Suicide

in the United States 1980-1992

Violence Surveillance Summary Series, No. 1

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Executive Summary

From 1980 to 1992, the age-adjusted suicide rate for the total U.S. population rose only slightly. Detailed analysis of the data reveals several notable trends in the age of suicide victims, the methods of suicide, and the geographic distribution of suicide cases.

Suicide rates increased among persons between the ages of 10 and 19 years, among young black males, and among elderly males of all races. Suicide rates for middle-aged adults declined, but the rate for Americans over age 60 increased for the first time since the late 1930s.

Firearms accounted for 77% of the increase in suicides from 1980–1992 and were disproportionately responsible for the increases among the young and the elderly. Suicides from strangulation also increased and were especially common among Native Americans and Asian or Pacific Islanders. The rates of suicide by poisoning decreased.

As in previous decades, western states had the highest rates of suicide. Firearms accounted for many of the geographic differences in suicide rates and explained much of the increase in several states.

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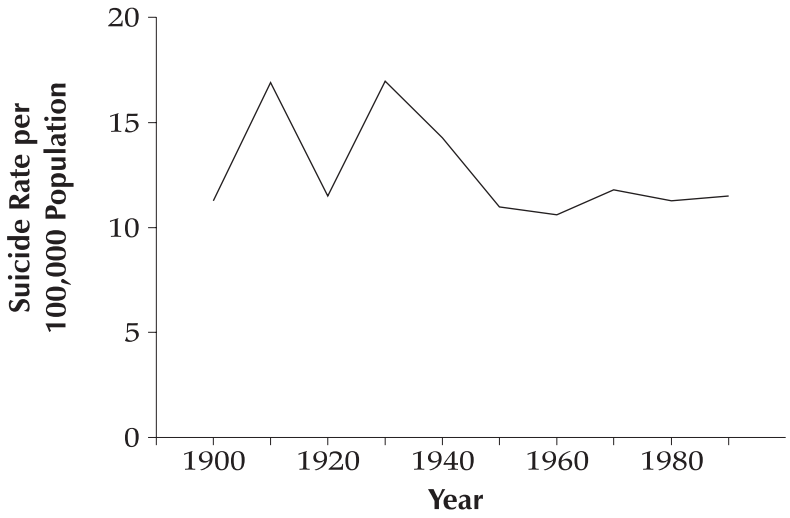
Introduction

A total of 384,262 suicides were recorded in the United States during the 13 years from 1980 through 1992. In 1992, more than 30,000 Americans took their own lives. Suicide, the ninth leading cause of death, has exceeded the number of homicides every year since 1981.

Nationally, the age-adjusted suicide rate has remained remarkably constant since the 1940s (Figure 1). Despite this apparent stability, however, suicide risk and the usual methods of suicide vary across age, race, and gender groups as well as between different geographic regions. This report documents some of the trends in suicide rates during the 1980s and early 1990s.

Despite apparent stability over recent decades, suicide rates have changed remarkably for some groups.

Figure 1. Age-Adjusted Suicide Rates, United States, 1900-1990



Data Sources

Suicide deaths for each year from 1980 through 1992 were obtained from vital statistics on the underlying causes of death prepared annually by the National Center for Health Statistics at the Centers for Disease Control and Prevention.[1] These data are based on death certificate information reported by each of the 50 states and the District of Columbia.

Some important data items—including marital status, educational level, Hispanic ethnicity, and the racial categories of Native American and Asian or Pacific Islander—are not consistently recorded. To estimate suicide rates by these variables, we analyzed data only from states where at least 90% of cases were reported in 1990. Suicides of nonresident aliens and U.S. citizens living abroad were excluded. We obtained data on marital status only for decedents who were at least 15 years of age and on educational level only for those 20 years of age. Suicides were identified using cause of death codes E950–E959* from the *International Classification of Diseases, Ninth Revision, Clinical Modification*.[2]

We used population data from the 1980 and 1990 census enumerations to calculate suicide rates (U.S. Bureau of the Census, unpublished data, 1980, 1990). Population estimates for the intercensal years, 1981–1989, and the postcensal years, 1991–1992, came from the current population reports compiled by the United States Bureau of the Census and are based on data from both the 1980 and 1990 censuses.[3] Census data for 1990 were used as the denominator in estimating suicide rates for Native Americans, Asian or Pacific Islanders, and Hispanic populations and rates by marital status and educational level.

*Specific codes are poisoning, E950.0–E952.9; strangulation, E953.0–953.9; firearm, E955.0–E955.4; cutting, E956.0–956.9.

We calculated age-adjusted rates by the direct method of standardization using the age distribution of the 1940 U.S. census population as the standard. Age-adjusted and age-specific rates do not include suicide deaths for which the decedent's age was not recorded. Crude rates, however, do include these deaths. Comparable statistics for previous decades were obtained from published reports of the Public Health Service.[4,5]

Results

National Rates and Premature Mortality

The total number of suicides in the United States increased by 13% during the study period, climbing from 26,869 in 1980 to 30,484 in 1992. However, the national age-adjusted suicide rate changed little over the same period. In 1980, the age-adjusted suicide rate was 11.3 deaths per 100,000.* The rate peaked at 11.9 in 1986, then fell to 11.1 by 1992.

Suicide was the ninth leading cause of death overall in 1992, and was among the 10 leading causes of death for all but the oldest and youngest age groups (Figure 2). For Americans 15–24 years of age, suicide was the third leading cause of death, behind unintentional injury and homicide. Although younger age groups have the highest number of suicides, the elderly have the highest rates.

Suicide is among the 10 leading causes of death for all but the youngest and oldest age groups.

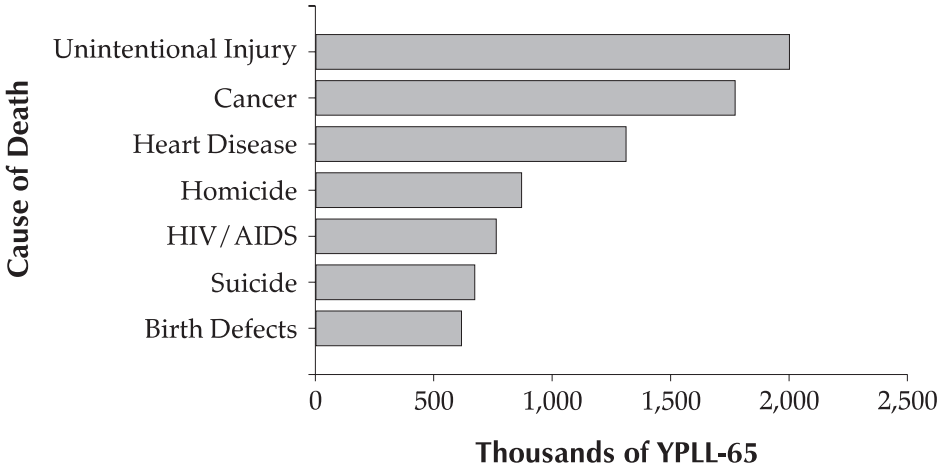
Years of potential life lost before the age of 65 (YPLL-65), which measures premature mortality, is another way of defining the scope of a public health problem.[6] By calculating the years between the age at death and age 65, this technique weighs more heavily those conditions that kill children, teenagers, and young adults. In terms of YPLL-65, suicide was the sixth leading cause of death in 1991 (Figure 3). It accounted for approximately 6% of YPLL-65 for all causes of death and was preceded in rank by unintentional injury, cancer, heart disease, and homicide. YPLL-65 attributable to suicide increased by 9% between 1980 and 1991.[7]

*All mortality rates in this surveillance summary are based on the annual number of deaths per 100,000 population.

Figure 2. Ten Leading Causes of Death, by Age Group, United States, 1992

Rank	Age Groups											Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+		
1	Congenital Anomalies 7,449	Unintentional Injuries 2,467	Unintentional Injuries 1,628	Unintentional Injuries 1,760	Unintentional Injuries 13,662	Unintentional Injuries 13,798	Malignant Neoplasms 16,882	Malignant Neoplasms 41,206	Malignant Neoplasms 91,609	Heart Disease 595,314		Heart Disease 717,706
2	SIDS 4,891	Congenital Anomalies 856	Malignant Neoplasms 557	Malignant Neoplasms 548	Homicide 8,019	HIV 10,426	HIV 14,203	Heart Disease 31,413	Heart Disease 72,516	Malignant Neoplasms 362,060		Malignant Neoplasms 520,578
3	Short Gestation 4,035	Malignant Neoplasms 479	Congenital Anomalies 245	Homicide 441	Suicide 4,693	Homicide 7,343	Heart Disease 12,698	Unintentional Injuries 7,485	Bronchitis Emphysema Asthma 10,098	Cerebro-vascular 125,392		Cerebro-vascular 143,769
4	Respiratory Distress Synd. 2,063	Homicide 430	Homicide 146	Suicide 304	Malignant Neoplasms 1,809	Suicide 6,172	Unintentional Injuries 12,010	HIV 5,575	Cerebro-vascular 9,709	Bronchitis Emphysema Asthma 78,182		Bronchitis Emphysema Asthma 91,938
5	Maternal Complications 1,461	Heart Disease 286	Heart Disease 130	Congenital Anomalies 203	Heart Disease 968	Malignant Neoplasms 5,303	Suicide 6,009	Cerebro-vascular 4,791	Diabetes 7,109	Pneumonia & Influenza 67,489		Unintentional Injuries 86,777
6	Placenta Cord Membranes 993	Pneumonia & Influenza 188	HIV 72	Heart Disease 154	HIV 578	Heart Disease 3,423	Homicide 4,460	Liver Disease 4,569	Unintentional Injuries 6,397	Diabetes 37,328		Pneumonia & Influenza 75,719
7	Perinatal Infections 901	HIV 161	Benign Neoplasms 53	Bronchitis Emphysema Asthma 62	Congenital Anomalies 450	Cerebro-vascular 796	Liver Disease 3,608	Suicide 4,018	Liver Disease 5,780	Unintentional Injuries 26,633		Diabetes 50,067
8	Unintentional Injuries 819	Perinatal Period 113	Pneumonia & Influenza 53	Pneumonia & Influenza 51	Pneumonia & Influenza 229	Liver Disease 765	Cerebro-vascular 2,591	Diabetes 3,203	Pneumonia & Influenza 3,453	Nephritis 18,711		HIV 33,566
9	Intrauterine Hypoxia 613	Septicemia 77	Bronchitis Emphysema Asthma 38	Benign Neoplasms 44	Cerebro-vascular 197	Diabetes 658	Diabetes 1,600	Bronchitis Emphysema Asthma 2,274	Suicide 3,105	Athero-sclerosis 15,995		Suicide 30,484
10	Pneumonia & Influenza 600	Anemias 65	Anemias 30	Cerebro-vascular 37	Bronchitis Emphysema Asthma 189	Pneumonia & Influenza 654	Pneumonia & Influenza 1,350	Homicide 2,046	HIV 1,785	Septicemia 15,884		Homicide 25,488

Figure 3. Leading Causes of Years of Potential Life Lost before Age 65 (YPLL-65), United States, 1991



Suicide was the sixth leading cause of years of life lost in 1991.

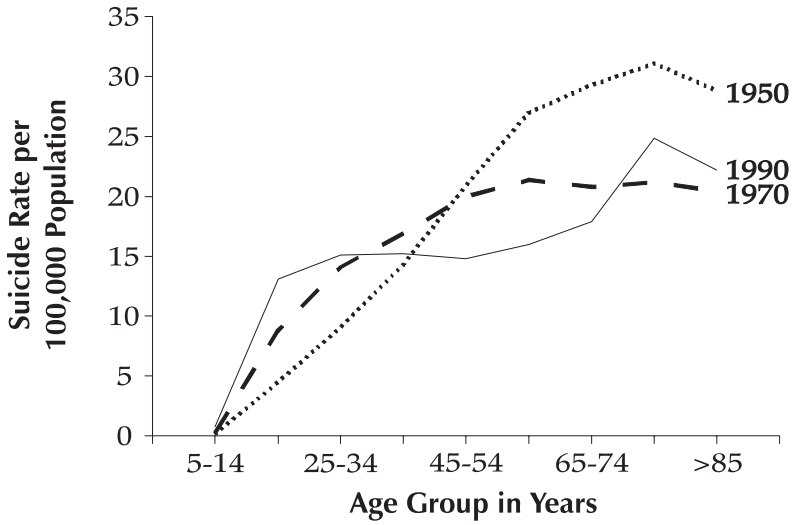
Source: NCHS underlying cause of death files

Age Trends and Cohort Effect

Despite the stability of the national suicide rate over recent decades, rates for teens and young adults increased dramatically from 1950 to 1990 (Figure 4). On the other hand, rates among adults have generally declined since 1950, with the exception of the oldest age groups. For these groups, suicide rates began rising in the 1980s and are still rising.

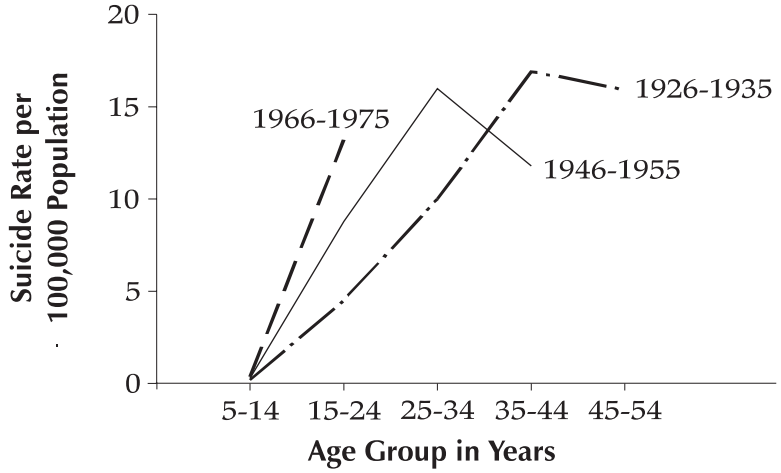
Suicide rates for teens and young adults increased dramatically from 1950 to 1990.

Figure 4. Age-Specific Suicide Rates, United States, 1950-1990



Analysis of age-specific suicide rates for three birth cohorts shows the rates of suicide early in life increasing for each successive cohort (Figure 5). Suicide rates in the middle adult years have generally declined for each successive generation. The trend toward higher suicide rates at earlier ages affects YPLL-65 and is an important public health concern.

Figure 5. Age-Specific Suicide Rates in Three Birth Cohorts, United States



Rates of suicide early in life have been increasing from one generation to the next.

Age-Specific Suicide Rates

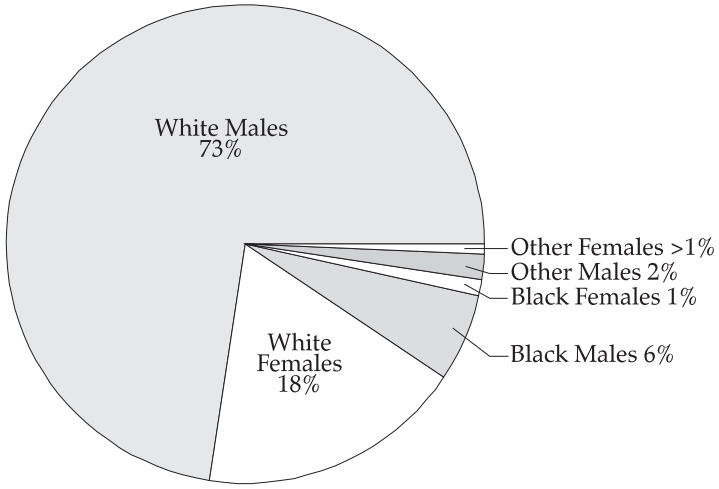
During the 1980s and early 1990s, as in previous decades, the elderly had the highest suicide rates, and children, the lowest (Table 1). Suicide rates for several other age groups changed substantially, however. In particular, there were net increases (>10%) in rates among persons aged 70 and older for the first time since the late 1930s. Among those aged 80 to 84 years, the rate increased 36% between 1980 and 1992. In 1992, this group had the highest suicide rate.

From 1980 to 1992, suicide rates also increased dramatically among persons younger than 20 years. Among children aged 10 to 14, suicide increased 121%. Although suicide remains a rare event in this age group (1.7 per 100,000 in 1992), its steep rate of increase is a concerning new trend. As in previous decades, rates among teens aged 15 to 19 continued to climb, increasing by 27% during 1980–1992. For the 20 to 24 age group, the rate of suicide levelled during the 1980s, after several decades of continued increase.

Race- and Gender-Specific Suicide Rates

In 1992, more than 90% of suicides were among whites, with white males accounting for 73% and white females for 18% of all suicide deaths (Figure 6, Table 2). The category "other races" is a combination of different racial and ethnic groups and may not represent the experience of any one of them very well. For that reason, we also estimated suicide rates for Native Americans and Asian or Pacific Islanders (Table 3). Age-adjusted rates show that for males, suicides were most common among Native Americans, followed by whites, then blacks, and finally Asian or Pacific Islanders (Figure 7). For females, whites had the highest rate, followed by Native Americans, Asian or Pacific Islanders, and blacks. In addition, the estimated age-adjusted suicide rate was lower for Hispanics than for non-Hispanics (Figure 8).

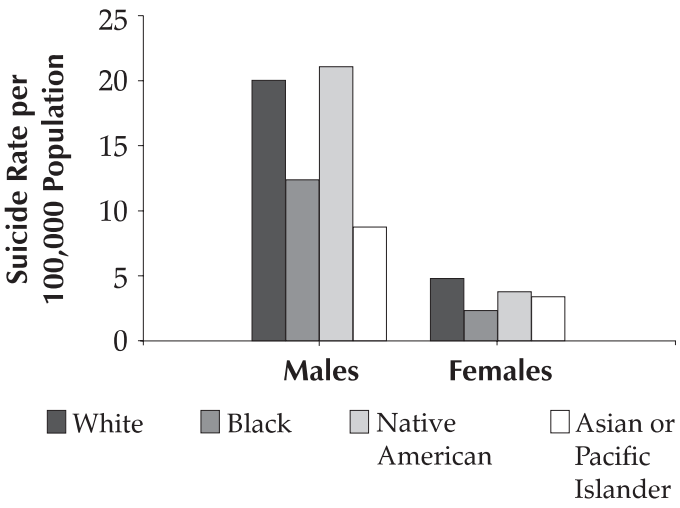
Figure 6. Distribution of Suicides, by Race and Sex, United States, 1992



Whites accounted for more than 90% of suicides in 1992.

In each of the racial and ethnic groups, suicide risk was higher for males than for females, but the male:female ratio for suicide differs among these groups. In 1992, the age-adjusted suicide rate for white males (19.4) was four times higher than the rate for white females (4.6). Among blacks, the rate was six times higher for males (12.3) than for females (2.0). Among Native Americans, the male:female ratio for suicide was 5.5 to 1, and among Asian or Pacific Islanders, it was only 2.5 to 1. Finally, among Hispanic groups, suicide was five times more common for males than for females, while for non-Hispanics, the ratio was 4:1.

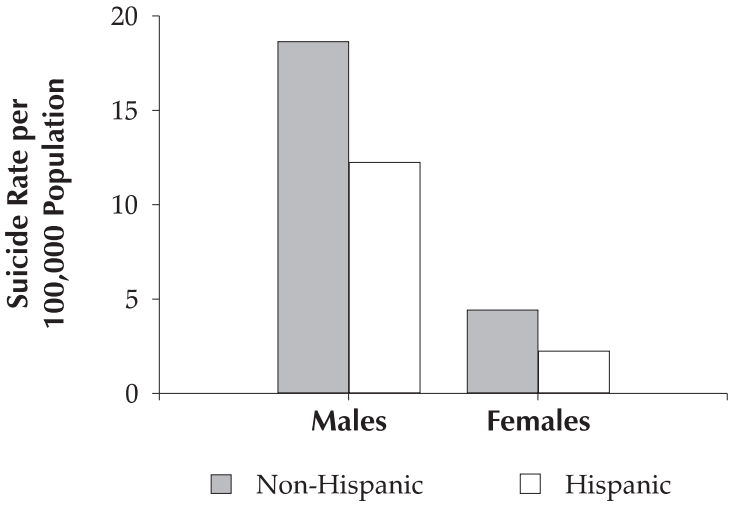
Figure 7. Estimated Age-Adjusted Suicide Rates,* by Race and Sex, United States, 1990



White males and white females have higher suicide rates than other race and sex groups.

*Estimates based on states with >95% reporting of Asian or Pacific Islander and Native American race.

Figure 8. Estimated Age-Adjusted Suicide Rates,* by Sex and Ethnicity, United States, 1990

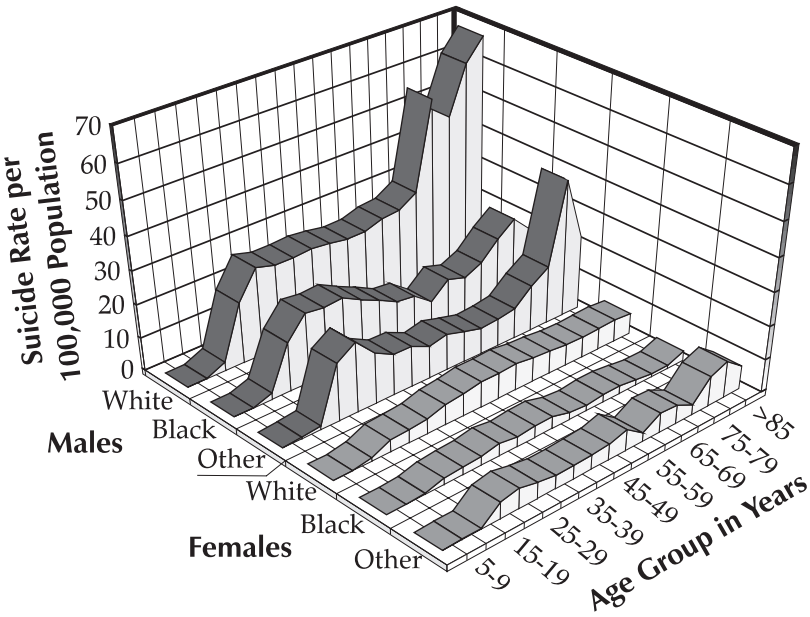


Non-Hispanic males and females have higher suicide rates than Hispanics.

*Estimates are based on states with >95% reporting of Hispanic ethnicity.

Throughout the life span, each race and sex group has its own unique pattern of suicide rates. Data for 1992 show the suicide rate for white males first increasing notably during the adolescent and young adult years, with a peak of 26.6 in the 20 to 24 age group (Figure 9, Table 2). The rate remains near this level until age 65, when it increases sharply, peaking at 67.6 for men over 85 years of age. Black males and males of other races, including Native Americans and Asian or Pacific Islanders display trends similar to those for white males. For black males, the 1992 suicide rate crests at 21.0 in the 30 to 34 age group, then drops gradually until after age 65, when it starts to rise again. The suicide rate among elderly black males, however, does not reach the rate observed among younger black men until age 80 years. The suicide rate for males of other races also increases in adolescence and young adulthood, reaching 21.1 in the 20 to 24 age group. The trend for Hispanic males is similar (Table 3). The increase in suicide rates among adolescent and young men is particularly prominent among Native Americans, for whom the lifetime peak suicide rate is reached in the 20 to 24 age group.

Figure 9. Age-Specific Suicide Rates, by Race and Sex, United States, 1992



Suicide rates for males peak during youth and old age. The trends for women differ.

For white females, the 1992 suicide rate increases slowly to crest at 8.1 in the 50 to 54 age group and then slowly declines through- out late adulthood. Black females have a similar change in suicide risk over the life span, except that their suicide rate peaks at 3.8 in the 30 to 34 age group. For both Asian or Pacific Islander and Native American females, suicide rates peak in the 30 to 34 age group and again later in life.

Both white and black males demonstrated modest increases (3% and 11%, respectively) in age-adjusted suicide rates between 1980 and 1992. These subtle overall changes were driven by substantial increases in suicide rates among adolescent and elderly men. The age-adjusted rates for males of other races declined by 14% over the 13 years. Finally, during the study period, suicide rates diminished for white females (19%), black females (13%), and females of other races (19%). For women of all races, the overall rate of decline was most notable during the middle adult years.

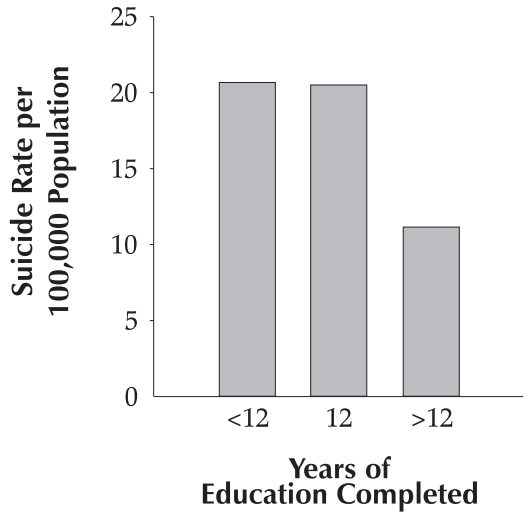
In all six race and sex groups, the greatest net increase in age-specific suicide rates was in the 10 to 14 age group, with the margins of increase ranging from 88% to 283% (Table 2). During the 1980s and early 1990s, suicide rates climbed most rapidly among young black males in both the younger teenage group (10 to 14 years, 283% increase) and the older teenage group (15 to 19 years, 165% increase). Substantial increases (>50%) were also noted for black males over 75 years of age, for males of other races ranging in age from 75 to 84, and for females of other races ranging from 60 to 69. The largest decreases in age-specific suicide rates between 1980 and 1992 were reported for black females and for females of other races during the middle adult years.

In all race and sex groups, suicide rates increased most for 10 to 14 year olds.

Level of Education and Marital Status

In general, young and middle-aged adults who have had some post-secondary education have a lower rate of suicide than those who have completed 12 or fewer years of school (Figure 10, Table 4). Paradoxically, higher levels of education seem to be associated with relatively higher suicide rates late in life. Marital status also has an impact on suicide rates, with married persons having lower suicide rates than single, never married individuals (Figure 11, Table 5). The highest rates occur among widowed and divorced persons.

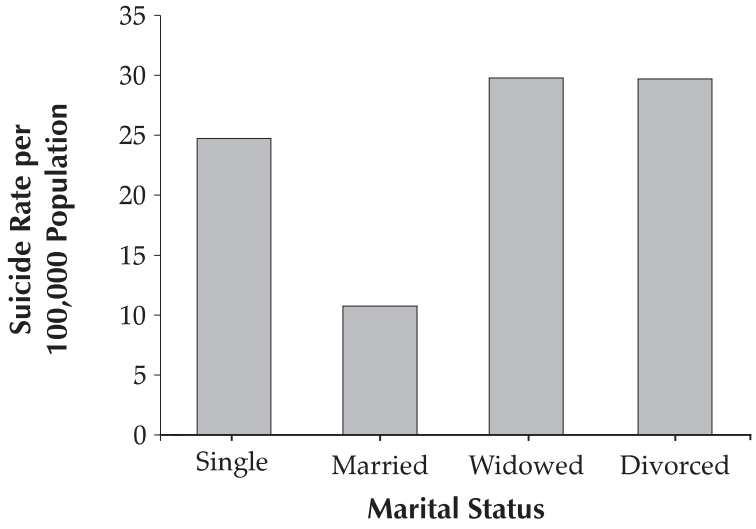
Figure 10. Estimated Age-Adjusted Suicide Rates,* by Level of Education, United States, 1990



*Estimates based on states with >95% reporting of educational level. Analysis limited to deaths of persons ≥ 20 years.

Until late in life, higher levels of education are associated with lower suicide rates.

Figure 11. Estimated Age-Adjusted Suicide Rates,* by Marital Status, United States, 1990



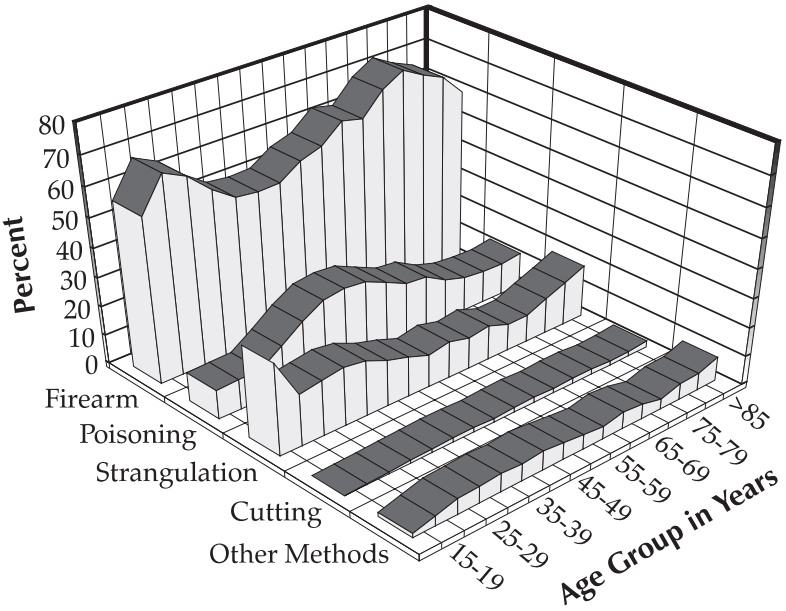
*Estimates based on states with >95% reporting or marital status. Analysis limited to deaths of persons ≥ 15 years.

Suicide is less common among married people than among widowed, divorced, or single people.

Method of Suicide

Firearms were used in most suicides in the United States during the 1980s and early 1990s (Table 1) and accounted for 60% of all suicides in 1992 (Figure 12). The next most commonly reported methods were poisoning (18%), strangulation (15%), and cutting (1%). Other, or unspecified, means accounted for 6% of all suicides in 1992. These relative proportions changed little between 1980 and 1992. Strangulation by hanging was a particularly prominent method among children, adolescents, and young adults. The greatest proportion of suicides due to poisoning occurred among middle-aged adults.

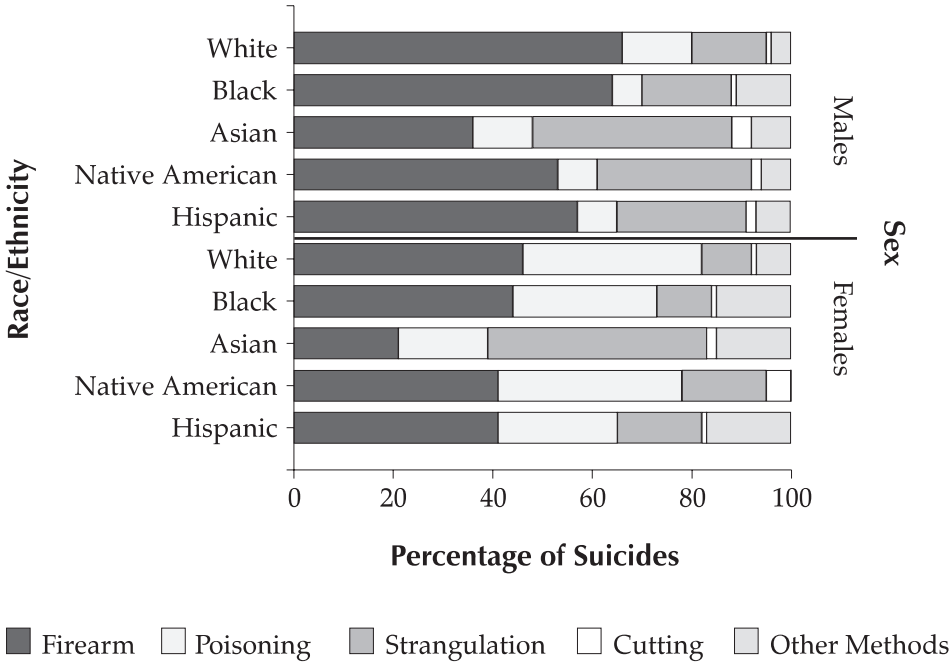
Figure 12. Percentage of Suicides for Five-Year Age Groups, by Method, United States, 1992



Firearms are by far the most common method of suicide.

The methods of suicide in 1990 also varied by race, ethnicity, and sex (Figure 13). Firearms accounted for the majority of suicides among white males (66%), black males (64%), Hispanic males (58%), non-Hispanic males (65%), and Native American males (53%). Among males who are Asian or Pacific Islanders, strangulation accounted for slightly more suicides (40%) than firearms (36%).

Figure 13. Estimated Percentage of Suicides,* by Method, Race, Ethnicity, and Sex, United States, 1990



*Estimates based on states with >95% reporting of race and ethnicity.

Firearms were also the principal means of suicide used by white (45%) and black (43%) females, Hispanic (39%) and non-Hispanic (43%) females, and Native American females (41%). Poisoning was also a prominent method for these groups (white, 36%; black, 29%; Hispanic, 25%; non-Hispanic, 36%; Native American, 37%). Strangulation accounted for the greatest proportion (40%) of suicide deaths among Asian or Pacific Islander females.

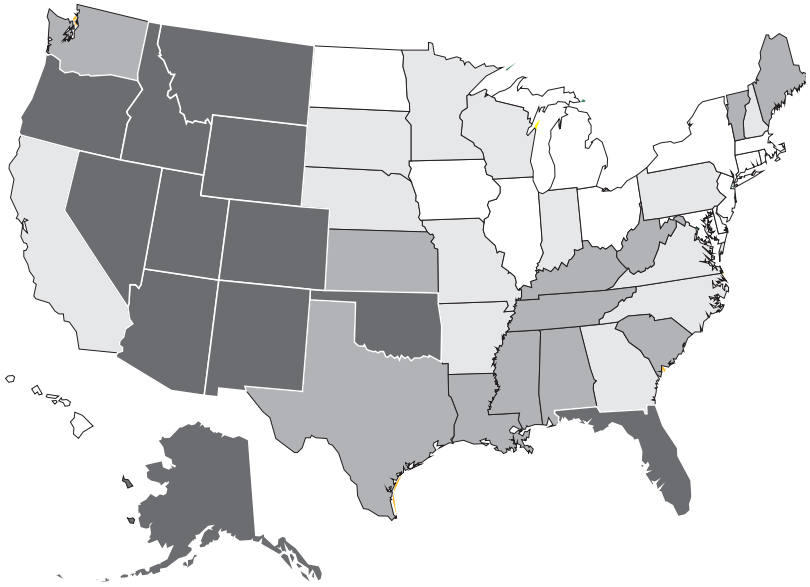
Only Asian or Pacific Islanders used some other means of suicide more frequently than firearms.

Between 1980 and 1992, the annual number of firearm suicides increased by 18% (Table 1). Firearms accounted for 77% of the increased number of suicides between 1980 and 1992. Increases in firearm suicides were particularly large in the age groups 10 to 19 years and greater than 80 years. The rate of suicide by strangulation also rose during the 1980s and early 1990s, particularly among children 10 to 14 years of age. The rates of suicide by poisoning, cutting, and other means declined during the 13-year study interval.

Geographic Variation

In 1990, age-adjusted suicide rates varied substantially across states (Figure 14, Table 6), from 22.2 in Nevada to 5.4 in the District of Columbia. The median state-specific suicide rate was 12.0. Montana, formerly ranked 9th, had the second highest rate. New Mexico dropped in rank from second to third, even though its rate (18.3) increased slightly from 1980. Idaho moved to fourth (18.2) after being 13th in 1980. Wyoming remained fifth despite a slight increase over the decade.

Figure 14. State Variations in Age-Adjusted Suicide Rates, United States, 1992



Suicides per 100,000, in Quartiles

5.1-10.7 | 10.8-11.5 | 11.6-12.9 | 13.0-22.9

National Rate = 11.1 per 100,000

Suicide rates are generally higher in the western states than in the rest of the country.

Suicide rates increased in 34 states during the 1980s, with increases of 20% or more in Nebraska, Montana, Idaho, and South Carolina. Nebraska's increase (44%) was driven largely by a drastic increase in suicides by poisoning and by firearm wounds. These increases propelled the state from 44th in 1980 to 15th in 1990. Montana's move to second in 1990 was due to

substantial increases (41%) in suicide from almost all methods. The increases in Idaho (39%) and in South Carolina (25%) were mostly from firearm-related suicides.

As noted above, the lowest rate in the country was in the District of Columbia. New Jersey had the second lowest rate (6.5), followed by New York (7.9), Massachusetts (8.1), and Connecticut (8.3). For all of these areas except Massachusetts, the rates had declined from 1980 to 1990.

Suicide rates increased in 34 states during the 1980s and decreased in 16 and the District of Columbia.

Overall, the suicide rates declined during the decade in 16 states and the District of Columbia, with the District of Columbia having the greatest percentage of decline. Alaska, California, Ohio, and New York all had declines exceeding 10% of their 1980 rate. The percentage of decline in the District of Columbia's suicide rate (39%) was mostly due to a 47% decline in suicides using firearms, followed by a 78% decline in suicides by poisoning. Similarly, Alaska's 16% decline was largely the result of a 32% decline in the firearm-related suicide rate. Interestingly, most of California's 15% decline in suicide is attributable to a 42% decline in the rate of suicide by poisoning. The 13% decline in Ohio's suicide rate was also largely driven by a decline in the poisoning-related suicide rate, while New York's 11% decline was mostly attributable to a 26% decline in the poisoning rate and a 30% decline in suicide by other methods (mainly jumping from buildings and bridges). New York's declines were offset, however, by a 15% increase in the rate of suicide by firearms.

As in previous decades, suicide rates in the western states were generally higher than those in the eastern and midwestern regions (Figure 14). The higher rates in the west appear to be largely a result of higher rates of firearm suicide. For most states, firearm suicide rates correlate strongly with overall suicide rates.

Discussion

Although the total national suicide rate appears to have changed very little in recent years, it masks considerable variation in age-, race-, sex-, and state-specific suicide rates. This variation is a source of both concern and optimism. High and increasing rates of suicide can help identify populations in need of attention. Although there is at present very little evidence that any of the currently proposed interventions can reduce suicide rates, the low and declining rates observed in some states and population groups offer hope that local environmental, legislative, and cultural features can reduce the likelihood of suicide.

During the 1980s, suicide rates—especially rates of firearm-related suicide—increased most rapidly for young males, elderly males, and black males. Firearms also accounted for most of the difference between suicide rates in western states and those in other regions. Relatively low rates of suicide decreased further among white females and females of other races, largely because of diminishing rates of suicide by poisoning. At the same time, however, suicide rates for black females did not decline.

The current challenge is to use these newly identified trends in suicide to develop preventive interventions.

The challenge facing public health and mental health officials is to use these newly identified trends to develop effective preventive interventions. In the absence of proven suicide prevention strategies, the following recommendations are suggested:[8]

- Ensure that new and existing suicide prevention programs are linked closely to professional mental health services in the community.
- Avoid reliance on a single prevention strategy.
- Evaluate new and existing suicide prevention programs.
- Incorporate promising but underused strategies—such as restricting access to lethal means—into current programs.
- Target groups with high and rising rates of suicide: males, teenagers, young adults, and the elderly.

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