

APPENDICES

APPENDIX A: THE EPIDEMIOLOGY OF YOUTH SUICIDE IN OREGON

In order to develop and focus prevention strategies, it is essential to understand who is at risk, and when and where suicide occurs. This is a summary of what is known about the epidemiology of suicide and suicide attempts among Oregon youth aged 10 to 24.

SUICIDE DEATHS

Data Source and Limitations

This section summarizes information gathered from death certificates. In order to classify a death as a suicide, medical examiners must be aware of specific evidence that the decedent attempted to kill himself or herself. Such evidence might include a suicide note, a recent period of depression, or a prior suicide attempt or threat. Because of this requirement, the number of deaths classified as suicides on death certificates is almost certainly an underestimate.

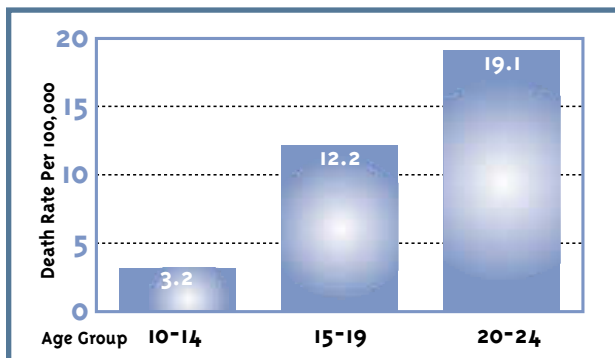
Overall Rates

Approximately 75 Oregon youth aged 10 to 24 commit suicide each year, making it the second leading cause of death for Oregonians in that age group. Oregon's 1997 suicide rate of 9.81 per 100,000 among youth aged 10 to 24 ranked 17th among states.

Age

The highest rate of suicide among youth occurs in those aged 20 to 24 (Figure 1). Although the rate among youth aged 10 to 14 is low, national statistics show that from 1980 to 1992, this rate increased 120% from 0.8 to 1.7 per 100,000.¹

**Figure 1: Suicide Death Rates Among Youth Aged 10-24
Oregon, 1994-1998**



Source: Oregon Death Certificates

Race

White youth account for the largest number of youth suicides in Oregon: 62 suicide deaths in 1998, representing 94% of total suicide deaths, at 9.1 deaths per 100,000 white population. Since the majority of Oregon's population is white, it is necessary to look at multiple years of data to make comparisons by race. From 1994 to 1998, suicide rates were highest among American Indian youth, and almost three times higher than for white youth: 15 deaths from 1994 to 1998, 4% of total suicide deaths, 24.5 deaths per 100,000 American Indian population. During this same time period, the figures for African American youth were: 10 suicide deaths, 3% of total youth suicide deaths, 12.3 deaths per 100,000 African American population. Asian youth manifested a significantly lower risk for suicide:⁶ suicide deaths, 1% of total suicide deaths, 4.7 deaths per 100,000 Asian population.

Gender

In 1998, male youth were seven times more likely to commit suicide than female youth (11.0 per 100,000 vs. 1.6 per 100,000).

Method of Suicide

Firearms are the leading method of suicide. From 1994 to 1998, firearms were used in 64% of Oregon youth suicides. Self-hanging was the second most common method (21%).

SUICIDE ATTEMPTS

Data Sources and Their Limitations

The information in this section is based on data from Oregon's Adolescent Suicide Attempt Registry, Youth Risk Behavior Survey, and Hospital Discharge Index.

Emergency room personnel are required by law to report suicide attempts by adolescents to the Oregon Health Division, and these reports are compiled into the Adolescent Suicide Attempt Registry. Note, however, that the registry records only attempts by youth aged 0 to 17, and does not include any attempts that do not result in a visit to an emergency room..

Additional data on youth suicide attempts is available from the Youth Risk Behavior Survey (YRBS), which is administered each year to a sample of Oregon middle and high school students. A strength of this survey is that it collects information by self-report of students, so it includes all suicide attempts whether or not they resulted in a visit to a health care provider. However, as with suicides included in the Adolescent Suicide Attempt Registry, these data also are limited to middle school and high school students.

The Hospital Discharge Index is a compilation of billing records from Oregon inpatient and psychiatric hospitals. This data source includes suicide attempts by patients of all ages, and attempts that do not result in a hospitalization are not included.

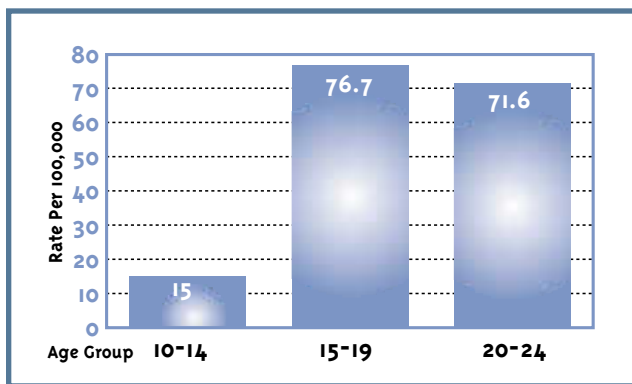
Overall Rates of Suicide Attempts

In 1998, a total of 761 suicide attempts were reported to the ER attempt registry. Among Oregon youth under age 18, approximately 44 attempts were reported to the registry for every death. Also in 1998, 366 youth aged 10 to 24 were hospitalized for suicide attempts.

Age

The highest rate of hospitalization for a youth suicide attempt occurred among those aged 15 to 19 (76.7 per 100,000) (see Figure 2).

Figure 2: Youth Suicide Attempts by Age Group
Oregon, 1998

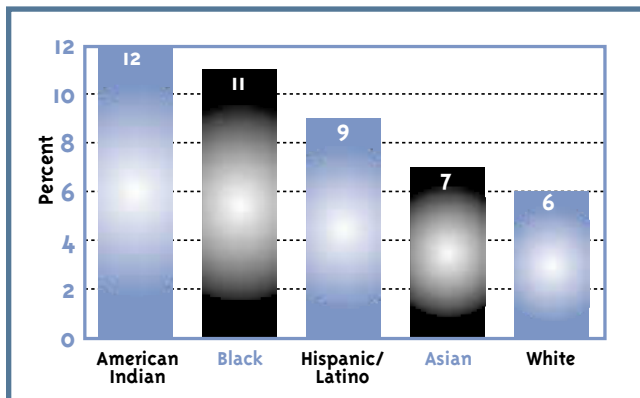


Source: Oregon Hospital Discharge Index

Race

Race information on suicide attempters is obtained from the adolescent suicide attempt registry (attempters under 18) and the YRBS. The 1998 registry reported the highest rate for American Indian youth under 18, at 103.2 per 100,000, followed by white youth at 100.6 per 100,000 and African American youth at 75.4 per 100,000. Asian youth had a lower rate of suicide attempts at 43.0 per 100,000. The YRBS also reported the highest prevalence of suicide attempts in American Indian students (Figure 3).

Figure 3: Percentage of Students Who Reported a Suicide Attempt in Previous year by Race/Ethnicity, Oregon, 1999



Source: Youth Risk Behavior Survey

Gender

Among adolescents (i.e., under 18) whose attempts led to an emergency room visit, females were 3.2 times more likely to attempt suicide than males (142.7 attempts per 100,000 females vs. 45.0 attempts per 100,000 males). This is a dramatic contrast to the predominance of males in deaths due to suicide.

Method of Suicide

Among youth whose attempt led to hospitalization, the most common was ingestion of drugs (94%). This is a dramatic contrast to the predominance of firearm use in completed suicides. Cutting or piercing injuries (3%), suffocation/strangulation (1%), and firearms (0.5%) were the next most common methods for this age group.

Risk Factors

In order to target prevention efforts, it is essential to understand what populations are most at risk and the characteristics of high-risk groups. Research data indicate that there are factors common to those who commit suicide and those who attempt suicide. The following table outlines some of the risk factors associated with youth suicide. The magnitude of the increased risk and the estimated prevalence of a particular risk factor vary from study to study; the elevated risk and the number of individuals with the factors might therefore be presented as a range. Through the identification of high-risk groups and the estimated size of a group with the particular characteristic, interventions can be more efficiently focused.

TABLE 1: RISK FACTORS FOR SUICIDAL BEHAVIOR

Risk Factor	Relative Risk	Estimated Population with Risk Factor in Oregon
Prior Attempt ²	1.5-14.0	13,500-68,000
Past Depression ³	3.4	30,500-34,000 ⁴
Major Depression ²	11.9	20,000
Poly-Substance Abuse ³	2.8-5.3	81,000 ⁵
Alcoholism ³	5.3	210,000 ⁶
Drug Abuse ²	14.8	156,000 ⁶
Family Hx of Suicide ⁷	3.9-7.0	30,500 ³
Incarceration ⁸	4.8	2,800 ⁹
Access to firearm ¹⁰	4.8	40,000 ¹¹
Homelessness ¹²	2.8	34,000 ¹³

Suicidal Ideation and Previous Suicide Attempts

Sixteen percent of high school students surveyed in the 1999 Oregon YRBS reported “seriously considering suicide,” 6% reported an attempt in the last 12 months, and 2% reported an attempt in the last six months that resulted in an injury requiring medical attention. Suicidal ideation appears to be a common experience among adolescents. Some risk factors may differentiate those who only contemplate suicide from those who proceed to actually attempting suicide. It is estimated that between 7% and 16% of adolescents and young adults (aged 10 to 24) have attempted suicide.² A previous suicide attempt has been identified as the most strongly associated risk factor for completing a suicide.² In 1998, one out of every three Oregon youth suicide attempters requiring an ER visit, (youth under 18) had made a prior attempt in the last 5 years. These facts support the need for appropriate follow-up care after a suicide attempt.

Major Depression and Other Mental Health Issues

A history of depression, mood disorder, or other mental health diagnosis is common in individuals who commit suicide. In fact, studies estimate that 90% of youth who commit suicide have at least one major psychiatric disorder.^{2,4}

Substance Abuse

Substance abuse increases the risk both for suicide and attempts in youth. Studies indicate that approximately one-third of youth who commit suicide were under the influence at the time of their death.⁷ Cross sectional studies using the Youth Risk Behavior Survey have observed that suicidal behavior often coexists with substance abuse.

History of Physical or Sexual Abuse

Thirteen percent of all Oregon high school students who took the 1999 YRBS said they had been purposely hit, kicked, or slapped by an adult family member in the last year. Six percent reported forced sexual intercourse, and 18% reported unwanted sexual touching. These youth were several times more likely to have made a suicide attempt than those students who did not report being abused.¹⁴

Incarceration

Suicide is the leading cause of death in jails and lock-up facilities. In Oregon juvenile detention facilities, 32% of the incarcerated youth reported a prior suicide attempt, compared to 9% of Oregon high school students.⁹ In 1997-1998, there was a cluster of three suicides in an Oregon juvenile correction facility.

Homelessness

Researchers have noted that homeless youth are at much greater risk of suicide than their domiciled peers. Studies of homeless youth in large urban areas found that 41% of their samples had considered suicide, and more than 25% had attempted suicide.¹⁵ Greenblat found that almost half of homeless youth aged 13 to 17 had attempted suicide.¹⁶ Ringwalt studied “throwaway” youth who were specifically told to leave home and found this sub-population to be at higher risk for suicidal behavior than homeless youth who were not told to leave home.¹³

Sexual Orientation

In an analysis of five studies involving representative samples of U.S. high school students Remafedi found higher rates of attempted suicide among homosexual youths compared to their heterosexual peers.¹⁷ This higher risk has been shown to be significant, with homosexual youth ranging from 3.4 to 13.9 times more likely than heterosexual youth to engage in suicide attempts.^{18,19} Safren and Heimberg found that gay, lesbian, and bisexual adolescents reported greater depression, hopelessness, and past and present suicide ideation than did heterosexual adolescents.²⁰ When accounting for other predictor variables, they concluded that environmental factors play a major role in predicting distress in this population.

Accessible Firearms

Firearms in the home, whether locked up or not, whether loaded or not, is associated with a higher risk for adolescent suicide, even after controlling for other psychological risk factors.²¹ According to the 1999 Oregon YRBS, students who reported a suicide attempt in the last year were twice as likely to report carrying firearms.²²

Multiple Risk Factors and Protective Factors

Research shows that the probability of adolescents having made a suicide attempt increases dramatically as a function of the number of risk factors they possess.²³ Nevertheless, it is the accumulation of risk factors and the absence of protective factors in a young person's life, rather than membership in or identification with a particular high-risk group, that increases the risk for suicidal behavior.¹² Results of the 1999 Oregon Youth Risk Behavior Survey indicate that as the number of environmental and behavioral risk factors increase, individuals are more likely to report a suicide attempt.¹⁴

DATA COLLECTION NEEDS

Death Scene Investigations and Manner of Death

Death by suicide is underreported, especially among youth, and the true prevalence of suicide attempts is unknown at this time. Law enforcement and medical examiner investigations of youth suicide often involve only immediate family members. However, relatives, friends, and adults who knew the deceased often have information that is not known to immediate family members. Improved investigations of youth suicide can improve the ability of local communities to evaluate how their systems of care respond to youth and families in crisis, and can assist them in developing community suicide prevention plans. Improved investigations would include an effort to correctly identify not just the mechanism of death (e.g., a firearm or ligature), but to determine a precipitating event, known factors that contributed to the death, and the underlying risk factor or reason the suicide occurred.

An additional benefit of in depth investigation is the connection of bereaved families and friends to support services. Research indicates that those who have lost a loved one to suicide are at increased risk for suicide themselves. Complicated grief can also lead to depression that may need clinical care.

Suicide Attempt Registry

Little is known about the difference between attempters and suicide completers. Research into post-treatment follow-up care in emergency rooms is needed to better understand the differences between successful interventions and those that fail.

Accurate, comprehensive data are critical to the development, implementation, and evaluation of effective prevention strategies. In order to evaluate if prevention efforts begun at age 16 carry through into adulthood, it will be necessary to track health data across time. Such data are needed for tracking the rate of attempts in each age group as time passes. Expanding the age range for data collection to all attempters would assist in defining the magnitude of the problem and in evaluating activities to prevent suicide. Without expanded attempt data on young adults and adults as they age, it will not be possible to evaluate if efforts begun in adolescence continue to bring results later on.

Survey Work on Risk Behaviors

School participation in the risk behavior survey is necessary to accomplish the goal of creating a representative sample of Oregon youth in high school and middle school. Accurate, comprehensive data are critical to the development, implementation, and evaluation of effective prevention strategies. Data from this survey can provide communities with a rich source of information to use in community planning efforts to best determine use of resources.

REFERENCES

- ¹ Centers for Disease Control. Injury Mortality Statistics.
<http://webapp.cdc.gov/sasweb/ncipc/mortrate.html>. National Center for Injury Prevention and Control.
- ² Brent D. Risk factors for adolescent suicide and suicidal behavior: Mental and substance abuse disorders, Family environmental factors and life stress. *Suicide and Life Threatening Behavior*. 1995;25;Supp: 52-63.
- ³ Brent D, Perper J, Moritz G, Liotus L, et al. Familial risk factors for adolescent suicide: a case-control study. *Acta Pyschiatr Scand*. 1994;89:52-58.
- ⁴ Lewinsohn P, Hops H, Roberts R, Seely J, Andrews, J. Adolescent psychopathology: 1. prevalence and incidence of depression and other DSM-III-R Disorders in high school students. *J of Abnormal Psychology*. 1993;102(1):133-144.
- ⁵ 1998 Oregon Public School Drug Use Survey. Office of Drug and Alcohol Abuse Programs. Oregon Department of Education. Salem, Oregon.
- ⁶ Center for Health Statistics. Oregon Youth Risk Behavior Survey, 1997. Health Division. Oregon Department of Human Services. 1998. Portland, Oregon.
- ⁷ Garland A, Zigler E. Adolescent suicide prevention; Current research and social policy implications. *American Psychologist*. 1993;48(2):169-182.

- ⁸ Memory J. Juvenile suicides in secure detention facilities: Correction of published rates. *Death Studies*. 1998;13:455-463.
- ⁹ Oregon juvenial inmate population, 1996. Oregon Criminal Justice Division
- ¹⁰ Kellerman A, et al. Suicide in the home in relation to gun ownership. *N Eng J Med*. 1992;327: 467-472.
- ¹¹ Center for Health Statistics. Oregon Behavioral Risk Factor Surveillance System, 1997. Health Division, Oregon Department of Human Resources.
- ¹² Yoder K. Comparing suicide attempters, suicide ideators, and nonsuicidal homeless and runaway adolescents. *Suicide and Life-Threatening Behavior*. 1999, 29(1): 25-36.
- ¹³ Ringwalt C, Greene J, Robertson M, McPheeters M. The prevalence of homelessness among adolescents in the United States. *Am J Public Health*. 1998;88(9):1325-9.
- ¹⁴ Center for Health Statistics. Youth Suicide. Results from the 1999 YRBS. Oregon Health Trends, Number 57. Health Division. Oregon Department of Human Services. 2000. Portland, Oregon.
- ¹⁵ Feitel B, Margetson N, Chamas J, Lipman C. Psychosocial background and behavioral and emotional disorders of homeless and runaway youth. *Hosp Community Psychiatry*. 1992; Feb;43(2):155-9.
- ¹⁶ Greenblat M, Robertson M. Life styles, adaptive strategies, and sexual behaviors of homeless adolescents. *Hosp Community Psychiatry*. 1993; 44(12): 1177-80.
- ¹⁷ Remafedi G. Sexual orientation and youth suicide. *JAMA*. 1999;282(13):1291-2.
- ¹⁸ Garofalo R, Wolf R, Kessel S, et al. The association between health risk behaviors and sexual orientation among a school-based sample of adolescents. *Pediatrics* 1998;101(5):895-902.
- ¹⁹ Bagley C, Tremblay P. Suicidal behaviors in homosexual and bisexual males. *Crisis*. 1997; 18(1), 24-34.
- ²⁰ Safren S, Heimberg R. Depression, hopelessness, suicidality, and related factors in sexual minority and heterosexual adolescents. *J Consult Clin Psychol*. 1999;67(6):859-66.
- ²¹ Bell C, Clark D. Adolescent suicide. *Pedia Clinic Nor Amer*. 1998;45(2):365-380.
- ²² Center for Health Statistics. A Potential for Violent Injury. Oregon Health Trends, Number 56. Health Division. Oregon Department of Human Services. June 2000. Portland, Oregon.
- ²³ Lewinsohn P, Rohde P, Seeley J. Psychosocial characteristics of adolescents with a history of suicide attempt. *J Am Acad Child Adolesc Psychiatry*. 1993;32(1):60-8.