspecified female genital organs (ICD No. 176)

For 1959-61 Malignant neoplasm of cervix uteri was the cause assigned to 53.4 percent of the 9,453 deaths of women of races other than white attributed to Malignant neoplasm of female genital organs (ICD Nos. 171-176).

The decline during 1949-64 in the death rate for Malignant neoplasm of female genital organs was greater for these women (from 39.5 to 27.5 deaths per 100,000 population) than for white women (from 28.9 to 23.6 deaths per 100,000). Mortality from this cause decreased among these women of other races for every 5-year age group over the span 20-79 years (table 20) with the greatest relative decrease (54.5 percent) occurring for the age group 25-29 years. The mortality experience during 1949-64 of cohorts of these women of other races born during successive 5-year periods from 1895-99 to 1925-29 shows that within each cohort mortality from neoplasm of the genital organs increased to the end of the life span. But for cohorts of these women born before 1895 the reverse was true—the death

rates were lower with advance in age. Despite the substantial reduction during 1949-64 in mortality among women of races other than white from these neoplasms, some of the 1964 age-specific death rates for this cause were twice the corresponding death rate for white women:

Age in years	White women	All other women
20-24	1.1	2.0
25-29	2.3	4.1
30-34	5.9	11.9
35-39	10.5	24.4
40-44	20.3	38.6
45-49	31.0	57.8
50-54	44.9	82.2
55-59	56.8	91.5
60-64	69.9	126.6
65-69	87.9	155.1
70-74	94.6	121.7

Age-adjusted death rates show that for each marital group of women of other races mortality from Malignant neoplasm of the genital organs was lower for 1959-61 than for 1949-51 (table 16). The relative decrease in the age-adjusted death rates for this cause for single women of these other races was about 24 percent, while that for the ever-married group was about 22 percent.

Within the population of races other than white the 1959-61 risk of dying from these neoplasms as measured by SMR's was higher for single, widowed, and divorced women than for married women (table 17). For these other races, both for 1959-61 and 1949-51, excess mortality from this cause for divorced and widowed women was more than 1.5 times that for married women, as measured by SMR's.

The pattern of change in mortality from 1949 to 1964 for Malignant neoplasm of cervix uteri is in general similar to that of the broader group of all neoplasms of the genital organs (table 20). Mortality for Malignant neoplasm of cervix uteri decreased for every 5-year age group over the span 20-79 years except for 60-64 and 65-69 years.

Leukemia and aleukemia.—During 1949-64 the female population of races other than white had a lower death rate for leukemia than did the other three color-sex groups. For these women the number of deaths per 100,000 population increased from 2.2 for 1949, to a peak of 3.9 for 1963, and then dropped to 3.4 for 1964. Over the age span 20-44 years there were some fluctuations in the trends by age for mortality from leukemia (table 20). But over the span 45-84 years

the trend for each 5-year age group continued upward during 1949-64, with the greatest relative increases at the older ages.

Age-adjusted death rates show that for single women of races other than white the death rate for leukemia was lower for 1959-61 than for 1949-51 (table 16). But, for married, widowed, and divorced women of races other than white this death rate was higher for 1959-61, compared with the corresponding rate for 1949-51.

Unlike the other three color-sex groups, the 1959-61 risk of dying from leukemia, as measured by SMR's, was lower for the single than for the ever-married population of women of races other than white (table 17). For 1959-61, widowed and divorced women of these other races had higher SMR's for leukemia than single or married women.

Diabetes mellitus.—For women of races other than white the death rate for diabetes decreased between 1949 and 1964 for every 5-year age group at ages 20-54 years and increased for every 5-year age group at ages 55 through 84 years (table 20). These women had the highest death rate for diabetes in 1959-61 among the four color-sex groups (35.5 deaths per 100,000). This rate for women of races other than white was 1.7 times the corresponding rate for men of other races (21.0 deaths per 100,000); and 1.3 times the corresponding rate for white women (26.5 deaths per 100,000). For each marital group almost all age-specific rates for Diabetes mellitus were higher for women of other races than for white women (table 3).

Unlike the favorable change in mortality for this cause for white women, for whom the death rate was somewhat lower for 1959-61, compared with that for 1949-51, age-adjusted death rates by marital status indicate that mortality from diabetes was markedly higher for 1959-61 for both single and ever-married women of other races, compared with the corresponding death rates for 1949-51 (table 16). The greatest relative increase (37.8 percent) in these age-adjusted death rates by marital status was for widows of races other than white.

Within the population of women of races other than white the relative difference, as measured by SMR's, in mortality from diabetes for single women compared with those for ever-married women was about the same for 1959-61 and 1949-51:

Period	Single	Single	Married	Widowed	Divorced
	(compared with married)	(compared with ever-married)			
1959-61	121	108	100	130	114
1949-51	110	105	100	115	92

For 1959-61 there was some excess risk of death from diabetes for these single women at ages 20-59 years, but at ages 60-64 years the excess risk occurred for married women. Among divorced and widowed women of races other than white, compared with married women of these races, the greatest excess risk of death (46.3 deaths per 100,000) occurred for widowed women aged 70-74 years. For these other races the excess risk of death per 100,000 population for diabetes for 1959-61 for unmarried women compared with married women was as follows:

Age in years	Single	Widowed	Divorced
20-24	2.1	-0.7	2.1
25-34	4.7	0.6	3.0
35-44	12.7	19.1	2.0
45-54	11.5	29.1	-0.4
55-59	12.8	36.0	7.2
60-64	-17.6	44.9	23.6
65-69	1.1	29.5	19.7
70-74	16.2	46.3	22.3

¹Corrected by removing 21,000 "mistallied Indians" from the denominator of this rate. For details of revision see appendix.

Vascular lesions affecting the central nervous system.—Mortality from this cause decreased substantially during 1949-64 for each 5-year age group of women of races other than white in the span 30-79 years (table 20). For every marital group of these women except widowed, the death rate for this cause was lower for 1959-61 than for 1949-51 (table 16).

For each marital group, age-specific rates for this cause for 1959-61 were with few exceptions substantially higher for these other women than for white women (table 3).

For these women of other races SMR's show that single women had lower mortality from this cause than ever-married women (table 17); and compared with married women, the widowed had the largest SMR.

Arteriosclerotic heart disease, including coronary disease (ASHD).—For women of races other than white cohort analysis shows that during 1949-64 there was a fluctuation in the level of mortality from ASHD at ages under 50 years, but for each age group over the span 50-84 years the trend of mortality from this cause was clearly upward (table 20). Throughout 1949-64 these women had higher death rates for ASHD at ages under 70 years than did white women, while at older ages white women had by far the higher death rates.

In 1960 white women in every marital status group had a larger percentage of persons at ages 70 years and over, compared with the corresponding percentage at

these older ages for all other women. As a result, despite the higher ASHD death rates for all other women at ages under 70 years, the 1959-61 death rates for each marital status group were greater for white women than the corresponding death rates by marital status for all other women (tables 1 and 16). Age-adjusted death rates for all other women by marital status indicate that the greatest relative increase between 1959-61 and 1949-51 in mortality from this cause occurred for widows.

As measured by SMR's, for 1959-61 single women of races other than white had about the same risk of mortality from ASHD as did ever-married women of races other than white (table 17). But for these women the SMR for widows was almost twice that for married women.

Single women of other races experienced an increased risk of death from ASHD over that for ever-married women at younger ages, over the span 20-54 years, but not at ages 55-69 years. This pattern of excess risk at younger ages resembles that for single white women. Also for races other than white the excess risk of death for 1959-61 from this cause for divorced and widowed women over that for married women increased rapidly with advance in age.

In general for each marital status group, age-specific death rates were higher for women of other races than for white women at ages under 70 years, and lower for women of other races than for white women at ages over 70 years (table 3). The statistical artifact described by Rosenwaike,⁷⁶ resulting from exaggeration of age at older ages by persons of races other than white, may account for this dropping with advancing age of their death rate for ASHD below the corresponding white death rate for this cause.

Cirrhosis of the liver.—For each marital group most of the age-specific death rates for Cirrhosis of the liver were higher for all other women than for white women (table 3). This relationship supports the findings of Terris⁶² that in the United States mortality from Cirrhosis of the liver is higher at the lower socioeconomic levels.

About 35 percent of the cirrhosis deaths among all other women in 1959-61 were medically certified as having been associated with alcoholism, compared with only 28 percent for white women. This may reflect a differential in the correctness and completion of the death certificate rather than a true difference in the proportions of cirrhosis deaths associated with alcoholism. As mentioned above for white women, contributory factors cited in studies of the etiology of this disease are dietary deficiencies, diseases of the bile duct, chemical toxins, and infections.

Death rates representing the mortality experience of individual cohorts of women of races other than white for data years 1914-64 are shown in table 19. These data show that successively younger cohorts of these women are at much greater risk at every age of dying from Cirrhosis of the liver than their predecessors. The highest death rates tend to occur during the middle years of life.

Age-adjusted death rates by marital status indicate that the death rate for Cirrhosis of the liver was markedly higher for 1959-61 for each marital group of women of races other than white, compared with the corresponding rates for 1949-51 (table 16). The greatest relative increase (125 percent) was for the divorced among these women.

For women of races other than white the relative difference by marital status, as measured by SMR's, in mortality from Cirrhosis of the liver was as follows for 1959-61 and 1949-51:

Period	Single (compared with ever-married)			Married	Widowed	Divorced
	Single (compared with married)	Single (compared with ever-married)	Single (compared with ever-married)			
1959-61 .	225	187	100	184	230	
1949-51 .	202	174	100	162	173	

Motor vehicle accidents.—For each marital status group the death rate for this cause for women of races other than white is somewhat lower than for white women (tables 1 and 16). For both white and all other women the death rate for Motor vehicle accidents for widowed and divorced persons is higher than for married and single persons.

The large SMR's for widowed and divorced women of races other than white reflect high death rates for this cause at younger ages, particularly at ages 20-24 years. For all Motor vehicle accidents age-specific rates for each marital status group of all other women are in general somewhat lower than the corresponding death rates for white women. In contrast, for motor vehicle accidents to pedestrians, age-specific rates for all other women are, in general, higher than the corresponding rates for white women (table 3).

All other accidents.—Mortality from these accidents, excluding motor vehicle accidents, declined between 1949-51 and 1959-61 for each marital group of women of races other than white (table 16). Mortality for this cause for 1959-61 as measured by SMR's was highest for widowed women of races other than white (table 17). The large SMR's for the widowed and divorced among these women reflect higher deaths for this cause at

almost every age, compared with the corresponding rates for married persons (table 3).

Suicide.—Within the population of races other than white, for each marital group of women except divorced, the mortality from this cause was higher for 1959-61 than for 1949-51 (table 16).

Similar to the pattern for white women, as measured by SMR's the risk of committing suicide for all other women is much higher for widowed and divorced than for married women (table 17).

For both white and all other women the risk of taking one's life tends to be high for the married group around the menopausal period. For widowed and divorced women of other races the high risk period is at younger ages (table 3).

Homicide.—Within the population of females of races other than white the death rate for Homicide declined between 1949 and 1964 for each of the 5-year age groups over the span 20-34 years, at ages 45-49 years, 60-64 years, and at ages 75 years and over (table 20). But in 1964 mortality from Homicide was still about six times as high for this group as for the white female population. At ages 25-29 years the death rate for Homicide in 1964 was 21.8 per 100,000 for women of races other than white, compared with only 2.5 per

100,000 for white women. For older cohorts (that is, for the 11 cohorts born during successive 5-year periods during 1875-1929), mortality from Homicide decreased with advance in age during 1949-64. For more recently born cohorts, however, mortality from this cause increased with age.

Age-adjusted rates for women of races other than white show that mortality from Homicide was lower for 1959-61 than for 1949-51 for each of the marital groups except widows (table 16). The relative decrease in mortality for this cause for the single group of these women was about 15 percent, and that for the divorced group about 13 percent.

As measured by SMR's, among women of races other than white, divorced and widowed women had, by far, higher mortality in 1959-61 from Homicide than single or married women (table 17); single women, according to this measure, had a lower risk of death from this cause than married women; and similarly from 1949-51 the risks from Homicide were lower for single and married than for divorced and widowed women.

Age-specific rates for each marital group for 1959-61 were, in general, markedly higher for all other women than for white women (table 3).

PART IV. DIFFERENTIAL MORTALITY BY MARITAL STATUS FOR MEN OF RACES OTHER THAN WHITE

MORTALITY FOR ALL CAUSES

As noted above for white men, differences between the levels of mortality by marital status for all other men for 1959-61 and the corresponding levels for 1949-51 are more clearly seen against the background of the changing trends of the age-specific death rates for the all other male population before 1954 and during 1954-63. It was during this latter 10-year period that the total death rate for the all other male population, after allowances for fluctuations associated with major influenza epidemics, tended to flatten out. This levelling off of the death rate followed a clear downturn that lasted, with some fluctuations, from the beginning of the century until about 1954. The changes in mortality trend by age for the all other male population in the United States during 1954-63 are shown below:

Age in years	Rate of change in percent	95-percent confidence limits ¹	
		Upper	Lower
1-4	-2.00	-1.54	-2.45
5-14	-1.73	-1.19	-2.25
15-24	-1.87	-1.49	-2.25
25-34	-0.94	-0.63	-1.24
35-44	+0.51	+0.75	+0.28
45-54	-0.70	-0.52	-0.87
55-64	-0.67	-0.52	-0.82
65-74	+2.24	+2.40	+2.09
75-84	+0.33	+0.53	+0.13
85 and over	+1.46	+1.81	+1.12

¹The probability is 95 percent that the true rate of change (in percent) has a value between the upper and lower limits shown.

For the four age-groups 1-4, 5-14, 15-24, and 25-34 years, the death rate continued to decline during 1954-63, but at a much slower rate than during prior years.⁷⁵ For the middle years (35-64 years) the death rate remained almost constant during 1954-63. Subsequent data for 1964 and 1965 indicate that this stationary level marked the beginning of an upturn in mortality for these men of races other than white at these ages. For the older age-groups (65-74, 75-84, and 85 years and over) the direction of the change in mortality was already upward for 1954-63.

Changes from 1940 in mortality for each marital class.—The total death rate for single men of races other than white 15 years of age and over was about 18

percent lower for 1959-61 than for 1949-51; and about 16 percent lower for 1949-51 than for 1940:

Period	Total death rate	Age-adjusted death rate
	Rate per 100,000 population	
1959-61	743.6	743.6
1949-51	903.0	1,038.6
1940	1,075.4	1,177.1

Only a small part of this reduction in mortality between 1949-51 and 1959-61 is attributable to an increase in the percent of single males of races other than white at ages 15-19 years (from 43.3 percent for 1950 to 44.9 percent for 1960),⁵ at which ages mortality is relatively low. Age-adjusted death rates show that between 1940 and 1959-61 mortality in this single male population decreased about 37 percent. This favorable change within the population of men of races other than white resulted from lower mortality for single male persons 15-44 years for 1949-51 compared with those for 1940; and from lower death rates for every age group for 1959-61 as compared with those for 1949-51:

Age in years	1959-61	1949-51	1940
Rate per 100,000 population			
15 and over	743.6	903.0	1,075.4
15-19	157.3	213.6	356.6
20-24	314.1	418.5	714.5
25-34	627.7	818.5	1,213.4
35-44	1,357.3	1,813.2	1,879.5
45-54	2,285.3	3,361.9	3,051.9
55-59	13,049.5	5,428.2	4,357.8
60-64	4,658.1	6,175.8	5,419.7
65-69	5,496.4	7,105.3	5,804.6
70-74	7,223.6	9,404.8	8,962.2
75 and over	10,284.5	11,419.5	13,790.5

¹Revised by removing 21,000 "mistallied Indians" from the denominator; reported death rate was only 2,558.1. For details of revision see appendix.

A downward trend in mortality at ages 15-19 and 20-24 years was also observed for the total male population of races other than white at these ages during 1949-61. Subsequently, however (during 1961-65), mortality for both of these age groups has been upward within this population.

The total death rate for married men of races other than white at ages 15 years and over was lower for 1949-51 than for 1940, but was somewhat higher for 1959-61 than for 1949-51. With the effect of the changing age-composition held constant, however, the level of mortality was lower for 1949-51 than for 1940; and lower for 1959-61 than for 1949-51:

Period	Total death rate	Age-adjusted death rate
Rate per 100,000 population		
1959-61	1,335.9	1,335.9
1949-51	1,331.1	1,491.8
1940	1,646.1	1,896.6

The greater total death rate for married men of races other than white for 1959-61 as compared with that for 1949-51 resulted from higher death rates at ages 65-69 and 70-74 years. For all other age groups the death rate for these married men was lower for 1959-61 than for 1949-51; and for every age group was lower for the latter period than for 1940:

Age in years	1959-61	1949-51	1940
Rate per 100,000 population			
15 and over	1,335.9	1,331.1	1,646.1
15-19	209.5	248.4	420.6
20-24	208.8	280.9	484.5
25-34	286.8	371.9	649.5
35-44	554.8	674.1	1,063.7
45-54	1,205.5	1,493.5	2,016.7
55-59	1,990.1	2,611.5	2,923.0
60-64	3,214.8	3,337.0	3,563.5
65-69	4,134.0	3,646.2	3,986.7
70-74	5,128.0	5,043.4	5,701.4
75 and over	7,103.0	7,980.6	9,876.6

Both the total death rate and the age-adjusted death rate for widowers of races other than white indicate an increase in mortality for this marital class for 1959-61 compared with corresponding mortality for 1949-51:

Period	Total death rate	Age-adjusted death rate
Rate per 100,000 population		
1959-61	7,004.8	7,004.8
1949-51	6,160.2	6,670.9
1940	6,498.2	7,868.4

This rise in mortality reflects higher death rates for 1959-61 for the age-groups 20-24, 65-69, 70-74, and 75 years and over:

Age in years	1959-61	1949-51	1940
Rate per 100,000 population			
15 and over	7,004.8	6,160.2	6,498.2
15-19	396.8	1,111.1	2,564.1
20-24	737.2	725.1	1,956.7
25-34	1,113.3	1,443.9	2,157.4
35-44	1,740.4	1,985.8	2,609.6
45-54	3,251.2	3,732.7	4,679.6
55-59	4,537.9	5,489.5	6,201.1
60-64	6,418.4	6,451.0	6,568.2
65-69	7,467.4	6,053.1	6,624.1
70-74	8,734.8	7,797.2	8,437.6
75 and over	12,474.7	11,513.6	14,758.5

The rise in mortality for these widowers at ages 65 years and over is consistent with the upturn in mortality for all men of races other than white at these ages observed for 1954-63.

For divorced men of races other than white the age-adjusted death rate shows a decrease in mortality for 1959-61 as compared with the corresponding mortality for 1949-51:

Period	Total death rate	Age-adjusted death rate
Rate per 100,000 population		
1959-61	2,972.4	2,972.4
1949-51	2,619.3	3,116.2
1940	3,479.4	4,027.9

The rise in the total rate unadjusted for age composition reflects higher death rates for 1959-61 at ages 20-24 years and 60-74 years:

Age in years	1959-61	1949-51	1940
Rate per 100,000 population			
15 and over	2,972.4	2,619.3	3,479.4
15-19	60.1	752.7	510.2
20-24	455.8	417.9	1,019.0
25-34	747.1	972.0	1,442.7
35-44	1,543.4	1,545.2	2,427.8
45-54	3,012.8	3,042.5	4,157.3
55-59	4,185.7	4,738.4	5,137.8
60-64	6,334.9	5,896.1	7,206.4
65-69	7,951.9	6,713.5	7,405.3
70-74	9,146.9	8,616.0	11,533.7
75 and over	10,840.7	16,837.6	19,292.0

Standardized mortality ratios.—If the 1959-61 death rates for married men of races other than white at ages 15 years and over had occurred in the corresponding male populations of each of the other three marital classes (single, widowed, and divorced), then the quotient of the observed number of deaths divided by the expected number, expressed as a percentage, would give the following standardized mortality ratios:

Marital status	Observed deaths	Expected deaths	SMR's
Single	38,657	25,485	152
Married	157,618	157,618	100
Widowed	59,817	32,789	182
Divorced	13,545	6,376	212

For men of races other than white the lowest mortality is found for the married population, the next most favorable for the single group, and the highest for widowed and divorced persons.

A comparison of these 1959-61 SMR's with the corresponding SMR's for 1940 indicates that the rank of marital classes by mortality for this earlier year was the same as that for 1959-61:

Marital status	1959-61 SMR's	1949-51 SMR's	1940 SMR's
Single	152	176	143
Married	100	100	100
Widowed	182	172	176
Divorced	212	201	205

The following SMR's were obtained by dividing men of races other than white into only two groups, i.e., single and ever-married:

Marital status	1959-61 SMR's	1949-51 SMR's	1940 SMR's
Single	136	159	130
Ever-married	100	100	100

The resulting SMR's show the single status to be more favorable than the above SMR's obtained by a comparison of the death rate for single men with that for men who had married one or more times and were still married at the time of death.

Excess risk of death by age, for the single, widowed, and divorced classes.—Excess deaths per 100,000, computed as described on page 3, are shown below (using married men of races other than white as the favorable status group):

Period and age in years	Single	Widowed	Divorced
1959-61			
20-24	105.5	529.5	247.5
25-34	341.9	828.9	461.6
35-44	807.0	1,192.2	994.1
45-54	1,093.0	2,070.7	1,829.4
55-59	¹ 1,080.9	2,599.5	2,240.2
60-64	1,419.2	3,310.0	3,223.7
65-69	1,421.2	3,477.1	3,982.5
70-74	2,208.9	3,801.8	4,236.1
1949-51			
20-24	138.0	445.0	137.4
25-34	448.3	1,076.0	602.3
35-44	1,146.8	1,320.6	877.0
45-54	1,896.7	2,273.1	1,572.5
55-59	2,892.2	2,995.2	2,183.9
60-64	2,936.8	3,221.5	2,647.4
65-69	3,590.0	2,498.0	3,183.4
70-74	4,593.0	2,900.1	3,762.4
1940			
20-24	231.1	1,479.4	537.1
25-34	567.7	1,517.8	798.4
35-44	824.6	1,562.5	1,378.8
45-54	1,056.5	2,717.7	2,184.7
55-59	1,477.0	3,376.8	2,281.5
60-64	1,924.8	3,115.7	3,777.5
65-69	1,893.4	2,746.9	3,560.5
70-74	3,458.0	2,901.6	6,184.9

¹Revised by removing 21,000 "mistallied Indians" from the denominator of the death rate. Before revision, the excess risk was only 579.5. For details of revision see appendix.

For single men of races other than white there is in general a consistent increase in the excess risks with advance in age for each of the three periods, 1959-61, 1949-51, and 1940. A comparison of these risks for single men for 1959-61 with those for the earlier periods shows that for every age group the excess risks for 1959-61 are lower than for 1949-51; and the risks for 1949-51 are higher than for 1940, except at ages under 35 years. Similarly, when the indexes of excess risk for the single group are calculated, using as the population at risk the survivors in the "ever-married" group of men of races other than white (i.e., married, widowed, and divorced), the results show some increases in the risks with advance in age, but the pattern is irregular after age 55 years:

Age in years	1959-61	1949-51	1940
20-24	99.1	130.3	207.7
25-34	321.8	421.3	526.8
35-44	742.4	1,085.4	728.6
45-54	918.4	1,699.3	776.6
55-59	1,759.6	2,502.1	993.1
60-64	939.6	2,349.7	1,324.1
65-69	660.8	2,978.2	1,227.5
70-74	1,172.1	3,687.7	2,512.5

¹Revised by removing 21,000 "mistallied Indians" from the denominator of the death rate. Before revision the excess risk was 256.6. For details of revision see appendix.

As might be expected, the excess risk when measured, using as the population at risk the survivors in the ever-married group, is lower than when the population at risk is limited to the survivors in the married group. As noted for the white male population, inasmuch as persons who marry face the risk of dissolution of their marriage by death or divorce, the ever-married group may constitute the better base on which to measure the excess risk of death for single persons.

For widowers of races other than white this method of analysis yielded no breaks in the increase of excess risk with advance in age for 1959-61, but for 1949-51 the largest excess risk was for the age group 60-64 years. For 1940 very high excess risks were found for young widowers of races other than white. For 1940 there are no cause-specific death rates available separately for white and all other widowers, but there are data that suggest* that for this year the excess risk of death for widowers of races other than white at ages under 25

years is attributable in great part to accidental deaths and tuberculosis. As remarked earlier for the white male population, for white and all other widowers together the principal causes of death at ages 20-24 years were accidental deaths (345.5 deaths per 100,000, over half of which involved motor vehicles); and Tuberculosis, all forms (274.0 deaths per 100,000). For both white and all other male persons at ages 15-24 years accidents and tuberculosis were also the two leading causes of death in 1940.

MORTALITY FOR SPECIFIED CAUSES

Tuberculosis, all forms.—For men of races other than white the 1959-61 death rate for this disease among ever married men was less than one-third of the 1949-51 death rate (table 21). For each of the marital groups there was a substantial reduction in mortality from this cause.

For this group of men the 1959-61 level of mortality for tuberculosis for divorced men was more than three times that for married men, and that for single and widowed men was more than twice the level for married men (table 22).

Despite the reductions in mortality between 1949-51 and 1959-61 age-specific death rates for tuberculosis for the latter period were substantially higher for each marital group of men of races other than white than the corresponding age-specific death rate for white men (table 11). For some of the most productive years of life and when heads of families usually have the responsibility of young children, death rates for this cause for married men of races other than white are very much higher than for married white men at these ages. For example, for the age group 35-44 years, the death rate for tuberculosis for married men of races other than white was 15.8 per 100,000, compared with only 2.2 per 100,000 for white married men at these ages.

For each cohort of all other men born at 5-year intervals during 1905-44, the death rate for tuberculosis peaked for the age group 20-24 years (table 23).

Malignant neoplasm of male genital organs.—Mortality from this cause is of relatively low frequency until about age 50 years; after which it rises steeply with advance in age. As shown below for 1964, the death rate per 100,000 population for this cause is markedly higher for the all other men than for the white

male population, for each 5-year age group in the span 50-84 years:

Age in years	White men	All other men
50-54	4.3	15.4
55-59	12.0	28.7
60-64	29.6	85.8
65-69	66.9	181.3
70-74	136.5	225.4
75-79	228.5	320.7
80-84	349.7	370.6

While the mortality trend for this cause during 1949-64 for the white male population was clearly downward for each 5-year age group in the span 40-84 years, for all other men the trend was upward for each 5-year age group in the span 60-84 years (table 25). Considering, for example, the mortality experience at 60-64 years of age for two cohorts of all other men born in successive 5-year periods during 1895-1904, the upturn in mortality for these neoplasms between 1959 and 1964 was as follows:

Period of birth of cohort	Age at death	Year of death	Death rate per 100,000
1900-04	60-64	1964	85.5
1895-99	60-64	1959	81.8

For men of races other than white the prostate was the site of about 95 percent of the 5,766 deaths in 1959-61 assigned to Malignant neoplasm of the male genital organs. Age-adjusted death rates by marital status show that mortality from these neoplasms for this male population increased for 1959-61 compared with the level of mortality for 1949-51 for all marital status groups except for single males (table 21).

For men of races other than white the 1959-61 risk of dying from these neoplasms as measured by SMR's was higher for ever-married than for single men (table 22), and widowed and divorced men had substantially higher risks of dying from these neoplasms than married men. This is the only cause among those shown in table 22 for which mortality is lower for single than for married men of races other than white.

Leukemia and aleukemia.—For the male population of races other than white the number of deaths from leukemia per 100,000 population increased from 3.3 deaths for 1949, to a peak of 5.4 deaths for 1963, and then dropped to 5.1 for 1964.

For the age groups 15-19 and 20-24 years the death rate for this cause declined slightly, but for each 5-year age group over the span 25-84 years, this rate, with minor exceptions, continued to rise (table 25). That there has been some reduction during recent years in mortality from this cause in the male population of races other than white is shown by intra-cohort analysis. For the three cohorts of men of races other than white born in three successive 5-year periods during 1945-59 the death rate declined with advance in age during 1949-64. But the death rate for this cause within the cohorts born before 1945 continued to rise with advance in age.

For men of races other than white age-adjusted death rates show that for married and widowed men the death rate for leukemia was higher for 1959-61 than for 1949-51 (table 21); but for the single group this death rate remained about the same; and for divorced men it was lower for 1959-61, compared with the corresponding rate for 1949-51.

The 1959-61 risk of dying from leukemia as measured by SMR's was still somewhat higher for single men of races other than white compared with that for ever-married men (table 22). But this differential was substantially smaller than the corresponding differential for 1949-51. For 1959-61 divorced men of races other than white had the largest SMR for leukemia.

Excess deaths from leukemia per 100,000 single men of races other than white, computed as described on page 3, are shown below (using ever-married men of races other than white as the favorable status group):

Age in years	1959-61	1949-51
20-24	1.0	0.8
25-34	0.6	1.5
35-44	0.3	1.8
45-54	-1.6	1.1
55-59	-1.1	2.0
60-64	-1.5	-6.6
65-69	-12.3	-1.0
70-74	-9.3	-0.9

According to this measure at ages 45-54 years and older these single men had a lower risk of dying from leukemia in 1959-61 than did the ever-married men.

Diabetes mellitus.—For men of races other than white the death rate for this cause has increased since at least 1949 for every 5-year age group in the span 30-84 years (table 25). Age-adjusted death rates by marital status indicate that this increase occurred for the married,

widowed, and divorced groups, but not for single men (table 21).

For 1959-61 in the population of men of races other than white, married men had the most favorable mortality level for diabetes, as measured by SMR's, with single men ranking next, and divorced men having the most unfavorable level, with an SMR of 195 (table 22). For 1949-51 the most unfavorable level was for single men, with an SMR of 181.

Within this population of men of races other than white, excess deaths from diabetes per 100,000 men in each of the unmarried groups are shown below (with this measure of higher risk based on death rates for diabetes in table 11 and computed as described on page 3 using married men as the favorable status group:

Period and age in years	Single	Widowed	Divorced
1959-61			
20-24	1.3	-0.9	-0.9
25-34	5.4	2.3	3.7
35-44	10.3	13.6	11.9
45-54	16.9	21.8	23.9
55-59	¹ 13.9	32.5	25.1
60-64	16.4	56.1	60.3
65-69	21.3	34.5	48.3
70-74	4.8	36.2	80.1
1949-51			
20-24	0.3	-2.3	-2.3
25-34	4.5	4.3	0.6
35-44	10.2	6.4	3.8
45-54	14.8	22.4	11.0
55-59	27.2	16.8	3.3
60-64	32.0	16.1	-10.5
65-69	37.7	10.2	6.3
70-74	32.4	10.2	-5.5

¹Revised by removing 21,000 "mistallied Indians" from the denominator of the death rate. For details of revision see appendix.

For 1959-61 the number of excess deaths per 100,000 population of each of the unmarried groups increased, with few exceptions, with advance in age up to about age 65 years and then declined.

In the total population of races other than white, as in the total white population, Diabetes mellitus is one of the few diseases for which the 1959-61 level of mortality was higher for women than for men. This higher level occurred for both single and ever-married women of

races other than white in almost every age group (tables 3 and 11).

Arteriosclerotic heart disease, including coronary disease (ASHD).—For men of races other than white mortality from ASHD increased during 1949-64 for every 5-year age group over the span 25-84 years (table 25). During this period mortality from this cause was greater for all other men than for white men at ages 20-44 years, while at older ages white men had, by far, the higher death rates.

Age-adjusted death rates indicate that for single men of races other than white there was little change in mortality from ASHD for 1959-61 from that for 1949-51 (table 21). But there were substantial increases in mortality from this cause for the married, widowed, and divorced groups, especially for widowers. These increases for the married, widowed, and divorced groups were relatively greater than the corresponding increases in mortality from ASHD for white men. The 1959-61 death rates for ASHD continued to be much higher for each marital group in the white male population, however, than the corresponding death rates in the male population of races other than white (table 11).

SMR's for 1959-61 indicate that for men of races other than white the single group had a higher risk of death from ASHD than did the ever-married group (table 22). Within the latter group the SMR's for the widowed and divorced men were each about twice that for married men. But the mortality differentials for these single and divorced men were not so great for 1959-61 as for 1949-51.

Within this population of men of races other than white the excess risk of death from ASHD for single men over the risk for ever-married men increased with advance in age, following a pattern similar to that for single white men (based on rates in table 11). At almost every age these excess risks for single men were lower for 1959-61 than for 1949-51. Also for widowed and divorced men, of races other than white, excess risk of death from this cause, over that for married men, increased steadily with advance in age, beginning with the age group 25-34 years.

Cirrhosis of liver.—For 1959-61 the death rate for Cirrhosis of liver was still somewhat higher for white men (22.3 deaths per 100,000) than for all other men (20.2 deaths). But mortality for this cause was more unfavorable for all other men because for the most productive years of life (20-54 years) their death rates for this cause were higher than those for white men. Moreover, between 1949-51 and 1959-61 their rate of

increase in this death rate at ages 20-54 years was greater than the corresponding rate of increase for white men.

Death rates for Cirrhosis of liver for cohorts of men of races other than white are shown at 5-year intervals during the 50-year period 1914-64 in table 24. For every age group there were substantial increases in mortality from this cause; but those for the early and middle adult years were relatively largest, especially during the 15-year period 1949-64. For example, for men of races other than white at ages 30-34 years this rate rose from 3.8 deaths per 100,000 for 1949 to 18.6 deaths for 1964.

Upturns in mortality for each of the four marital groups are reflected in this increase in mortality from cirrhosis for the total male population of races other than white (table 21). The greatest numerical increases for 1959-61 over that for 1949-51 were for divorced and widowed men of races other than white.

Within this group of men of races other than white as measured by SMR's the 1959-61 death rates for divorced, single, and widowed men are, respectively, more than four, three, and two times that for married men (table 22).

For 1959-61, mortality from cirrhosis for single men was higher for all other men than for white men at ages under 55 years; while for ever-married men, it was higher for all other men than for white men at ages 20-44 years (table 11).

The percentage of deaths from Cirrhosis of liver among men of races other than white in 1959-61 for which alcoholism was mentioned on the death certificate was about 38 percent compared with about 35 percent for women of races other than white and about 34 percent for white men.

Motor vehicle accidents.—During 1949-61 the high point of mortality from Motor vehicle accidents was reached in 1956 (42.6 deaths per 100,000 male population of races other than white); then the curve fell almost steadily to 32.8 deaths per 100,000 for 1961. Since then, however, its direction has been upward for men of other races.

For each group of ever-married men of other races (married, widowed, and divorced) there was some improvement in the 1959-61 death rate for this cause, compared with the corresponding 1949-51 death rate (table 21); but for single men 15 years and over the level of mortality from Motor vehicle accidents was about the same for the two periods.

For 1959-61 single white men as a group had higher death rates for Motor vehicle accidents than all other

single men, owing to the very high rate for single white men at ages 15-19 and 20-24 years (table 11). But for each age group in the span 25-74 years all other single men had higher rates than single white men. Part of this excess mortality for single men of races other than white results from higher death rates for them for Motor vehicle accidents to pedestrians. At every age the death rate for Motor vehicle accidents to pedestrians was higher for all other single men than for single white men (table 11).

For all other ever-married men about 24 percent of all deaths from Motor vehicle accidents were fatalities compared with about 16 percent for ever-married white men.

For the population of races other than white at every age except 15-19 years the percentage of deaths from Motor vehicle accidents resulting in pedestrian deaths were higher for single than for ever-married men:

Age in years	Percent of motor vehicle fatalities that are deaths of pedestrians			
	All Other		White	
	Single	Ever-married	Single	Ever-married
15 and over ..	21.4	23.8	10.8	15.8
15-19	12.1	14.9	4.8	4.3
20-24	11.1	9.5	3.5	3.2
25-34	21.6	11.4	6.9	4.4
35-44	32.2	17.3	20.3	7.7
45-54	46.6	22.7	31.7	12.1
55-59	53.1	31.4	44.9	19.4
60-64	61.7	37.0	50.7	22.7
65-69	80.0	43.6	56.9	27.6
70-74	77.8	57.6	65.1	34.7
75 and over	87.5	62.9	68.6	46.4

Relative mortality from Motor vehicle accidents, as measured by SMR's, was more than twice as high in 1959-61 for divorced as it was for married men of races other than white (table 22). Widowed and single men of other races also had higher levels of mortality from this cause than married men of these races.

All other accidents.—There was some reduction between 1949-51 and 1959-61 in the death rate for other accidents for men of races other than white (table 21). But since then mortality from this cause has been upward. In 1960 there were 6,035 accidental deaths excluding motor vehicle fatalities in the male population of races other than white. Of these 339 deaths (5.6

percent) were caused by firearms. Again in 1966 about 6 percent of the accidental deaths excluding motor vehicle fatalities in this male population were caused by firearms—430 deaths. Other frequent causes of these 7,011 accidents were falls (1,095 deaths), fire and explosion of combustible material (1,315 deaths), and drowning (1,094).

Age-specific death rates for 1959-61 for these accidents excluding Motor vehicle accidents are with few exceptions higher for all other men than for white men for each marital group (table 11).

Widowed and divorced men of races other than white have greater mortality from these accidents, as measured by SMR's, than married or single men of races other than white (table 22).

Suicide.—The Suicide rate increased between 1949-51 and 1959-61 for each marital group of men of races other than white (table 21). Owing to the accelerated increase in the Suicide rate for these men, the 1959-61 color differentials for this cause are smaller than for 1949-51 for each marital group except divorced:

Ratio of death rate for white men to that for all other men

Period	Ratio of death rate for white men to that for all other men			
	Single	Married	Widowed	Divorced
1959-61	1.77	2.05	3.41	3.77
1949-51	2.12	2.54	4.10	3.65

For single men of races other than white decreases in the death rate at ages over 45 years were more than offset by increases in mortality from this cause at younger ages:

Age in years	Single		Married	
	1959-61	1949-51	1959-61	1949-51
	Rate per 100,000 population			
15 and over	10.8	9.5	10.8	8.7
15-19	3.3	1.8	4.5	8.9
20-24	11.0	7.6	8.7	7.6
25-34	20.8	16.7	11.5	7.6
35-44	20.8	20.4	9.3	8.8
45-54	17.1	21.7	11.4	8.7
55-59	22.9	32.8	13.0	12.5
60-64	23.6	40.5	12.6	12.6
65-69	21.0	32.2	12.1	7.6
70-74	12.5	56.7	7.7	8.1
75 and over	37.2	48.7	11.1	10.1

Age in years	Widowed		Divorced	
	1959-61	1949-51	1959-61	1949-51
	Rate per 100,000 population			
15 and over	24.1	17.9	25.5	23.9
15-19	-	-	-	-
20-24	79.0	43.3	15.7	6.3
25-34	66.8	26.5	23.5	24.3
35-44	35.8	21.0	24.8	24.1
45-54	21.3	22.3	31.9	34.2
55-59	25.1	14.4	13.9	9.1
60-64	22.8	19.3	36.3	35.3
65-69	22.0	17.5	28.4	-
70-74	18.2	19.0	8.4	-
75 and over	21.3	9.0	28.6	57.0

For married and widowed men of races other than white the Suicide rates for 1959-61 were higher at almost every age than the corresponding rates for 1949-51. Mortality from this cause for 1959-61 as measured by SMR's was more than twice as high for divorced and widowed as for married men of races other than white (table 22).

Homicide.—During the period 1949-64 the death rate for Homicide for men of races other than white decreased at ages 20-24, 25-29, and 30-34 years, but increased at almost all older age groups (table 25). This pattern of change by age is the reverse of that for Suicide, for which the rate for these men increased during 1949-64 at younger ages and decreased at older ages.

For each marital group of these men, except for widowed, the death rate for Homicide was lower for 1959-61 than for 1949-51 (table 21).

Decreases in the Homicide rates for 1959-61, compared with the corresponding rates for 1949-51, were recorded for each age group of single men of races other than white except at 65-69 years; and for each age

group of married men of races other than white over the span 15-59 years:

Age in years	Single		Married	
	1959-61	1949-51	1959-61	1949-51
	Rate per 100,000 population			
15 and over	57.2	70.3	45.8	57.1
15-19	23.6	25.8	54.9	79.8
20-24	67.5	78.7	62.0	79.9
25-34	119.1	137.4	63.1	80.3
35-44	115.8	145.9	55.7	65.3
45-54	68.0	95.9	39.1	42.6
55-59	24.7	79.1	24.1	31.7
60-64	31.0	38.0	21.9	17.8
65-69	28.6	23.4	15.8	12.3
70-74	15.6	39.7	12.1	9.4
75 and over	27.9	34.1	10.4	10.6

Age in years	Widowed		Divorced	
	1959-61	1949-51	1959-61	1949-51
	Rate per 100,000 population			
15 and over	59.3	59.0	129.7	141.3
15-19	66.1	61.7	60.1	
20-24	131.6	194.8	141.4	107.6
25-34	262.7	248.4	174.1	208.7
35-44	165.2	165.5	165.0	159.2
45-54	104.3	79.9	128.3	119.0
55-59	58.2	54.4	48.6	64.0
60-64	42.7	36.6	79.9	91.9
65-69	30.7	20.6	71.1	46.9
70-74	18.2	22.0	33.7	39.0
75 and over	21.3	11.1	38.2	85.5

For men of races other than white the highest Homicide rate in 1959-61 was for widowers at ages 25-34 years; and the second highest rate for divorced men at these ages. For single, married, and widowed men the 1959-61 Homicide rate for all other men was more than 10 times the corresponding rate for white men (tables 8 and 21).

As measured by SMR's the 1959-61 Homicide rate for divorced and widowed men of races other than white were, respectively, about 3.0 and 2.5 times that for married men of these races (table 22).

SUMMARY

Moriyama¹ showed for 1940 and Shurtleff² for 1949-51 that among both men and women at every age, married persons, on the average, live longer than the single, widowed, or divorced. This finding is also supported by the mortality experience in the United States for 1959-61. As for the earlier periods, it was found that the rank order of the widowed and divorced classes shifts with advancing age for white men and women and for all other men. But for 1959-61 the shift occurred at a younger age than it did for 1949-51 or 1940. For white women at ages 15-19 years and 20-24 years the 1959-61 death rate for widows was the highest of the four marital classes but beyond 25 years it was below that for divorced white women. A similar pattern is seen for white men and for all other men, but for all other women the 1959-61 death rate for widows remained higher than that for all other divorced women throughout the life span.

When allowance is made for the variation in age distribution by age standardization, using standardized mortality ratios, the 1959-61 mortality levels for single and widowed white men were each about 1.5 times that of white husbands, and the mortality level for divorced white men was more than double that of white husbands. A similar pattern holds for all other men, except that the mortality level for widowed men of races other than white is about 1.8 times that for husbands. Again for 1959-61 as for earlier periods, mortality differentials by marital status are not so large for women as they are for men.

For each of the four marital classes the death rates for all other men are higher than those for white men in every age group from 20 years until about 65-69 years, and the death rates for all other women are higher than those for white women during approximately the same span of years. The drop of the death rate for all other persons below that for white persons at advanced ages may result from exaggeration of age of the population of races other than white in the census.

For white women two major features of the 1959-61 mortality experience by cause are: (1) the level of mortality for the ever-married, as measured by standardized mortality ratios, was much lower than for the single for tuberculosis, accidents other than motor vehicle accidents, and Malignant neoplasm of breast, and (2) the level of mortality for the ever-married was much higher than that for the single for Malignant neoplasm of

cervix uteri, Homicide, Diabetes mellitus, and Cirrhosis of liver. For Malignant neoplasm of breast, the death rate was higher for married white women at ages under 35 years, but beyond that age the death rate for this cause for single white women was higher than that for married white women. Another highlight among the findings for white women is that, despite improvement in the survival rate for breast cancer, there has been no reduction in recent years in the mortality rate for this cause for young married women. It remains to be seen whether the increases during the present decade in mortality from this disease for young married women mark the beginning of an upward turn paralleling a continuing increase in the incidence of the disease. A puzzling fact is that, in contrast to the rise in the death rate for breast cancer for young married white women, there has been a drop in the death rate for this cause for single white women. For almost every cause shown, the mortality levels for widowed and divorced white women are higher than those for married or single white women.

Among white men there are only two causes for which the single have lower mortality than the overall level for the ever-married: Malignant neoplasm of male genital organs and Homicide. But single white men have lower mortality from every cause shown than divorced white men. Also single white men have lower mortality than widowed white men for all but the following four causes—Tuberculosis, Leukemia and aleukemia, Diabetes mellitus, and Cirrhosis of liver. A striking feature of the mortality experience for white men is the very high mortality from a number of causes among those men whose marriages have ended in divorce. The mortality levels from Homicide and tuberculosis are about seven times as high among divorced white men as among married white men; from Cirrhosis of liver, about six times as high; and from Motor vehicle accidents, all other accidents, and Suicide, about four times as high. In contrast to the decrease since 1949 in the death rate for Diabetes mellitus for white women for each 5-year age group in the span 45-84, for white men the death rate for this cause increased since 1954, for each 5-year age group in the span 30-84 years. Nevertheless 1959-61 age-specific death rates for this cause were still higher for ever-married white women than for ever-married white men except at ages 25-54 years. At ages 15-19 years single white women had a somewhat higher death rate from Diabetes mellitus than did single white men; but at

all other ages single white men had higher rates than single white women. Contrary to the 1959-61 pattern for white women, married white men had lower relative mortality from Diabetes mellitus (as measured by standardized mortality ratios) than single white men. Between 1949-51 and 1959-61 there was a drop in the age-adjusted Suicide rate for single and married white men, but a rise in this rate for widowed and divorced white men.

For women of races other than white the differences in mortality by marital status are less pronounced than are those for white women. For women of races other than white the only cause for which the standardized mortality ratio for single women is lower than that for married women is Homicide. For each marital group almost all 1959-61 death rates for age groups under 55 years for Cirrhosis of liver are substantially higher for all other than for white women. There were reductions between 1949-51 and 1959-61 for most of the causes shown for each of the four marital groups of women of races other than white. Nevertheless the 1959-61 mortality levels for a number of causes, including Tuberculosis, all forms, Malignant neoplasm of cervix uteri, Vascular lesions affecting central nervous system, Cirrhosis of liver, Other accidents (excluding Motor vehicle accidents), and Homicide, are still markedly higher for all other women than for white women.

Within the population of other races for men, as for women, differences in mortality by cause between

married and unmarried persons are less marked than those for the same sex in the white population. Some of this leveling off of the mortality differentials by marital status for the population of races other than white may be attributable to misreporting of marital status. Similar to the pattern for white men, the only cause shown for which the standardized mortality ratio for all other single men was lower than that for all other married men was Malignant neoplasm of male genital organs. The 1959-61 age-specific death rates for this cause were higher for all other than for white men throughout most of the life span, beginning with about age 35 years. For men of races other than white there was a large reduction between 1949-51 and 1959-61 for each of the marital groups in mortality from Tuberculosis, all forms. But the 1959-61 death rate for this cause was still substantially higher for each marital class of all other men than for the corresponding group of white men. Among the causes for which increases in mortality were recorded for ever-married men of races other than white between 1949-51 and 1959-61 were Malignant neoplasm of digestive organs and peritoneum, Malignant neoplasm of respiratory system, Malignant neoplasm of male genital organs, Leukemia and aleukemia, Diabetes mellitus, Arteriosclerotic heart disease including coronary disease, Cirrhosis of liver, and Suicide.

REFERENCES

- ¹Moriyama, I. M.: Deaths from selected causes, by marital status, by age and sex: United States, 1940. *Vital Statistics—Special Reports* 23(7):118-165. Public Health Service. Washington, D.C., Nov. 1945.
- ²Shurtleff, D.: Mortality among the married. *J. Am. Geriatrics Soc.* 4(7):654-655, July 1956.
- ³Zalokar, J. B.: Marital status and major causes of death in women. *J. Chron. Dis.* 2(1):50-60, Jan. 1960.
- ⁴Sheps, M. C.: Marriage and mortality. *Am. J. Pub. Health* 51(4):547-555, Apr. 1961.
- ⁵U.S. Bureau of the Census: *United States Census of Population, 1960—United States Summary, Detailed Characteristics* PC(1)—ID, U.S., table 177. Washington. U.S. Government Printing Office, 1963.
- ⁶*The Official Catholic Directory, 1960.* United States Catholic Conference, Washington, D.C.
- ⁷Fecher, C. J.: The decline of tuberculosis death rates among Sisters. *America* 38:58-60, 1927.
- ⁸Fecher, C. J.: Health of the religious clergy. *Review for Religious* 23(3):316-327, May 1964.
- ⁹Fraumeni, J. F., et al: Cancer mortality among nuns: role of marital status in neoplastic disease in women. *J. Nat. Cancer Inst.* 42(3):455-468, Mar. 1969.
- ¹⁰The Surgeon General's Advisory Committee on Smoking and Health: *Smoking and Health.* PHS Pub. No. 1103. Public Health Service. Washington. U.S. Government Printing Office, 1964.
- ¹¹Haenszel, W., Shimkin, M. B., and Miller, H. P.: Tobacco smoking patterns in the United States. *Public Health Monograph No. 45.* PHS Pub. No. 463. Public Health Service. Washington. U.S. Government Printing Office, 1956. pp. 1-111. Fig. 20.
- ¹²Hammond, E., and Garfinkle, L.: Smoking habits of men and women. *J. Nat. Cancer Inst.* 27(2):419-442, Aug. 1961.
- ¹³Nix, J. T.: Study of the relationship of environmental factors to the type and frequency of cancer causing death in nuns, 1963. *Hospital Progress* 45(7):71-74, 1964.
- ¹⁴Taylor, R. S., Carroll, B. E., and Lloyd, J. W.: Mortality among women in three Catholic religious orders with special reference to cancer. *Cancer* 12:1207-1225, Nov.-Dec. 1959.
- ¹⁵MacMahon, B.: Breast cancer at menopausal ages: an explanation of observed incidence changes. *Cancer* 10(5):1037-1044, Sept.-Oct., 1957.
- ¹⁶Shimkin, M. B.: Cancer of the breast: some old facts and new prospectives. *J.A.M.A.* 183(5):358-361, Feb. 1963.
- ¹⁷Kraus, A. S., and Oppenheim, M. D.: Trend of mortality from cancer of the breast. *J.A.M.A.* 194(1):89-90.
- ¹⁸National Institutes of Health: *End Result in Cancer*, Report No. 3. U.S. Department of Health, Education, and Welfare, 1968.
- ¹⁹Clemmesen, J.: Carcinoma of the breast, results from statistical research (Symposium). *Brit. J. Radiol.* 21(251):583-590, 1948.
- ²⁰Clemmesen J., and Nielsen, A.: Age distribution figures for cancer in Danish towns and country 1943 to 1947. *Acta Unio.internat.contra cancerum* (Special) 8:160-179, 1952.
- ²¹Dorn, H. F., and Cutler, S. J.: Morbidity from cancer in the United States; Part 1. Variation in incidence by age, sex, race, marital status and geographic region. *Public Health Monograph No. 29.* Washington. U.S. Government Printing Office, 1955.
- ²²Anderson, E., et al.: Possible relationships between menopause and age at onset of breast cancer. *Cancer* 3:410-414, May 1950.
- ²³Gagnon, F.: Contribution to the study of etiology and prevention of cancer of the cervix of the uterus. *Am. J. Obst. & Gynec.* 60(3):516-522, 1950.
- ²⁴Gagnon, F.: The lack of occurrence of cervical carcinoma in Nuns, in *Proceedings of the Second National Cancer Conference.* New York. American Cancer Society, Inc., 1953. pp. 625-634.
- ²⁵Gagnon, F.: Marital status and pregnancy in the causation of cancer of the cervix uteri. *Schweiz. Z. Path. Bakt.* 18:755-764, 1955.
- ²⁶Denôix, P. F., and Moine, M.: Relations entre l'activité génitale et la fréquence des décès par cancer de l'utérus et du sein. *Bulletin de l'Institut National d'Hygiène.* 6(1):585-589, Jan.—Mar. 1951.

- ²⁷Logan, W. P. D.: Marriage and childbearing in relation to cancer of the breast and uterus. *Lancet* 2(6797):1199-1202, Dec. 1953.
- ²⁸Lilienfeld, A. M.: Possible existence of predisposing factors in the etiology of selected cancers of non-sexual sites in females: A preliminary inquiry. *Cancer* 9:111-122, 1956.
- ²⁹Lilienfeld, A. M.: The relation of cancer of the female breast to artificial menopause and marital status. *Cancer* 9(5):927-934, 1956.
- ³⁰*The Registrar-General's Decennial Supplement, England and Wales, 1931. Occupational Mortality.* Part IIA. London, His Majesty's Stationery Office, 1938. Tables. 405 pp.
- ³¹Adams, M. J. T., and Spicer, C. C.: Recent mortality from breast cancer. *Lancet* 2(7415):732-734, Oct. 1965.
- ³²Moore, F. D., et al: Carcinoma of the breast: a decade of new results of old concepts. *New England J. Med.* 277(6):293-296; 277(7):343-349; 277(8):411-416; and 277(9):460-467.
- ³³MacMahon, B.: Cohort fertility and increasing breast cancer incidence. *Cancer* 11(2):250-254, 1958.
- ³⁴MacMahon, B., and Feinleib, M.: Breast cancer in relation to nursing and menopausal history. *J.Nat.Cancer Inst.* 24(3):733-982, Mar. 1960.
- ³⁵Duffield, T. J., and Jacobson, P. H.: Cancer mortality and marital status: an analysis of death attributed to cancer among the white population of New York City during 1939-41. *J.Nat.Cancer Inst.* 6(2):103-112, Oct. 1945.
- ³⁶*The Registrar-General's Decennial Supplement, England and Wales, 1951. Occupational Mortality.* Vol. II, Part 2. London. Her Majesty Stationery Office, 1958. Tables.
- ³⁷Haenszel, W.: Cancer mortality among the foreign-born in the United States. *J.Nat.Cancer Inst.* 26(1):37-132, Jan. 1961.
- ³⁸Graham, S., Levin, M., and Lilienfeld, A. M.: The socioeconomic distribution of cancer of various sites in Buffalo, N. Y., 1948-1952. *Cancer* 13(1):180-191, Jan.-Feb. 1960.
- ³⁹Wynder, E. L., Bross, I. J., and Hirayama, T.: A study of the epidemiology of cancer of the breast. *Cancer* 13(3):559-601, May-June 1960.
- ⁴⁰Pascua, M.: Trends of female mortality from cancer of breast and cancer of genital organs. *Bull.World Health Organ.* 15:5-41, 1956.
- ⁴¹Levin, L., et al.: Lactation and menstrual functions as related to cancer of the breast. *Am.J.Pub.Health* 54(4):580-587, Apr. 1964.
- ⁴²Bailer, J. C., and Eisenberg, H.: Uterine tumors of unspecified origin. *Cancer* 18(5):589-591, May 1965.
- ⁴³Dorn, H. F., and Cutler, S. J.: Morbidity from cancer in the United States. *Public Health Monograph No. 56.* PHS Pub. No. 590. Public Health Service. Washington. U.S. Government Printing Office, 1959.
- ⁴⁴Sorby, M.: *Cancer and Race: A Study of the Incidence of Cancer Among Jews.* New York. William Wood and Company, 1931.
- ⁴⁵Wolff, G.: Cancer and race with special reference to Jews. *Am.J.Hyg.*, sect. A 29:121-137, May 1939.
- ⁴⁶Davidsohn, I.: *Medical Leaves*, 2(19), p. 19, 1939.
- ⁴⁷Sugar, M., and Levy, W. E.: Symposium on cancer; incidence of carcinoma of cervix in Jewish women. *New Orleans M. & S.J.* 103:424, Apr. 1951.
- ⁴⁸Kennaway, E. L.: The racial and social incidence of cancer of the uterus. *Brit.J.Cancer* 2(3):177-213, 1948.
- ⁴⁹Lundin, F. E., Erickson, C. C., and Sprunt, D. H.: Socioeconomic distribution of cervical cancer: in relation to early marriage and pregnancy. *Public Health Monographs No. 73.* PHS Pub. No. 1209. Public Health Service. Washington. U.S. Government Printing Office, 1964. pp. 1-41.
- ⁵⁰Wynder, E. L., et al: A study of environmental factors in carcinoma of the cervix. *Am.J.Obst. & Gynec.* 68(4):1016-1052, 1954.
- ⁵¹Terris, M., and Oalman, M. C.: Carcinoma of the cervix: an epidemiologic study. *J.A.M.A.* 174:1847-1851, Dec. 1960.
- ⁵²Jones, E. G., MacDonald, I., and Breslow, L.: A study of epidemiologic factors in carcinoma of the uterine cervix. *Am.J.Obst. & Gynec.* 76(1):1-10, 1958.
- ⁵³Rotkin, I. D., and King, R. W.: Environmental variables related to cervical cancer. *Am.J.Obst. & Gynec.* 83:720-728, Mar. 1962.
- ⁵⁴Dunham, L. J., et al: Some environmental factors and the development of uterine cancers in Israel and New York City. *Acta Unio internat.contra cancerum* 16:1689-1692, 1960.

- ⁵⁵Schonberg, L. A., et al: Cancer of the cervix in a Mexican population. *J.A.M.A.* 191(2):84-86, Jan. 1965.
- ⁵⁶Cornet, G.: Die Sterblichkeitsverhältnisse in den Krankenpflegeorden. *Z. Hyg.* 6:65-96, 1889.
- ⁵⁷National Academy of Science, National Research Council: *The Biologic Effects of Atomic Radiations: Summary Reports*. Washington, D.C., 1965; and Medical Research Council: *The Hazards to Man of Nuclear and Allied Radiations*. London. Her Majesty's Stationery Office, 1956.
- ⁵⁸Joslin, E. P., et al: *The Treatment of Diabetes Mellitus*. Philadelphia. Lea and Febiger, 1940. pp. 1-783.
- ⁵⁹National Center for Health Statistics: Characteristics of persons with diabetes, United States, July 1964-June 1965. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 10-No. 40. Washington. U.S. Government Printing Office, Oct. 1967. (Also unpublished tabulations based on data from the Health Interview Survey in the National Center for Health Statistics.)
- ⁶⁰Forsham, P. H., Renald, A. E., and Thorn, G. W.: Diabetes mellitus in *Principles of Internal Medicine*, 4th ed. New York. McGraw-Hill Book Company, 1962.
- ⁶¹Lew, E. A.: Some implications of mortality statistics relating to coronary artery disease. *J.Chron.Dis.* 6(3):192-209, Sept. 1957.
- ⁶²Terris, M.: Epidemiology of cirrhosis of the liver: national mortality data. *Am.J.Pub.Health.* 57(12):2076-2088, 1967.
- ⁶³Metropolitan Life Insurance Company: Cirrhosis of the liver and socioeconomic status. *Statistical Bulletin*, June, 1968. pp. 4-6.
- ⁶⁴Bayo', F.: Mortality and remarriage experience for widow beneficiaries under OASDI. *Proceeding of the Meeting of the St. Louis Society of Actuaries*, June 5-6, 1969.
- ⁶⁵Madigan, F. C., and Vance, R. B.: Differential sex mortality: a research design. *Social Forces* 35:193-199, 1957.
- ⁶⁶Madigan, F. C.: *The Differential Mortality of the Sexes, 1900-1954: Cultural and Biological Factors in the Diverging Life Chances of American Men and Women*. (Thesis) Chapel Hill. University of North Carolina, 1965.
- ⁶⁷Vance, R. B., and Madigan, F. C.: Differential mortality and the "style of life" of men and women: research design. *1965 Annual Conference of the Milbank Memorial Fund*. New York. Milbank Memorial Fund, 1956. pp. 150-163.
- ⁶⁸Madigan, F. C.: Are sex mortality differentials biologically caused? *Milbank Mem.Fund Quart* 35(2):202-223, Apr. 1957.
- ⁶⁹Madigan, F. C.: Role satisfactions and length of life in a closed population. *Am.J.Soc.* 67(6):640-649, May 1962.
- ⁷⁰Young, M., Benjamin, B., and Wallis, C.: The mortality of widowers. *Lancet* 2(7305):454-456, Aug. 1963.
- ⁷¹Spector, H. I.: Marital tuberculosis. *Am.Rev. Tuberc.* 40:147-156, July-Dec. 1939.
- ⁷²Paterson, J. F.: Tuberculosis in married couples. *Am.J.Hyg.* 32(3):67-78, Nov. 1940.
- ⁷³Kannel, W. B.: Cigarette smoking and coronary heart diseases. *Ann.Int.Med.* 60(6):1103-1106, June 1964.
- ⁷⁴Durkheim, E.: *Suicide, A Study in Sociology* trans. by John A. Spaulding and George Simpson. Glencoe, Ill. The Free Press, 1951. (1st ed. 1897. Translation made from edition under the supervision of Marcel Mauss in 1930.)
- ⁷⁵National Center for Health Statistics: The change in mortality trend in the United States. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 3-No. 1. Public Health Service. Washington, U.S. Government Printing Office, Mar. 1964. pp. 10-11.
- ⁷⁶Rosenwaike, I.: On measuring the extreme aged in the population. *American Statistical Association Journal* 63(321):29-40, Mar. 1968.
- ⁷⁷Stewart, H. L.: Epidemiology of cancers of uterine cervix and corpus, breast, and ovary in Israel and New York City. *J.Nat.Cancer Inst.* 37:1-95, 1966.
- ⁷⁸Siegel, J. S.: Completeness of Coverage of the Non-white Population in the 1960 Census and Current Estimates, and Some Implications. U.S. Bureau of the Census (mimeographed). Prepared for presentation at the Conference of Social Statistics and the City, June 22-23, 1967, by the Joint Center for Urban Studies of the Massachusetts Institute of Technology and Harvard University.
- ⁷⁹U.S. Bureau of the Census: *U.S. Census of Population: 1960, Vol. 1, Characteristics of the Population, Part 1, United States Summary*, Washington. U.S. Government Printing Office, 1964. p. xxxix.
- ⁸⁰Akers, D. S.: Smudges on the Census Schedule. Paper presented at the meeting of the American Statistical Association, Washington, D. C., Dec. 30, 1967.

⁸¹National Office of Vital Statistics: The comparability of reports on occupation from vital records and the 1950 census, by D. L. Kaplan, E. Parkhurst, and P. K. Whelpton. *Vital Statistics—Special Reports*, Vol. 53, No. 1. Washington, D.C. Public Health Service, June 1961.

⁸²U.S. Bureau of the Census: *Evaluation and Research Program of the U.S. Censuses of Population and Housing, 1960, Accuracy of Data on Population Characteristics as Measured by CPS-Census Match*. Series ER60, No. 5. Washington. U.S. Government Printing Office, 1964.

⁸³Kitagawa, E. M., and Hauser, P. M.: Methods used in a current study of social and economic differentials in mortality. *Emerging Techniques in Population Research, Proceedings of the 1962 Annual Conference of the Milbank Memorial Fund*. New York. Milbank Memorial Fund. The deaths matched in this study were a sample of those occurring in May-August, 1960.

⁸⁴National Center for Health Statistics: Comparability of marital status, race, nationality and country of origin, on the death certificate and matching census record: United States, May-August 1960. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 2-No. 34. Public Health Service. Washington. U.S. Government Printing Office.

⁸⁵U.S. Bureau of the Census: *U.S. Census of Population: 1960, Subject Reports, Marital Status*. Final Report PC(2)-4E. Washington. U.S. Government Printing Office, 1966. Table E. p. 11.

⁸⁶National Center for Health Statistics: Comparability of age on the death certificate and matching census record, United States, May-August 1960. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 2-No. 29. Public Health Service. Washington. U.S. Government Printing Office, June 1968.



Table 16. Comparison of age-adjusted death rates¹ for women of races other than white for selected causes of death, by marital status: United States, 1949-51 and 1959-61

[Numbers after causes of death are category numbers of the Seventh Revision of the International Lists, 1955]

Cause of death	Single		Ever married							
			Total		Married		Widowed		Divorced	
	1959-61	1949-51	1959-61	1949-51	1959-61	1949-51	1959-61	1949-51	1959-61	1949-51
All causes-----	405.4	606.8	1,270.3	1,547.6	684.4	930.4	3,893.1	4,115.1	1,072.4	1,447.3
Tuberculosis, all forms-----001-019	11.0	86.8	12.7	60.7	9.6	56.1	24.0	69.6	20.4	93.8
Malignant neoplasm of digestive organs and peritoneum-----150-159	13.7	16.8	60.1	62.6	32.7	37.8	181.8	165.4	53.8	67.3
Malignant neoplasm of respiratory system-----160-164	2.3	2.0	9.0	6.4	5.5	4.3	23.0	14.7	13.2	11.7
Malignant neoplasm of breast-----170	9.3	9.7	31.8	29.4	22.9	20.8	69.5	62.0	36.8	38.4
Malignant neoplasm of female genital organs-----171-176	15.9	21.0	54.1	69.3	36.6	50.0	127.2	142.5	67.1	90.5
Leukemia and aleukemia-----204	1.9	2.4	4.9	3.1	3.6	2.8	10.5	4.4	5.6	5.4
Diabetes mellitus-----260	11.1	9.8	41.1	35.3	24.6	24.1	115.6	83.9	32.0	25.9
Vascular lesions affecting central nervous system-----330-334	46.4	59.1	221.2	250.0	102.0	134.9	766.1	738.8	137.8	194.5
Arteriosclerotic heart disease, including coronary disease-----420	51.8	47.9	238.0	180.6	103.9	93.4	846.3	550.3	162.5	147.3
Cirrhosis of liver-----581	7.9	4.2	13.3	8.5	10.3	6.3	22.5	16.4	27.0	12.0
Motor vehicle accidents-----E810-E835	12.6	13.4	11.8	11.9	10.3	10.1	17.2	17.5	17.7	18.6
All other accidents-E800-E802, E840-E962	14.4	16.5	24.8	28.6	14.6	16.8	68.7	77.8	26.5	31.9
Suicide-----E970-E979	2.2	1.9	3.1	2.3	2.6	2.3	4.8	2.1	5.2	5.2
Homicide-----E964, E980-E985	11.6	13.7	13.7	14.1	13.7	14.3	10.6	8.5	25.0	28.6

¹For each of the marital classes the standard population used to obtain the 1949-51 age-adjusted rates was 3 times the 1960 female population of races other than white in the specified marital group, classified in the same age groups as those for which age-specific rates are shown in table 3. The death rate for 1959-61 serves as both the crude rate and as the age-adjusted death rate for comparison with the age-adjusted rate for 1949-51.

Table 17. Standardized marital status-mortality ratios¹ for women of races other than white for selected causes of death: United States, 1959-61

[Numbers after causes of death are category numbers of the Seventh Revision of the International Lists, 1955]

Cause of death	Single ² (compared with married)	Single ^{2,3} (compared with ever married)	Married	Widowed	Divorced
All causes-----	136	112	100	173	140
Tuberculosis, all forms----001-019	257	219	100	166	198
Malignant neoplasm of digestive organs and peritoneum-----150-159	125	103	100	153	144
Malignant neoplasm of respiratory system-----160-164	137	113	100	141	205
Malignant neoplasm of breast---170	130	116	100	141	138
Malignant neoplasm of female genital organs-----171-176	135	115	100	154	159
Leukemia and aleukemia-----204	108	95	100	146	146
Diabetes mellitus-----260	121	108	100	130	114
Vascular lesions affecting central nervous system-----330-334	124	95	100	174	119
Arteriosclerotic heart disease, including coronary disease---420	143	104	100	180	137
Cirrhosis of liver-----581	225	187	100	184	230
Motor vehicle accidents--E810-E835	127	118	100	150	173
All other accidents-----E800-E802, E840-E962	137	117	100	196	173
Suicide-----E970-E979	104	252	100	248	204
Homicide-----E964, E980-E985	75	71	100	175	192

¹The standardized mortality ratios are expressed, after adjustment for age by the indirect method, in terms of the corresponding cause-specific death rates for married women of races other than white.

²The SMR's for the single group have been corrected by removing from the population aged 55-59 years, the 21,000 "mistallied Indians." For details of revision see appendix.

³The second SMR for the single group is expressed in terms of the death rates for the ever married group. Data refer to female persons of races other than white 15 years of age and over.

Table 18. Death rates for tuberculosis, all forms (ICD Nos. 001-019) for women, of races other than white, by birth cohort and age at death: death rates at 5-year intervals, 1914-64

[Rates per 100,000 population in age group]

Age at death	Cohort and period of birth														
	1940-1944	1935-1939	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894	1885-1889	1880-1884	1875-1879	1870-1874
15-19 years----	2.2	10.0	58.5	113.2	162.1	195.6	243.6	229.7	268.6	138.1					
20-24 years----	3.0	5.9	16.7	105.7	192.3	220.3	281.2	331.6	348.8	355.5	184.9				
25-29 years----		5.1	9.4	28.5	109.7	159.3	221.7	262.7	334.4	289.8	348.4	193.3			
30-34 years----			6.8	16.2	26.0	98.0	145.8	171.6	236.2	240.2	211.9	299.5	183.2		
35-39 years----				10.6	17.9	28.4	76.4	107.2	138.4	170.9	210.8	221.7	240.4	149.6	
40-44 years----					11.3	16.2	26.8	75.5	104.5	126.2	161.1	179.0	163.7	219.4	154.8
45-49 years----						10.6	14.5	25.4	77.6	80.8	116.3	143.9	165.6	175.9	185.9
50-54 years----							9.8	17.6	31.6	55.6	74.7	111.0	148.0	167.9	171.2
55-59 years----								11.1	19.0	26.1	55.4	70.1	115.9	136.6	144.4
60-64 years----									12.7	25.0	24.2	72.2	69.7	97.2	139.5
65-69 years----										21.7	23.3	28.8	53.0	77.6	76.6
70-74 years----											16.7	25.1	33.1	42.5	65.3
75-79 years----												31.9	29.6	38.2	73.8
80-84 years----													22.5	30.2	42.0

NOTE: At ages 20-45 years the first figure in each row, moving from right to left, is the death rate for data year 1914, the second figure for 1919, the third figure for 1924, and the last figure for 1964. At ages 15-19 years the last figure is for 1959.

Table 19. Death rates for cirrhosis of liver (ICD No. 581) for women, of races other than white, by birth cohort and age at death: death rates at 5-year intervals, 1914-64

[Rates per 100,000 population in age group]

Age at death	Cohort and period of birth														
	1940-1944	1935-1939	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894	1885-1889	1880-1884	1875-1879	1870-1874
20-24 years----	2.0	1.8	0.9	0.6	1.0	0.8	2.3	0.9	2.1	0.9	1.0				
25-29 years----		6.8	6.9	3.2	2.6	2.3	1.4	1.8	1.1	1.7	3.6	1.2			
30-34 years----			16.9	11.8	5.3	3.9	3.9	2.6	3.4	3.1	2.7	2.6	4.3		
35-39 years----				22.9	14.2	11.4	6.1	4.6	4.9	6.6	5.2	2.7	3.5	4.4	
40-44 years----					29.8	19.2	12.1	10.8	10.4	8.9	8.7	9.6	5.1	5.9	5.8
45-49 years----						24.5	22.8	16.2	11.2	6.1	8.5	12.4	8.0	11.1	11.1
50-54 years----							25.9	21.2	16.9	13.6	12.2	14.1	14.7	18.3	14.1
55-59 years----								21.9	22.6	16.0	11.7	17.0	18.9	12.0	14.8
60-64 years----									17.2	17.1	15.4	11.1	15.4	12.5	23.2
65-69 years----										20.1	11.1	11.0	13.1	19.6	18.6
70-74 years----											6.8	12.6	12.4	14.2	4.2
75-79 years----												12.6	11.1	11.8	8.2
80-84 years----													6.3	13.2	4.0

NOTE: At ages 20-45 years the first figure in each row, moving from right to left, is the death rate for data year 1914, the second figure for 1919, the third figure for 1924, and the last figure for 1964.

Table 20. Death rates for specified causes for women of races other than white, by birth cohort and age at death: United States, 1949, 1954, 1959, and 1964

[Numbers after causes of death are category numbers of the Seventh Revision of the International Lists, 1955]

Cause of death and age	Cohort and period of birth														
	1940-1944	1935-1939	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894	1885-1889	1880-1884	1875-1879	1870-1874
<u>Malignant neoplasm of breast (170)</u>	Rates per 100,000 population in age group														
20-24 years-----	0.4	0.3	0.7	0.6											
25-29 years-----		2.4	2.6	2.7	2.3										
30-34 years-----			8.9	8.3	10.7	9.0									
35-39 years-----				18.0	15.7	18.2	13.9								
40-44 years-----					25.4	28.5	44.8	22.9							
45-49 years-----						47.8		44.4							
50-54 years-----								39.1							
55-59 years-----								48.0	47.5						
60-64 years-----								63.3	57.9	60.0					
65-69 years-----								76.6	71.6	67.5	54.2				
70-74 years-----									80.3	55.0	57.6	65.5			
75-79 years-----										71.9	81.7	73.1	55.8		
80-84 years-----											74.1	81.1	82.9	78.7	68.0
												92.5	81.1		
													92.5		
<u>Malignant neoplasm of genital organs (171-176)</u>															
20-24 years-----	2.0	1.8	3.0	3.3											
25-29 years-----		4.1	7.9	7.4	9.0										
30-34 years-----			11.9	12.9	16.2	25.5									
35-39 years-----				24.4	30.8	33.6	48.6								
40-44 years-----					38.6	47.8	58.7	74.3							
45-49 years-----						57.8	69.4	85.5	104.7						
50-54 years-----							82.2	87.9	112.8	119.8					
55-59 years-----								91.5	117.2	120.8	134.6				
60-64 years-----									126.6	124.0	154.6	144.9			
65-69 years-----										155.1	131.3	111.4	159.5		
70-74 years-----											121.7	117.7	133.1	154.0	
75-79 years-----												123.0	125.0	152.6	150.8
80-84 years-----													116.3	147.2	116.0
<u>Malignant neoplasm of cervix uteri (171)</u>															
20-24 years-----	0.6	0.7	1.5	1.4											
25-29 years-----		2.8	5.1	4.9	5.5										
30-34 years-----			8.6	9.1	11.4	16.1									
35-39 years-----				15.2	23.4	21.9	28.8								
40-44 years-----					26.0	31.2	38.1	42.2							
45-49 years-----						35.3	42.8	48.3	53.7						
50-54 years-----							42.2	46.7	58.6	55.9					
55-59 years-----								42.5	60.5	56.0	58.6				
60-64 years-----									61.0	46.9	67.5	55.6			
65-69 years-----										70.9	64.5	47.5	53.0		
70-74 years-----											52.0	49.7	55.9	62.8	
75-79 years-----												47.4	56.5	55.3	65.6
80-84 years-----													60.0	56.6	52.0
<u>Leukemia and aleukemia (204)</u>															
20-24 years-----	0.9	1.9	1.0	1.4											
25-29 years-----		1.7	1.6	0.7	1.6										
30-34 years-----			1.7	2.4	1.9	2.3									
35-39 years-----				2.3	2.8	3.0	2.3								
40-44 years-----					1.3	5.7	2.9	3.1							
45-49 years-----						4.9	3.7	7.1	3.6						
50-54 years-----							6.3	6.0	6.0	4.5					
55-59 years-----									11.0	5.7	5.0				
60-64 years-----										11.0	9.2	2.8			
65-69 years-----											16.1	6.9	8.1	3.0	
70-74 years-----												13.1	9.7	6.9	4.4
75-79 years-----													11.9	4.6	7.9
80-84 years-----														15.0	17.0
															8.0

NOTE: Except for the age group 80-84 years the first figure in each row, moving from right to left, is the death rate for data year 1949, the second figure for 1954, the third figure for 1959, and the fourth figure for 1964. For the age group 80-84 years the first figure is for 1954.

Table 20. Death rates for specified causes for women of races other than white, by birth cohort and age at death: United States, 1949, 1954, 1959, and 1964--Con.

[Numbers after causes of death are category numbers of the Seventh Revision of the International Lists, 1955]

Cause of death and age	Cohort and period of birth														
	1940-1944	1935-1939	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894	1885-1889	1880-1884	1875-1879	1870-1874
<u>Diabetes mellitus (260)</u>	Rates per 100,000 population in age group														
20-24 years-----	1.3	1.2	1.0	2.9											
25-29 years-----		2.8	3.1	2.5	3.3										
30-34 years-----			4.2	3.7	3.5	5.3									
35-39 years-----				6.4	6.7	5.9	8.9								
40-44 years-----					15.9	16.5	15.2	20.0							
45-49 years-----						33.3	29.4	47.8	35.3	56.4					
50-54 years-----							53.6	82.1	86.4	56.4	73.9				
55-59 years-----								91.3	153.7	119.9	93.3	95.8			
60-64 years-----										174.8	125.6	88.1	113.7		
65-69 years-----											176.0	129.1	128.3	120.4	
70-74 years-----												183.0	157.4	111.8	126.2
75-79 years-----													150.0	139.6	80.0
80-84 years-----															
<u>Vascular lesions affecting central nervous system (330-334)</u>															
20-24 years-----	4.6	5.4	3.8	2.9											
25-29 years-----		11.0	7.3	9.7	9.6										
30-34 years-----			19.2	20.4	20.6	23.0									
35-39 years-----				38.1	37.8	45.5	49.6								
40-44 years-----					69.3	80.2	97.1	114.3							
45-49 years-----						105.9	125.9	171.6	190.6						
50-54 years-----							193.0	216.7	284.6	309.5					
55-59 years-----								278.5	354.1	387.7	426.8				
60-64 years-----									504.0	521.9	583.8	609.7			
65-69 years-----										727.6	719.5	660.2	791.7		
70-74 years-----											878.3	972.0	933.1	966.4	
75-79 years-----												1134.8	1261.1	1182.9	1298.4
80-84 years-----													1493.8	1754.7	1392.0
<u>Arteriosclerotic heart disease including coronary disease (420)</u>															
20-24 years-----	2.4	3.1	3.7	3.2											
25-29 years-----		4.1	5.9	4.6	6.2										
30-34 years-----			15.5	11.5	15.2	14.6									
35-39 years-----				32.5	27.5	31.4	27.9								
40-44 years-----					62.4	62.0	70.6	68.6							
45-49 years-----						114.2	122.0	120.7	129.8						
50-54 years-----							226.1	231.9	228.2	212.8					
55-59 years-----								367.5	368.7	309.4	289.3				
60-64 years-----									648.3	546.9	501.3	393.1			
65-69 years-----										973.2	705.3	571.6	575.0		
70-74 years-----											1118.1	1025.7	778.6	687.6	
75-79 years-----												1500.0	1275.0	1115.8	944.3
80-84 years-----													1873.8	1850.9	1186.0
<u>Homicide (E964, E980-E985)</u>															
20-24 years-----	15.5	16.8	18.0	24.5											
25-29 years-----		21.8	21.6	22.2	22.5										
30-34 years-----			19.2	24.2	19.5	22.8									
35-39 years-----				20.6	21.7	17.6	20.5								
40-44 years-----					18.1	16.3	15.1	15.1							
45-49 years-----						11.3	10.8	14.5	12.3						
50-54 years-----							9.7	7.1	10.1	8.7					
55-59 years-----								8.5	7.7	3.5	6.1				
60-64 years-----									4.8	3.8	1.3	6.5			
65-69 years-----										4.7	3.4	3.8	3.0		
70-74 years-----											3.6	4.6	6.2	3.5	
75-79 years-----												0.7	2.8	5.3	8.2
80-84 years-----													1.3	1.9	12.0

NOTE: Except for the age group 80-84 years the first figure in each row, moving from right to left, is the death rate for data year 1949, the second figure for 1954, the third figure for 1959, and the fourth figure for 1964. For the age group 80-84 years the first figure is for 1954.

Table 21. Comparison of age-adjusted death rates¹ for men of races other than white for selected causes of death, by marital status: United States, 1949-51 and 1959-61

[Numbers after causes of death are category numbers of the Seventh Revision of the International Lists, 1955]

Cause of death	Single		Ever married							
			Total		Married		Widowed		Divorced	
	1959-61	1949-51	1959-61	1949-51	1959-61	1949-51	1959-61	1949-51	1959-61	1949-51
All causes-----	743.6	1,038.6	1,762.0	1,910.1	1,335.9	1,491.8	7,004.8	6,670.9	2,972.4	3,116.2
Tuberculosis, all forms-----001-019	22.2	129.7	30.3	102.4	22.6	85.5	107.6	234.8	84.5	266.2
Malignant neoplasm of digestive organs and peritoneum-----150-159	29.8	37.8	105.2	97.0	83.9	79.6	366.2	299.0	165.5	150.2
Malignant neoplasm of respiratory system-----160-164	18.3	13.3	58.4	27.8	47.6	23.2	169.8	72.0	130.3	59.5
Malignant neoplasm of male genital organs-----177-179	6.9	7.0	40.6	31.8	29.6	24.5	189.2	124.4	45.9	41.1
Leukemia and aleukemia-----204	3.2	3.2	7.2	5.1	6.4	4.6	17.2	10.8	8.1	10.0
Diabetes mellitus-----260	9.1	9.2	25.1	18.3	19.9	15.4	89.0	53.7	40.8	23.5
Vascular lesions affecting central nervous system-----330-334	56.8	74.2	233.2	241.6	170.4	185.8	1,064.4	915.6	299.5	326.3
Arteriosclerotic heart disease, including coronary disease-----420	110.1	111.4	375.8	266.2	276.6	202.5	1,646.5	1,003.9	563.1	437.9
Cirrhosis of liver-----581	15.8	11.4	20.3	13.0	15.7	10.9	53.8	31.3	77.2	34.6
Motor vehicle accidents-----E810-E835	53.7	53.6	44.4	48.1	40.7	44.1	72.1	77.9	88.9	89.8
All other accidents-E800-E802,E840-E962	68.5	81.4	61.2	67.5	50.6	56.3	169.8	171.0	132.1	148.5
Suicide-----E970-E979	10.8	10.0	12.2	9.9	10.8	8.8	24.1	17.0	25.5	24.3
Homicide-----E964,E980-E985	57.2	68.9	49.6	56.9	45.8	54.4	59.3	51.1	129.7	133.3

¹For each of the marital classes the standard population used to obtain the 1949-51 age-adjusted rates was 3 times the 1960 male population of races other than white in the specified marital group classified in the same age groups as those for which age-specific rates are shown in table 3. The death rate for 1959-61 serves as both the crude rate and as the age-adjusted death rate for comparison with the age-adjusted rate for 1949-51.

Table 22. Standardized marital status-mortality ratios¹ for men of races other than white for selected causes of death: United States, 1959-61

[Numbers after causes of death are category numbers of the Seventh Revision of the International Lists, 1955]

Cause of death	Single ² (compared with married)	Single ^{2,3} (compared with ever married)	Married	Widowed	Divorced
All causes-----	152	136	100	182	212
Tuberculosis, all forms----001-019	312	257	100	227	348
Malignant neoplasm of digestive organs and peritoneum----150-159	140	127	100	147	186
Malignant neoplasm of respiratory system-----160-164	153	136	100	156	250
Malignant neoplasm of male genital organs-----177-179	92	83	100	142	155
Leukemia and aleukemia-----204	127	118	100	110	123
Diabetes mellitus-----260	147	133	100	154	195
Vascular lesions affecting central nervous system-----330-334	129	112	100	174	169
Arteriosclerotic heart disease, including coronary disease---420	157	135	100	182	193
Cirrhosis of liver-----581	338	273	100	245	449
Motor vehicle accidents--E810-E835	115	111	100	171	223
All other accidents-----E800-E802,E840-E962	153	142	100	253	256
Suicide-----E970-E979	191	135	100	219	236
Homicide-----E964,E980-E985	105	100	100	248	296

¹The standardized mortality ratios are expressed after adjustment for age by the indirect method in terms of the corresponding cause-specific death rates for married men of races other than white.

²Data refer to male persons of races other than white 15 years of age and over. The SMR's for the single group have been corrected by removing from the population aged 55-59 years the 21,000 "mistallied Indians."

³The second SMR for the single group is expressed in terms of the death rates for the ever married groups.

Table 23. Death rates for tuberculosis, all forms (ICD Nos. 001-019) for men of races other than white, by birth cohort and age at death: Death rates at 5-year intervals, 1914-64

[Rates per 100,000 population in age group]

Age at death	Cohort and period of birth														
	1940-1944	1935-1939	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894	1885-1889	1880-1884	1875-1879	1870-1874
15-19 years----	0.7	5.0	39.0	81.8	99.0	133.3	154.8	148.5	185.3	115.7					
20-24 years----	2.4	3.0	9.4	82.0	192.1	179.1	239.5	284.4	294.6	329.6	201.5				
25-29 years----		5.3	10.5	23.5	91.2	172.0	199.8	265.9	304.2	292.9	304.9				
30-34 years----			10.2	20.2	27.3	101.1	189.9	214.0	274.9	265.1	236.1	305.3	235.5		
35-39 years----				16.7	21.0	37.6	123.5	166.9	211.4	262.4	257.7	259.3	264.6	224.3	
40-44 years----					18.9	27.1	52.5	156.7	200.7	224.4	267.7	259.4	208.8	280.8	236.0
45-49 years----						30.2	38.2	64.7	174.1	188.9	220.6	239.4	222.3	205.2	
50-54 years----							33.0	55.9	84.3	196.5	222.7	223.1	243.0	223.6	207.0
55-59 years----								45.9	64.9	96.6	187.5	177.5	187.2	212.3	199.0
60-64 years----									50.9	64.6	100.4	179.1	165.7	180.7	219.3
65-69 years----										79.5	70.5	88.5	178.9	151.6	147.1
70-74 years----											78.9	85.5	111.9	131.6	123.0
75-79 years----												75.9	85.9	109.0	160.3
80-84 years----													52.9	95.6	97.6

NOTE: At ages 20-45 years the first figure in each row, moving from right to left, is the death rate for data year 1914, the second figure for 1919, the third figure for 1924, and the last figure for 1964. At ages 15-19 years the last figure is for 1959.

Table 24. Death rates for cirrhosis of liver (ICD No. 581) for men of races other than white, by birth cohort and age at death: Death rates at 5-year intervals, 1914-64

[Rates per 100,000 population in age group]

Age at death	Cohort and period of birth														
	1940-1944	1935-1939	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894	1885-1889	1880-1884	1875-1879	1870-1874
20-24 years----	1.5	1.2	0.8	0.5	0.3	0.5	1.0	2.2	0.6	1.0	0.2				
25-29 years----		6.1	3.4	4.1	2.7	1.0	1.4	2.8	3.3	2.9	2.5				
30-34 years----			18.6	14.2	5.8	3.8	2.5	3.8	4.9	3.1	4.8	4.5	5.1		
35-39 years----				34.9	19.7	10.0	9.3	5.5	4.9	9.2	8.9	7.5	5.2	9.4	
40-44 years----					40.7	23.4	17.4	14.4	9.9	13.2	13.9	15.6	8.3	11.8	13.8
45-49 years----						51.7	31.3	17.4	17.0	14.0	15.1	19.0	19.9	14.4	11.7
50-54 years----							47.3	38.3	26.2	22.3	22.3	25.3	22.4	33.6	29.7
55-59 years----								47.9	38.5	35.9	29.6	35.9	31.6	31.9	20.8
60-64 years----									50.9	35.4	26.8	27.0	28.0	22.7	33.5
65-69 years----											42.4	33.3	30.7	27.9	45.3
70-74 years----												31.9	35.8	22.4	28.9
75-79 years----													32.8	20.2	23.1
80-84 years----														20.6	17.8

NOTE: At ages 20-45 years the first figure in each row, moving from right to left, is the death rate for data year 1914, the second figure for 1919, the third figure for 1924, and the last figure for 1964.

Table 25. Death rates for specified causes for men of races other than white, by birth cohort and age at death: United States, 1949, 1954, 1959, and 1964

[Numbers after causes of death are category numbers of the Seventh Revision of the International Lists, 1955]

Cause of death and age	Cohort and period of birth														
	1940-1944	1935-1939	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894	1885-1889	1880-1884	1875-1879	1870-1874
Rates per 100,000 population in age group															
<u>Malignant neoplasm of respiratory system (160-164)</u>															
20-24 years-----	0.4	0.3	0.8	1.1											
25-29 years-----		1.0	1.2	1.4	0.5										
30-34 years-----			3.8	3.1	3.5	2.2									
35-39 years-----				14.1	11.0	7.1	6.5								
40-44 years-----					35.1	26.7	18.1	14.4							
45-49 years-----						53.8	49.7	36.8	23.9						
50-54 years-----							113.3	78.7	67.3	49.0					
55-59 years-----								157.6	125.7	92.0					
60-64 years-----									196.8	162.4	60.6				
65-69 years-----										258.0	166.2	70.2			
70-74 years-----											199.5	95.4	67.9		
75-79 years-----												135.8	100.7	48.2	
80-84 years-----												165.2	128.3	80.8	68.2
													111.8	117.8	78.0
<u>Malignant neoplasm of genital organs (177-179)</u>															
20-24 years-----	0.1	0.3	0.0	0.2											
25-29 years-----		0.3	0.3	0.5	0.5										
30-34 years-----			0.7	0.3	0.5	1.1									
35-39 years-----				1.3	1.3	1.4	2.0								
40-44 years-----					2.3	2.9	2.1	4.3							
45-49 years-----						6.6	5.3	7.1	6.1						
50-54 years-----							15.4	15.4	20.2	20.8					
55-59 years-----								28.7	43.2	48.3	21.0				
60-64 years-----									85.5	81.8	46.0				
65-69 years-----										181.3	106.4	75.1			
70-74 years-----											122.0	108.8			
75-79 years-----											235.2	214.9	128.9		
80-84 years-----											320.7	277.8	251.3	236.5	
												370.6	386.7	300.0	
<u>Leukemia and aleukemia (204)</u>															
20-24 years-----	1.9	1.2	2.1	2.0											
25-29 years-----		3.2	2.2	2.4	1.8										
30-34 years-----			2.8	2.8	3.8	2.2									
35-39 years-----				3.1	2.1	2.7	3.4								
40-44 years-----					4.1	3.5	3.7								
45-49 years-----						4.3	4.8	3.7							
50-54 years-----							8.2	5.1	3.6						
55-59 years-----								8.1	9.0	3.5					
60-64 years-----									10.5	9.7	10.8				
65-69 years-----										17.8	16.1	8.0			
70-74 years-----											25.9	19.3	9.9		
75-79 years-----												23.2	20.1	9.6	
80-84 years-----												25.9	21.4	16.7	9.5
													29.3	24.2	12.2
														26.5	31.1
<u>Diabetes mellitus (260)</u>															
20-24 years-----	2.3	1.2	1.9	2.3											
25-29 years-----		2.9	3.9	2.4	4.5										
30-34 years-----			4.4	4.4	3.5	3.8									
35-39 years-----				8.7	5.3	4.8	4.3								
40-44 years-----					12.8	6.2	8.2	7.1							
45-49 years-----						18.1	18.6	8.2	7.1						
50-54 years-----							31.4	13.4	14.1						
55-59 years-----								26.9	20.8	20.2					
60-64 years-----								44.4	40.6	27.9	30.3				
65-69 years-----									76.9	59.9	52.8	39.1			
70-74 years-----										100.0	72.2	51.8	55.6		
75-79 years-----											105.4	95.6	73.1	71.9	
80-84 years-----											118.1	96.0	80.8	69.8	
												139.7	124.4	56.1	

NOTE: Except for the age group 80-84 years the first figure in each row, moving from right to left, is the death rate for data year 1949, the second figure for 1954, the third figure for 1959, and the fourth figure for 1964. For the age group 80-84 years the first figure is for 1954.

Table 25. Death rates for specified causes for men of races other than white, by birth cohort and age at death: United States, 1949, 1954, 1959, and 1964—Con.

[Numbers after causes of death are category numbers of the Seventh Revision of the International Lists, 1955]

Cause of death and age	Cohort and period of birth														
	1940-1944	1935-1939	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894	1885-1889	1880-1884	1875-1879	1870-1874
<u>Vascular lesions affecting central nervous system (330-334)</u>	Rates per 100,000 population in age group														
20-24 years-----	3.4	3.3	4.7	5.3	8.0										
25-29 years-----		8.4	6.6	9.1	15.3	17.4									
30-34 years-----			17.2	15.7	34.5	35.2	40.0								
35-39 years-----				34.5	61.9	68.1	76.4	75.0							
40-44 years-----						108.3	121.2	127.9	148.6						
45-49 years-----							190.0	198.8	249.2	265.9					
50-54 years-----								301.2	329.1	354.5	403.1				
55-59 years-----									485.8	540.1	581.7	536.9			
60-64 years-----										806.3	743.5	695.0	788.9		
65-69 years-----											1023.2	1044.7	948.5	871.9	
70-74 years-----												1253.4	1275.8	1252.6	1215.9
75-79 years-----													1486.8	1677.8	1429.3
80-84 years-----															
<u>Arteriosclerotic heart disease including coronary disease (420)</u>															
20-24 years-----	3.1	2.6	2.6	4.0	8.0										
25-29 years-----		12.5	7.8	9.1	8.0	20.0									
30-34 years-----			26.3	27.7	20.6	48.8	40.0								
35-39 years-----				67.3	58.1	84.8	101.0								
40-44 years-----					145.3	124.4	107.1	101.0							
45-49 years-----						238.7	224.2	193.8	195.2						
50-54 years-----							405.5	386.5	358.8	327.8					
55-59 years-----								646.4	592.9	525.4	458.9				
60-64 years-----									944.4	887.2	794.0	540.4			
65-69 years-----										1509.8	1146.4	886.2	777.8		
70-74 years-----											1718.4	1505.7	1192.5	915.8	
75-79 years-----												1953.4	1766.7	1496.2	1279.4
80-84 years-----													2283.8	2486.7	1846.3
<u>Homicide (E964, E980-E985)</u>															
20-24 years-----	75.1	73.1	75.6	87.1	102.4										
25-29 years-----		90.2	83.3	97.1	92.6	92.9									
30-34 years-----			89.0	85.2	98.1	76.1	88.5								
35-39 years-----				98.1	75.5	70.3	78.4	88.5							
40-44 years-----						70.3	73.8	75.2							
45-49 years-----						62.5	57.6	66.7	62.3						
50-54 years-----							53.3	43.9	47.7	52.0					
55-59 years-----								34.2	33.2	36.8	41.8				
60-64 years-----									35.2	27.4	28.1	18.7			
65-69 years-----										25.0	22.4	22.9	18.7		
70-74 years-----											17.3	12.6	14.9	17.5	
75-79 years-----												19.0	16.2	19.2	19.0
80-84 years-----													7.4	13.3	7.3

NOTE: Except for the age group 80-84 years the first figure in each row, moving from right to left, is the death rate for data year 1949, the second figure, for 1954, the third figure for 1959, and the fourth figure for 1964. For the age group 80-84 years the first figure is for 1954.

APPENDIX

EARLIER DATA ON MORTALITY BY MARITAL STATUS

The first of the special reports on marital status was Bulletin 109, issued by the Bureau of the Census in 1912, and entitled *Mortality Statistics: 1910*. This report shows deaths by marital status (single, married, widowed, divorced, and unknown) for the District of Columbia and each of the 21 registration States of 1910. These figures are also shown for each registration city of 250,000 or more in 1910; and for the aggregate of cities in all registration States, and the aggregate of rural parts of all registration States. Many of these early bulletins practically constituted preprints of what was later put into the annual reports. But these figures by marital status were not included in the annual report for 1910.

The 52,420 deaths reported in the registration area in 1914 attributed to "cancer and other malignant tumors" was the subject of another of these reports issued by the Bureau of the Census in 1916, entitled *Mortality From Cancer and Other Malignant Tumors in the Registration Area of the United States, 1914*. In this report, deaths were cross-tabulated by marital status in table 5, "Deaths from cancer and other malignant tumors, in the registration States, of single, married, widowed, and divorced persons, and to those of unknown conjugal condition, by sex, age, color, general nativity, and parent nativity: 1914."

A study of deaths from all causes and from influenza and pneumonia during the last 4 months of 1918, occurring in Indiana and Kansas and the City of Philadelphia (excluding deaths in the armed forces) was published by the Bureau of the Census in 1920, under the title *Special Tables of Mortality From Influenza and Pneumonia, in Indiana, Kansas, and Philadelphia, Pennsylvania, September 1 to December 31, 1918*. This group of deaths is cross-tabulated by marital status in table 3.

The Bureau of the Census made annual tabulations of deaths in the death-registration area, by sex, age, and marital condition for each of the years 1924-28. These were put at the disposal of Walter F. Wilcox, who used these deaths, together with the population as enumerated in the census of 1920 and 1930, as the basis for the first study of death rates by marital status for the United States. This study constitutes Chapter XIII of his notable monograph *Introduction to the Vital Statistics of the United States (1900-1930)*. The study shows

death rates by age, sex, and marital condition, separately for 1924, and for 1924-28, for the aggregate of death registration States, for the four major geographic divisions, and for each registration State. It also shows marriages dissolved by death and divorce in the death registration States of 1924, separately for 1924, and for 1924-28, and also for the death registration States of 1900.

A series of reports entitled *Vital Statistics—Special Reports* were published over the period 1936-60 (covering data year 1934). The even numbered volumes from volume 2 (for data year 1934) up to and including volume 34 (for data year 1948) were a subseries known as "State Summaries." In volumes 2, 4, 6, 8, and 10, for, respectively, each of the 5 years from 1935-39, the number of deaths for all persons by sex and marital status is included for the District of Columbia and for each reporting State. Either white and all other are shown separately or it is possible to obtain the number of all other by subtracting white from the total.

There are 3 numbers of *Vital Statistics—Special Reports* (vol. 23, Nos. 2 and 7 and vol. 32, No. 6) based on deaths occurring in 1940, that constitute the first definitive analyses of mortality differentials by marital status for the continental United States. The first of these, "Mortality by Marital Status, by Age, Race, and Sex, Urban and Rural: United States, 1940," was prepared by Dr. Elizabeth H. Pitney, Bureau of the Census. The second mortality-marital status study based on data for 1940, "Deaths from Selected Causes by Marital Status, by Age and Sex, United States, 1940" was prepared by Dr. I. M. Moriyama. The third study, "Cancer Mortality, by Marital Status: United States, 1940," prepared by Sally Lewis, showed mortality statistics from cancer and other malignant tumors, for selected sites, by marital status, age, sex, and race. The most recent publication on this subject for the continental United States, prepared by Dewey Shurtleff was "Mortality from Selected Causes by Marital Status: United States, 1949-51," vol. 39, No. 7, *Vital Statistics—Special Reports*. Data from this earlier report are frequently used in the present report as base lines from which are measured changes in mortality differentials by marital status from 1949-51 to 1959-61.

QUALIFICATION OF DATA

The death rates by marital status, by age, color, and sex, for 1959-61, on which the summary figures in this report are based, are the average annual rates computed from (1) the deaths in 1959-61 exclusive of those for which marital status was not entered on the death certificate (see appendix table I) and (2) three times the 1960 population as enumerated in the 25-percent sample of the 1960 census. The age-sex-color sample estimates were not controlled by the Bureau of the Census to the total count of persons enumerated in each of the marital categories.

Deaths among the armed forces overseas and among U.S. nationals living abroad were excluded.

The category "white" includes in addition to persons reported as "white," persons reported to be Mexican or Puerto Rican. The categories "races other than white" or "all other" consist of persons reported as Negro, American Indian, Chinese, and Japanese; other numerically small racial groups; and persons of mixed racial stock.

It is known that both the numerators and denominators of these death rates are defective, particularly for the population of races other than white. One of the reasons why numerators are defective is that marital status is not entered on all death certificates. For 1949-51 this item was missing on 45,261 certificates; and for 1959-61, on 42,367 certificates. Denominators of mortality rates are defective because for some age-color-sex groups, particularly again in the population of races other than white there have been large undercounts and some misclassification by marital status and other personal characteristics in decennial censuses.⁷⁸

The 1959-61 age-sex-color mortality curves by marital status (fig. 3) revealed a number of anomalies, including the following: (1) there was a pronounced dip in the death rates at ages 55-59 years for both single men and women of races other than white; (2) the average annual death rates for 1959-61 showed excessively high death rates for widowed and divorced persons, especially at ages 15-44 years; and (3) beginning at about age 65 years, the mortality rate for persons of races other than white dropped well below that for white persons; and this occurred for both men and women and for each of the four marital status groups. Following are discussed the probable errors resulting in each of these irregularities. Next is presented a set of revised death rates for single and ever-married males or races other than white, for whom differences between reported and revised death rates are greater than they are for any other color-sex groups.

1. "*Mistallied Indians*" in the population of races other than white.—It was found that a small part of the abrupt dip in the death rate at ages 55-59 years in the population of races other than white reflected the unusual heaping in the 1960 census at ages 55-59 years. The Bureau of the Census stated:

... the heaping on age 59 reflects the over-reporting of 1900 as the year of birth. To obtain age from date of birth, the computer subtracted the year and quarter year of birth from the census data. Persons born in the first quarter of 1900 would have been 60 years old on April 1, 1960, and those born in the three remaining quarters would have been 59 on the census date. Thus, about three-fourths of the persons reporting the year of birth in which the last digit is 0, will appear in the age statistics as having an age ending in 9. Furthermore, if the year of birth was guessed at as one ending in 0, and the month not reported, the allocated age in about three-quarters of the cases would end in 9 rather than 0.⁷⁹

But, after thus accounting for some heaping in the general population at ages 55-59 years, the question still remained as to why there was excessive heaping at these ages for the single population of races other than white—about equally for both men and women. It was not until December, 1967, that the Bureau of the Census published the answer, by advising that some 14,000 single Indians, about equally distributed by sex, had been artificially created by smudges on the 1960 census schedules.⁸⁰ Inasmuch as the denominators of the 1959-61 death rates were three times the 1960 population in the subgroup as estimated by the Census, these "mistallied Indians" also had been multiplied by three, increasing by 19 percent the number of single men of races other than white at ages 55-59 years, and by 32 percent the number of single women of races other than white at these ages. The straightening of this decided dip at ages 55-59 years in the mortality curve (for example, see revised mortality curve for single men of races other than white in fig. 3) by the removal of these "mistallied Indians" suggests the general reliability of the mortality data on which the

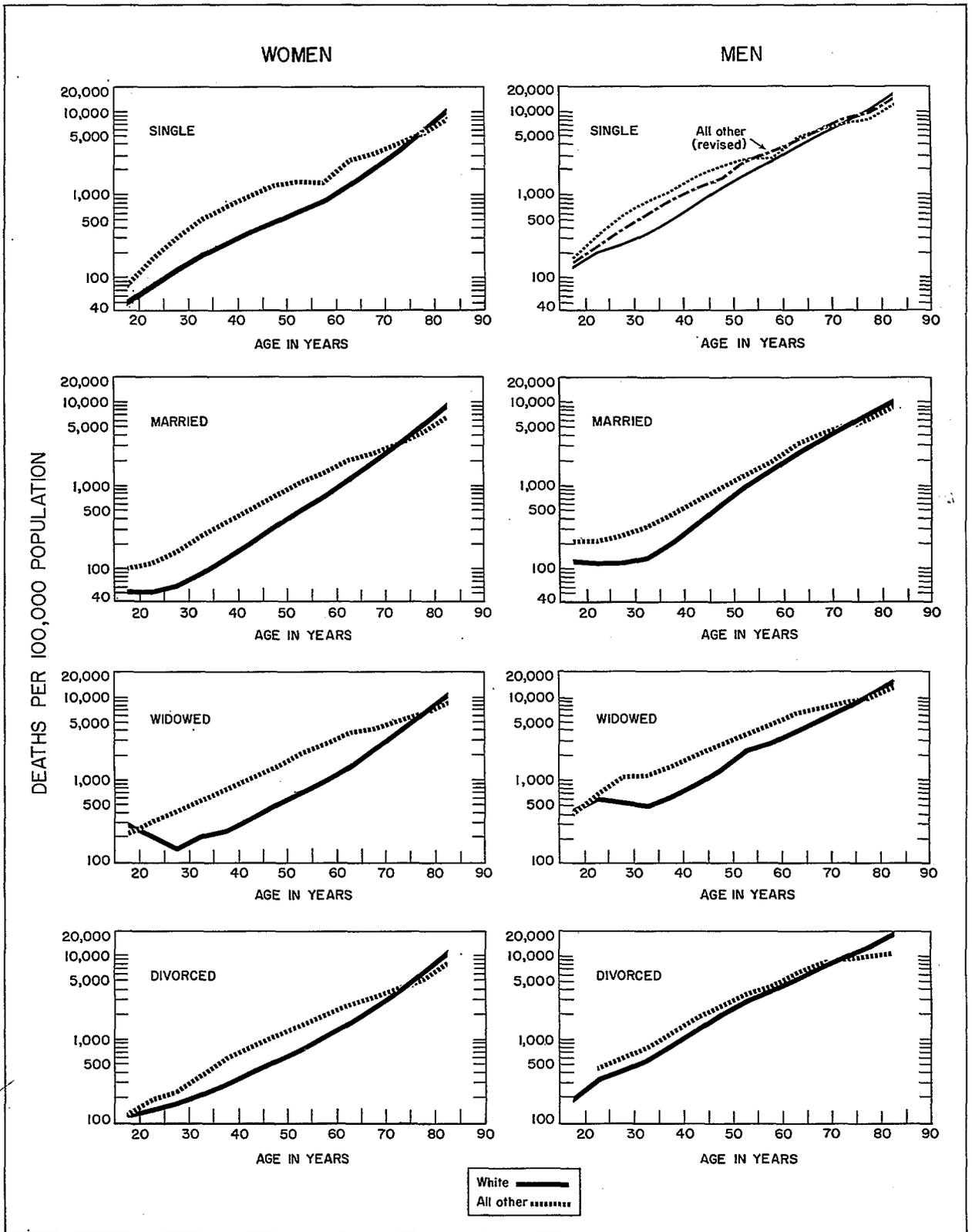


Figure 3. Age-sex-color-specific death rates by marital status: United States, 1959-61.

summary figures are based. Any large discrepancy in the death rates by age, except in the unlikely event in which there is a compensative discrepancy, will probably appear as a major distortion in the mortality curve that represents those death rates.

2. *Effect of misclassification by marital status in census.*—The discordances in responses to marital status on the death certificate and the census schedule as shown in the 1950⁸¹ and 1960⁸²⁻⁸⁴ census-death record tabulations suggests that part of the excessively high death rates for both young widowed and young divorced persons (15-44 years of age) is attributable to misclassification in the census of these young persons as married or single. Following are some “net difference rates” found by Hambright, for marital status for persons 15-44 years of age, by sex and color, based on certificates for deaths occurring during May-August, 1960, that were matched with the census record:⁸⁴

Marital status	White		All Other	
	Male	Female	Male	Female
Single	-1.9	-1.5	0.8	0.4
Married	-1.3	-1.2	-4.0	-4.2
Widowed	80.8	29.4	45.2	21.2
Divorced	21.1	5.4	43.7	22.7

The formula for the above net difference rates is as follows:

$$\text{Net difference rate} = \frac{d_{di} - d_{ci}}{d_{ci}} \times 100, \text{ where}$$

d_{di} = the sample of decedents selected and matched with 1960 census records classified as in marital status *i* according to the death certificate; and

d_{ci} = the sample of decedents selected and matched with 1960 census records classified as in marital status *i* according to the census records.

The revised rate was calculated in the following way:

$$\text{Revised} = \text{Actual} \div (1 + \text{net difference rate})$$

Revising the death rate in this manner results, for example, in slightly raising the rates for single and

married white men at ages 15-44 and in substantially lowering the death rate for widowed and divorced white men at these ages. Actually the result is to cut the excessively high death rate for white widows at ages 15-44 years almost in half. Even after such a major reduction, however, there still would remain a large excess risk of death for these white widowers compared with that for their married counterparts. Other net difference rates by marital status may be found in the study by Hambright.⁸⁴

Also there is some information on problems of enumeration of divorced persons from a study of the 1960 census characteristics of a sample of 554 persons who received divorces in March 1960. Following are shown the numbers and percents of these 554 persons who were reported in another marital status in the 1960 census.⁸⁵

Marital status in census	Total	Male	Female
Number			
Total	554	229	325
Divorced	418	156	262
Married, spouse present	53	36	17
Separated	30	13	17
Other marital status	41	18	23
Marital status not reported	12	6	6
Percent			
Total	100.0	100.0	100.0
Divorced	75.5	68.1	80.6
Married, spouse present	9.6	15.7	5.2
Separated	5.4	5.7	5.2
Other marital status	7.4	7.9	7.1
Marital status not reported	2.2	2.6	1.8

In summary, as to the effects of misclassification, there is evidence for each of the four color-sex groups, especially for persons at ages 15-44 years, that misclassification as either married or single of persons who are actually widowed or divorced accounts in part for the reported excessively high death rates for widowed and divorced persons. Because of the very large numbers of persons in the married and single groups at ages 15-44 years compared with the corresponding numbers in the widowed and divorced groups, the effect at these ages of misclassification in the census by marital status on the death rates is negligible for single and

married persons compared with the corresponding effect for widowed and divorced persons.

3. *Effect on mortality rates of overstating the extreme aged in the population of races other than white.*—An artifact may account for reported death rates for all other persons being below that for white persons beginning at about age 75 years. Data from the Bureau of the Census show a decline in the proportions of centenarians in the United States between 1910 and 1960. Census data also show a close correlation between the illiteracy rate and the relative number of reported centenarians, with over-reporting of extreme age much more frequent for the population of races other than white. At the same time, as shown below by the ratio of death rates for all other persons to that for white persons, the mortality rate for all other persons at ages 75 years and over continued to drop even further below that for white persons during the period 1940 through 1959-61:

Period and age in years	Men			Women		
	Death rates ¹	Ratio of death rate for all other men to that for white men	Death rates ¹	Ratio of death rate for all other women to that for white women		
1940						
65-69	44.6	49.0	1.10	32.9	39.5	1.20
70-74	67.8	70.2	1.04	54.0	58.7	1.09
75 and over	137.8	126.5	0.96	123.4	102.0	0.83
1949-51						
65-69	4,067.0	4,591.5	1.13	2,525.1	3,369.9	1.33
70-74	6,020.4	6,290.1	1.04	4,261.9	5,146.9	1.21
75 and over	12,083.7	9,945.4	0.82	10,275.7	8,360.6	0.81
1959-61						
65-69	4,073.4	5,030.3	1.23	2,157.8	3,395.9	1.57
70-74	5,912.1	6,336.4	1.07	3,596.2	4,637.0	1.29
75 and over	12,432.7	9,786.5	0.79	10,027.8	7,910.2	0.79

¹For 1940 rates are numbers of deaths per 1,000 population; and for 1949-51 and 1959-61, death rates are per 100,000 population.

A statistical artifact that may account for this distorting consequence upon the death rate for races other than white has been demonstrated by Rosenwaike.⁷⁶ An estimate of the U.S. population 85 years of age and over as of January 1, 1951, constructed from official statistics of death, using a modification of Vincent's method of extinct generations, was only about 2 percent lower than the estimate from census data on the comparable population. It therefore appears that the dropping of the death rate for the population of races other than white below that for the white population is not due primarily to greater exaggeration of age on

enumeration than in vital records. As this author demonstrates, even were the tendency toward age overstatement among persons of a given age interval identical on census and mortality records, the resulting death rate for the oldest age category would be understated because the excess number of deaths—as distinguished from the “true” number of deaths among the extreme aged—come from a population experiencing a lower mortality rate. This leads

. . . to the result that the number of decedents reported for the oldest age category in an individual year is overstated to a relatively smaller extent than is the number of living, a circumstance which produces a mortality rate that is too low.⁷⁶

That the death rate for persons of races other than white at ages 75 years and over fell between 1940 and 1959-61 further below the corresponding death rate for white persons may reflect the greater reduction for older white persons in exaggeration of age on the death record and census schedules. It is believed that the more favorable mortality for the population of races other than white with advancing age shown throughout this report results from this distortion of the death rate. This conclusion is consistent with the fact that in the above described matching study the age given on the death certificate was more often younger than the age on the census record for decedents of races other than white over age 45 years.⁸⁶ As Rosenwaike indicates, if age overstatement among persons of a given age interval is greater on census than on mortality records the resultant death rate for the oldest age category will be even more greatly understated than would be the case if the age overstatement were identical on census and mortality records.

Effect of Revised Death Rates on Marital Status

The available estimates of undercoverage in the census and misclassification in the census or on the death certificate are not adequate for producing a set of revised death rates by marital status to which any given precision might be attached. For example, the estimates of undercoverage in the census⁷⁸ are by age, color, and sex, but not by marital status. So if the

revision procedures include correcting for undercoverage, it must be assumed that for any given age-color-sex group the percent of undercoverage in the census was the same for each marital class.

To satisfactorily correct for misclassification it would be necessary to know whether, for a specified age-color-sex-marital status group, the death certificate or the census record was more nearly accurate. But no such data exist to evaluate the findings of the above described matching study. Furthermore, if one is of the opinion that the death certificate should be the standard, available data permit revision of only the populations in the single and ever-married group (the latter by the subtraction of the revised figure for the single group from the revised figure for the total, as shown in appendix table II). This restriction is due to the unavailability of reliable estimates for each age-color-sex-marital status group of the probability of two or more vital events (for example, obtaining a divorce and remarrying; or becoming a widow and then dying) in the period covered by the above described matching study. Furthermore, if the death certificate is taken as the standard, even to revise the population for the single group, one is forced to make the assumption (an assumption, however, that is not preposterous) that

the relative amount and direction of inaccuracies as to marital status on the census records is about the same for single persons who were still living at the end of the period for which matching of death certificates with census records was done, as they were for single persons who died during the matching period (April-August 1960). This assumption is necessary because the matching study is based on a sample of decedents.

Despite these limitations, available estimates of inaccuracies in the numerators and denominators of the death rates clearly indicate that the census records and death certificates for the population of races other than white are markedly more inadequate than the corresponding records for the white population. For races other than white the inaccuracies for the male population are somewhat greater than for the female population. Consequently, if revision of the death rates for this male population does not result in any reversals in mortality differentials by marital status, it may be safely assumed that revisions of death rates for none of the other three color-sex groups would result in such reversals. As shown below, and in figure 3, no such reversals in mortality differentials did occur when the death rates for single and ever-married males of races other than white were based on revised numbers of

deaths and populations, using procedures described in appendix tables I and II (assuming the death certificate to be the standard):

Age in years	All Other Males				White males reported	
	Reported		Revised		Single	Ever-married
	Single	Ever-married	Single	Ever-married		
15 and over	743.6	1,762.0	642.8	1,646.4	752.0	1,651.7
15-19	157.3	209.0	146.0	134.4	121.5	125.6
20-24	314.1	215.2	245.0	214.7	205.6	122.0
25-29	517.4	263.5	363.8	241.1	240.9	124.0
30-34	800.2	344.0	580.1	311.7	333.5	150.3
35-39	1,134.2	494.8	872.4	466.1	495.5	223.6
40-44	1,688.1	756.1	1,193.2	731.6	765.0	384.6
45-49	2,018.3	1,098.1	1,522.0	1,059.9	1,146.5	653.0
50-54	2,581.4	1,709.5	2,329.4	1,509.9	1,705.8	1,100.0
55-59	2,558.1	2,307.4	3,236.1	2,322.5	2,315.2	1,670.7
60-64	4,658.1	3,753.8	4,489.8	3,546.3	3,653.5	2,634.7
65-69	5,496.4	4,867.8	5,859.8	4,982.7	5,303.5	3,926.1
70-74	7,223.6	6,123.3	7,786.5	6,234.3	7,509.0	5,713.7
75-79	8,164.7	7,244.5	9,519.0	7,315.4	10,658.1	8,634.6
80-84	12,056.7	10,765.9	14,151.8	10,552.2	16,089.8	13,754.7
85 and over	15,471.4	15,764.8	19,368.0	14,622.9	23,766.3	23,259.1

Thus it may be safely conjectured that if similar revisions of the death rates by marital status for the other three color-sex groups were carried out, the result would be to reduce slightly the large mortality differentials between the white and all other

populations. Part of the reduction for undercoverage in the census would be compensated for by the addition of deaths for which marital status was not entered on the death certificate. Also the concomitant removal of the 42,000 "mistallied Indians" (21,000 for each of the sexes) would straighten out the anomalous dip in the death rate at ages 55-59 years for the single population of races other than white. Furthermore, data from the matching study and from the vital statistics system indicate that within a given color-sex group, correcting the death rates would result in reducing the excessively high death rates at the younger ages for the widowed and divorced groups; but unfavorable mortality differentials between these two marital classes and the married group would not be eliminated.

In other words, estimates of undercoverage, overcoverage and misclassification by marital status on either or both the death certificate and the census record indicate that the exact amount of mortality differentials by marital status may not be obtainable from the unrevised death rates on which the present report is based. But there is no reason to believe that if these rates were corrected the present differentials would be reversed or eliminated. Therefore, in the analysis emphasis is on the existence of mortality differentials by marital status and their relative magnitudes rather than on their absolute sizes.

Table I. Actual and revised¹ number of deaths by marital status, by age, color, and sex: United States, 1959-61

Color, sex, and age	Total				Single			
	Marital status not on death certificate but on census	Marital status on death cer- tificate	Revised number of deaths	Percent under- state- ment	Marital status not on death certificate but on census	Marital status on death cer- tificate	Revised number of deaths	Percent under- state- ment
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
White males								
Total, 15 years and over-----	22,419	2,359,807	2,382,226	.94	9,081	274,937	284,018	3.20
15-19 years-----	140	21,656	21,796	.64	125	20,646	20,771	.60
20-24 years-----	212	23,398	23,610	.89	171	15,111	15,282	1.11
25-29 years-----	191	21,078	21,269	.89	114	6,821	6,935	1.64
30-34 years-----	283	27,034	27,317	1.03	132	5,877	6,009	2.19
35-39 years-----	432	40,771	41,203	1.04	152	6,759	6,911	2.19
40-44 years-----	614	63,521	64,135	.95	193	8,279	8,472	2.27
45-49 years-----	993	101,036	102,029	.97	361	11,669	12,030	3.00
50-54 years-----	1,615	149,863	151,478	1.06	566	16,498	17,064	3.31
55-59 years-----	2,100	197,142	199,242	1.05	747	21,027	21,774	3.43
60-64 years-----	2,722	254,977	257,699	1.05	968	25,914	26,882	3.60
65-69 years-----	3,185	322,253	325,438	.97	1,448	32,545	33,993	4.25
70-74 years-----	3,328	349,929	353,257	.94	1,577	35,213	36,790	4.28
75-79 years-----	2,865	323,423	326,288	.87	1,245	31,273	32,518	3.82
80-84 years-----	2,073	249,181	251,254	.82	781	21,590	22,371	3.49
85+ years-----	1,666	214,545	216,211	.77	501	15,715	16,216	3.08
All other males								
Total, 15 years and over-----	7,804	277,441	285,245	2.74	2,330	38,657	40,987	5.68
15-19 years-----	60	3,906	3,966	1.51	51	3,652	3,703	1.38
20-24 years-----	109	5,209	5,318	2.05	85	3,367	3,452	2.46
25-29 years-----	171	6,255	6,426	2.66	121	2,608	2,729	4.43
30-34 years-----	259	8,167	8,426	3.07	152	2,579	2,731	5.57
35-39 years-----	408	11,261	11,669	3.50	128	2,709	2,837	4.51
40-44 years-----	542	14,623	15,165	3.57	121	2,720	2,841	4.26
45-49 years-----	689	19,240	19,929	3.46	155	2,793	2,948	5.55
50-54 years-----	892	25,046	25,938	3.44	206	3,221	3,427	6.01
55-59 years-----	924	29,634	30,558	3.02	352	3,334	3,686	9.55
60-64 years-----	996	33,642	34,638	2.88	402	3,155	3,557	11.30
65-69 years-----	871	37,182	38,053	2.29	199	2,882	3,081	6.46
70-74 years-----	708	31,561	32,269	2.19	129	2,319	2,448	5.27
75-79 years-----	503	23,164	23,667	2.13	122	1,574	1,596	7.19
80-84 years-----	366	14,649	15,015	2.44	107	935	1,042	10.27
85+ years-----	306	13,902	14,208	2.15	0	809	809	0
White females								
Total, 15 years and over-----	6,913	1,778,452	1,785,365	.39	1,055	171,259	172,314	.61
15-19 years-----	33	8,566	8,599	.38	33	6,983	7,016	.47
20-24 years-----	34	8,680	8,714	.39	34	3,068	3,102	1.09
25-29 years-----	46	10,359	10,405	.44	20	1,811	1,831	1.09
30-34 years-----	90	15,803	15,893	.56	27	2,000	2,027	1.33
35-39 years-----	137	24,977	25,114	.54	20	2,610	2,630	.76
40-44 years-----	167	36,859	37,026	.45	17	3,527	3,544	.47
45-49 years-----	224	54,318	54,542	.41	28	4,833	4,861	.57
50-54 years-----	349	73,968	74,317	.46	47	6,767	6,814	.68
55-59 years-----	360	96,070	96,430	.37	66	8,404	8,470	.77
60-64 years-----	537	137,591	138,128	.38	98	11,204	11,302	.86
65-69 years-----	724	196,225	196,949	.36	84	15,456	15,540	.54
70-74 years-----	924	252,443	253,367	.36	96	21,005	21,101	.45
75-79 years-----	1,053	285,608	286,661	.36	127	25,241	25,368	.50
80-84 years-----	1,085	272,470	273,555	.39	122	26,764	26,886	.45
85+ years-----	1,150	304,515	305,665	.37	236	31,586	31,822	.74
All other females								
Total, 15 years and over-----	3,319	223,887	227,206	1.46	487	16,272	16,759	2.91
15-19 years-----	31	2,042	2,073	1.49	22	1,606	1,628	1.35
20-24 years-----	42	2,930	2,972	1.41	21	1,228	1,249	1.68
25-29 years-----	87	4,203	4,290	2.02	17	1,007	1,024	1.66
30-34 years-----	140	6,630	6,790	2.06	24	1,110	1,134	2.11
35-39 years-----	209	9,319	9,528	2.19	65	1,161	1,226	5.30
40-44 years-----	223	12,099	12,322	1.80	89	1,180	1,269	7.01
45-49 years-----	233	15,181	15,414	1.51	0	1,260	1,260	0
50-54 years-----	290	19,431	19,721	1.47	0	1,259	1,259	0
55-59 years-----	321	23,294	23,615	1.35	71	1,231	1,302	5.45
60-64 years-----	369	26,920	27,289	1.35	69	1,198	1,267	5.44
65-69 years-----	360	27,716	28,076	1.28	0	1,066	1,066	0
70-74 years-----	355	25,352	25,707	1.38	0	1,001	1,001	0
75-79 years-----	278	19,733	20,011	1.38	42	771	813	5.16
80-84 years-----	193	13,580	13,773	1.40	31	580	611	5.07
85+ years-----	188	15,437	15,625	1.20	36	614	650	5.53

See footnote at end of table.

Table I. Actual and revised¹ number of deaths by marital status, by age, color, and sex: United States, 1959-61--Con.

Married				Widowed				Divorced			
Marital status not on death certificate but on census	Marital status on death certificate	Revised number of deaths	Percent under-statement	Marital status not on death certificate but on census	Marital status on death certificate	Revised number of deaths	Percent under-statement	Marital status not on death certificate but on census	Marital status on death certificate	Revised number of deaths	Percent under-statement
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
6,016	1,479,504	1,485,520	.40	4,848	474,361	479,209	1.01	2,474	108,586	111,060	2.25
15	827	842	1.78	0	15	15	0	0	28	28	0
41	7,482	7,523	.54	0	66	66	0	0	527	527	0
58	12,836	12,894	.44	0	113	113	0	19	1,117	1,136	1.67
127	18,813	18,940	.67	0	176	176	0	24	1,885	1,909	1.25
245	29,890	30,135	.81	11	391	402	2.73	24	3,299	3,323	.72
352	48,314	48,666	.72	26	925	951	2.73	43	5,389	5,432	.79
359	77,628	77,987	.46	66	2,185	2,251	2.93	207	8,561	8,768	2.36
490	114,880	115,370	.42	139	5,133	5,272	2.63	420	11,737	12,157	3.45
793	149,635	150,428	.52	197	10,488	10,685	1.84	363	13,892	14,255	2.54
1,095	189,823	190,918	.57	309	21,647	21,956	1.40	350	14,871	15,221	2.29
889	229,328	230,217	.38	560	41,898	42,458	1.31	288	15,297	15,585	1.84
703	228,140	228,843	.30	814	70,211	71,025	1.14	234	13,037	13,271	1.76
447	184,784	185,231	.24	987	94,667	95,654	1.03	186	9,834	10,020	1.85
173	117,763	117,936	.14	1,022	102,054	103,076	.99	97	5,701	5,798	1.67
229	69,361	69,590	.32	717	124,392	125,109	.57	219	3,411	3,630	6.03
3,300	157,618	160,918	2.09	1,651	59,817	61,468	2.69	523	13,545	14,068	3.72
9	187	196	4.59	0	6	6	0	0	1	1	0
24	1,647	1,671	1.44	0	28	28	0	0	58	58	0
50	3,186	3,236	1.55	0	89	89	0	0	201	201	0
107	4,734	4,841	2.21	0	161	161	0	0	434	434	0
257	6,966	7,223	3.56	16	357	373	4.29	7	821	828	8.45
372	9,430	9,802	3.80	26	760	786	3.31	23	1,171	1,194	1.93
374	12,766	13,140	2.85	58	1,428	1,486	3.90	102	1,564	1,666	6.12
417	16,405	16,822	2.48	100	2,687	2,787	3.59	169	1,841	2,010	8.41
396	19,042	19,438	2.04	113	4,524	4,637	2.44	63	1,810	1,873	3.36
382	20,984	21,366	1.79	163	6,762	6,925	2.35	49	1,745	1,794	2.73
330	22,267	22,597	1.46	289	9,484	9,773	2.96	53	1,678	1,731	3.06
237	17,371	17,608	1.35	306	10,078	10,384	2.95	36	1,085	1,121	3.21
167	11,672	11,839	1.41	198	8,797	8,995	2.20	16	618	634	2.52
105	6,305	6,410	1.64	149	6,739	6,888	2.16	5	304	309	1.62
73	4,656	4,729	1.54	233	7,917	8,150	2.86	0	214	214	0
2,225	620,283	622,508	.36	3,196	933,157	936,353	0.34	437	46,840	47,277	0.92
0	1,452	1,452	0	0	30	30	0	0	68	68	0
0	5,133	5,133	0	0	78	78	0	0	367	367	0
17	7,777	7,794	.21	9	106	115	7.82	0	619	619	0
47	12,386	12,433	.37	16	318	334	4.79	0	1,009	1,009	0
90	19,826	19,916	.45	15	753	768	1.95	12	1,651	1,663	.72
113	28,634	28,747	.39	19	1,954	1,973	.96	18	2,577	2,595	.69
115	41,350	41,465	.27	43	4,518	4,561	.94	38	3,393	3,431	1.10
151	53,005	53,156	.28	89	9,627	9,716	.91	62	4,220	4,282	1.44
134	63,111	63,245	.21	123	19,336	19,459	.63	37	4,859	4,896	.75
194	78,520	78,714	.24	202	41,773	41,975	.48	43	5,557	5,600	.76
369	93,682	94,051	.39	217	80,345	80,562	.26	54	6,018	6,072	.88
448	90,457	90,905	.49	317	134,253	134,570	.23	63	5,804	5,867	1.07
293	69,467	69,760	.42	571	184,969	185,540	.30	62	4,878	4,940	1.25
156	38,789	38,945	.40	759	202,428	203,187	.37	48	3,404	3,452	1.39
98	16,694	16,792	.58	816	252,669	253,485	.32	0	2,416	2,416	0
1,168	85,487	86,655	1.35	1,515	110,822	112,337	1.35	149	7,987	8,136	1.83
9	389	398	2.26	0	9	9	0	0	7	7	0
21	1,541	1,562	1.34	0	50	50	0	0	69	69	0
50	2,777	2,827	1.76	0	161	161	0	20	171	191	10.47
93	4,571	4,664	1.99	0	416	416	0	23	413	436	5.27
68	6,377	6,445	1.05	76	858	934	8.13	0	714	714	0
78	8,107	8,185	.95	56	1,698	1,754	3.19	0	891	891	0
196	9,540	9,736	2.01	37	3,097	3,134	1.18	0	1,051	1,051	0
250	10,876	11,126	2.24	40	5,921	5,961	0.67	0	1,085	1,085	0
146	11,122	11,268	1.29	86	9,562	9,648	0.89	18	1,058	1,076	1.67
124	10,197	10,321	1.20	156	14,310	14,466	1.07	20	846	866	2.30
85	8,458	8,543	.99	253	17,122	17,375	1.45	22	710	732	3.00
48	5,740	5,788	.82	288	17,776	18,064	1.59	19	480	499	3.80
0	3,345	3,345	0	220	15,092	15,312	1.43	16	247	263	6.08
0	1,558	1,558	0	151	11,102	11,253	1.34	11	147	158	6.96
0	889	889	0	152	13,648	13,800	1.10	0	98	98	0

¹Revised by allocating deaths at ages 15 years and over, for which marital status was not stated or not valid on death certificate, to marital category on census schedule, as determined by comparison of response data. Excluded are deaths for which marital status was not stated or not valid on both records, i.e. on death certificate and on census schedule. For allocation formula see National Center for Health Statistics Technical Information Notes No. 37.

Table II. Three times (3 x) 1960 population of single men of races other than white, 15 years of age and over, revised to remove miscalculated Indians, and for marital status misclassification and undercount, by age, together with concomitant estimate of three times 1960 population of ever married men of races other than white, 15 years of age and over

Age	All marital categories: 3 x 1960 population			Single 3 x 1960 population		
	Actual count: P_i	Percent of net undercount ¹ : e_i	Revised population ² : P_i	25 percent sample ³		
				Actual figures: S_1	3 x number of miscalculated Indians ⁴	Column (4) minus column (5)
	(1)	(2)	(3)	(4)	(5)	(6)
Total, 15 years and over-----	18,341,610	13.5	21,211,641	5,198,598	21,000	5,177,598
15-24 years-----				3,394,206		3,394,206
15-19 years----	2,389,704	12.5	2,731,090	(2,322,246)		(2,322,246)
20-24 years----	1,879,554	17.5	2,278,247	(1,071,960)		(1,071,960)
25-34 years-----				826,395		826,395
25-29 years----	1,833,876	19.7	2,283,781	(504,096)		(504,096)
30-34 years----	1,884,108	18.0	2,297,693	(322,299)		(322,299)
35-44 years-----				399,972		399,972
35-39 years----	1,898,037	14.5	2,219,926	(238,848)		(238,848)
40-44 years----	1,676,529	12.8	1,922,625	(161,124)		(161,124)
45-54 years-----				263,163		263,163
45-49 years----	1,589,238	11.5	1,795,749	(138,387)		(138,387)
50-54 years----	1,346,418	17.8	1,637,978	(124,776)		(124,776)
55-64 years-----				198,063	21,000	177,063
55-59 years----	1,195,938	5.9	1,270,922	(130,332)	(21,000)	(109,332)
60-64 years----	862,965	9.7	955,664	(67,731)		(67,731)
(65 years & over)-	(1,785,243)	(1.8)	(1,817,966)			
65-74 years-----				84,537		84,537
65-69 years----	740,868	1.8	754,448	(52,434)		(52,434)
70-74 years----	500,598	1.8	509,774	(32,103)		(32,103)
75-84 years-----				27,033		27,033
75-79 years----	312,429	1.8	318,156	(19,278)		(19,278)
80-84 years----	137,265	1.8	139,781	(7,755)		(7,755)
85 years & over--	94,083	1.8	95,808	5,229		5,229

¹The estimated amounts and percents of net understatement of the population by age, sex, and color in the 1960 population for each 5-year age group up to 65 years and for 65 years and over, by age, color, and sex, were prepared by Jacob S. Siegel, Bureau of the Census, for presentation at the Conference on Social Statistics and the City, June 22-23, 1967, sponsored by the Joint Center for Urban Studies of the Massachusetts Institute of Technology and Harvard University, in a paper entitled "Completeness of Coverage of the Nonwhite Population in the

1960 Census and Current Estimates, and Some Implications" (mimeographed, Bureau of the Census). The base of the percents is the corrected population. The formula for the percent of net understatement is $e_i = (\bar{P}_i - P_i) (100) / \bar{P}_i$.

The value of 1.8 percent understatement estimated by the Bureau of the Census for the group 65 years and over was assigned to each of the following age groups: 65-69, 70-74, 75-79, 80-84, and 85 years and over.

Table II. Three times (3 x) 1960 population of single men of races other than white, 15 years of age and over, revised to remove mistallied Indians, and for marital status misclassification and undercount, by age, together with concomitant estimate of three times 1960 population of ever married men of races other than white, 15 years of age and over--Con.

Single 3 x 1960 population						
Column (6) adjusted to total count by marital status ⁵	5-year age groups in column (7) adjusted to totals in age groups in column (3) ⁶	10-year age groups in column (8) partially revised for marital sta- tus misclas- sification ⁷	10-year age groups in column (9) further revised for marital status ⁸		5-year age groups ob- tained from 10-year age groups in column (11) ⁹	Estimate of ever-married population by 5-year age groups: column (3) minus column (12)
			Change during April-August 1960			
			3x estimated number of first marriages during April- August 1960	column (9) plus column (10)		
(7)	(8)	(9)	(10)	(11)	(12)	(13)
5,299,333	6,073,841	6,236,410				
3,428,121 (2,345,450) (1,082,671)	3,937,777 (2,628,018) (1,309,759)	3,856,614	87,855	3,944,469	2,535,469 1,409,000	195,621 869,247
834,652 (509,133) (325,519)	1,039,197 (638,537) (400,660)	1,182,779	38,256	1,221,035	750,239 470,796	1,533,542 1,826,897
403,969 (241,235) (162,734)	473,363 (284,897) (188,466)	555,390	7,884	563,274	325,177 238,097	1,894,749 1,684,528
265,793 (139,770) (126,023)	312,599 (159,727) (152,872)	337,149	3,660	340,809	193,691 147,118	1,602,058 1,490,860
178,832 (110,424) (68,408)	191,723 (115,667) (76,056)	191,724	1,404	193,128	113,904 79,224	1,157,018 876,440
(85,382) (52,958) (32,424)	86,034 (53,421) (32,613)	83,394	624	84,018	52,579 31,439	701,869 478,335
27,303 (19,471) (7,832)	27,531 (19,481) (8,050)	25,180	-	25,180	(17,817) (7,363)	300,339 132,418
5,281	5,617	4,177	-	4,177	4,177	91,631

²The formula for the revised population is as follows:

$$\bar{P}_i = [P_i / (1 - \bar{e}_i)] (100).$$

³The 25-percent sample figures were not controlled to the total count in any given marital status category by the Bureau of the Census. See later columns for adjustment to total count for each marital status category.

⁴For an explanation of the creation of these mistallied American Indians, see "Indians and Smudges on the Census Schedule," by Donald S. Akers, Population Division, Bureau of the Census, presented at the meeting of the American Statistical Association, December 30, 1967, Washington, D.C.

⁵The total count by marital status for each color-sex group was published by the Bureau of the Census for persons 14 years of age and over in 1960 *Census of Population* (vol. I, ch. B, table 49). Also published in the same report by sex, color, and marital status were the number of persons 14 years of age, as reported in the 25-percent sample (ch. D, table 176), and the total count (176,108) of persons 14 years of age (ch. B, table 46). These data were used to obtain estimates, for each of the four color-sex groups, of the number of persons 15 years of age and over by marital status. The procedures used are shown below for the male population of races other than white.

Marital status	Complete count of persons 14 years of age and over		Persons 14 years of age in 25-percent sample
	(1)	(2)	(3)
Total	6,289,978	176,768	176,108
Single	1,918,185	175,730	175,074
Married	3,908,090	885	881
Widowed	310,761	62	62
Divorced	152,942	91	91
	<i>Numbers in column (2) adjusted to total count at age 14</i>	<i>Numbers in column (1) minus numbers in column (3)</i>	<i>Numbers in column (4) multiplied by 3</i>
	(3)	(4)	(5)
Total	176,108	6,113,370	18,341,610
Single	175,074	1,743,111	5,229,333
Married	881	3,907,209	11,721,627
Widowed	62	310,699	932,097
Divorced	91	152,851	458,553

⁶For any given age group the numerator of the adjustment factor is the population for this age group shown in column (3); and the denominator is the sum of the population in each of the four marital status groups for this age group after adjustment to the total count by marital status.

⁷This partial revision of the population for misclassification of marital status was based on a comparison of response data from deaths occurring during May-August 1960 where the corresponding data on census schedules have been used. The procedure employed is that proposed by Dr. Kitagawa for adjusting death rates. This procedure does not rely on the marginal distributions, but uses the entire cross-classification of marital status response data for each 10-year age group. This procedure may be illustrated as follows, using males of races other than white in a given 10-year age group.

Let:

- P = the enumerated population of males of races other than white in a given age group
- P_i = the enumerated population of males of races other than white in marital status i
- \hat{P} = the revised population of males of races other than white in a given age group, using death certificate as the standard to correct for misclassification by marital status on the census
- \hat{P}_i = the revised population of males of races other than white in a given age group in marital status i

Also let the following be the notation for the values in the attached cross-classification of age response results:

Marital status census record	Marital status on death certificate					Total
	Single	Married	Widowed	Divorced	Not stated and not valid	
Total ^a	$\sum_i x_{i1}$	$\sum_i x_{i2}$	$\sum_i x_{i3}$	$\sum_i x_{i4}$	$\sum_i x_{i5}$	$= \sum_{i,j} x_{ij}$
Single	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	$\sum_j x_{1j}$
Married	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	$\sum_j x_{2j}$
Widowed	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	$\sum_j x_{3j}$
Divorced	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	$\sum_j x_{4j}$
Not stated or not valid	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	$\sum_j x_{5j}$

^aIn the totals the i 's refer to the rows and the j 's to the columns.

Then:

$$\hat{P}_i = \sum_{j=1}^4 \left[P_i \frac{x_{ij}}{\sum_{j=1}^4 x_{ij}} \right] + \frac{x_{i5}}{4} \left[\sum_{j=1}^4 P_i \frac{x_{j5}}{\sum_{j=1}^4 x_{j5}} \right]$$

The second term of the right-hand member of the above equation represents the allocation of the estimated number of persons for whom marital status was not stated (using the death certificate as standard) to marital status i .

There were no persons classified as "not stated marital category" published for the 25-percent sample by the Bureau of the Census. But the procedure for correcting for misclassification by marital status, using the death certificate as the standard, yielded for each 10-year age group a number of persons classified on the death certificate as "not stated marital category" together with the distribution of these persons by marital status on the census schedule. This census distribution was retained for this group,

except that the small number of persons classified as "not stated marital category" on both the death certificate and the census schedule were excluded from the distribution. This seemed more appropriate than to reintroduce a group classified as "not stated marital status" on the census. The Bureau of the Census made assignments for all nonresponse and inconsistent responses on the marital status item. Because of unknown probabilities for more than one change in marital status between the date of enumeration and the death of a person during May-August 1960, this formula was applied only to revise the single population. The revised ever-married population was obtained by subtracting the revised single population from the reported total population.

⁸Data from the vital statistics registration system (including marriage and divorce rates by age, color, and sex) were used to revise the 10-year age groups in column (9). To illustrate for single persons, to the first preliminary estimates for 3 times the number of single persons in the United States, as of April 1, 1960, by age, color, and sex, obtained from the formula for P_1 defined above in footnote 7 there were added 3 times the estimated number of first marriages during April-August 1960. This was necessary because most persons married for the first time during April-August 1960 were, of course, single at the time of the census.

⁹Preliminary estimates of values for 5-year age groups were obtained from the values for the 10-year age groups revised for misclassification by marital status in the following manner. For all age groups except the end groups 15-24 years and 75-84 years, linear interpolation was used. The average number of persons at the midyear of each of the 10-year age groups (taken to be one-tenth of the total number of persons in the 10-year age groups) were plotted on semi-logarithmic paper (at ages 21, 31, 41, 51, 61, 71, and 81 years for those sections of the population

curve for which the number of persons increases with advance in age; and at ages 19, 29, 39, 49, 59, 69, and 79 years for those sections of the population curve for which the number of persons decreases with advance in age). A straight line was drawn between each pair of succeeding points. The resulting connected line was taken to represent the locus of the average number of persons per single year of age for succeeding age groups (that is for the age groups 15-24 years, 16-25 years, 17-26 years, continuing through 75-84 years. Then the average number of persons in each of the two sets of 5-year age groups between each pair of original points were read from the line, except for the end groups 20-24 and 75-79. The sum of each set of five values was taken to be the preliminary estimate of the total number of persons in the 5-year age group. Then each set of these two derived 5-year age groups were adjusted so that their sum was equal to the original total for the 10-year age group from which they were extrapolated.

For single persons the value for the end group 15-24 years was divided into values for 5-year age groups by subtracting the estimated number of persons in the one 5-year age group shown on the chart from the original total for the 10-year age group. For single persons 75-84 years of age and for all other marital status groups the value for both the end groups 15-24 years and 75-84 years were divided into values for 5-year age groups by assuming that the percentages of the 10-year age groups in each of the 5-year age groups were the same as the percentages in that age group in the nearest prior column in which values for 5-year age groups are shown.

It is assumed that for all persons in a given age-color-sex group as of April 1, 1960, the pattern of discordance of responses on marital status on the death certificate and the census schedule is the same as the pattern of this discordance for that segment of these persons in the given age-color-sex group who died during April-August 1960.

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