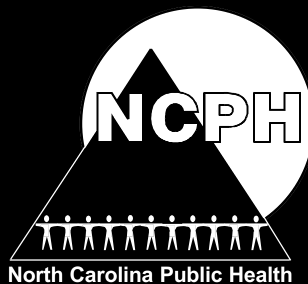

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Suicide in North Carolina

by

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ABSTRACT

Objectives

This report uses suicide and related data to compare North Carolina to the nation and to examine statewide trends and patterns. The purpose is to identify population groups at greatest or increasing risk for suicide so that prevention measures might be developed.

Methods

Data are primarily from death certificates, Medical Examiner reports, school surveys, and hospital discharge files. Because of wide differences in the suicide experience of age, race, and gender groups, percentages and population-based rates are specific or adjusted for those factors.

Results

North Carolina's age-adjusted suicide rate is similar to the nation's. However, firearm suicides are more frequent in North Carolina. Other salient findings are:

- Older adults, especially older white men, have the highest suicide rates.
- Rates are increasing among elderly whites (both males and females), younger minorities, and younger males.
- Guns are used in about two-thirds of all suicides in North Carolina.
- Middle school students are even more likely than high school students to report suicide thoughts or attempts.
- The ratio of nonfatal hospitalized suicide attempts to completed suicides is estimated at 5:1 overall, 10:1 for females.

Conclusions

Prevention strategies should include better diagnosis and treatment of mental illness and substance abuse, school-based education programs, and a reduction in the easy availability of firearms.

Introduction

In 1995, 904 North Carolina residents died from suicide. The state's suicide rate increased from 11.2 deaths per 100,000 population in 1980 to 12.6 in 1995, an increase of 13 percent. During this period, the age-adjusted suicide rate rose 6.7 percent. This modest overall increase contrasts with substantial rate increases in some age groups. Increased rates at younger ages, noted in an earlier study,[1] were one reason for this study.

Not only are certain age-specific suicide rates increasing, but suicide ranks in the top ten causes of death for all but the oldest (65+) and youngest (<10) age groups. It is the third leading cause at ages 15-24 and the fourth at ages 10-14 and 25-34.

The purpose of this study is to examine trends and patterns in suicide, as a basis for establishing preventive measures for North Carolina.

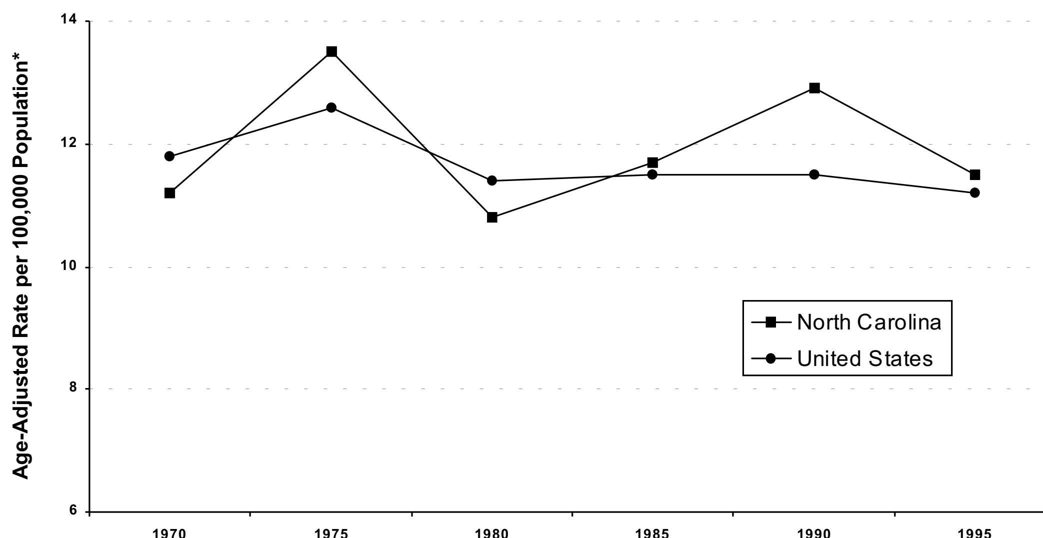
Comparisons to the United States

Figure 1 depicts the North Carolina and United States age-adjusted suicide rates (per 100,000 population) for every fifth year between 1970 and 1995. Generally, the rates are very similar. However, suicides by firearms have been more frequent in North Carolina than in the nation. In 1995, firearms accounted for 67 percent of North Carolina suicides compared to 59 percent of U.S. suicides. The age-adjusted firearm suicide rate was 7.6 in North Carolina compared to 6.5 in the nation.[2]

Changes from 1980-84 to 1991-95

As shown in the following table, the state's suicide rates for ages 10-14, 15-19, 30-34, 80-84, and 85+ were higher in 1991-95 than in 1980-84. On the other hand, rates declined for adults between the ages of 35 and 75.

Figure 1
Age-Adjusted Suicide Rates*
North Carolina and United States, 1970 to 1995



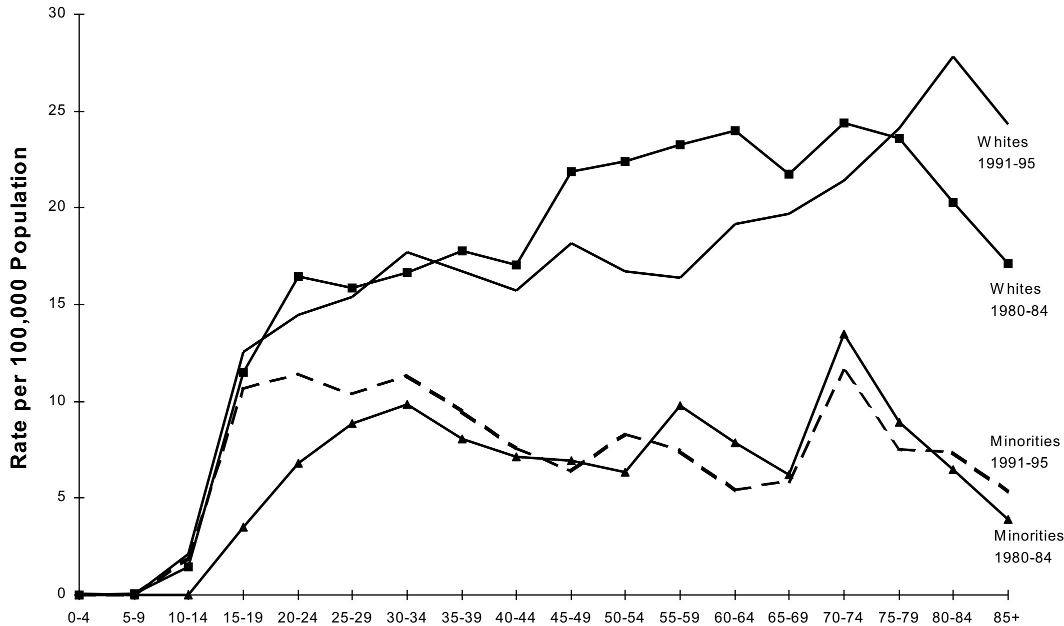
*Adjusted by the direct method, using 10-year age groups and the 1940 U.S. Census as the standard population.

Source: State Center for Health Statistics

Age-Specific Suicide Rates and Percent Changes
North Carolina, 1980-84 and 1991-95

Age Group	Deaths per 100,000 Population 1980-84	1991-95	Percent Change
0-4	0.0	0.0	0.0
5-9	0.0	0.0	0.0
10-14	1.0	2.1	110.0
15-19	8.6	12.0	39.5
20-24	13.9	13.7	- 1.4
25-29	14.1	14.1	0.0
30-34	15.1	16.2	7.3
35-39	15.8	15.0	- 5.1
40-44	16.4	13.9	- 15.2
45-49	19.1	15.8	-17.3
50-54	19.4	15.1	- 22.2
55-59	20.7	14.8	- 28.5
60-64	20.9	16.7	- 20.1
65-69	18.7	17.3	- 7.5
70-74	22.3	19.7	- 11.7
75-79	20.8	21.2	1.9
80-84	15.0	24.2	61.3
85+	14.5	20.9	44.1

Figure 2
Age-Race-Specific Suicide Rates
North Carolina, 1980-84 and 1991-95



Source: State Center for Health Statistics

Because of wide differences in the suicide rates of age groups, comparisons over time should use age-adjusted or age-specific rates. Similarly, wide differences among race-gender groups suggest the use of rates specific for race and gender as well as age, as used in the next comparisons.

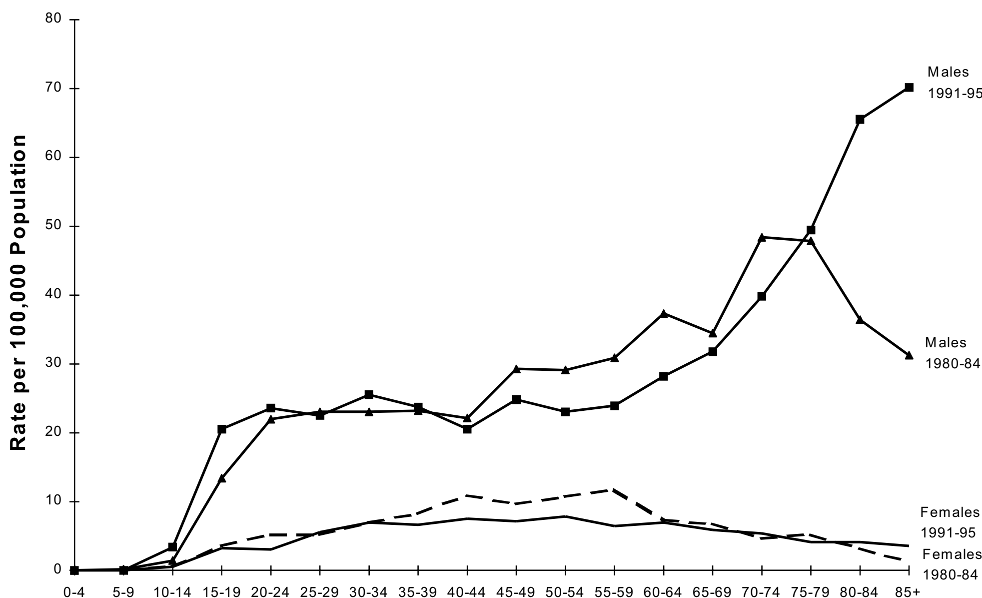
Figure 2 depicts the 1980-84 and 1991-95 suicide rates for age-race groups. Among whites, rates for adults between 35 and 75 have declined while rates for older whites have risen. In contrast, the major change for minorities has occurred at younger ages: the rates for ages 10-14 through 35-39 all rose between 1980-84 and 1991-95. The largest percentage increases for minorities were in the age groups 10-14 (the rate increased from 0.0 to 1.9) and 15-19 (3.5 to 10.7, an increase of 206 percent).

A recent national report[3] shows that the suicide rate for blacks ages 10-19 rose 114 percent between 1980 and 1995. The rate for blacks ages 10-14 rose 233 percent. Researchers speculate that one factor may be growth of the black middle class. “Black youths in upwardly mobile families may experience stress associated with their new social environments.” Breakdown of the family and easier access to alcohol, illicit drugs, and lethal suicide methods were also mentioned as possible contributing factors.

Figure 3 depicts the 1980-84 and 1991-95 suicide rates for age-gender groups. Among males, the suicide rate rose 143 percent at ages 10-14, 53 percent at ages 15-19, 80 percent at ages 80-84, and 125 percent at ages 85 and older. The major increases for females occurred at ages 80-84 (28%) and 85 and older (177%).

From these data, it is clear that whites and males have much higher rates of suicide. Also, whites and both males and females contributed to the suicide rate increases at older ages, while minorities and males primarily account for the increased rates at younger ages.

Figure 3
Age-Gender-Specific Suicide Rates
North Carolina, 1980-84 and 1991-95



Source: State Center for Health Statistics

The distribution of suicides by race and gender has changed, as shown by Figure 4. Minorities accounted for proportionately more and white females for proportionately fewer suicides in 1991-95 than in 1980-84. Still, in 1991-95, white males accounted for nearly 7 out of 10 suicides in North Carolina.

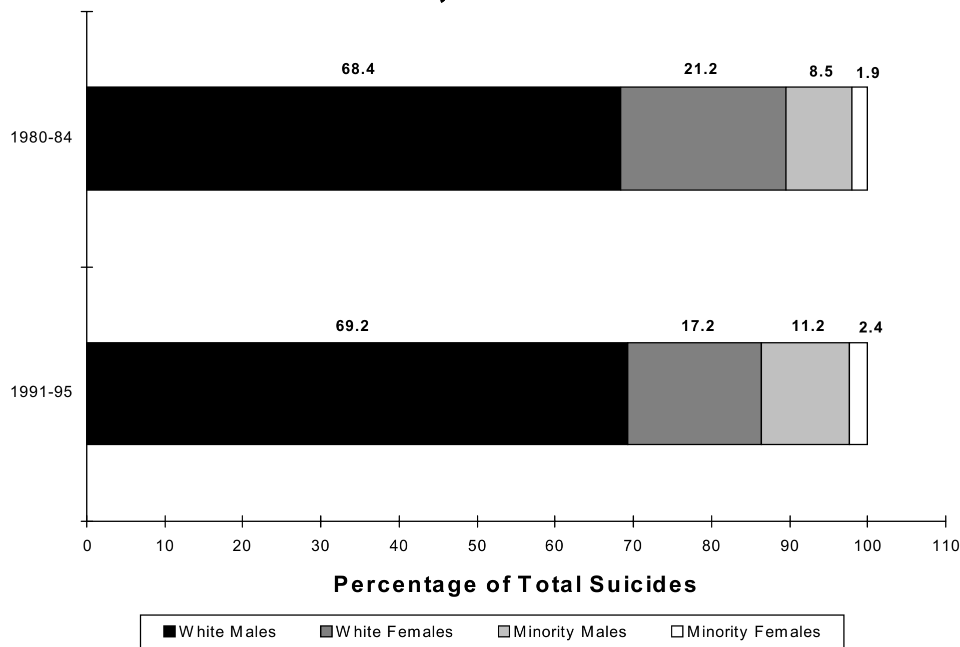
Figure 5 provides a final comparison between 1980-84 and 1991-95: percentage distributions of suicides by method. Because of wide differences between males and females in their methods, the data are shown by gender. While firearms still account for about two of every three suicides, the percentage by hanging and strangulation increased 42 percent among males. This may reflect rising suicide rates at younger ages. As seen later, strangulation/hanging is found to be particularly prominent among the young.

Age-Specific Suicide Rates by Race-Gender

Population groups at highest risk for suicide need to be identified so that appropriate interventions can be targeted. For this purpose, rates specific for age-race-gender would be helpful. This means that 10 years of data (1986-95) are needed to achieve adequate numbers for all population groups.

Throughout life, each race-gender group has its own frequency and pattern of suicide, as depicted in Figure 6. For white males, the rate increases during adolescence and young adulthood, rising to 27.4 at ages 30-34. The rate then increases steadily before rising sharply at ages 75-79. The peak rate of 73.5 occurs among white males 85 and older. The pattern is similar for minority males, with peaks at ages 30-34, 70-74, and 85 and older.

Figure 4
Percentage of Suicides by Race-Gender
North Carolina, 1980-84 and 1991-95



Source: State Center for Health Statistics

For white females, peak rates occur at ages 30-34, 50-54, and 65-69 with diminishing rates thereafter. For minority females, suicide rates peak at ages 30-34, 45-49, and 65-69. Compared to the other race-gender groups, the suicide rates of minority females are low throughout the life span.

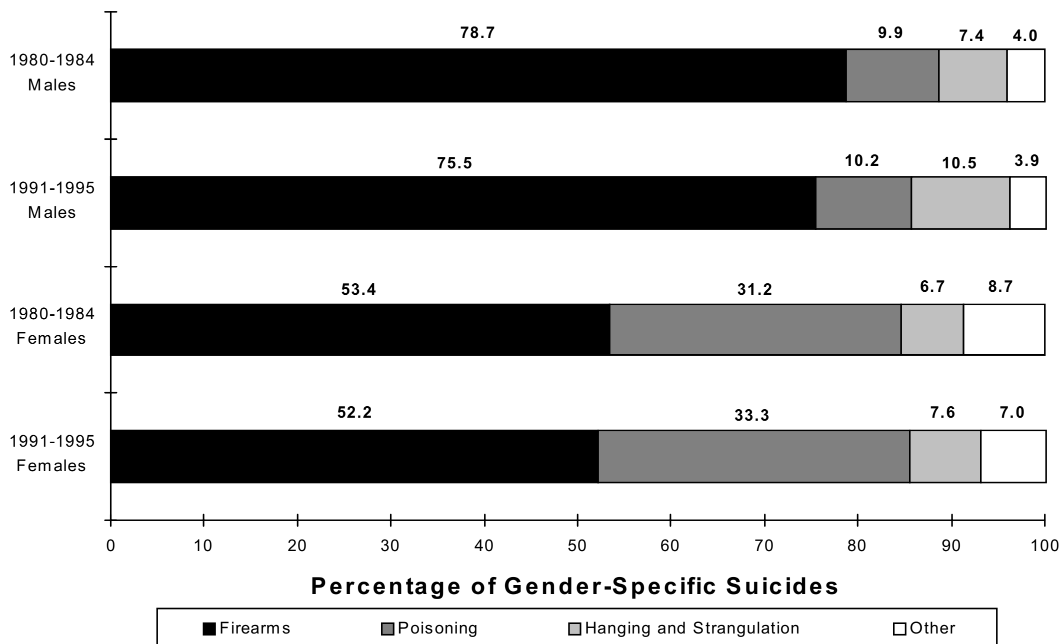
Method of Suicide

As already seen (Figure 5), firearms are used in most suicides. This is true at all ages, as shown in Figure 7. The use of firearms is most prominent at older ages, with relatively high use also occurring at ages 15-19 and 20-24. Poisoning is second in prominence with the greatest proportion occurring among victims ages 45-49. Strangulation/hanging is used in nearly half of suicides at ages 10-14. The methods of suicide also vary by race and gender, as seen in Figure 8. Differences are greater by gender than by race.

Medical Examiner Findings for Blood Alcohol

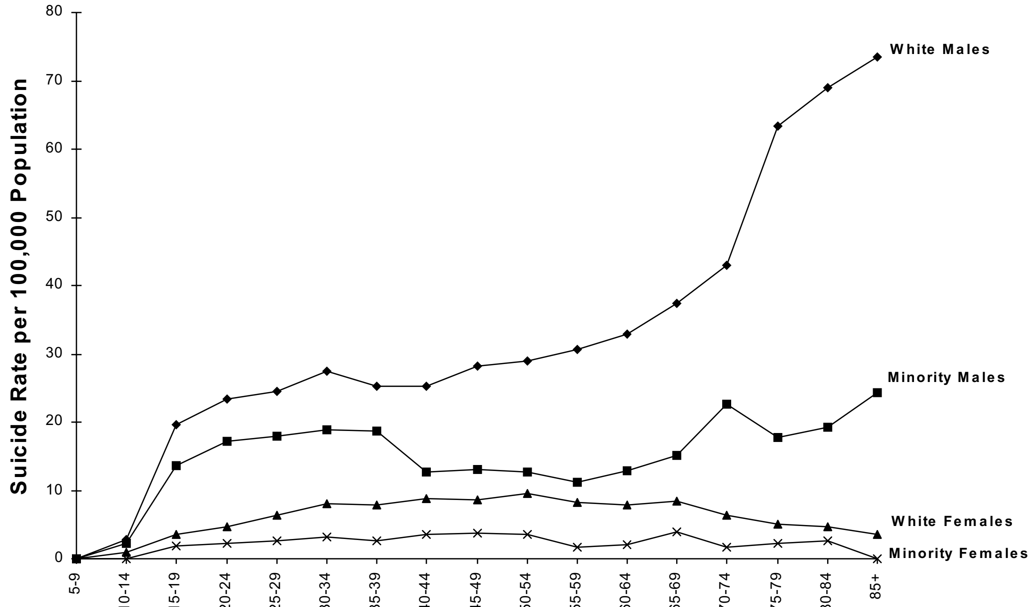
During 1991-95, North Carolina's Office of the Chief Medical Examiner (OCME) investigated 4,513 suicides. Of those, 3,966 (88%) were tested for blood alcohol. Results show that 69.0 percent were negative/none detected, 7.7 percent had a level less than 80 mg %, and 23.3 percent had a level of 80 mg % or greater. A blood alcohol level of 80 mg % or greater is illegal in North Carolina DWI laws. By race and gender, the percentages with a level of 80 mg % or greater were: white males, 26.3; minority males, 19.8; white females, 16.2; minority females, 14.1. By age, the percentages with blood alcohol 80 mg % or greater were 30 percent or higher at ages 20-24 through 40-44.

Figure 5
Method of Suicide by Gender
North Carolina, 1980-84 and 1991-95



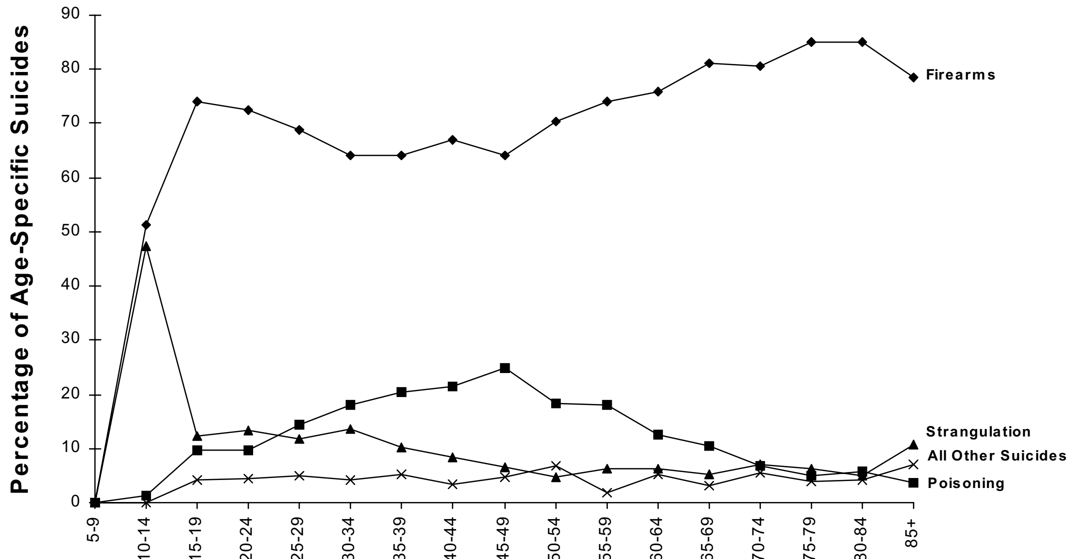
Source: State Center for Health Statistics

Figure 6
Age-Specific Suicide Rates by Race-Gender
North Carolina, 1986-95



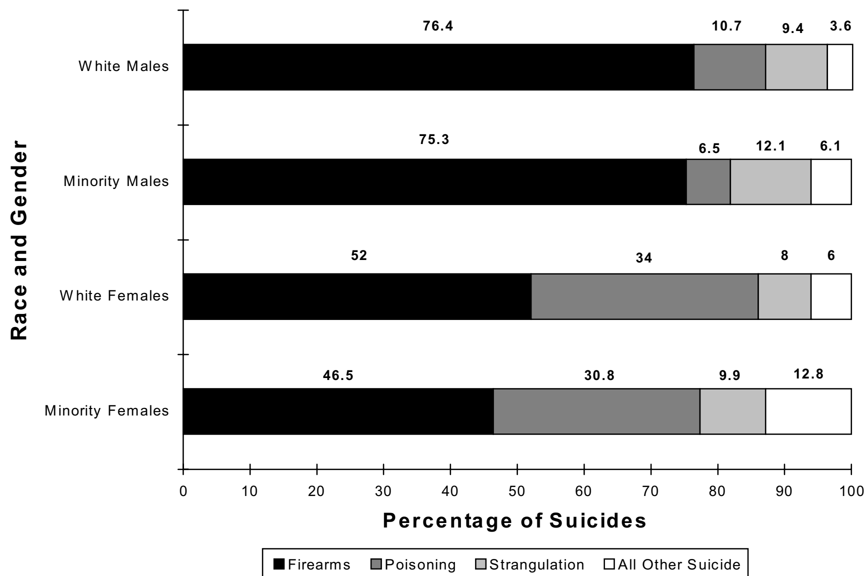
Source: State Center for Health Statistics

Figure 7
Age-Specific Percentage of Suicides by Method
North Carolina, 1986-95



Source: State Center for Health Statistics

Figure 8
Percentage of Suicides for Race-Gender Groups by Method
North Carolina, 1986-95



Source: State Center for Health Statistics

Suicide-Related Behaviors Among Adolescents

Suicide is the fourth leading cause of death among North Carolinians ages 10-14, the third leading cause among ages 15-24; and the suicide rates at ages 10-14 and 15-19 have increased substantially over the past decade.

In 1995, the North Carolina Department of Public Instruction surveyed middle school students (grades 6-8) and high school students (grades 9-12) concerning certain health-related behaviors.[4,5] High school students were also surveyed in 1993.[6] In 1995, 3.5 percent of high school students reported an "injurious" suicide attempt during the past year, meaning the attempt resulted in an injury, poisoning, or overdose that had to be treated by a doctor or nurse. Many more said they had attempted suicide (9%), made a suicide plan (15%), or seriously considered suicide (20%). Females, whites, and tenth graders were most likely to report these suicidal thoughts or attempts, except blacks (3.7%) were more likely than whites (2.8%) to report an injurious suicide attempt. Except for injurious attempts, the 1995 results suggest improvements since 1993, as shown in Figure 9.

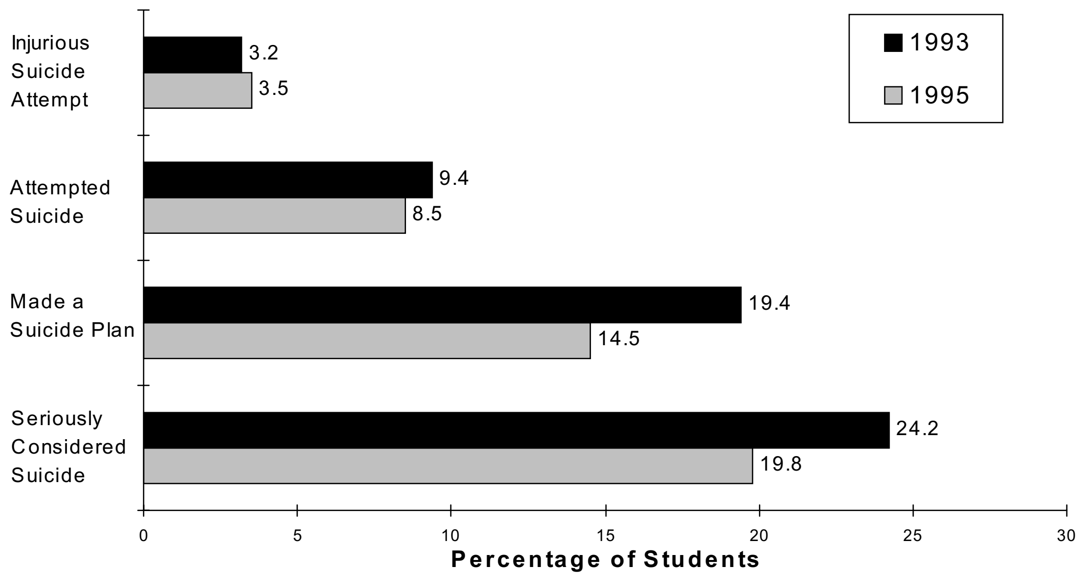
Particularly alarming are the 1995 results for middle school students, who were more likely than high school students to report suicide attempts and making a suicide plan, as shown in Figure 10. Females, non-black minorities, and eighth graders were most likely to report these behaviors.

National Year 2000 health objectives include two addressing suicide among teenagers:

Objective 6.1a Reduce suicides at ages 15-19 to no more than 8.2 per hundred thousand people.[7]

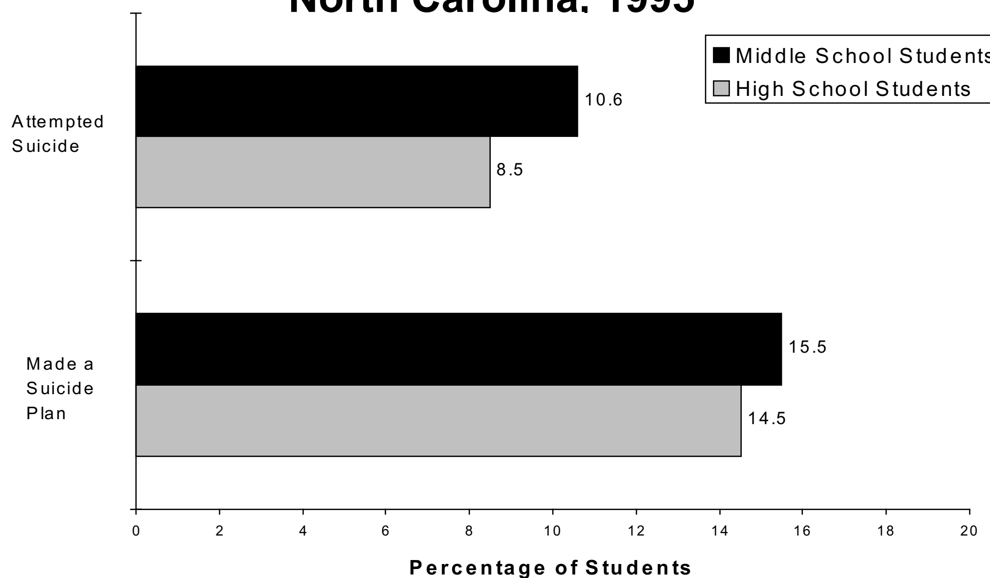
The North Carolina rate was 13.8 in 1995.

Figure 9
Percentage of High School Students Reporting Suicidal Thoughts or Attempts During Past 12 Months North Carolina, 1993 and 1995



Source: Youth Risk Behavior Survey, N.C. Department of Public Instruction, 1993 and 1995.

Figure 10
Percentage of Middle and High School Students Reporting Suicide Attempts and Plans During Past Twelve Months North Carolina, 1995



Source: N.C. Department of Public Instruction, 1995

Objective 6.2 Reduce by 15 percent (to 1.8 percent[8]) the incidence of injurious suicidal attempts among adolescents aged 14 through 17.[7]

The North Carolina percentage for high school students was 3.5 in 1995.

Attempted Suicide Injuries Treated in Hospitals

Beginning in 1997, North Carolina hospital discharge data provide information on inpatients treated for injuries from attempted suicide. For the nine months January through September, 2,776 such patients were reported. Thirty-four percent had used tranquilizers and other psychotropic agents, and another 46 percent had used other drug or medicinal substances. The next most frequent means (7%) was a cutting and piercing instrument. A majority of the patients were female (61%), white (71%), and between the ages of 25 and 45 (52%). Thirty-eight of the 2,776 patients died in the hospital.

By annualizing the 9-month number and adjusting for an estimated 17 percent missing E-codes among injuries,* it is estimated that 4,400 **nonfatal** suicide attempts were treated in North Carolina hospitals in 1997. Provisionally, resident deaths during 1997 include about 878 suicides. The resulting ratio of nonfatal hospitalized attempts to completed suicides is about 5:1. The corresponding ratio for North Carolina females is about 10:1.

Discussion

In addition to youth ages 15-19, national health objective 6.1 targets other population groups at unusual risk for suicide: men ages 20-34, white men ages 65 and older, and American Indian/Alaska Native men in reservation states. The Year 2000 target for the general U.S. population is an age-adjusted rate of no more than 10.5 suicides per 100,000 people.[7] North Carolina's 1995 age-adjusted rate was 11.5.

Identification of increasing and elevated rates of suicide can point to populations in need of attention. In North Carolina, this study reveals increasing rates among elderly whites (both males and females), younger minorities, and younger males. Older adults have the highest suicide rates, and older white men are especially likely to die by suicide.

Teen suicide is increasing in North Carolina, primarily among minorities and males, and attempted suicide is much more frequent than completed suicide. Attempted suicide is a risk factor for future completed suicide.[7] The challenge is to develop prevention and treatment programs that can reverse the trend in suicide among the young and help prevent suicide at older ages.

Suicide prevention strategies would include better diagnosis and treatment of mental illness and substance abuse, tighter prescription requirements for highly toxic psychotropic drugs, and devices that shut off a car's engine if dangerous levels of carbon monoxide build up inside the car.[9] Another strategy is to implement school-based programs designed to educate administrators, faculty, students, and parents about the warning signs of suicide and resources available for help.[9] Since firearms are used in most suicides, successful prevention of suicide must address this issue also. Education about the dangers of loaded firearms and promotion of trigger locks may be effective. Consideration should be given to tighter permitting requirements and other means of reducing the easy availability of firearms. A central principle of injury prevention is that it is easier to remove the physical agent of potential injury than it is to modify risk-taking behavior.[10]

*Among all injury patients, an E-code (external cause of injury) was not reported for 17 percent.

References

[1]Cheryl Waller. “North Carolina Performance on Year 2000 Child Health Objectives,” *SCHS Studies,* No. 102. N.C. Department of Environment, Health, and Natural Resources, Raleigh, February 1997.

[2]National Center for Health Statistics. “Advance Report of Final Mortality Statistics, 1995,” *Monthly Vital Statistics Report,* Vol. 45, No. 11 (5)2. Hyattsville, Maryland: Public Health Service, June 12, 1997.

[3]Centers for Disease Control. “Suicide Among Black Youths – United States, 1980-1995,” *Morbidity and Mortality Weekly Report,* Vol. 47, No. 10, March 20, 1998.

[4]N.C. Department of Public Instruction. *Middle School Risk Behavior: 1995 Survey Results.* Raleigh, September 1996.

[5]N.C. Department of Public Instruction. *High School Risk Behavior: 1995 Survey Results.* Raleigh, September 1996.

[6]N.C. Department of Public Instruction. *1993 Youth Risk Behavior Survey.* Raleigh, March 1993.

[7]U.S. Department of Health and Human Services, Public Health Service. *Healthy People 2000: National Health Promotion and Disease Prevention Objectives,* DHHS Publication No. (PHS) 91-50212. U.S. Government Printing Office, Washington, September 1990.

[8]National Center for Health Statistics. *Healthy People 2000 Review, 1993.* Hyattsville, Maryland: Public Health Service, 1994.

[9]Department of Environment, Health, and Natural Resources, Center for Health and Environmental Statistics. “Suicide,” *Leading Causes of Mortality: North Carolina Vital Statistics 1988 – Volume 2.* Raleigh, June 1990.

[10]Jeffrey J. Boyd and Eve K. Moscicki. “Firearms and Youth Suicide,” *American Journal of Public Health*, Vol. 76, No. 10, October 1986.

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