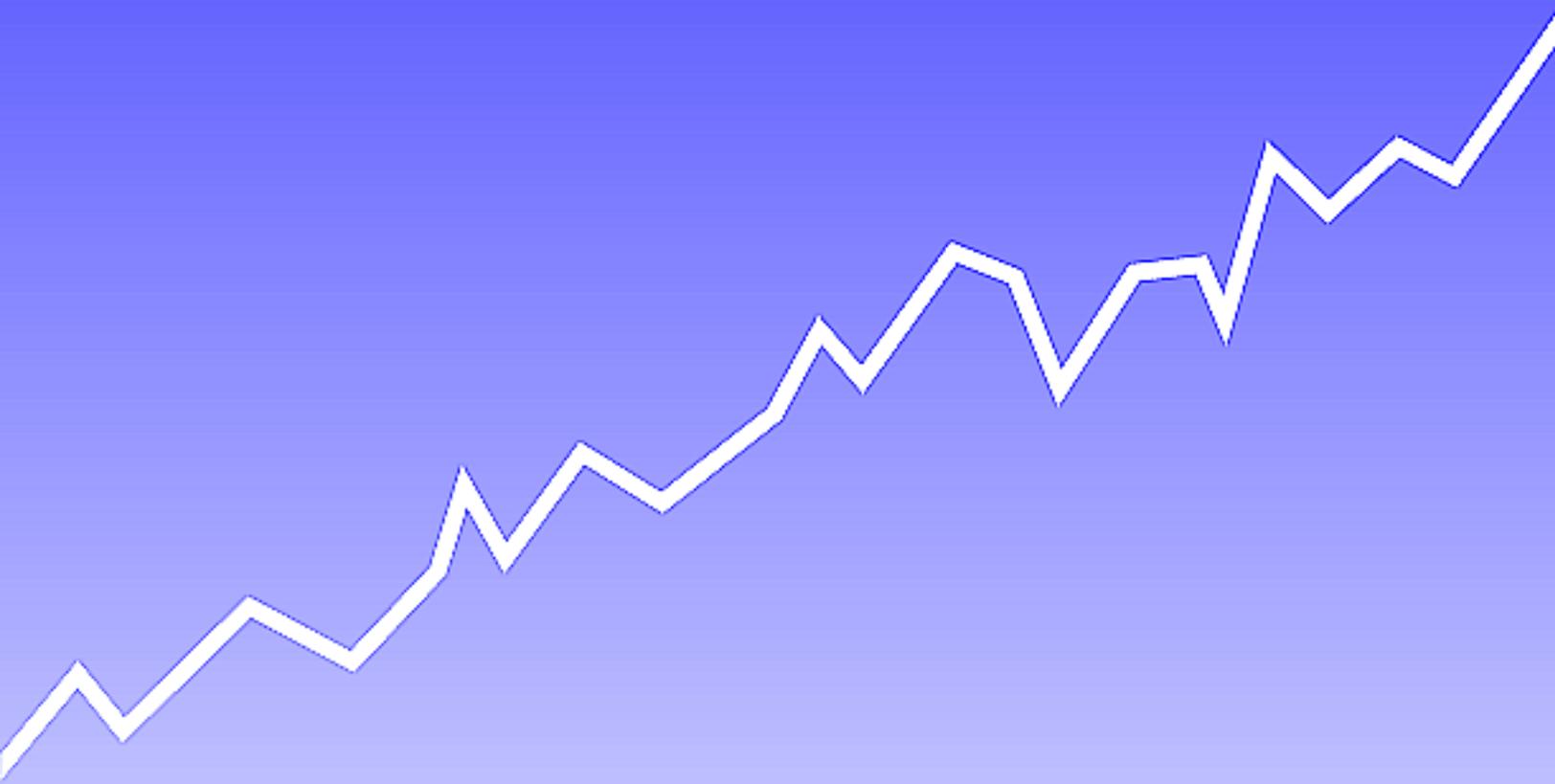


Suicide

and Suicidal Thoughts by Oregonians



Center for Health Statistics
Center for Disease Prevention and Epidemiology
Oregon Health Division
Oregon Department of Human Resources

SUICIDE

And Suicidal Thoughts by Oregonians



Oregon Department of Human Resources
Health Division
Center for Disease Prevention and Epidemiology
Center for Health Statistics
800 NE Oregon Street, Suite 215
Portland, Oregon 97232

Elinor Hall
Administrator
Oregon State Health Division

Edward J. Johnson II
State Registrar
Oregon Center for Health Statistics

November 1997

Desktop Publishing by:
Phyllis E. Mason

Acknowledgements:

Many people reviewed and otherwise contributed to this report, including Tammis Alexander, Linda Duke, David Fleming, M.D., Joyce Grant-Worley, David Hopkins, Lore Lee, Bob MacKay, Don Peterson, Barbara Pizacani, and Cathy Riddell.

Center for Health Statistics
PO Box 14050
Portland, OR 97293-0050

Telephone: (503) 731-4354

CONTENTS

LIST OF FIGURES	7
LIST OF TABLES	9
INTRODUCTION	11
SUICIDE IDEATION	12
SUICIDE COMPLETION	13
IDEATION VERSUS COMPLETION	14
METHODOLOGY	15
BRFSS	15
MORTALITY DATA	16
RESULTS AND DISCUSSION	17
SUICIDE IDEATION	17
DEMOGRAPHIC CHARACTERISTICS..	17
HEALTH CHARACTERISTICS	22
LOGISTIC REGRESSION ANALYSIS.....	23
SUICIDE DEATHS	25
DEMOGRAPHIC CHARACTERISTICS..	26
THE SUICIDAL EVENT	31
NATIONAL COMPARISON	36
IDEATION VERSUS COMPLETION	39
OTHER RISK FACTORS	40
PREVENTION	43
IDENTIFICATION OF	
AT-RISK PERSONS	43
FIREARM-RELATED RISK.....	44
REFERENCES AND ENDNOTES.....	47
INDEX	55

Readers may notice the unusual pagination (for a document published in the U.S.) in this report. Because this document was also published on the World Wide Web (<http://www.ohd.hr.state.or.us/cdpe/chs/docs/suicide.htm>), software limitations precluded the customary use of lower case roman numerals for the front matter.

FIGURES

FIGURE 1.	Suicide Rates with Trend Line, Oregon and U.S. Residents, 1960-1994	11
FIGURE 2.	Percentage of Oregonians Who Considered Committing Suicide, by Age, 1994	18
FIGURE 3.	Percentage of Oregonians Who Considered Committing Suicide, by Household Income, 1994	19
FIGURE 4.	Percentage of Oregonians Who Considered Suicide, by the Number of Days Their Physical or Mental Health Was Not Good or They Were Unable to Engage in Their Usual Activities, 1994	22
FIGURE 5.	Percentage of Oregonians Who Considered Committing Suicide, by Risk Behavior, 1994	23
FIGURE 6.	Age-Specific Suicide Rates by Sex, Oregon Residents, 1992-94	25
FIGURE 7.	Age-Specific Suicide Rates, Oregon Residents, 1959-61 and 1992-94	27
FIGURE 8.	Suicide Death Rates by County of Residence, Oregon, 1988-94	29
FIGURE 9.	Percentage of Suicides by Method and Sex, Oregon Residents, 1990-94	34
FIGURE 10.	Percentage of Suicides Involving Selected Methods, by Age, Oregon Residents, 1990-94	35
FIGURE 11.	Age-Specific Suicide Rates, Oregon and U.S. Residents, 1992-94	36
FIGURE 12.	Number of Oregonians Who Considered Suicide for Every One that Committed Suicide, by Age, 1992-1994	40
FIGURE 13.	Number of Oregonians Who Said They Needed Mental Health Care but for Whom It Was Unavailable, by Age and Sex, 1994	43

TABLES

TABLE 1.	Percentage of Adult Oregonians Who Reported Considering Suicide by Demographic Characteristics, Oregon, 1994	20
TABLE 2.	Logistic Regression-Generated Odds Ratios for Suicide Ideation by Selected Demographic Characteristics, Oregon, 1994	24
TABLE 3.	Suicide by Age and Sex, Oregon Residents, 1959-1961 and 1992-1994	26
TABLE 4.	Suicide Rates by Marital Status and Age, Oregon Residents 25 or Older, 1988-1992	28
TABLE 5.	Suicide Rates by Age and Educational Attainment, Oregon Residents, 1988-1992	29
TABLE 6.	Suicides by County of Residence, Oregon, 1988-1994	30
TABLE 7.	Suicide Characteristics by Region, Oregon Residents, 1990-1994	31
TABLE 8.	Occupations with a Significantly Elevated Proportion of Deaths Due to Suicide, by Age Group, Oregon Residents, 1984-1994	32
TABLE 9.	Method of Asphyxia by Age, Oregon Residents, 1990-1994	35
TABLE 10.	Percentage of Suicides Committed with Guns, by Race, Oregon Residents, 1986-1994	36
TABLE 11.	Suicide Rates by Sex, Oregon and the U.S.	36
TABLE 12.	Suicide Rates by Method and Year, Oregon Residents, 1959-61 and 1992-94	45

INTRODUCTION

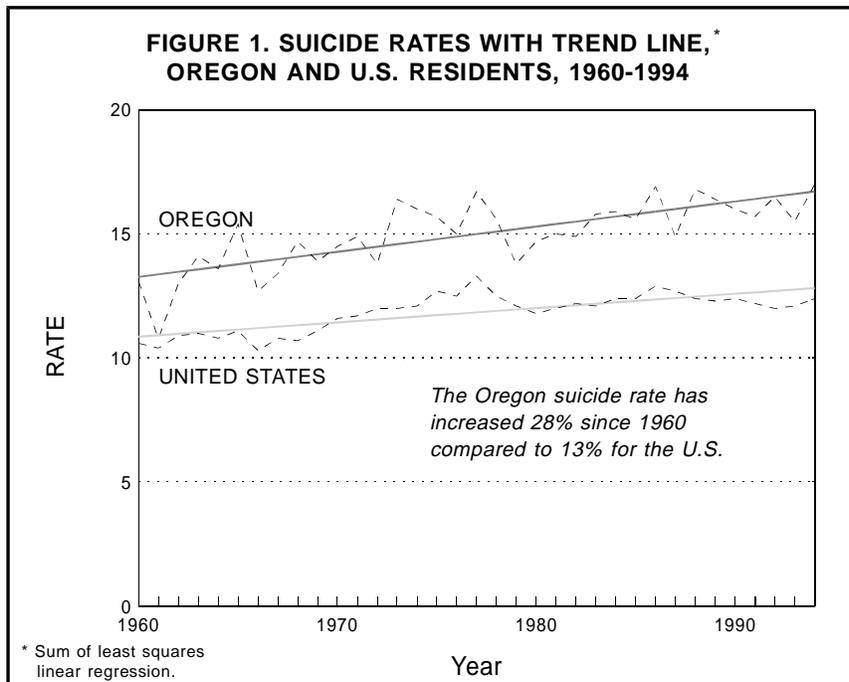
In Paris on a chilly evening in late October of 1985 I first became fully aware that the struggle with disorder in my mind - a struggle which had engaged me for several months - might have a fatal outcome. - William Styron¹

Like the author William Styron, thousands of Oregonians wrestle with the emotional havoc of suicidal thoughts. And while the vast majority, like Styron, do not ultimately commit suicide, more than 500 intentionally end their lives every year.

Over the past several decades, Oregonians have witnessed an increase in the state's suicide rate, culminating in a record high 17.0 deaths per 100,000 population in 1994 (Figure 1). Although the rate often exhibits considerable random statistical fluctuation from year to year, the trend has been upward, driven principally by suicidal behavior among adolescents and young adults. By 1994, an Oregonian, was far more likely to commit suicide than the average American; the state rate was 42% higher than the national rate (12.0) and ranked tenth among all states.

The burdens of suicide include economic costs (e.g., medical expenditures and lost productivity) as well as the emotional trauma experienced by friends and family of the suicide victim. That trauma is particularly difficult to bear because of the often

During nine of the past ten years, Oregon's suicide rate has exceeded the nation's by at least 25%.



unexpected nature of the event, possible feelings of guilt, and the social stigma associated with suicide.²

This report describes the behaviors and demographic characteristics of Oregonians who seriously considered suicide (ideators) and the characteristics of Oregonians who committed suicide (completers). Data are from the Behavioral Risk Factor Surveillance System (BRFSS), a random digit-dialed telephone survey, and death certificates. This is the first time the BRFSS has been used by a state to determine prevalence of suicide ideation. The data in this report show that while many commonly held beliefs about suicidal behavior are accurate, others are not. The following are some highlights from the report:

SUICIDE IDEATION

- One in 36 adult Oregonians, or 2.8%, seriously considered suicide during the previous year.
- Women were 28% more likely than men to seriously consider suicide (3.2% vs. 2.5%).
- Oregonians 18-24 years old were nine times more likely to seriously consider suicide than were those 65 or older (4.7% vs. 0.5%).
- Divorced/separated residents were three times more likely to seriously consider suicide than were those who were married (6.0% vs. 1.9%).
- Suicide ideation occurred five times more often among high school drop-outs than it did among four-year college graduates (5.6% vs. 1.2%).
- Oregonians living in coastal counties (4.0%) and east of the Cascades (3.5%) seriously considered suicide more often than those living elsewhere (2.6%).
- Among Oregonians of working age and able to work, the unemployed were eight times more likely to seriously consider suicide than were the self-employed (10.0% vs. 1.2%).
- Residents in households with less than \$10,000 in annual income were eight times more likely to seriously consider suicide than were those living in \$35,000+ households (7.6% vs. 1.0%).
- Persons who said their mental health was not good during all of the previous 30 days were 59 times more likely to seriously consider suicide than were those whose mental health was not good no more than one day (25% vs. 0.4%).

- Oregonians who were unable to engage in their usual activities during all of the preceding 30 days were seven times more likely to seriously consider suicide than those who were limited no more than one day (20% vs. 3.1%).
- Persons who smoked, had a poor diet, did not exercise or were overweight more often seriously considered suicide.

SUICIDE COMPLETION

- An Oregonian was three times more likely to commit suicide than to be murdered.
- During 1994, 525 Oregonians committed suicide, or 17.0 per 100,000 population.
- Males were four times more likely than females to commit suicide (26.2 per 100,000 vs. 6.8).
- The suicide rate was two times higher among residents 75 or older than it was among 15- to 24-year-olds (36.3 per 100,000 vs. 16.2).
- Whites were more apt to commit suicide than were other races; compared to the Chinese and Japanese, whites were three times more likely (16.5 per 100,000 vs. 5.5).
- Overall, married Oregonians were least apt to commit suicide.
- Residents with a high school education or less were most apt to commit suicide.
- Oregonians living in coastal counties or east of the Cascade Mountains were 39% and 18% more likely, respectively, to commit suicide than those living elsewhere in the state.
- Suicides were committed more often during January, the first week of the month, Mondays, and the morning hours.
- Most suicides (62%) were committed with guns; other common methods included asphyxiation (12%), poisoning with solids or liquids (12%), and poisoning with gas (8%).
- Males, children, and the elderly more often used immediately lethal methods.
- Over the past several decades, the death rate for suicides caused by firearms has increased more than four times faster than the rate for other methods.

IDEATION VERSUS COMPLETION

- There were demographic differences between suicide ideators and completers. For example, females were more likely than males to consider suicide but males were far more likely to actually commit suicide and while young Oregonians most often had suicidal thoughts, the elderly were most apt to commit suicide.
- Demographic similarities also existed; both ideation and completion were less common among residents who were: married, attended college and lived in the non-coastal areas of western Oregon.

METHODOLOGY

Two data sources were used to describe the characteristics of suicide ideators and completers, the Behavioral Risk Factor Surveillance System (BRFSS) and the death certificate-based mortality file.

BRFSS

The BRFSS was conducted by health departments in 49 states and the District of Columbia, in conjunction with the federal Centers for Disease Control and Prevention (CDC). The survey, in which Oregon has participated since 1988, consists of approximately 120 questions about health-related behaviors associated with the leading causes of death.

In 1994, 2,845 Oregonians aged 18 and older were interviewed in a random digit-dialed telephone survey. The resulting data were weighted by the CDC (for age, sex, and the probability of being sampled within a household) to reflect the population of adult Oregonians. Persons who considered suicide were identified with the question, “During the past 12 months, did you ever seriously consider attempting suicide?”³ This question was asked for the first time during 1994 and was asked only in Oregon. Survey results may be affected by the accuracy of the interviewee’s response as well as by the absence of telephones in some households; minority and low income groups are less likely to have phone service and are therefore under-represented in this survey.

Both univariate and multivariate analysis of suicide ideation are presented. Univariate associations were tested for significance using the C-Sample procedure in Epi-Info, a software package distributed by the CDC. Table 1 shows the prevalence of suicide ideation and relative risk (with confidence intervals) for demographic and behavioral groups. Because many risk factors for suicide ideation are inter-related, the multiple logistic regression procedure in SPSS was used to identify significant correlates; this statistical procedure controls for the association between different variables. (For example, the income level of women is lower than that of men, and low income is associated with a greater risk of suicide ideation. It therefore contributes to the elevated risk among women.) Table 2 shows the odds ratios and their confidence intervals for the four statistically significant correlates (employment status,

The BRFSS is an annual telephone survey of nearly 3,000 Oregonians.

income level, mental health, and physical health) and age and sex. Note that the statistical power of the model was limited by the relatively small sample size; a larger sample probably would have yielded additional significant correlates.

The initial comparisons between demographic and risk factor groups are based on the relative risk between subsets (e.g., males vs. females); these better reflect the actual risk of suicidal ideation for persons in the groups than do the regression-derived odds ratios because those with one risk factor often also have other characteristics that put them at risk. For example, 1.2% of self-employed Oregonians considered suicide, compared to 10.0% of unemployed residents—an eightfold difference. By comparison, the logistic regression-generated odds ratio was half that, 3.96. This shows that after controlling for other variables, there was a fourfold difference in the risk of suicide ideation between the two groups. The logistic regression-generated ratio is lower because it takes into account that the unemployed are also more likely to have other risk factors, such as poor physical or mental health. It better illustrates the association of a particular characteristic independent of other variables.

MORTALITY DATA

The second data source, used to describe those who committed suicide, was the mortality file based on death certificates of Oregon residents. Because suicide is an uncommon event, an insufficient number of deaths occur in any one year to allow meaningful analysis for many of the variables (e.g., method). Therefore, most data are presented for a multi-year period. Unless otherwise noted, all mortality statistics are for a five-year period, 1990-1994. Some death rates are for the period 1988-1992, however, because denominator (population) data were available only from the 1990 census (e.g., number of Oregonians by years of education). Other subsets are based on fewer (e.g., suicides by age) or greater (e.g., suicides by race) cumulative years depending on the number of deaths within certain subsets (in order to provide stable rates for the most recent time period). Rates are per 100,000 population.

RESULTS AND DISCUSSION

Suicide and suicide ideation have many causes but suicide ideators and completers often exhibit certain risk factors. These may be endogenous, such as certain psychiatric illnesses, personality disorders, alcoholism, and low concentrations of particular neurotransmitter metabolites. They may be situational, such as stressful life events (e.g., serious illness or disability, loss of employment) and loss or disruption of normal social support mechanisms (e.g., divorce, moving from one place to another, death of a loved one). Other risk factors are not causal but rather markers of individuals at higher risk (e.g., those who are male, or elderly, or who have made a previous attempt are more likely to commit suicide).

The risk factors included in the BRFSS (including demographic characteristics and health-related behaviors) are described first, followed by an analysis of mortality data (including demographic characteristics and a description of the time, place and method of suicide). Risk factors common to both the BRFSS and mortality databases are then compared. Lastly, an overview of factors not assessed by the BRFSS or mortality data, but known from other studies, concludes this section.

SUICIDE IDEATION

Demographic Characteristics

Overall, 2.8% of adult Oregonians reported seriously considering suicide during the previous 12 months (Table 1). This is similar to, but slightly higher than, the proportion reported for New Haven, Connecticut (2.3%), and in a five city study (2.6%).^{4,5}

Gender. Women were 28% more likely to seriously consider suicide than were men, 3.2% compared to 2.5%.

Age. Suicidal thoughts occurred significantly⁶ more often among the young. (Youth suicide was described in the October 1995 issue of *Oregon Health Trends*.) Almost 1 in 20 (4.7%) adults aged 18–24 reported considering suicide. The proportion declined in each subsequent age group, with only 1 in 200 (0.5%) Oregonians 65 or older reporting suicidal ideation, more than a ninefold difference compared to young adults (Figure 2).

For the first time, Oregonians were surveyed about suicidal thoughts.

Women were one-fourth more likely to consider suicide than were men.

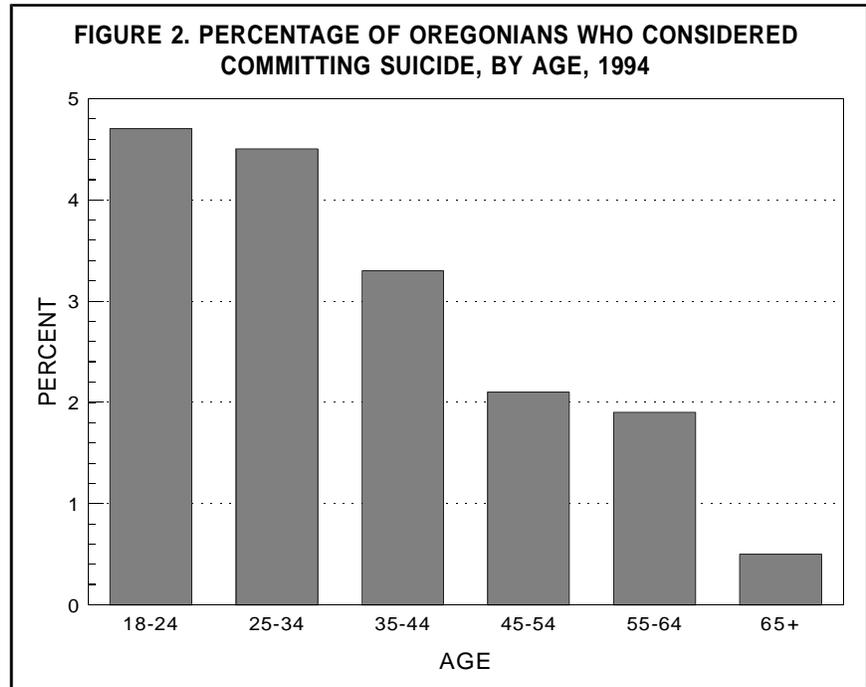
Race/Ethnicity. Marked differences were apparent by race/ethnicity, but the sample size was small for all minority groups. This was particularly true for African Americans and American Indians where fewer than 50 individuals in each group were interviewed (percentages based on fewer than 50 interviews are considered unreliable). Asians were notable in that none of the 59 persons sampled reported considering suicide. These results may, however, be influenced by the relatively lower prevalence of telephone service among some minority groups compared to whites.

Marital Status. Significant differences in the frequency of suicide ideation existed between Oregonians by marital status. Divorced and separated residents most often considered suicide during the previous year (6.0%). Suicide ideation occurred less frequently among never married (4.8%), married (1.9%), and widowed (0.9%) residents.

Educational Attainment. An inverse relationship existed between educational attainment and the frequency of suicide ideation. Among 25- to 64-year-olds, high school dropouts were five times more likely to consider suicide than were four-year college graduates (5.6% vs. 1.2%). High school graduates and college dropouts, too, were significantly more likely to have suicidal thoughts than were college graduates (Table 1).

High school drop-outs were five times more likely to consider suicide than were college graduates.

FIGURE 2. PERCENTAGE OF OREGONIANS WHO CONSIDERED COMMITTING SUICIDE, BY AGE, 1994



Place of Residence. The sample size was too small to allow calculation of meaningful values for suicide ideation by county of residence. However, differences were apparent between regions. Coastal residents⁷ most often seriously considered suicide; 4.0% did so compared to 2.6% of other western Oregon residents. Suicide ideation was also more common east of the Cascade Range (3.5%).

Employment Status. Among residents of working age and able to work, those who were jobless reported considering suicide most frequently—and in fact were eight times more likely to do so than self-employed Oregonians (10.0% vs. 1.2%). The difference was statistically significant. Wage earners were more than twice as likely to ideate than were the self-employed (2.9% vs. 1.2%). Many of the employment classifications (e.g., retired, unable to work) are surrogate measures for other demographic variables (e.g., age, health status) that are better measured by other survey questions.

One in ten unemployed Oregonians reported considering suicide.

Household Income. Money may not buy happiness, but it is significantly associated with less of a desire to consider suicide. Oregonians in households with less than \$10,000 in annual income were far more likely to consider suicide than those living in \$35,000+ households (7.6% vs. 1.0%). The declining risk of suicidal thoughts with increasing affluence is shown in Figure 3.

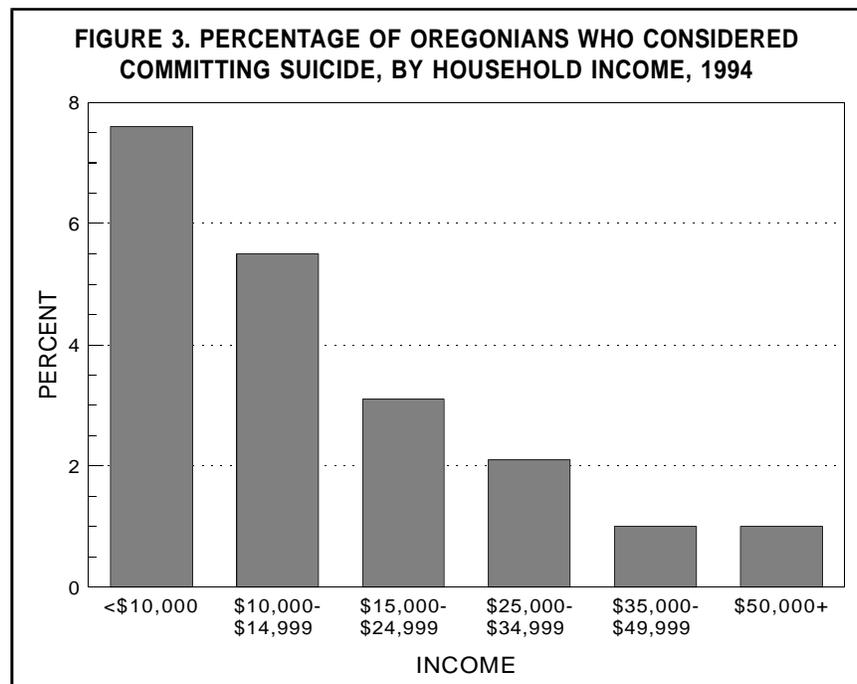


TABLE 1.
PERCENTAGE OF ADULT OREGONIANS WHO REPORTED CONSIDERING SUICIDE BY
DEMOGRAPHIC AND BEHAVIORAL CHARACTERISTICS, OREGON, 1994¹

CHARACTERISTIC	%	SAMPLE SIZE	RELATIVE RISK & C.I. ²		CHARACTERISTIC	%	SAMPLE SIZE	RELATIVE RISK & C.I. ²					
TOTAL	2.8	2837	-	-	EMPLOYMENT								
SEX				Self-employed						1.2	312	1.0	-
Male	2.5	1215	1.0	-	For Wages	2.9	1397	2.5	0.9 - 6.7				
Female	3.2	1622	1.3	0.8 - 2.1	Out of Work	10.0	113	8.5	2.9 - 25.0				
AGE				Homemaker						3.3	228	2.8	0.9 - 9.1
18 - 24	4.7	260	9.1	2.4 - 34.4	Student	2.5	111	2.2	0.5 - 10.0				
25 - 34	4.5	530	8.6	2.5 - 30.4	Retired	0.3	589	0.3	0.1 - 1.6				
35 - 44	3.3	661	6.3	1.8 - 22.1	Unable to Work	15.1	87	13.0	4.8 - 33.3				
45 - 54	2.0	464	3.9	1.0 - 14.8	HOUSEHOLD INCOME								
55 - 64	1.9	306	3.8	0.9 - 15.4	<\$10,000	7.6	355	7.5	2.0 - 27.2				
65+	0.5	616	1.0	-	\$10,000 - 14,999	5.5	319	5.4	1.4 - 20.8				
RACE/ETHNICITY				\$15,000 - 24,999						3.1	568	3.0	0.8 - 11.5
White	2.8	2607	1.0	-	\$25,000 - 34,999	2.4	461	2.3	0.6 - 9.3				
Black	9.6	28	3.5	1.0 - 12.5	\$35,000 - 49,999	1.0	487	0.9	0.2 - 4.4				
Asian	0.0	59	-	-	\$50,000+	1.0	460	1.0	-				
Indian	6.6	35	2.4	0.4 - 16.7	HEALTH STATUS								
Hispanic	3.4	89	1.2	0.4 - 4.2	Excellent	1.5	697	1.0	-				
MARITAL STATUS				Very Good						1.4	1047	1.0	0.4 - 2.2
Married	1.9	1566	2.2	0.7 - 7.3	Good	3.3	724	2.2	1.0 - 5.0				
Divorced/Separated	6.0	450	7.0	2.1 - 23.4	Fair	7.6	257	5.1	2.2 - 12.5				
Widowed	0.9	291	1.0	-	Poor	12.8	106	8.5	3.6 - 20.0				
Never Married	4.8	528	5.6	1.6 - 20.0	DAYS PHYSICAL HEALTH NOT GOOD*								
EDUCATION (AGES 25 - 64)				0 - 1						1.5	2017	1.0	-
<High School	5.6	176	4.8	2.0 - 11.7	2 - 9	3.9	481	2.7	1.4 - 5.0				
High School	4.8	568	4.1	1.9 - 9.2	10 - 29	12.9	179	8.9	5.0 - 14.3				
Some College	2.7	636	2.4	1.1 - 5.1	30	7.4	128	5.0	2.3 - 11.1				
College Graduate	1.2	586	1.0	-	DAYS MENTAL HEALTH NOT GOOD*								
REGION				0 - 1						0.4	1892	1.0	-
Coast	4.0	195	1.5	0.6 - 3.8	2 - 9	3.3	589	7.5	3.3 - 16.7				
Other Western	2.6	2271	1.0	-	10 - 29	10.4	215	23.8	11.1 - 50.0				
East of Cascades	3.5	371	1.3	0.6 - 2.7	30	25.1	117	58.8	25.0 - 100.0				

TABLE 1.
PERCENTAGE OF ADULT OREGONIANS WHO REPORTED CONSIDERING SUICIDE BY
DEMOGRAPHIC AND BEHAVIORAL CHARACTERISTICS, OREGON, 1994¹

CHARACTERISTIC	%	SAMPLE SIZE	RELATIVE RISK & C.I. ²		CHARACTERISTIC	%	SAMPLE SIZE	RELATIVE RISK & C.I. ²	
DAYS ACTIVITIES LIMITED**					SERVINGS OF FRUIT & VEGETABLES ****				
0 - 1	3.1	1056	1.0	-	<1	6.8	76	3.5	1.2 - 9.8
2 - 9	7.1	293	2.3	1.2 - 4.4	1 - 2	4.7	863	2.4	1.2 - 5.0
10 - 29	11.1	113	3.6	1.9 - 6.7	3 - 4	1.7	1271	0.9	0.4 - 1.8
30	20.4	66	6.7	3.4 - 12.5	5+	2.0	627	1.0	-
HAVE A HEALTH CARE PLAN					PHYSICAL EXERCISE				
Yes	2.4	2473	1.0	-	No Exercise	3.8	619	1.5	0.9 - 2.4
No	6.1	357	2.6	1.5 - 4.4	At Least Some	2.6	2217	1.0	-
SMOKING STATUS					NUMBER OF RISK FACTORS*****				
Smoker	4.5	603	2.0	1.1 - 3.4	0	0.0	248	-	-
Former Smoker	2.5	847	1.1	0.6 - 2.0	1	0.1	638	-	-
Never Smoker	2.3	1183	1.0	-	2	1.6	661	-	-
OVERWEIGHT***					3	3.4	563	-	-
Yes	3.7	736	1.4	0.9 - 2.4	4 - 5	5.1	522	-	-
No	2.6	2032	1.0	-	6 - 7	9.9	177	-	-
					8+	44.4	28	-	-

1. Based on the 1994 Oregon Behavioral Risk Factor Surveillance System. Not shown are the categories "refused" and "unknown." Percentages based on a sample of fewer than 50 persons are considered unreliable.

2. The relative risk was calculated from figures computed to three decimal places; they are, therefore, more accurate than, and would not necessarily be identical to, figures the reader might calculate using the values in the "%" column. C.I. = 95% confidence interval.

* Number of days during the preceding 30 days.

** Number of days during the past 30 that the respondent was unable to engage in his or her usual activities.

*** Females with the body mass index (weight in kilograms divided by height in meters squared (W/H²)) ≥ 27.3 and males with body mass index ≥ 27.8 .

**** Number of times during the preceding day.

***** Risk factors include the following categories: female, 18-24 years old, African American, Indian, out of work, incapacitated 10 or more days during the previous month, smoker, overweight, no more than a high school education, household income less than \$10,000 per year, physical health or mental health that was not good at least 10 days during the previous month, no health insurance, no consumption of fruit or vegetables, no physical exercise. Relative risk could not be calculated because no respondent with no risk factors had considered suicide.

Health Characteristics

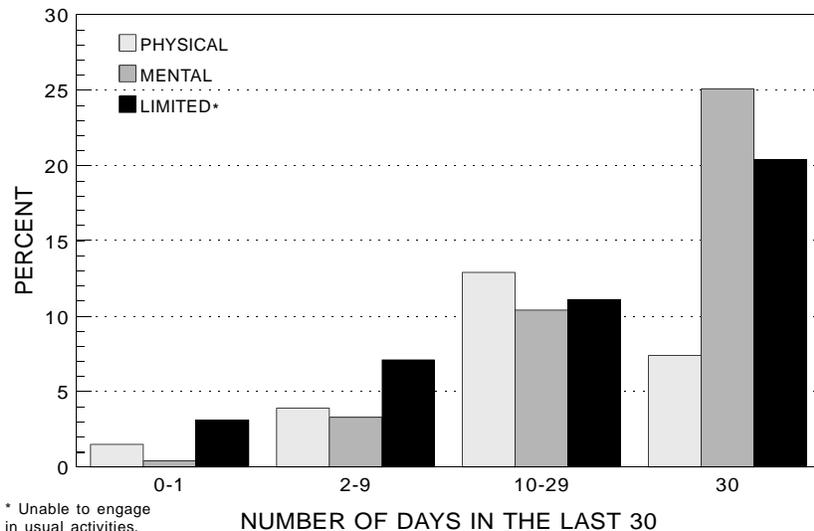
Health Status. The survey included several measures of health status (Table 1). In all cases, those in good health were significantly less likely to consider suicide (Figure 4). Among the host of risk factors, the most striking was the 59-fold disparity between persons who said their mental health was not good for any of the past 30 days and those reporting no more than one day when their mental health was not good (25% vs. 0.4%). Clinical depression—what has been called the despair beyond despair—is the most common mental illness reported in association with suicide; alcoholism ranks second.²

Significant differences also existed between Oregonians reporting that they were limited by poor physical or mental health from engaging in their usual activities all of the past 30 days and those limited no more than one day of the past 30 (20% vs. 3.1%). Lastly, Oregonians without health insurance of any type were 2.6 times more likely to consider suicide than those with insurance (6.1% vs. 2.4%), a significant difference.

Risky Behaviors. Oregonians with poor health habits more often thought about committing suicide. Twenty-two percent of Oregonians smoke and these residents were significantly more likely to consider suicide than were those who never smoked (4.5% vs. 2.3%). Also at risk of suicidal ideation were persons consuming less than three servings of fruits and vegetables per day; they were two to four times more likely to consider suicide than those

Residents who said that their mental health was not good during all of the previous 30 days were 59 times more likely to also report having considered suicide.

FIGURE 4. PERCENTAGE OF OREGONIANS WHO CONSIDERED SUICIDE, BY THE NUMBER OF DAYS THEIR PHYSICAL OR MENTAL HEALTH WAS NOT GOOD OR THEY WERE UNABLE TO ENGAGE IN THEIR USUAL ACTIVITIES, 1994



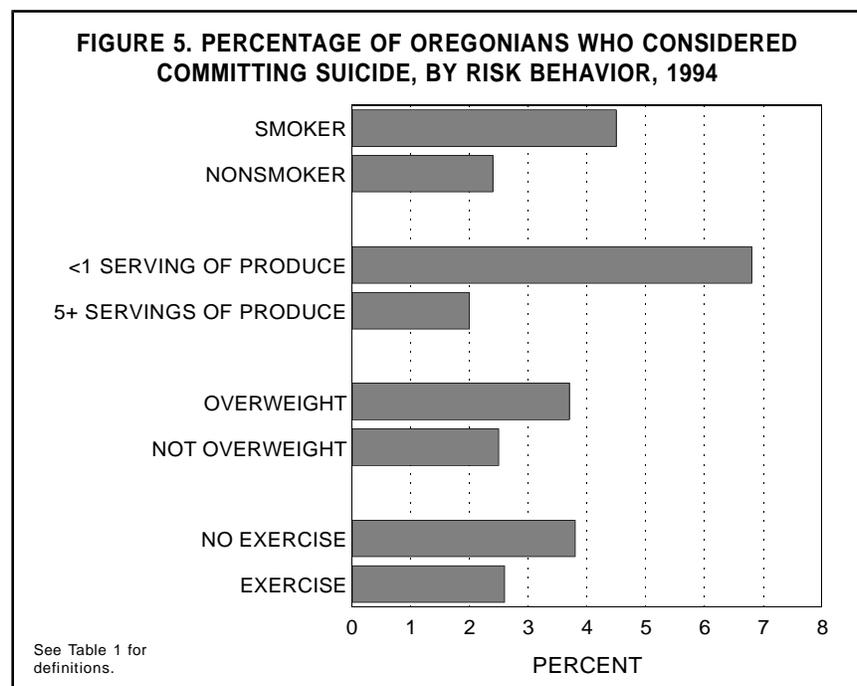
who ate at least three servings daily, a significant difference. Obese people, too, more often had suicidal thoughts; while 3.7% of overweight Oregonians considered suicide, only 2.6% of other Oregonians did so. The figures were almost identical for persons who did not exercise compared to those exercised at least occasionally, 3.8% compared to 2.6% (Figure 5).

People with poor health habits more often considered suicide.

Logistic Regression Analysis

Some of the apparent differences between demographic groups are at least partially explained by the prevalence of other risk factors within the groups. Multiple logistic regression is a statistical procedure that controls for the effect of one or more variables on another, permitting the comparison of subsets free from the effects of other variables included in the statistical model.⁸ Four variables in the model were significant correlates with suicide ideation: employment status, household income, physical health, and mental health. A larger survey sample size would likely yield others.

Gender. The male-female dichotomy in the prevalence of suicidal thoughts reflects the economic disparity between the sexes as well as differences in health status. After controlling for these and other demographic variables through multiple logistic regression, males were found to be at higher risk than females, though not significantly so (Table 2). The female-male disparity resulted from the increased prevalence of unemployment, poverty, and poorer levels of mental and physical health among



women.

Age. As with gender, some of the differences between the age groups reflect the association between age and other factors. Although univariate analysis showed significant differences in the relative risk of suicide ideation between age groups, these disparities were greatly reduced once other variables were taken into account. Age was not a significant correlate of suicide ideation after controlling for other factors.

Employment Status. Employment status was a significant correlate with suicide ideation even after controlling for the interaction of demographic variables. The risk of suicidal thoughts was over five times higher among the unemployed compared to the self-employed (Table 2).

Household Income. Poverty was clearly associated with

TABLE 2.
LOGISTIC REGRESSION-GENERATED ODDS RATIOS FOR SUICIDE IDEATION
BY SELECTED DEMOGRAPHIC CHARACTERISTICS, OREGON 1994¹

CHARACTERISTIC	ODDS RATIO & CONF. INTERVAL		CHARACTERISTIC	ODDS RATIO & CONF. INTERVAL	
SEX			HOUSEHOLD INCOME		
Male	1.0	-	<\$10,000	6.4	2.0 - 20.5
Female	0.8	0.5 - 1.4	\$10,000 - 14,999	4.1	1.3 - 13.5
AGE			\$15,000 - 24,999	2.7	0.8 - 8.4
18 - 24	1.9	0.3 - 13.4	\$25,000 - 34,999	2.4	0.7 - 7.9
25 - 34	1.9	0.3 - 12.5	\$35,000 - 49,999	1.0	0.3 - 4.1
35 - 44	2.2	0.3 - 14.3	\$50,000+	1.0	-
45 - 54	1.6	0.2 - 10.5	DAYS PHYSICAL HEALTH NOT GOOD²		
55 - 64	1.0	0.1 - 6.8	0 - 1	1.0	-
65+	1.0	-	2 - 9	1.5	0.8 - 2.5
EMPLOYMENT			10 - 29	4.5	2.3 - 9.0
Self-employed	1.0	-	30	1.6	0.6 - 4.5
For Wages	1.6	0.6 - 4.2	DAYS MENTAL HEALTH NOT GOOD²		
Out of Work	5.4	1.7 - 16.7	0 - 1	1.0	-
Homemaker	1.3	0.4 - 4.5	2 - 9	5.4	2.4 - 12.1
Student	0.7	0.2 - 3.5	10 - 29	12.2	5.3 - 28.2
Retired	0.2	0.2 - 3.1	30	24.4	2.4 - 59.1
Unable to Work	3.6	1.1 - 11.8			

1. Based on the 1994 Oregon Behavioral Risk Factor Surveillance System. Multiple logistic regression controls for inter-variable association (see the methodology section). Variables included in the model were: sex, age, race/ethnicity, marital status, education, region, employment status, household income, physical health, and mental health. Odds ratios are shown for those variables that were statistically significant (employment status, household income, physical health, and mental health) and for sex and age. Note that the last two variables were not significant correlates after controlling for the other variables. Because the model was based on a small sample, its statistical power was limited. Not shown are the categories "refused" and "unknown."

2. Number of days during the preceding 30 days.

a greater risk of suicide ideation. Even after controlling for other factors, Oregonians living in households with less than \$10,000 annual income were over six times more likely to report suicidal thoughts than were those whose household income exceeded \$35,000.

Poverty and mental health were important correlates with suicide ideation.

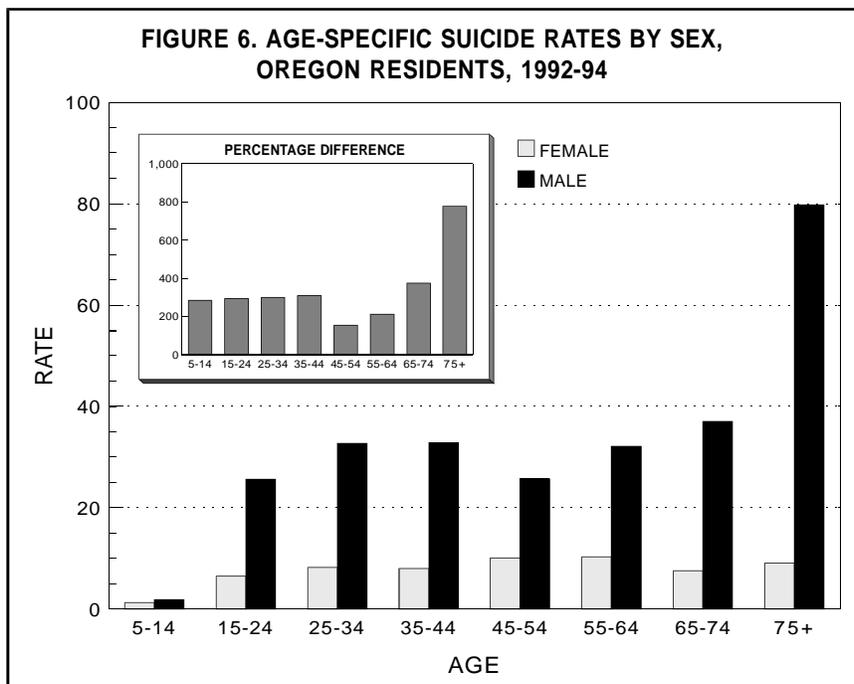
Physical Health. Independent of other risk factors, Oregonians whose physical health was not good during 10-29 of the previous 30 days were 4.5 times more likely to think about killing themselves compared to those reporting no more than one day during the previous 30.

Mental Health. The more days an Oregonian experienced poor mental health, the more likely he or she was to consider suicide. Even after controlling for other factors, residents who said their mental health was not good during all of the previous 30 days were 24 times more likely to ideate than those reporting no more than one day during the past 30. This 24-fold greater risk was the highest odds ratio recorded among the significant correlates.

SUICIDE DEATHS

In 1994, suicide was the ninth leading cause of death among Oregonians and the third leading cause of premature death before age 65 (after unintentional injuries and cancer). In that year, 525 Oregonians committed suicide—about three persons every

Median age at death
Suicide: 42
Other causes: 77



two days. For every adult resident who committed suicide, 133 others seriously considered doing so.⁹

Demographic Characteristics

Gender. Males were four times more likely than females to commit suicide during 1992-94; their death rate was 26.2 per 100,000 population compared to 6.8 for females. However, relative to males, females have become increasingly likely to kill themselves over the past several decades. Between 1959-61 and 1992-94, the rate for females grew from 5.0 to 6.8 per 100,000—a 36% increase. The rate for males rose from 20.5 to 26.2 per 100,000—a 28% increase.

Age. A common misconception is that adolescents are

Suicides by gender
Males: 79%
Females: 21%

Age range of Oregonians who committed suicide: 7 to 98

**TABLE 3.
 SUICIDES BY AGE AND SEX, OREGON RESIDENTS,
 1959-1961 AND 1992-1994**

AGES	1959-1961			1992-1994		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
ALL AGES						
Rate	12.7	20.5	5.0	16.3	26.2	6.8
Number	675	541	134	1489	1174	315
5-14						
Rate	1.0	1.6	0.4	1.6	1.9	1.3
Number	11	9	2	21	13	8
15-24						
Rate	5.0	8.8	1.4	16.2	25.6	6.5
Number	34	29	5	201	162	39
25-34						
Rate	13.4	21.3	5.7	20.5	32.7	8.2
Number	82	64	18	273	219	54
35-44						
Rate	18.1	29.8	6.7	20.3	32.8	8.0
Number	127	103	24	312	250	62
45-54						
Rate	21.7	31.3	11.7	17.9	25.7	10.1
Number	140	103	37	192	138	54
55-64						
Rate	25.4	40.1	10.7	20.8	32.1	10.3
Number	123	97	26	147	109	38
65-74						
Rate	26.1	44.1	9.3	20.5	36.0	7.6
Number	93	76	17	143	114	29
75+						
Rate	35.3	71.0	5.0	36.3	79.8	9.1
Number	65	60	5	200	169	31

Rates per 100,000 population.

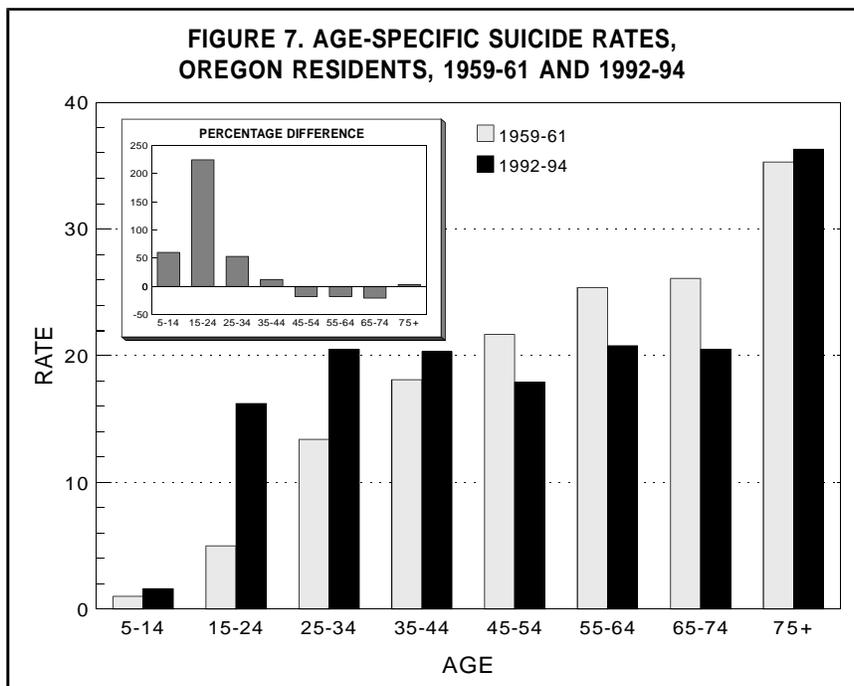
most apt to commit suicide—but this is not so. In fact, suicide rates are highest among the elderly, particularly among males (Figure 6). While females 75 or older were about half again as likely to commit suicide as were 15- to 24-year-olds, elderly males were more than three times as likely to do so than younger males (Table 3). The elderly also showed the greatest disparity in male versus female rates; males 75 or older were nearly nine times more likely to take their own lives.

Suicide was the second leading cause of death for 15- to 34-year-olds and third for 5- to 14-year-olds.

Although suicide rates have risen overall, this is due largely to rate increases among younger Oregonians (Table 3). The largest increases in Oregon were among youth aged 15 to 24. For each subsequent age group, the percentage increase was less than for the preceding group. Among Oregonians aged 45 to 74, the rates for 1992-94 were lower than those for 1959-61. The rate for persons 75 or older was only slightly higher during the most recent time period than it was several decades ago (Figure 7).

Elderly males were three times more likely to commit suicide than were their younger counterparts.

Race. Suicide was most common among whites. During 1986-94, the death rate for this group was 16.6 per 100,000 population, three times that for Oregonians of Chinese and Japanese ancestry (5.6). The rates for African Americans and American Indians were 10.6 and 13.7, respectively. Whites had the highest death rates among all age groups except 15–24 and 25–34, where American Indian rates were highest.¹⁰ Although Oregon females were far less likely than males to com-



mit suicide, the proportion varied by race: African Americans, 13% of suicide deaths were female; whites, 21%; American Indians, 28%; Chinese and Japanese, 54%.¹¹

Oregonians of both sexes were less likely to kill themselves if they were married.

Marital Status. Both men and women were less likely to commit suicide if they were married (Table 4). However, there was a gender dichotomy. Among men, suicide rates were highest for widowers but among women, they were highest for divorcees. Surprisingly, the widowed to married rate ratios were highest in the youngest age groups for both sexes. The risk of suicide after bereavement has been reported to be highest during the first year, followed by a gradual decline during the next three years.¹² The death of parents, particularly mothers, has also been linked to an elevated risk of suicide.¹³

In contrast to divorced men, whose highest suicide rate occurred in the oldest age group, the suicide rates for divorced women declined with advancing age.

Educational Attainment. In general, and after stratifying by age, the highest suicide rates were found among Oregonians who did not attend college (Table 5). At 43.5 suicides per 100,000 population, those 65 or older who did not attend high school had the highest rate. In contrast, the lowest rate (8.9) occurred among 25- to 44-year-olds with a four-year college degree. Compared to four-year college graduates, Oregonians with a post-baccalaureate education were more likely

TABLE 4.
SUICIDE RATES BY MARITAL STATUS AND AGE, OREGON
RESIDENTS 25 OR OLDER, 1988-1992

MARITAL STATUS	MALES				FEMALES			
	25-44	45-64	65+	TOTAL 25+	25-44	45-64	65+	TOTAL 25+
SINGLE								
RATE	43.5	55.2	92.4	46.8	12.2	14.7	15.2	12.7
NUMBER	227	33	25	285	39	6	5	50
MARRIED								
RATE	16.6	18.1	36.3	21.1	5.6	7.0	8.5	6.5
NUMBER	248	190	236	674	91	69	43	203
DIVORCED								
RATE	68.3	64.1	132.1	73.1	18.6	17.3	12.2	17.3
NUMBER	198	112	67	377	66	38	10	114
WIDOWED								
RATE	150.8	86.0	130.8	123.9	32.3	15.9	10.6	12.2
NUMBER	9	19	128	156	7	17	54	78
WIDOWED/MARRIED RATE RATIOS	9.1	4.8	3.6	5.9	5.8	2.3	1.2	1.9

Rates per 100,000 population.

to commit suicide.

Place of Residence. Oregonians living east of the Cascade Mountains were 15% more likely to kill themselves during 1988-94 than those living west of the range; 18.3 of every 100,000 did so compared to 15.9 of every 100,000 living west of the Cascades, a significant difference. Within western Oregon, coastal residents were 39% more likely to commit suicide than other residents (21.6 vs. 15.5 per 100,000).¹⁴ These broad geographic measures mask the very different rates occurring within individual counties, however (Figure 8). A nearly threefold difference was recorded between the county with the highest death rate (Curry, 27.4) and the lowest (Yamhill, 9.9).¹⁵ Because death rates can be affected by the age distribution of a population, age-adjusted death rates are also shown in Table 6.¹⁶

The characteristics of persons who committed suicide varied by region (Table 7). For example, suicide completers east of the Cascade Mountains were more apt to be male, under 25 or over 64 years of age, and to shoot themselves (especially with a rifle).¹⁷ Some of these differences may reflect the demographic composition of Oregonians living east of the Cascades vis-a-vis those living in western Oregon. For example, the higher proportion of gunshot deaths probably can be explained, at least in part, by the higher proportion of suicides by males and younger and older residents.¹⁸ Education, too, may be a factor; firearms are chosen more often by persons with less than a college education and the proportion of eastern Oregonians with a baccalaureate

**TABLE 5.
SUICIDE RATES BY AGE AND
EDUCATIONAL ATTAINMENT,
OREGON RESIDENTS,
1988-1992**

Years of Education	AGE GROUP		
	25-44	45-64	65 and Over
8 or fewer	20.7	21.3	43.5
9-11	31.7	16.1	21.5
12	32.1	28.1	32.2
13-15	12.1	9.7	21.4
16	8.9	13.8	22.8
17 or more	14.8	21.2	32.0

Rates per 100,000 population.

Residents living east of the Cascade Range and in coastal counties were most apt to commit suicide.

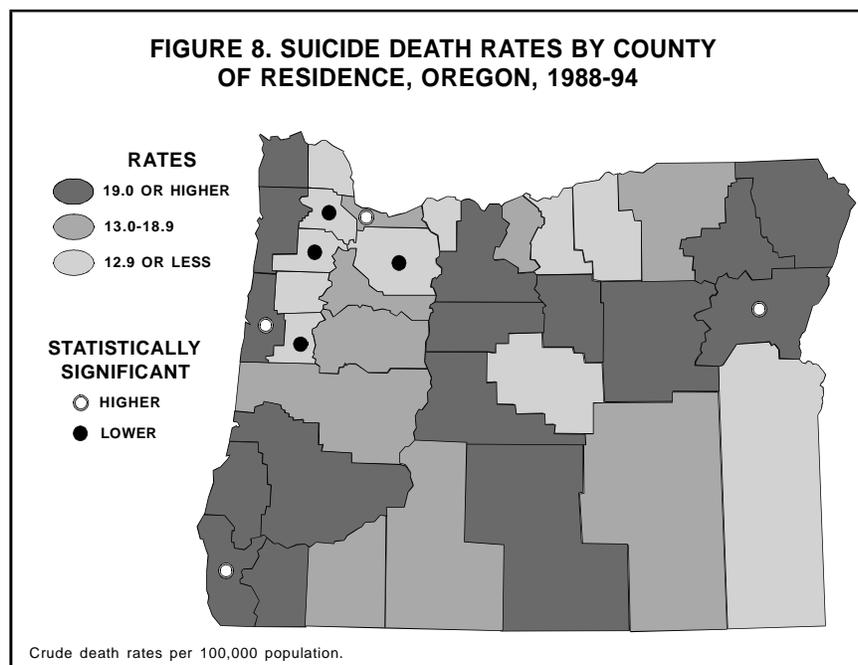


TABLE 6.
SUICIDES BY COUNTY OF RESIDENCE, OREGON, 1988-1994

COUNTY	NUMBER			CRUDE RATE			AGE-ADJUSTED RATE#		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
OREGON	3,325	2,602	723	16.3	25.9	7.0	14.8	23.6	6.4
BAKER	29	26	3	**26.4	**47.8	5.4	23.5	40.7	6.7
BENTON	62	45	17	*12.2	*17.6	6.8	*11.4	*16.4	6.7
CLACKAMAS	249	189	60	*12.5	*19.2	5.9	*11.5	*17.9	5.5
CLATSOP	48	39	9	20.3	33.4	7.5	18.5	30.4	6.8
COLUMBIA	34	29	5	12.8	21.9	3.7	*10.5	17.9	3.8
COOS	82	67	15	19.2	31.8	6.9	17.5	29.1	6.3
CROOK	13	12	1	12.8	23.8	*2.0	*9.0	16.6	*1.9
CURRY	39	28	11	**27.4	40.2	15.2	**23.1	32.1	14.6
DESCHUTES	107	85	22	19.3	30.9	7.9	17.5	27.2	8.1
DOUGLAS	131	111	20	19.6	**33.6	5.9	**19.0	**32.5	5.8
GILLIAM	1	0	1	8.1	.0	16.0	*2.0	.0	3.5
GRANT	11	9	2	19.6	32.0	7.1	15.4	25.7	5.5
HARNEY	10	6	4	20.1	24.0	16.2	19.4	20.0	19.5
HOOD RIVER	13	11	2	10.7	17.9	3.3	11.7	19.4	3.5
JACKSON	200	157	43	18.9	30.3	8.0	16.3	26.3	6.9
JEFFERSON	21	18	3	21.6	36.9	6.2	22.7	38.4	6.3
JOSEPHINE	91	73	18	20.0	33.2	7.7	16.8	27.7	6.8
KLAMATH	76	59	17	18.4	28.5	8.3	16.9	25.3	8.8
LAKE	13	13	0	25.4	50.7	.0	27.1	**54.5	.0
LANE	313	261	52	15.5	26.4	*5.0	13.9	23.8	*4.7
LINCOLN	61	40	21	**22.0	29.9	14.7	19.7	28.5	11.6
LINN	99	80	19	15.2	25.0	5.7	13.8	22.7	5.5
MALHEUR	26	18	8	13.9	19.6	8.4	11.2	*15.5	7.3
MARION	266	211	55	16.1	25.8	6.6	15.2	24.5	5.9
MORROW	6	6	0	10.7	21.1	.0	11.8	22.9	.0
MULTNOMAH	761	572	189	**18.2	28.2	*8.8	**16.7	**26.1	**8.0
POLK	47	38	9	13.1	22.0	4.9	*10.7	18.1	4.1
SHERMAN	2	2	0	15.0	29.7	.0	17.5	32.4	.0
TILLAMOOK	37	26	11	23.9	34.2	14.0	17.9	24.0	12.0
UMATILLA	67	58	9	15.8	27.4	4.3	13.9	24.1	*3.6
UNION	35	30	5	21.0	36.5	5.9	19.4	33.9	5.7
WALLOWA	13	12	1	26.1	48.5	4.0	21.9	40.4	3.6
WASCO	31	25	6	20.3	33.6	7.6	19.0	31.3	7.3
WASHINGTON	279	211	68	*12.3	*18.9	5.9	*11.6	*18.4	5.4
WHEELER	6	3	3	59.1	59.8	58.5	45.9	41.6	51.9
YAMHILL	46	32	14	*9.9	*13.8	6.0	*8.7	*12.0	5.7

All rates per 100,000 population.

Rates adjusted to the 1940 U.S. standard million.

** Significantly higher than state average.

* Significantly lower than state average.

or higher degree is less than that for their western counterparts.¹⁹ Finally, gun ownership is more common east of the Cascades, particularly in the counties with the lower population densities.²⁰

Employment Status. Death certificate data, unlike BRFSS data, do not indicate whether a person was employed, unemployed or retired but instead records the decedent’s usual occupation. Because occupation and age are often inter-related, analysis is by age group.²¹ Some percentages are based on relatively few events, but the differences, like all of those shown in Table 8, are statistically significant compared to the age-specific proportional mortality for all other occupations.²²

Other studies have also found an elevated risk of suicide for many of the occupations listed in Table 8, including: chemists, law enforcement officers, physicians, construction workers, and fishermen, among others.^{23,24} The differences in the risk of suicide between occupational groups may be related to sociodemographic differences, self-selection for occupation, ease of access to lethal agents, or job stress.²³ Unemployment can lead not only to thoughts of suicide (as shown by the BRFSS data), but to committing it. Research at the national level has demonstrated a significant association between unemployment and suicide, a relationship that held for whites and non-whites and both sexes.²⁵ Differences by age have been noted, however; periods of economic prosperity are associated with higher suicide rates in younger adults, but lower rates in older adults.²⁶

The Suicidal Event

Temporal Distribution. Beginnings pose a risk—beginning of the year, beginning of the month, beginning of the week.

During 1980-94, Oregonians were 5.8% more likely to commit suicide at the beginning of a new year. The average number of deaths per day peaked during January at 1.27, compared 1.20, the daily average throughout the remainder of the year. December was the least dangerous month (1.08); in fact, the period around Christmas saw the fewest suicides. During the two-week period from December 16–31, an average of 0.95 Oregonians committed suicide daily, 28% less than the 1.32 deaths recorded during December 1–15 and January 1–15. Nationally, suicide rates were below average on holidays, with the exception of New Year’s Day; Americans were 21% more likely to commit suicide on January 1 than on the average day.²⁷

The first week of each month was the riskiest; 5.0% more Oregonians committed suicide during the first through seventh of

**TABLE 7.
SUICIDE CHARACTERISTICS BY
REGION, OREGON RESIDENTS,
1990-1994**

CHARACTERISTIC	EAST OF THE CASCADES	COASTAL COUNTIES	OTHER COUNTIES
	PERCENT		
SEX			
MALE	81	76	78
FEMALE	19	24	22
AGE			
<25	18	10	16
>64	28	24	23
METHOD			
FIREARMS	73	65	59
ASPHYXIA	10	8	13
POISONING*	11	13	8

* Solids and liquids.

***Beginnings and
birthdays posed an
increased risk
of suicide.***

**TABLE 8.
OCCUPATIONS WITH A SIGNIFICANTLY ELEVATED PROPORTION OF
DEATHS DUE TO SUICIDE, BY AGE GROUP,
OREGON RESIDENTS, 1984-1994***

OCCUPATION	NO. OF DEATHS@	% DUE TO SUICIDE	RISK **
AGES 25-44			
ALL OCCUPATIONS	14,728	12.9	1.0
PRECISION INSPECTORS, TESTERS	8	50.0	3.9
POSTAL SERVICE MAILCARRIERS	23	34.8	2.7
MISC. MECHANICS & REPAIRERS+	91	34.1	2.7
STOCK & INVENTORY CLERKS	26	30.8	2.4
COMPUTER SYSTEMS ANALYSTS & SCIENTISTS	33	30.3	2.4
VEHICLE WASHERS	30	30.0	2.3
CARPET INSTALLERS	20	30.0	2.3
HOUSEHOLD APPLIANCE & SM. TOOL REPAIRERS	20	30.0	2.3
AGES 45-64			
ALL OCCUPATIONS	42,330	2.6	1.0
CHEMISTS	21	19.0	7.2
CEMENTING & GLUEING MACHINE OPERATORS	12	16.7	6.3
BIOLOGISTS	21	14.3	5.4
DENTISTS	43	9.3	3.5
BARBERS	96	8.3	3.2
INSPECTORS (EXC. CONSTRUCTION)	62	8.1	3.1
MEDICAL DOCTORS & SCIENTISTS	111	6.7	2.4
PERSONNEL & LABOR RELATIONS MANAGERS	124	6.4	2.5
HIGH SCHOOL TEACHERS	161	6.2	2.4
LAWYERS	119	5.9	2.2
MOTOR VEHICLE & BOAT SALES	187	5.3	2.0
AGES 65+			
ALL OCCUPATIONS	207,412	0.6	1.0
SPEECH THERAPISTS	6	16.7	28.5
TRADE & INDUSTRIAL TEACHERS	7	14.3	24.5
PRECISION METAL ASSEMBLERS	40	7.5	12.9
BROADCAST EQUIPMENT OPERATORS	44	6.8	11.7
PROJECTIONISTS	33	6.1	10.4
BUSINESS & PROMOTION AGENTS	63	4.8	8.2
GARBAGE COLLECTORS	59	3.4	5.8
TYPESETTERS	89	3.4	5.8
SLICING & CUTTING MACHINE OPERATORS	137	2.9	5.0
POWER PLANT OPERATORS	108	2.8	4.8
ROOFERS	130	2.3	4.0
SHIP CAPTAINS & MATES (EXCEPT FISHING)	184	2.2	3.7
LAWYERS	384	2.1	3.6
FISHERMEN	382	2.1	3.6
MINERS	234	2.1	3.7
CRANE & TOWER OPERATORS	207	1.9	3.3
POLICE, SHERIFFS, DETECTIVES	584	1.9	3.2
PAINTERS, SCULPTERS, ETC.	281	1.8	3.1
INDUST. TRUCK & TRACTOR EQUIP. OPERATORS	458	1.7	3.0
SHEETMETAL WORKERS	407	1.7	3.0
ELECTRICAL POWER INSTALLERS/REPAIRERS	234	1.7	2.9
SAWING MACHINE OPERATORS	712	1.7	2.9
PLUMBERS	854	1.6	2.8
PAINTERS, PAPERHANGERS, PLASTERERS	833	1.6	2.7
HEAVY EQUIPMENT OPERATORS	617	1.6	2.8
PRODUCTION SUPERVISORS	321	1.6	2.7
PRIVATE POLICE, GUARDS	519	1.5	2.7
LOCOMOTIVE ENGINEERS	410	1.5	2.5
OPERATING ENGINEERS (MATERIAL MOVING)	1,207	1.4	2.4
MILITARY PERSONNEL	1,438	1.3	2.4
LOGGERS	3,260	1.3	2.4

*Occupations are listed if they met two criteria: (1) The proportion of deaths due to suicide was at least twice the overall proportion for the age group and (2) The difference was statistically significant ($p < 0.05$).

@ Number of deaths from all causes.

**Risk compared to decedents in all other occupations.

+Cameras, watches, office machines, heaters, air conditioners, elevators and refrigerators.

the month than thereafter (daily averages of 1.25 vs. 1.19). Other studies have also shown a peak early in the month.²⁸

Mondays, too, were dismaying for some residents. More Oregonians killed themselves on a Monday than any other day of the week. Each subsequent day of the work week saw a decline in the number of suicides. Just 12% of suicides occurred on Saturday compared to 16% on Monday, a 33% difference. Other studies have also noted the elevated risk of suicide on Mondays.²⁹

Hourly, more suicides were committed between 8:00 a.m. and 11:59 a.m. than at any other time. This has also been reported by others.²⁹ As with the day of the week, the number of suicides declined for each subsequent four-hour period.

Birthdays can serve as a reminder of the passage of time and bring into focus an assessment of one's life. For some Oregonians that assessment may convince them that they have nothing to live for; residents under age 65 were 58% more likely to kill themselves on their birthdays than on any other day of the year, a significant difference.

Contrary to popular belief, there is little evidence of a causal relationship between the lunar phase and suicide. In a recent review of 20 studies on the subject, it was found that the minority of reports noting such a relationship were often confounded by other variables, such as season, weather, holidays, or weekdays.³⁰

Place of Suicide. Three-fourths (74%) of all suicides occurred in the home. Ranking a very distant second as a suicide site was the street (6.7%). Public buildings ranked third (3.4%) with residential institutions and recreation areas tied for fourth (1.6% each). Thirteen Oregonians (0.5%) committed suicide in jail.

Place of Death. Most suicidal deaths occurred at home (60%); only 14% survived long enough to be treated at a hospital. Other sites included: nursing home, 0.7%; jail, 0.5%; and other, 25% (e.g., street, public building, forest). The attempters most likely to die before reaching the hospital were those who either drowned themselves or used poison gas.

Method. More suicides were committed with guns than by all other methods combined, but Oregonians have used a wide variety of means to kill themselves. In rank order, they are:

1. *Firearms.* Most suicides were committed with firearms (62%) and most of these were with handguns (62% of all firearms suicides); rifles (24%) and shotguns (13%) accounted for most of the remainder.

Fewer Oregonians committed suicide around Christmastime than at any other time of the year.

Almost two of every three suicides were committed with guns; most of these were handguns.

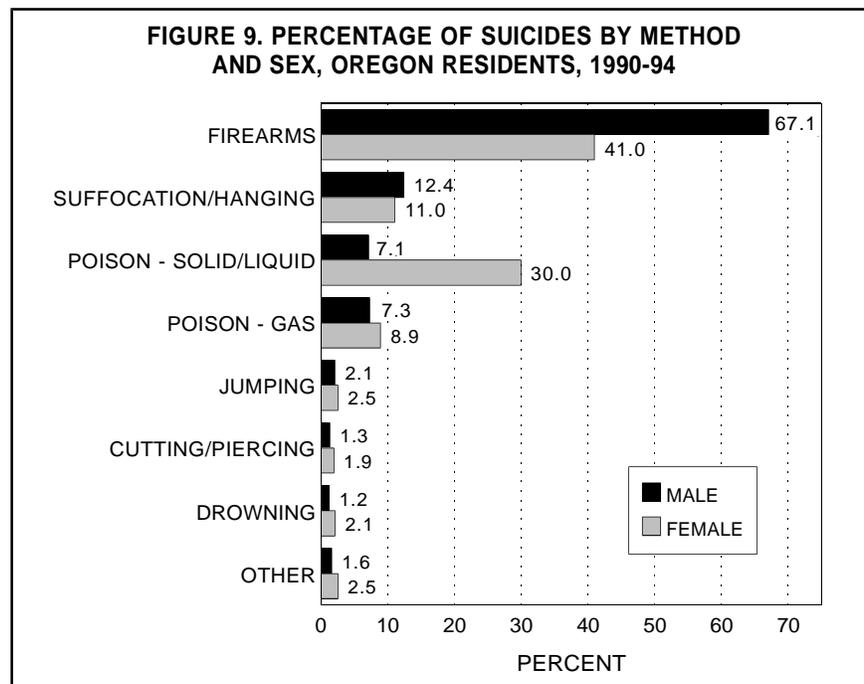
2. *Asphyxiation*. Suffocation and hanging ranked a distant second at 12%; more than four out of five (84%) of these deaths were by hanging; another 15% were by asphyxia with a plastic bag.

3. *Poisoning with solids or liquids*. Also at 12%, but ranking third, was poisoning with substances other than a gas. The most common agents were tranquilizers (39%), combinations of drugs (28%), analgesics including opiates (12%), sedatives (4.5%), and agricultural and caustic substances such as lye (2.7%).

4. *Poisoning with gas*. Poison gases were used in 7.7% of suicides. The vast majority (93%) of these deaths involved motor vehicle exhaust.

5. *Other methods*. Less frequently used methods included jumping from a high place (2.2%),³¹ cutting and piercing (1.4%), and drowning (1.4%). Even more rare methods included: self-immolation, stepping in front of traffic or trains, exposure, and crashing motor vehicles. The last means of suicide can be particularly vexing for investigators to identify. It has been estimated that 1.6% to 5.0% of vehicular fatalities are suicides that escaped detection.^{32,33} If this were to hold true in Oregon, it would mean an additional 40 to 125 suicides of Oregonians during 1990-94.

Men and women made different choices in their method of suicide (Figure 9). Although most suicides were committed with guns, there was a considerable dichotomy by sex; fully two-thirds (67%) of males shot themselves, but only two-fifths (41%) of fe-



males did. (Handguns were used in 76% of firearm-caused suicides among females, versus 59% among males.) Females were four times more likely than males to use solid or liquid poisons (30% vs. 7.1%). They were also somewhat more likely to use gas (8.9% vs. 7.3%). Overall, females were three times more likely to commit suicide by methods less likely to be immediately fatal—and hence with a greater chance of discovery and treatment—than were males (37% vs.12%).³⁴

The method also varied with age. Firearm use was most common among children aged 5 to 14 (73%) and adults 65 or older (74%). Men in this latter age group were most likely to use guns (82%); females 85 or older were least likely (15%). Suffocation and hanging were most common among Oregonians 34 or younger, accounting for 17% of their suicides; younger residents were more likely to choose hanging and older ones asphyxiation with a plastic bag (Table 9).³⁵ Poisoning with solids or liquids peaked during ages 35 to 64 (16%), while poisoning with gas was most common in persons aged 35 to 54 (12%). Figure 10 shows the distribution of deaths by age and method. Overall, completers 35-44 years old were two to three times more likely than those 5-14, and 75 or older to use less lethal methods (24% vs. 9% and 10%).

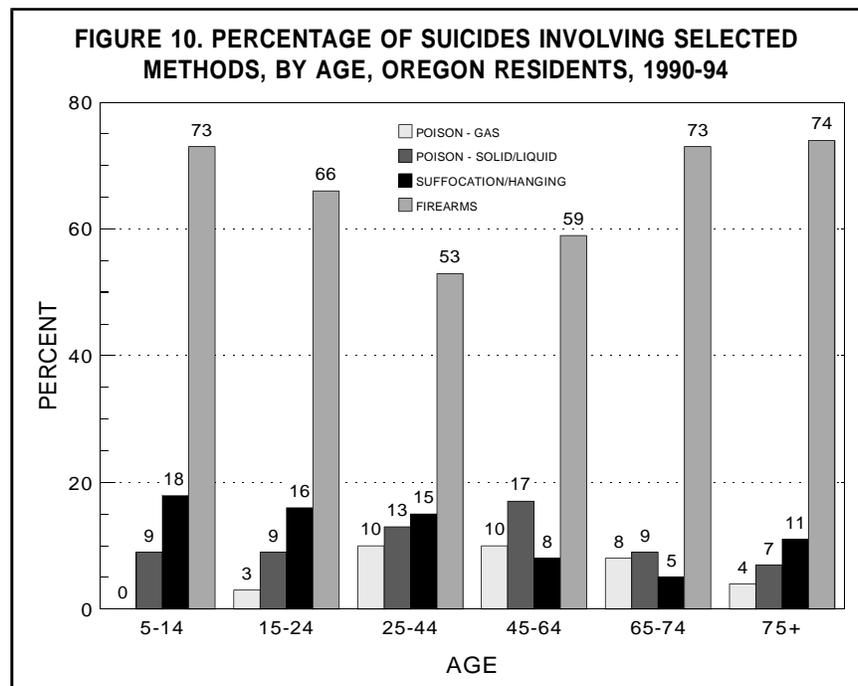
Different racial groups also made different choices about the method of suicide. Whites and African Americans were half again as likely to use guns as were others (Table 10).

**TABLE 9.
METHOD OF ASPHYXIA BY AGE,
OREGON RESIDENTS,
1990-1994**

AGE	PERCENT*	
	HANGING	SUFF.**
5-14	100	0
15-34	94	5
35-54	86	12
55-74	71	29
75-84	57	38
85+	23	77

* Percentages do not always equal 100% because "other" category is not shown.
** Suffocation by plastic bag.

Firearm use was most common among children and the elderly.



**TABLE 10.
PERCENTAGE OF SUICIDES
COMMITTED WITH GUNS, BY
RACE, OREGON RESIDENTS,
1986-1994**

Whites	62
African Americans	62
American Indians	40
Chinese & Japanese	39
Other	42

National Comparison

The 1994 suicide rate in Oregon was 42% higher than the nation’s (17.0 vs. 12.0 per 100,000 population). This continues a long-term trend; since at least 1960, Oregon’s rate has consistently been higher than the nation’s. During the past decade the difference has ranged between 17% and 42%; in nine of those ten years, the difference exceeded 25%.

This greater propensity of Oregonians to commit suicide spans all age groups, with the largest differences occurring among the youngest and oldest residents. The Oregon 1992-94 age-specific suicide death rate for 5- to 14-year-olds was 78% higher than the nation’s, and the rate for those 75 or older was 63% higher (Figure 11).³⁶ The Oregon-U.S. disparity was greater among females than males; Oregon females were 48% more likely to kill themselves than were their counterparts nationally, while Oregon males were 32% more likely to do so (Table 11).

There are a number of possible explanations for the higher rates in Oregon:

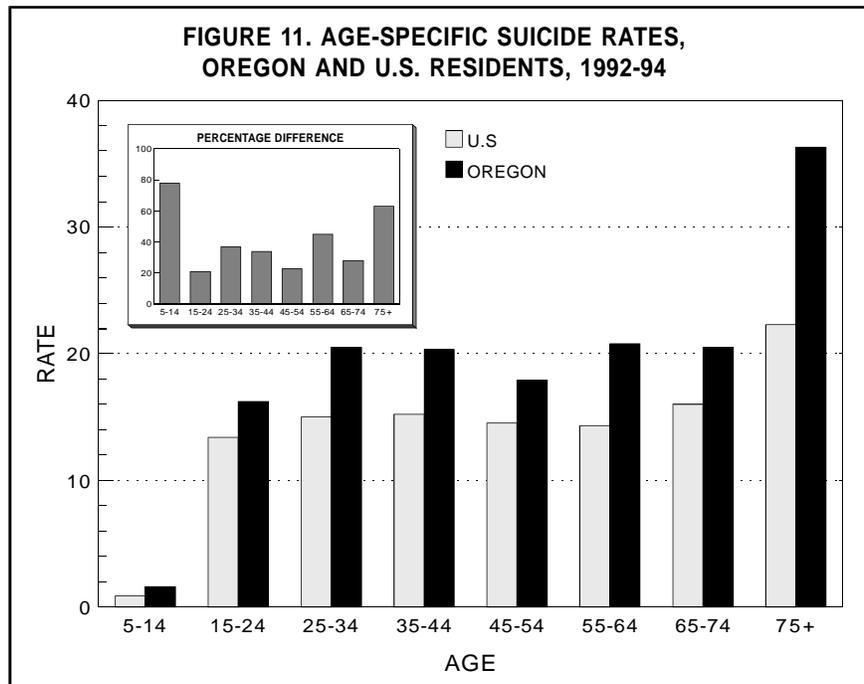
1. Advanced age is associated with increased risk of suicide, and Oregon’s proportion of those aged 65 and above is larger than the nation’s (14% vs. 13%). However, this age-distribution variation accounts for less than 2% of the difference between the Oregon and U.S. rates.³⁷

2. Whites are more apt to commit suicide than are other

**TABLE 11.
SUICIDE RATES BY SEX,
OREGON AND THE U.S.**

AREA	MALE	FEMALE
Oregon*	26.2	6.8
U.S.**	19.9	4.6

Rates are per 100,000 population.
* 1992-1994, ** 1993



ances and compared to the nation, a greater proportion of Oregonians are white; in the 1990 decennial census, 93% of the state's residents reported that they were white compared to 80% of the nation's. This disparity accounts for 16% of the difference between the Oregon and U.S. rates.³⁸

3. Lower household income is associated with suicidal behavior. In 1994, Oregon's median household money income level ranked 29th among the states and was 2.5% below the national level.³⁹

4. Regions with high divorce rates (an indicator of the degree of social integration) are likely to also have higher suicide rates.⁴⁰ Oregon's 1994 divorce rate ranked 16th highest among the states and was 15% higher than the nation's.

5. Excessive alcohol consumption is known to be linked to suicidal behavior, and Oregonians are more apt to be chronic drinkers (60+ drinks per month).⁴¹ Results from the 1995 BRFSS showed that the state's prevalence of chronic drinking was 35% above the national median and twelfth highest in the nation; Oregon's 1994 alcoholism death rate was 19% higher than the nation's and ranked twelfth highest.^{42,43}

6. Poor mental health is associated with suicidal behavior and Oregonians reported 11% more days per month per person when their mental health was not good (compared to the median number of days nationally); Oregon ranked tenth highest among the states.⁴⁴

7. The number of days a person is unable to engage in their usual activities is linked to suicidal thoughts; Oregonians reported 6.7% more days per month when they were limited in their activities (compared to the median number of days nationally); Oregon ranked 19th highest among the states.⁴⁴

8. Selective migration is another possible explanation. Oregon attracts new residents from other locales, as do many other western states with high suicide rates. Recent research has shown that variations in the suicide rates among states are linked to the higher suicide risk of in-migrants from non-contiguous states.⁴⁵

9. The residents of western states are known for their pioneering spirit and rugged individualism. These cultural characteristics can nurture a social isolation that keeps at-risk people from seeking early intervention.⁴⁶

10. Finally, at least part of the difference may be due to more complete reporting. Oregon, unlike most states, has a centralized medical examiner system with trained forensic pathologists.⁴⁷ These physicians not only investigate individual

Oregonians are more apt to be older, white, poorer, divorced, alcohol abusers, and in poorer mental health. These factors may contribute to the higher suicide rate for the state compared to the nation.

**Unlike most states,
Oregon has a
centralized medical
examiner system.**

deaths, they also oversee and provide expertise to local physicians appointed to investigate unattended deaths and deaths due to external causes. In many other states, such deaths may be investigated by elected or appointed coroners, who may be lawyers, police officers, justices of the peace, morticians, physicians, or others.

Farberow and his colleagues concluded that the characteristics of the coroners and medical examiners and their offices (e.g., the proportion of deaths autopsied) predicted suicide rates essentially as well as the characteristics of the community they served.⁴⁸ Some medical examiners and coroners are reluctant to attribute a suicidal death to suicide, often in consideration of the surviving family for at least two reasons: social stigma and life insurance considerations.^{29,49} This may occur in Oregon, but is believed to be relatively uncommon. Oregon medical examiners largely adhere to the national operational criteria developed for determining whether a death resulted from a suicide (see page 38).⁵⁰ Nationally, estimates of the true suicide rate range from 1.01 to 1.8 times the official rate.² O'Carroll has reviewed the issues related to the validity and reliability of suicide data and concluded that the true national suicide rate is no more than 1.25 times the official rate.²

CRITERIA USED BY MEDICAL EXAMINERS IN DETERMINING WHETHER A DEATH WAS A SUICIDE

Self-Inflicted

There is evidence that death was self-inflicted. This may be determined by pathological (autopsy), toxicological, investigatory, and psychological evidence, and statements of the decedent or witnesses.

Intent

There is evidence (explicit, implicit, or both) that at the time of injury the decedent intended to kill himself or herself or wished to die and that the decedent understood the probable consequences of his or her actions.

1. Explicit verbal or nonverbal expression of intent to kill self.
2. Implicit or indirect evidence of intent to die, such as
 - * preparations for death inappropriate in the context of the decedent's life,
 - * expression of farewell or the desire to die or an acknowledgment of impending death,
 - * expression of hopelessness,
 - * expression of great emotional or physical pain or distress,
 - * effort to procure or learn about means of death or to rehearse fatal behavior,
 - * precautions to avoid rescue,
 - * evidence that the decedent recognized high potential lethality of means of death,
 - * previous suicide attempt,
 - * previous suicide threat,
 - * stressful events or significant losses (actual or threatened), or
 - * serious depression or mental disorder.

IDEATION VERSUS COMPLETION

Within the cohort of ideators are persons truly at risk of suicide, as well as those who are not. The BRFSS and death data have shown that there were both demographic differences and similarities between suicide ideators and completers.

Among the most striking differences were those by gender and age. Females were 1.3 times more likely than males to *consider* suicide but males were 3.9 times more likely to actually *commit* suicide. When males seriously considered suicide, they were far more likely to follow through. For every 73 adult males who considered suicide, 1 took his own life; the ratio among females was 372 to 1, a fivefold difference.

By age, young Oregonians were far more likely than persons 65 or older to consider suicide but not to actually do so. Residents 18-24 years old were 9.4 times more likely to report suicidal thoughts than those 65 or older but elderly residents were 2.2 times more likely to commit suicide. Among the youngest group, 275 Oregonians *considered* suicide for every one who *committed* suicide; in the older group the ratio was 18 to 1, a 15-fold difference compared to 18- to 24-year-olds (Figure 12).

This pattern of increased suicide ideation among youth but higher death rates among the elderly is similar to Oregon and other data for suicide *attempts*: adolescents are more likely to make attempts that do not result in death. The ratio among Oregonians aged 17 or younger is at least 31 unsuccessful attempts for every suicide death.⁵¹ Among the nation's elderly, the ratio has been reported to be 1:1—far different from the 10-25 attempts reported for every suicide death in the general population.^{4,52}

The reasons for the demographic disparities between ideators and completers are unclear; there are insufficient data common to both datasets to develop a fuller understanding of the dissimilarities. However, some of the differences in the ideation/death dichotomy between males and females may be related to the chosen method of suicide; males were more likely to use firearms and other methods associated with a greater certainty of death.

Demographic similarities also existed, however. Both ideation and completion were less common among residents who were: married, attended college and lived in the non-coastal areas of western Oregon.

Females were more likely to think about committing suicide, but males were more likely to actually do so.

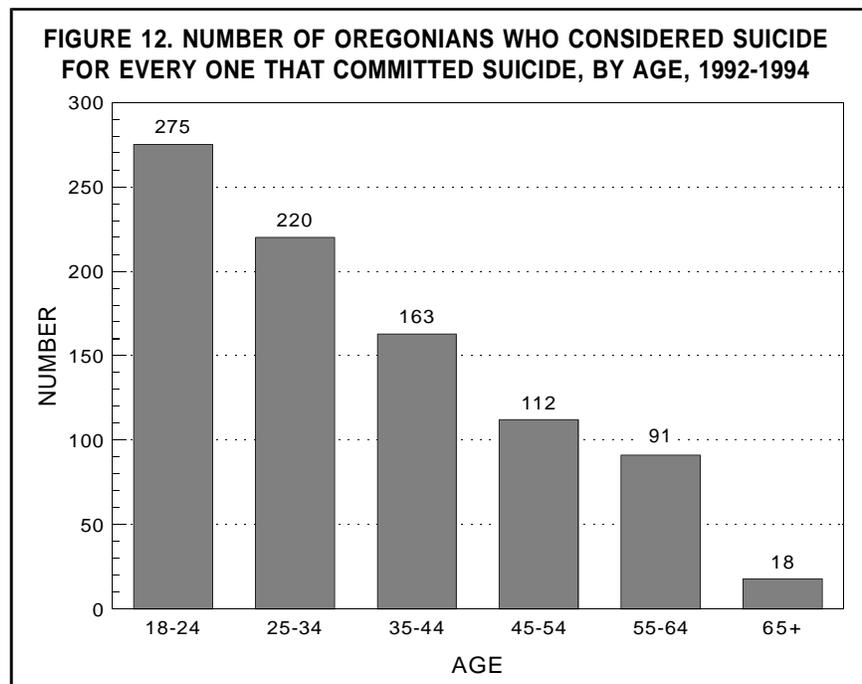
Although Oregonians 18-24 years old most often thought about suicide, residents 75 or older most often committed suicide.

OTHER RISK FACTORS

While the BRFSS and mortality data provide insight into many of the risk factors associated with suicidal behavior, other factors have also been identified by researchers. Among these are genetic factors, chronic pain, alcoholism, sexual orientation, and “contagion.”

Genetic Factors

Considerable evidence has demonstrated a correlation between suicide and genetic factors *independent* of those related to depression.^{53,54} One example involves persons with low cerebrospinal fluid levels of the serotonin metabolite 5-hydroxyindoleacetic acid (5-HIAA); levels appear to be low in patients at risk regardless of when they attempt suicide. Low levels are particularly associated with violent suicide attempts.⁵⁵ Asberg *et al* have shown that among persons who attempt suicide, those with low levels of 5-HIAA have a more than 20% chance of killing themselves within a year.⁵⁶ Homovanillic acid, a dopamine metabolite, has also been linked to suicide attempts.^{55,57} The genetic predisposition of suicidal behavior is borne out in studies of identical twins separated at birth. Although the siblings were raised apart, their inherited suicidal urges more often mirrored each other than did those of fraternal twins or non-twin siblings.^{53,58,59}



Chronic pain

Many studies have shown a greater risk of suicidal behavior or thoughts among people with such conditions as chronic back pain, HIV-associated pain, multiple sclerosis, migraine headaches, or central nervous system lesions.⁶⁰⁻⁶³ Suicidal ideation is time-dependant among chronic pain sufferers: the longer the duration of the pain, the greater the likelihood of suicidal thoughts.⁶⁴ Unfortunately, the presence of a chronic debilitating or terminal illness is only rarely noted on death certificates, so the incidence of suicide associated with such conditions is unknown.

Alcoholism

Suicide and alcoholism are often associated, but the meaning of the relationship is under debate. Hendin has summarized the three prevailing views: “Some have seen alcoholism and suicide as related because both are the consequences of common underlying causes; others have seen alcoholism as a form of suicide or a temporary substitute for it; still others see alcoholism, regardless of its cause, as having consequences that lead to suicide.”⁵³

Sexual orientation

There is evidence that gay and lesbian individuals are at increased risk of suicide and suicide ideation, although this remains controversial.⁶⁵⁻⁶⁸ In a recent study, Bagley and Tremblay reported that the risk of a serious suicide attempt was 13.9 times greater for young homosexual and bisexual males than for heterosexual males.⁶⁹ Remafedi and colleagues concluded that “suicide attempts were not explained by experiences with discrimination, violence, loss of friendships, or current personal attitudes toward homosexuality” but that “the unusual prevalence of serious suicide attempts remains a consistent and disturbing finding in the existing reports of young homosexual males.”⁶⁷ However, in two studies of persons who committed suicide, no more than 5% of the suicides in the samples under study were by persons believed to be gay.^{70,71} Bagley and Tremblay, however, summarized other studies noting that “gay and bisexual youth have been at risk for life experiences often linked to suicidal crises. These include: being physically, verbally, and emotionally abused in families, schools and society; experiencing declining academic achievement and truancy; becoming throwaways, runaways, street youth, and delinquents; engaging in prostitution for survival purposes and/or as a way to act out learned negative stereotypes; and not

Besides the risk factors identified from Oregon data, associations between suicide and genetic background, chronic pain, alcoholism, sexual orientation, and “contagion” have been identified.

being able to access qualified services when needed.”⁶⁹

Studies assessing the link between sexual orientation and suicide have been hampered by methodological limitations, including: 1) a lack of consensus for key terms (e.g., *suicide attempt* and *sexual orientation*), 2) uncertain reliability and validity of measures for these terms, 3) nonrepresentative samples, and 4) lack of appropriate nongay and/or clinical control groups for making accurate comparisons.^{73,74} National or statewide data on the frequency of suicide attempts among gays and lesbians do not exist.⁷³ Some persons in research studies who committed suicide may not have been identified as gay because of a conflict about a homosexual orientation that had been hidden from others.⁷⁵ For these reasons, the magnitude of the impact of sexual orientation on suicidal behavior remains unclear and needs further work.

“Contagion”

Exposure to suicidal behavior in one or more persons has been shown to influence others to commit or attempt suicide. The effect appears to be strongest among adolescents and can lead to clusters of suicides. One important source of contagion is the news media, but this does not mean that media reporting of suicide should be curtailed. Rather, appropriate news coverage can strengthen community efforts to address the suicide issue by describing help available in the community, explaining how to identify persons at high risk of suicide, and presenting information about risk factors for suicide.⁷²

PREVENTION

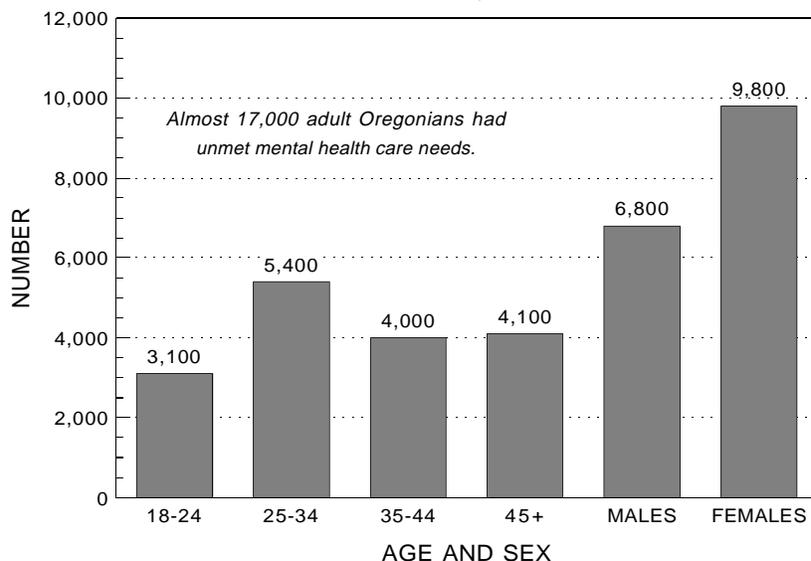
Suicide is rarely the result of a single conflict, problem, or cause, although a single event may act as a trigger. It is often the result of an accumulation of unresolved issues that erodes a person's ability to cope. Family, friends, and coworkers are often in the best position to identify persons at high risk of suicide.

IDENTIFICATION OF AT-RISK PERSONS

It is essential that people learn to recognize the warning signs of emotional distress that can lead to suicide. Some are subtle; others are not. Too often, those in a position to recognize these signs do not—or they deny or minimize them. Techniques for identifying and assisting suicidal persons have been described by Quinnett.⁷⁶

Physicians, too, frequently have an opportunity to identify persons contemplating suicide. A landmark study found that 82% of those who committed suicide had contacted a physician within the previous six months, and 53% had done so within the previous month. Yet even though 71% of the patients had previously threatened or attempted suicide, only 17% of non-psychiatric physicians were aware of this history. Over half of those seen within six months had substantial evidence of primary depressive illness, but the diagnosis was

FIGURE 13. NUMBER OF OREGONIANS WHO SAID THEY NEEDED MENTAL HEALTH CARE BUT FOR WHOM IT WAS UNAVAILABLE, BY AGE AND SEX, 1994



WARNING SIGNS

possible indicators of increased suicide risk

Changes in behavior:

- Accident proneness
- Drug and alcohol abuse
- Physical violence toward self, others, animals
- Loss of appetite
- Sudden alienation from family, friends, and co-workers
- Worsening performance at work/school
- Putting personal affairs in order
- Loss of interest in personal appearance
- Disposal of possessions
- Letters, notes, poems with suicidal content
- Taking unnecessary risks
- Purchasing a gun

Changes in mood:

- Expressions of hopelessness, impending doom
- Explosive rage
- Dramatic highs and lows
- Crying spells
- Poor appetite, weight loss
- Lack of sleep or excessive sleep
- Talks about committing suicide

Changes in thinking:

- Preoccupation with death
- Difficulty concentrating
- Irrational speech
- Hearing voices, seeing visions, expressing obviously false and bizarre beliefs
- Sudden interest or disinterest in church/religion

Changes in life events:

- Death of a family member or friend, especially by suicide
- Separation or divorce
- Loss of important relationship
- Public humiliation or failure
- Serious physical illness or trauma
- Loss of financial security

made by only 38% of the physicians.⁷⁷ (In sharp contrast to the old myth that claims those who threaten suicide never commit it, a previous suicide attempt is one of the best predictors of a completed suicide. Among attempters, 10% to 20% will ultimately die by suicide.⁷⁸)

Whether a suicide ideator ultimately attempts suicide depends on many factors, but within the universe of ideators are Oregonians who need health services but for whom it is unavailable. During 1994, no less than an estimated 16,600 adult Oregonians were unable to obtain needed mental health care—and of these, 4,500 thought about killing themselves (Figure 13). Those who said they needed mental health treatment but did not receive it were 59% more likely to report being suicidal than those who needed treatment and received it (27% vs. 17%).⁷⁹

Total Suicides*:	2,405
With guns:	1,479
With handguns:	914
<small>*1990-1994</small>	

FIREARM-RELATED RISK

Gun ownership is significantly associated with suicide. Over the past several decades, the firearm suicide rate has increased more than four times faster than the rate for other methods (Table 12). Koop and Lundberg have reported that the dramatic increase

HOW TO HELP ⁸³

someone who is threatening suicide

- *Be direct. Talk openly and matter-of-factly about suicide.*
- *Be willing to listen. Allow expressions of feelings. Accept the feelings.*
- *Be non-judgmental. Don't debate whether suicide is right or wrong, or feelings are good or bad. Don't lecture on the value of life.*
- *Get involved. Become available. Show interest and support.*
- *Don't dare him or her to do it.*
- *Don't act shocked. This will put distance between you.*
- *Don't be sworn to secrecy. Seek support.*
- *Offer hope that alternatives are available but do not offer glib reassurance.*
- *Take action. Remove means, such as guns or stock-piled pills.*
- *Get help from persons or agencies specializing in crisis intervention and suicide prevention.*

in suicide among children and adolescents in the U.S. is “almost solely due to firearms.”⁸⁰ After controlling for demographic and behavioral risk factors, persons living in households with guns have been found to be 4.8 times more likely to commit suicide than those living in homes without guns.⁸¹ The risk was higher with the presence of handguns than with long guns (5.8 times vs. 3.0 times) and with the presence of loaded guns and unlocked guns (9.2 times and 5.6 times, respectively).

A study of suicide in King County, Washington, and metropolitan Vancouver, British Columbia, showed that 15-to 24-year-olds were significantly more likely to commit suicide where gun control laws were less restrictive (King County); virtually all of the difference was due to an almost tenfold higher rate of suicide with handguns in King County.⁸²

Another study in Washington State found that purchase of a handgun appears to be associated with a long-lasting increased risk of violent death, including suicide. While the purchaser was at the greatest risk of committing suicide, other family members were also more apt to fatally shoot themselves. The risk of suicide was greatest within a year of the purchase, but remained significantly elevated more than five years after the purchase.⁸⁴

Because an attempt with gun is often immediately lethal and very little planning effort is needed when the firearm is available, suicide by this means may be committed impulsively, with little or no time to reconsider the action. Moreover, there is little opportunity for post-attempt rescue. Owners of firearms should weigh the reasons for keeping guns against the possibility that it might be used in a suicide. If a gun *is* present in the home—as it is in half of all Oregon households⁸⁵—then it should be stored unloaded, separated from its ammunition and locked away to reduce the risk of suicide or other injury to family members and visitors.

TABLE 12.
SUICIDE RATES BY METHOD
AND YEAR, OREGON RESIDENTS,
1959-61 AND 1992-94

METHOD	1959-61	1992-94	% CHANGE
TOTAL	12.7	16.3	+28
GUNS	6.9	9.9	+43
OTHER	5.8	6.4	+10

Rates per 100,000 population.

Young persons are most likely to make impulsive suicide attempts. When made with household medications, the attempts are seldom fatal; when made with guns they usually are.

REFERENCES AND ENDNOTES

1. Styron, W. *Darkness Visible: A Memoir of Madness*. Random House. New York. 1990.
2. O'Carroll PW, Rosenberg ML, Mercy JA. Suicide. *In Violence in America: A Public Health Approach*. M Rosenberg, MA Fenley, eds. Oxford University Press. 1991. New York.
3. Two other questions concerning suicidal behavior were asked but because of operational considerations and the small sample size, they are not included in this analysis.
4. Moscicki, EK, et al. Suicidal Ideation and Attempts: The Epidemiologic Catchment Area. *In US DHHS, Report of the Secretary's Task Force on Youth Suicide: Vol 4*. Washington, DC. 1988.
5. Paykel ES, et al. Suicidal feelings in the general population: a prevalence study. *Brit J Psych*. 1974; 124:460-469.
6. The use of the term "significant" or "significantly" in this report means statistically significant (i.e., $p < 0.05$).
7. Includes residents of the following counties: Clatsop, Coos, Curry, Lincoln, and Tillamook.
8. Odds ratios were calculated using a multiple logistic model containing the following variables: age, sex, employment status, household income, region of the state, race/ethnicity, education, marital status, and mental and physical health.
9. The ratio is based on the suicide ideation rate (from BRFSS data) divided by the suicide death rate (from the death certificate data).
10. Oregon Health Division. *Multicultural Health: Mortality Patterns by Race and Ethnicity, Oregon, 1986-1994*. Department of Human Resources. Portland, OR. 1997.
11. The Chinese and Japanese figure is based on a small number (13) of events. There were 45 African American suicides and 50 American Indian suicides.
12. MacMahon B, Pugh T. Suicide in the widowed. *Am J Epidemiol*. 1965; 81:23.
13. Bunch J, Barraclough B, Nelson B, Sainsbury P. Suicide following bereavement of parents. *Social Psych*. 1971; 6:193-199.
14. Coastal counties include Clatsop, Coos, Curry, Lincoln, and Tillamook.
15. Among the counties with rates significantly different compared to the state rate.
16. Age-adjusted death rates control for the age-distribution within

- the counties and states; any remaining differences are due to factors other than age. The rates are adjusted to the 1940 U.S. standard million. The U.S. age-adjusted suicide rate for 1988-1994 was 10.8 per 100,000 population; for 1994 it was 11.3.
17. The firearm-caused death rates are higher east of the Cascade Range for both unintentional injuries and homicides, as well.
 18. Males and persons 24 or younger and 65 or older account for a greater proportion of the population east of the Cascade Mountains. However, the difference compared to the western Oregon population is small: males, 50% east vs. 49% west; age 24 or younger, 37% east vs. 35% west; age 65 or older, 15% east vs. 14% west.
 19. Gunshot wounds caused the deaths of 73% of Oregon decedents with a grade school education or less. The proportion declined as the number of years of education increased falling to 50% among Oregonians with more than a baccalaureate degree.
 20. Unpublished 1992-1993 BRFSS data.
 21. Proportional mortality is analyzed because population data by occupation and age are unavailable. Although proportional mortality is a useful measure of the risk of dying from a certain cause relative to other causes, the reader should be aware that even though decedents in a particular occupation may be more likely to die from a suicide vis-a-vis other causes, it does not necessarily follow that their suicide death rate is higher than for other occupations: the proportion of deaths attributable to suicide may appear to be higher because the death rates for other causes are lower than average.
 22. Proportions were deemed statistically significant if the chi-square p value was less than 0.05.
 23. Liu T, Waterbor JW. Comparison of suicide rates among industrial groups. *Am J Industrial Med.* 1994; 25:197-203.
 24. Boxer PA, Burnett C, Swanson N. Suicide and occupation: a review of the literature. *J Occup and Environ Med.* 1995; 37:442-452.
 25. Yang B. The Impact of the Economy on Suicide in Different Social and Demographic Groups. Presented at the Eastern Economic Association. Cincinnati, Ohio. March 1990.
 26. Yang B, Lester D. Crime and unemployment. *J Socio-Econ.* 1994; 23:215-222.
 27. Lester D. Suicide and homicide rates on national holidays. *Psych Ref.* 1987; 60:414.
 28. Lester D, Frank ML. Beware the nones of March: suicide at the

- beginning of the month. *Psychological Ref.* 1987; 61:938.
29. Maldonado G, Kraus JF. Variation in suicide occurrence by time of day, day of the week, month and lunar phase. *Suicide and Life Threatening Behavior.* 1991; 21:174-87.
 30. Martin SJ, Kelly IW, Saklofske DH. Suicide and lunar cycles: a critical review over 28 years. *Psycholog. Rep.* 1992; 71: 787-795.
 31. Most jumping deaths were from bridges or overpasses. The Vista Avenue Viaduct ("Suicide Bridge") in Portland was the most commonly chosen bridge.
 32. Peck DL, Warner K. Accident or suicide? Single-vehicle car accidents and the intent hypothesis. *Adolescence.* 1995; 30: 463-472.
 33. Schmidt CW, et. al. Suicide by vehicular crash. *Am J Psych.* 1977; 134:175-178.
 34. The degree of lethality was estimated by stratifying the methods by the proportion of deaths that occurred in a hospital (excluding DOA). The more lethal methods included drowning, poisoning with a gas, hanging and suffocation, and firearms; 0% to 12% occurred in a hospital. Less lethal methods included cutting or piercing, poisoning with solids or liquids, jumping from a high place, and other; 18% to 23% occurred in a hospital.
 35. While just 5.1% of 65- to 74-year-olds committed suicide by asphyxiation, 16% of persons 85 or older did so. Hanging became proportionately less frequent with advancing age, while suffocation with a plastic bag became increasingly common, especially among women 85 or older; 100% of their suffocation and hanging deaths involved this method, compared to 57% for similarly aged men (Table 9). Almost half (46%) of all suicides by women aged 85 or older involved suffocation/hanging, compared to 10% by males.
 36. Although the 1992-94 Oregon rate for 5- to 14-year-olds is based on a relatively small number of deaths (21), the difference between the state rate and national rate is consistent with long-term patterns. For the period 1985-1994, Oregon's suicide rate for this age group was 76% higher than the national rate.
 37. Comparing the age-adjusted death rates to the crude death rates for Oregon and the U.S. reveals how much of the difference between Oregon and the U.S. results from population age differences. The following data are from the Centers for Disease Control and Prevention's WONDER (Wide-ranging On-line Data for Epidemiological Research) system. Because the National Center for Health Statistics data do not include updated cause of death data available from the Oregon

Center for Health Statistics, the following rates are slightly lower than actuality but should not affect the comparison. The crude death rates for 1994 for Oregon and the U.S. were 16.6 and 12.0 per 100,000, respectively. The age-adjusted (to the standard million) death rates were 14.6 and 10.6. The Oregon versus U.S. difference in crude death rates was 38.3%; for age-adjusted death rates the difference was 37.7%. The difference between the age-adjusted death rate disparity and the crude death rate disparity was just 1.6%.

38. This was calculated for 1985-94 in the same manner as the effect of age on suicide rates; see above. The federal Centers for Disease Control and Prevention recently calculated age-, sex-, race-, and Hispanic ethnicity-adjusted suicide death rates for each state. When the suicide rate was adjusted to control for these factors, Oregon's rate ranked ninth highest among the states during 1990-1994. (CDC. Regional variations in suicide rates - 1990-1994. MMWR. August 29, 1997; 46:789-793.)
39. U.S. Bureau of the Census. <http://www.census.gov/statab/ranks/pg21.txt>.
40. Lester, D. The association between alcohol consumption and suicide and homicide rates: a study of 13 nations. *Alcohol and Alcoholism*. 1995; 3:465-468.
41. Gruenewald RJ, et al. Suicide rates and alcohol consumption in the U.S., 1970-89. *Addiction*. 1995; 90:1063-1075.
42. Comparative alcoholism death rates were calculated using the Centers for Disease Control and Prevention's WONDER (Wide-ranging On-line Data for Epidemiological Research) system. The following International Classification of Disease (Ninth Revision) codes were used: 291, 303, 305.0, 425.5, 357.5, 535.3, 571.0-571.3.
43. U.S. Centers for Disease Control and Prevention. 1995 BRFSS Summary Prevalence Report. National Center for Chronic Disease Prevention and Health Promotion. Behavioral Surveillance Branch. Atlanta, Georgia. 1996.
44. U.S. Centers for Disease Control and Prevention. 1994 BRFSS Summary Prevalence Report. National Center for Chronic Disease Prevention and Health Promotion. Behavioral Surveillance Branch. Atlanta, Georgia. 1995.
45. Lester D. Explaining regional differences in suicide rates. *Soc Sci Med*. 1995; 40:719-721.
46. Berman A. State Seeks Way to Address Rise in Teen Suicide. *The Oregonian*. October 10, 1995, pages c1,c3.
47. Combs DL, Parrish RG, Ing R. Death Investigation the United States and Canada, 1995. US DHHS. Centers for Disease

- Control, National Center for Environmental Health. Atlanta, GA. 1995.
48. Farberow NL, MacKinnon DR, Nelson FL. Suicide: who's counting? *Pub Health Rep.* 1977; 92:223-232.
 49. Nelson FL, Farberow NL, MacKinnon DR. The certification of suicide in eleven western states: an inquiry into the validity of reported suicide rates. *Suicide and Life-Threatening Behavior.* 1978; 8:75-88.
 50. Rosenberg ML, et al. Operational criteria for the determination of Suicide. *J Forensic Sci.* 1988; 33:1445-1456.
 51. Hopkins DD, Grant-Worley JA, Fleming DW. Fatal and nonfatal suicide attempts among adolescents, Oregon, 1988-1993. *MMWR.* 1995; 44:312-323.
 52. Richardson R, Lowenstein S, Weissberg M. Coping with the suicidal elderly. *Geriatrics.* 1989; 44:43-51.
 53. Hendin H. *Suicide in America.* W.W. Norton and Co. New York, New York. 1995.
 54. Roy A. Possible Biologic Determinants of Suicide. *In: Current Concepts of Suicide.* D. Lester, ed. The Charles Press. Philadelphia. 1990.
 55. Traskman L, Asberg M, Bertilsson L, et al. Monoamine metabolites in CSF and suicidal behavior. *Arch. Gen. Psychiatry.* 1981; 38:631-636.
 56. Asberg M, et al. Psychobiology of Suicide, Impulsivity, and Related Phenomena. *In: Psychopharmacology: The Third Generation of Progress* (pp.655-666). HY Meltzer, ed. Raven Press. New York, NY.1987.
 57. Agren H. Symptom patterns in unipolar and bipolar depression correlating with monoamine metabolites in the cerebrospinal fluid, II: suicide. *Psychiatry Res.* 1980; 3:225-236.
 58. Roy A, Segal N, Centerwall B, et al. Suicide in twins. *Arch Gen Psychiatry.* 1991; 48:29-32.
 59. Roy A. Genetic and biologic risk factors for suicide in depressive disorders. *Psychiatric Quart.* 1993; 64:345-358.
 60. Penttinen J. Back pain and risk of suicide among Finnish farmers. *Am J Public Health.* 1995; 85:1452-1453.
 61. Breitbart W. Suicide Risk and Pain in Cancer and AIDS Patients. *In: Current and Emerging Issues in Cancer Pain: Research and Practice.* Chapman CR, Foley KM, eds. Raven Press; New York, NY. 1993.
 62. Stenager E, Jensen K, Knudsen L. Acute and chronic pain syndromes in multiple sclerosis. *Acta Neurol Scand.* 1991; 84:197-200.
 63. Breslau N, Davis GC, Andreski P. Migraine, psychiatric disor-

- der, and suicide attempts: an epidemiologic study of young adults. *Psychiatry* Tes. 1991; 37:11-23.
64. Hinkley BS, Jaremko ME. Effects of pain duration on psychosocial adjustment in orthopedic patients: the importance of early diagnosis and treatment of pain. *J Pain Symptom Manage*. 1994; 9:175-185.
 65. Harry, J. Sexual Identity Issues. *In: Alcohol, Drug Abuse, and Mental Health Administration: Report of the Secretary's Task Force on Youth Suicide, Vol. 2: Risk Factors for Youth Suicide* (pp. 2-131 - 2-142). (DHHS Publ. No. (ADM) 89-1624). Washington, DC. 1989.
 66. Hendin H. Suicide among homosexual youth. *Am J Psychiatry*. 1992; 149:1416-1417.
 67. Remafedi G, Farrow JA, Deisher RW. Risk Factors for attempted suicide in gay and bisexual youth. *Pediatrics*. 1991; 87:869-875.
 68. Safe Schools Coalition. The 1995 Seattle Teen Health Risk Survey. http://members.tripod.com/~claytoly/ssp_execsum.
 69. Bagley C, Tremblay P. Suicidality Problems of Gay and Bisexual Males: Evidence From a Random Community Survey of 750 Men Aged 18-27. *In: Suicidal Behaviors in Adolescents and Adults: Taxonomy, Understanding, and Prevention*. Bagley C, Ramsay R, eds. Avebury, Brookfield, Vermont. In Press.
 70. Rich CL, Fowler RC, Young D, Blenkush M. San Diego Suicide Study: comparison of gay to straight males. *Suicide and Life-Threatening Behavior*. 1986; 16:448-457.
 71. Shaffer D, Fisher P, Hicks RH, et al. Sexual orientation of adolescents who commit suicide. *Suicide and Life Threatening Behavior*. 1995; 25 (supplement):64-71.
 72. Centers for Disease Control. Suicide contagion and the reporting of suicide: Recommendations from a national workshop. *MMWR*. 1994;43,RR-6:13-17.
 73. Muehrer P. Suicide and sexual orientation: a critical summary of recent research and direction for future research. *Suicide and Life Threatening Behavior*. 1995; 25 (supplement):72-81.
 74. Moscicki EK. Epidemiology of suicide behavior. *Suicide and Life Threatening Behavior*. 1995; 25:22-35.
 75. Friedman RC, Downey JI. Homosexuality. *New Engl J Med*. 1994; 331:923-930.
 76. Quinnett P. *Suicide: The Forever Decision*. Crossroads. New York. 1993.
 77. Murphy GE. The physicians responsibility for suicide. II. Errors of omission. *Ann Intern Med*. 1975; 82:305-309.
 78. Hirshfeld RMA, Davidson L. Risk Factors for Suicide. *In: Amer Psych Rev of Psych*, vol. 7. Frances AJ, Hales RE, eds. Wash-

- ington. Amer Psych Press; 1988:289-306.
79. The “true” figure is probably higher since the BRFSS does not sample persons without a household telephone (i.e., low income households are less likely to have phone service and persons within low income households are more likely to have suicidal thoughts).
 80. Koop CE, Lundberg GD. Violence in America: A public health emergency. *JAMA*. 1992; 267:3075-3076.
 81. Kellerman AL, et al. Suicide in the home in relation to gun ownership. *N Engl J Med*. 1992; 327:467-472.
 82. Sloan JH, et al. Firearm regulations and rates of suicide. *New Engl J Med*. 1990; 322:369-373.
 83. American Association of Suicidology. <http://www.cyberpsych.org/aashelp.htm>
 84. Cummings P, Koepsell TD, Grossman DC, et al. The association between the purchase of a handgun and homicide or suicide. *Am J Public Health*. 1997; 87:974-978.
 85. Nelson DE, Grant-Worley JA, Powell K, et al. Population estimates of household firearm storage practices and firearm carrying in Oregon. *JAMA*. 1996; 275:1744-1748.

INDEX

A

age 17, 24, 25, 26, 31, 35, 36, 39
 alcohol consumption 37
 alcoholism 37, 41
 asphyxiation 34, 49

B

birthdays 33
 BRFSS methodology 15

C

Centers for Disease Control and Prevention 15
 change in age-specific suicide rates 26
 Christmas 31
 chronic pain 41
 "contagion" 42

D

demographic characteristics
 age 17, 24, 25, 26, 29, 35, 36, 39
 county of residence 30
 educational attainment 18, 28, 29, 39, 48
 employment status 19, 24, 29, 32
 gender 17, 23, 26, 28, 31, 34, 36, 39
 marital status 28, 37, 39
 martial status 18
 place of residence 19, 28, 30, 39
 race 18, 26, 31, 35, 37
 diet 22

E

educational attainment 18, 28, 29, 40, 48
 employment status 19, 24, 31, 32
 exercise 23

F

firearms 28, 44, 48
 change over time 44
 gun control laws 44
 prevalence 44

G

gender 17, 23, 26, 27, 31, 34, 35, 39
 genetic factors 40
 geographic differences. *See* place of residence
 gun control laws 45
 guns. *See* firearms

H

handguns 35, 44
 health characteristics
 exercise 23
 health status 22, 25
 mental health 22, 25
 overweight 23
 risky behaviors 22
 holidays 31
 homosexuality. *See* risk factors: sexual orientation
 household income 19, 24, 37
 how to help 44

I

ideation vs. completion 14, 26, 39, 40
 identification of at-risk persons 43
 income. *See* household income
 insurance, health 22, 44

J

jail 31
 January 31
 jumping from a high place 34

L

lethality 34, 35, 49
 limited activities 37
 logistic regression 15
 age 24
 employment 24
 gender 23
 household income 24

mental health 24
 physical health 24
 lunar phase 33

M

marital status 18, 28, 37, 39
 media, news 42
 medical examiner system 38
 mental health 22, 25, 37
 limited activities 37
 unmet needs 43, 44
 metabolite
 dopamine 40
 serotonin 40
 method of suicide
 age 34
 asphyxiation 33
 asphyxiation with a plastic bag 34, 49
 carbon monoxide 34
 crashing motor vehicles 33
 cutting and piercing 33
 drowning 33
 exposure 33
 firearms 33, 34, 44
 gas 33, 34
 gender 35
 handguns 34
 jumping from a high place 33
 lethality 34
 motor vehicle exhaust 34
 plastic bag 34, 48
 poisoning with gas 33
 poisoning with solids or liquids 33
 race 35
 self-immolation 33
 sex 34
 solids and liquids 33, 34
 stepping in front of traffic or trains 33
 methodology
 BRFSS 15
 Centers for Disease Control and Prevention 15
 mortality data 16
 multiple logistic regression 15
 odds ratio 16
 relative risk 16
 migration 37

Mondays 33
month of suicide 31
mortality data, methodology 16
motor vehicle exhaust 34
multiple logistic regression 15

N

national comparison 36

O

occupation 32
odds ratios 16
Oregon-U.S. comparison 35
overweight 23

P

physical health 25
physical limitations 37
place of death 31
place of residence 19, 29, 30, 39
place of suicide 31
plastic bag 35, 49
poisoning 34
prevention 43
proportional mortality 48

R

race 18, 27, 29, 35, 37
relative risk 16
residence. *See* demographic characteristics: place of residence
risk factors 17
 alcoholism 40
 behaviors 22
 chronic pain
 central nervous system lesions 40
 HIV-associated pain 40
 migraine headaches 40
 multiple sclerosis 40
 "contagion" 42
 death of parents 28
 demographic factors 17, 23, 26
 genetic factors 40
 health 22, 25
 sexual orientation 40
role of physicians 43
rugged individualism 37

S

serotonin 40
sexual orientation 41
smoking 22
Styron, William 11
suicide attempts 39
suicide completion. *See* suicide deaths
suicide criteria 38
suicide deaths
 age 26
 birthdays 31
 educational attainment 28, 31
 employment status 31
 gender 26
 holidays 31
 lunar phase 31
 marital status 28
 median age 24
 method 35. *See also* method of suicide
 month 31
 New Year's Day 31
 occupation 32
 place of residence 29
 place of suicide 33
 race 27
 suicide rates by age and sex 24
 summary 13
 temporal distribution 31
 weekdays 33
suicide ideation
 age 17, 24
 educational attainment 18
 employment status 19, 24
 gender 17, 23
 health status 20
 household income 19, 25
 marital status 18
 mental health 22, 25
 physical health 20, 25
 place of residence 19
 race/ethnicity 18
 risk factors 21
 summary 12
suicide rates by age and sex 26

T

terminal illness 41
time of suicide 31
true suicide rate 38

U

U.S. age-adjusted suicide rate 48
U.S. suicide rates 36
unemployment 19, 31

V

Vista Avenue Viaduct ("Suicide Bridge") 49

W

warning signs 43
weekdays 31
western states 37

OREGON DEPARTMENT OF HUMAN RESOURCES
HEALTH DIVISION
CENTER FOR DISEASE PREVENTION AND EPIDEMIOLOGY
CENTER FOR HEALTH STATISTICS
Telephone: (503) 731-4354
Suite 215
800 N.E. Oregon Street, #23
Portland, Oregon 97232

Bulk Rate
U.S. Postage
PAID
Portland, Oregon
Permit #701