Family and Community Health Bureau
Center for Health Statistics
Population Health Assessment Quarterly
Volume 1, Issue 4
Special Issue 2000

Adolescent Health Status

Introduction

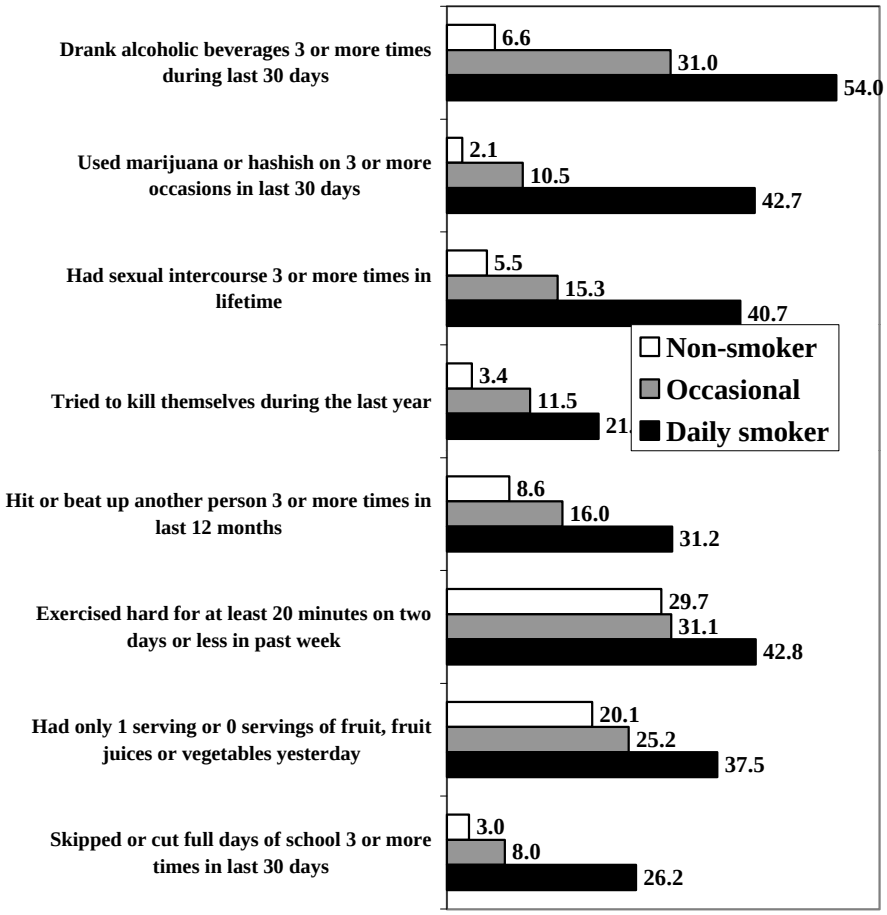
Adolescence is a unique time of transition within the lifespan, with profound physical, emotional, social and intellectual changes that have an impact on the health of young people.

The health of adolescents is directly affected by the behaviors they engage in. These behaviors, both positive and negative, are influenced by the young people themselves and the social environment that surrounds them, such as families, peers, communities and society.

In an article looking at long term consequences of adolescent behaviors, Hedberg et al. suggested: "*...socioeconomic factors, even more than health risk behaviors, are critical determinants of mortality in the U.S... improving adolescent health requires a broad prevention strategy that addresses the many influences on adolescents, including schools, the media, government regulations, and the characteristics of the families, neighborhoods, and cultures in which adolescents live and learn...* " (1).

The Tobacco and Youth Risk Behavior Endowments created by the 1999 Minnesota Tobacco Legislation have identified six areas that have immediate and long term effects on adolescent health. Tobacco use has received most of the attention and funding within the Endowments. The other youth risk behaviors are: alcohol and other drug use, sexual behaviors that can lead to pregnancy, HIV/AIDS or sexually transmitted diseases, violence, suicide, lack of physical activity, and lack of proper nutrition. These behaviors often cluster together, as is demonstrated in **Figure 1** which shows the distribution of other risk behaviors among 9th grade non-smokers, occasional smokers and current smokers.

Figure 1. 9th Grade Risk Behaviors and Social Factors Associated With Smoking Cigarettes*, 1998 Minnesota Student Survey



*Students were asked: During the last 30 days, how frequently have you smoked cigarettes?
"Non-smokers" have not smoked any cigarettes in the past 30 days. (n=33,016)
"Occasional smokers" have smoked in the past 30 days, but "less than one cigarette per day." (n=6,449)
"Daily smokers" indicated that in the past 30 days they smoked anywhere from "1-5 cigarettes per day" to "two packs or more per day." (n=8,055)

The idea that youth risk behaviors cluster together is not new. While large numbers of youth avoid any significant involvement in risky behavior, some young people are involved simultaneously in multiple behaviors that pose risks to themselves and to society. Yet, our approach to improving adolescent health often focuses on targeting specific behaviors, such as pregnancy prevention or illegal drugs, rather than working with each adolescent as a whole person.

Results from the Minnesota Student Survey (MSS) (2) provide a view of how strongly youth risk behaviors are related to one another. In **Figure 1**, involvement in youth risk behaviors is compared for non-smokers, occasional smokers, and daily smokers. Most of the youth risk behaviors are strongly associated with cigarette smoking. Daily smokers, for example, are eight times more likely than non-smokers to say that they drank alcohol frequently (54.0% to 6.6%).

Figure 1 shows the *association* of other youth risk behaviors with cigarette smoking, but similar data may be presented using alcohol, violence or any other risk behavior as the focal point. When these figures are created, the patterns are similar to those seen in **Figure 1**. In general, among ninth graders, the strongest cluster of inter-relationships can be found between smoking cigarettes, alcohol and marijuana use, and sexual activity. Violence and suicide attempts, at least as measured by the MSS, have moderately strong relationships with other behaviors. Lack of physical activity and nutrition are also related to other youth risk behaviors, but not as strongly.

Over the years, the high level of association between many different behaviors among youth has led to the search for social, environmental and personality factors that all or most of these behaviors might have in common. Work at the University of Minnesota to identify protective and risk factors for adolescent health status has been part of that tradition. Some progress may be achieved in reducing youth risk behaviors through education and community activities that focus on underlying factors that seem to influence these behaviors.

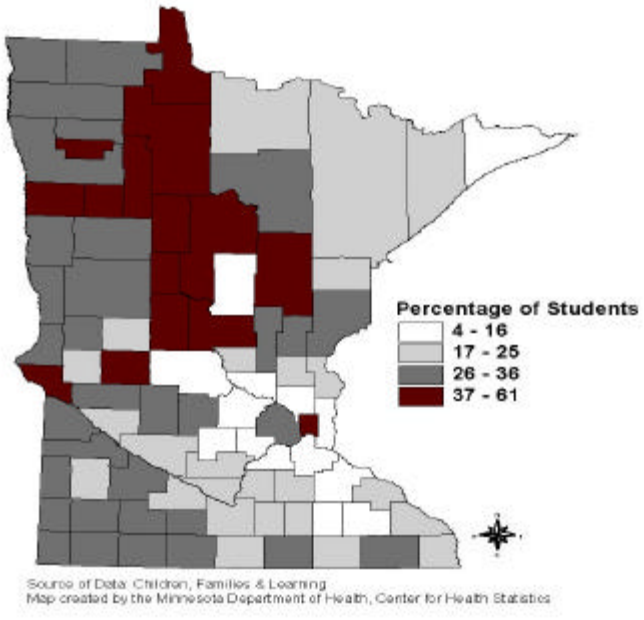
The unique role of cigarette smoking with the cluster of youth risk behaviors should not be overlooked. Given the high degree of clustering with other behaviors, smoking may be a good indicator of other risk behaviors among youth. Smoking tends to begin relatively early in adolescence and is not very easy to hide, at least to peers. For these reasons, smoking and other tobacco use could be viewed as an early warning signal that alerts family, friends and adults to look at what else is going on in that person's life and at what can be done to help him or her get back on the path of healthy youth development.

Socioeconomics and Health Status

Socioeconomic factors have been linked to health status. Goal 2 of Healthy People 2010 is to eliminate health disparities, which " *include differences that occur by gender, race or ethnicity, education or income, disability, living in rural localities, or sexual orientation* " (3).

The lack of socioeconomic data available for youth have led to the use of other indicators that can serve as proxies for poverty among students. One such measure is the percent of students enrolled in free or reduced lunch programs. **Figure 2** looks at county level geographic disparities in the percent of students in grades 5-12 who are eligible for free or reduced lunch programs in Minnesota public schools (4). Major methods for determining eligibility for free or reduced lunch (5) are listed below[1]. It is important to note that the map below likely underreports students eligible for free or reduced lunch, and such underreporting varies between communities. Also, socioeconomically disadvantaged youth who have dropped out of school may not be represented in this data. Despite these caveats, the map demonstrates that in some regions of Minnesota, as many as 61% of youth in school may be eligible for these programs.

Figure 2. Students in Grades 5-12 Eligible for Free or Reduced Lunch Programs by County of Residence, Minnesota 1998-99



[1] Methods for determining eligibilty are based on (1) families submitting applications for Educational Benefits, which may be used for a variety of other school-related programs. Only complete applications are considered for meal benefits; (2) children are electronically certified for free meals based on submission of MFIP case and Food Stamp case numbers; and (3) a school completes an application on behalf of a child known to be needy, based on the best available household information. Under this option, families are still informed of the actions taken by the school.

Under USDA (United States Department of Agriculture) School Nutrition Programs, schools are required annually to verify a percentage of approved applications on file. Households are asked to provide written evidence of income to substantiate the original determination of benefit. In a report describing their organization, Covering Kids[2] wrote: "*On June 20, 2000, President Clinton signed into law a provision...to allow for more effective use of the school lunch program in identifying uninsured children who are eligible for Medicaid or State Child Health Insurance Programs (SCHIP) and helping them enroll in these health insurance programs...Effective October 1, 2000, the legislation will allow states and school food authorities the option to share information from school lunch applications with a person directly connected with the administraton of the state Medicaid or SCHIP program for the purpose of identifying children eligible for benefits and enrolling in these programs.*" (6).

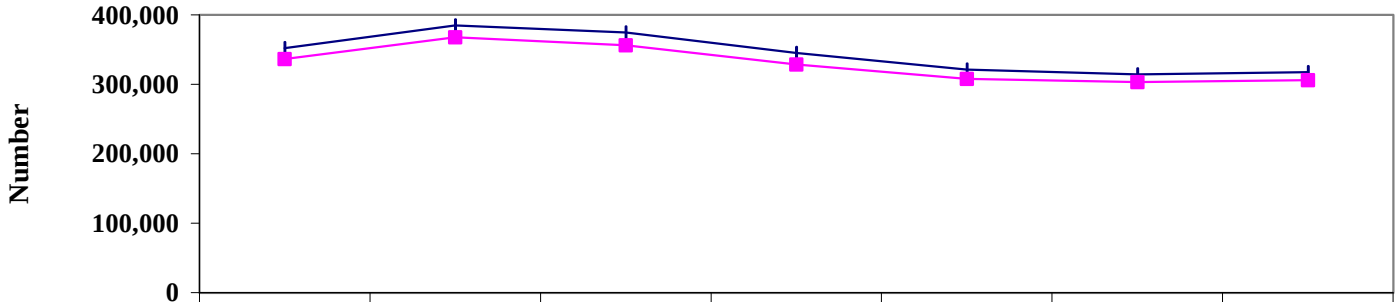
Population Projections

It is estimated that both the number of adolescents and their percentage of the total population will decrease from 1995 to 2025 (7). In 1995, the adolescent population aged 10 to 19 comprised an estimated 15% of the total population in Minnesota. By 2010, adolescents will make up an estimated 13%, and by 2025, 12%. **Figure 3** presents adolescent population projections from 1995 to 2025, by gender. **Table 1** illustrates that the percent change from 1995 to 2025 in the adolescent population will vary by region in Minnesota, with the southwestern region experiencing the greatest change of -27%, compared to +3.5% in the central region (7). Overall, **Figure 4** shows that the western portion of Minnesota will have the smallest number of adolescents in 2025, and the metro and central regions will have the largest.

While Minnesota population projections expect an overall decrease in the adolescent population through 2025, an increase in the number of non-white youth is expected. **Figure 5** shows an increase from an estimated 79,200 non-white adolescents in 1995 to 149,900 in 2025. The greatest increase is expected to be in the Hispanic population (**Figure 6**) from an estimated 16,200 in 1995 to 49,600 in 2025. In 1995 the non-white adolescent population made up 12% of all adolescents in Minnesota. They are expected to comprise 22% in 2025.

In a review of the important roles of culture, race, and poverty on health, Bell et al. found that socioeconomically disadvantaged youth are more likely to engage in health risk behavior, especially tobacco and other substance use. The authors outlined strategies which emphasized "....*working with young people, their parents, and their communities in order to deliver "culturally effective" health care services, with an emphasis on prevention, health promotion, and risk reduction*" (8). Given the expected increase in the diversity of youth, it is critical that Minnesota adapt and develop effective strategies to reduce health disparities.

Figure 3. 1995 Estimated Adolescent Population (Age 10-19), and 2000-2025 Projections, by Gender, Minnesota



	1995	2000	2005	2010	2015	2020	2025
Male	352,100	384,800	374,700	345,300	321,400	314,300	317,500
Female	336,600	367,900	356,400	328,700	307,900	303,000	306,200

Source: State Demographic Center, MN Planning

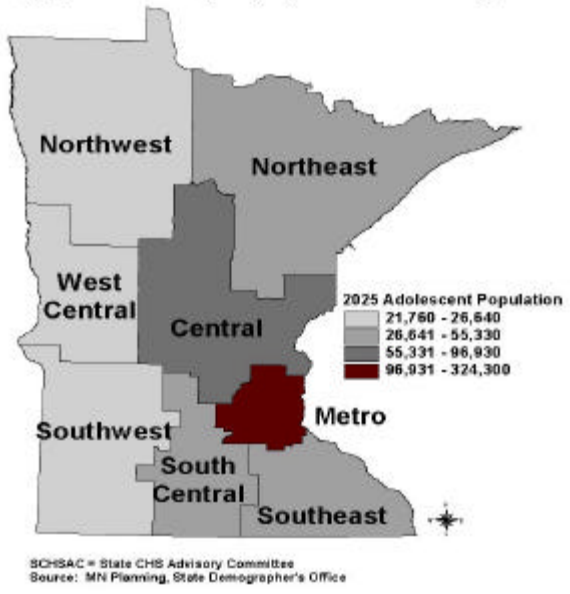
2The Covering Kids Program is funded by The Robert Wood Johnson Foundation and is focused on identifying and enrolling children eligible for Medicaid and other health coverage programs. Minnesota is a Covering Kids grant recipient.

Table 1. 1995 Estimated Adolescent Population (Age 10-19) and 2000-2025 Projections , by Region*

REGION	Number of Counties	1995 Estimated Population	Projected Population 2000	2005	2010	2015	2020	2025	% Change 1995-2025
Northwest	13	31,280	33,640	31,480	28,300	26,360	25,700	25,660	-18.0
Northeast	7	48,575	52,580	48,900	43,040	38,780	37,500	37,450	-22.9
West Central	8	28,458	29,880	28,200	24,940	22,450	21,600	21,760	-23.5
Central	14	93,668	106,870	104,830	97,110	92,720	93,030	96,930	3.5
Southwest	16	36,372	37,950	34,710	30,410	27,650	26,700	26,640	-26.8
South Central	11	44,528	46,480	44,060	39,320	36,010	35,480	36,160	-18.8
Southeast	11	68,333	73,910	70,720	62,950	57,200	55,240	55,330	-19.0
Metro	7	337,522	371,460	368,460	348,030	328,340	322,400	324,300	-3.9

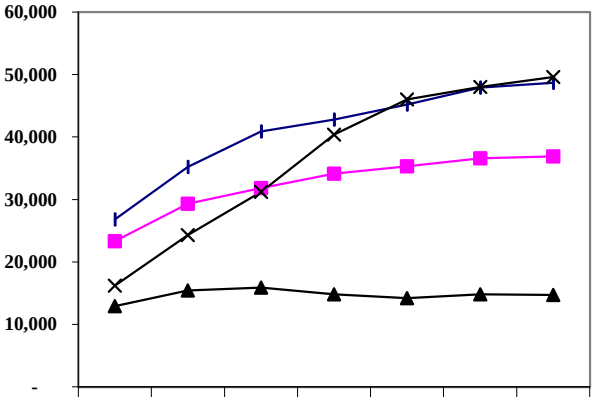
Source: State Demographic Center, MN Planning *As defined by the State Community Health Services Advisory Committee (SCHSAC).

Figure 4. Projected Adolescent Population (Aged 10 - 19 yrs.) by SCHSAC* Region



SCHSAC = State CHS Advisory Committee
Source: MN Planning, State Demographer's Office

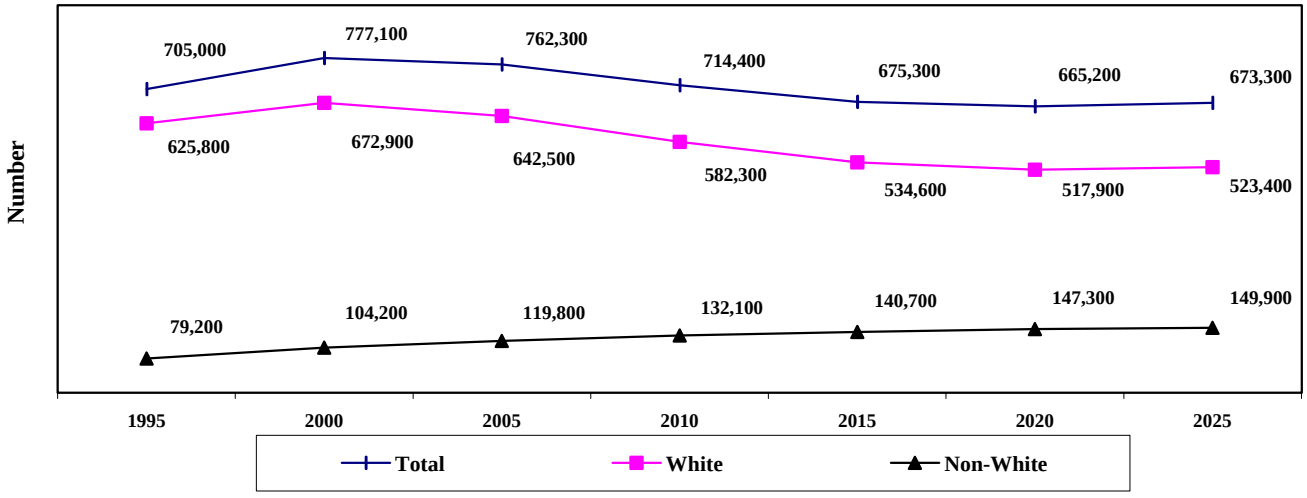
Figure 6. 1995 Estimated Adolescent Population (Age 10-19) and 2000-2025 Projections, by Minority Group, Minnesota



	1995	2000	2005	2010	2015	2020	2025
African American	26,800	35,200	40,900	42,800	45,200	47,900	48,700
Asian/Pacific Island	23,300	29,300	31,800	34,100	35,300	36,600	36,900
Native American	12,900	15,400	15,900	14,800	14,200	14,800	14,700
Hispanic	16,200	24,300	31,200	40,400	46,000	48,000	49,600

Source: State Demographic Center, MN Planning

Figure 5. 1995 Estimated Adolescent Population (Age 10-19) and 2000-2025 Projections, by Total, White and Non-White Groups, Minnesota



Source: State Demographic Center, MN Planning

The period of adolescence provides a unique opportunity to invest in the health and well-being of youth. Good health (physical, emotional, social and spiritual) enables young people to make the most of their teenage years while laying a strong foundation for adult life. Lifestyle patterns developed during adolescence often continue into adulthood and influence long-term prospects for health and risk of chronic disease. It is clear that investment in health during adolescence has long-term benefits. Equally, the costs of not investing are staggering. Hedberg, et al. reviewed societal costs (**Table 2**) of tobacco use, diet and activity patterns, alcohol and illicit drug use, injuries, and sexual behaviors among adolescents (1).

Table 2. Societal Costs Related to Adolescent Health-Compromising Behaviors (United States, 1998)

Category	Cost Reported ($ billion)	Year	Adjusted 1998 Dollars billion
Tobacco	100	1994	110
Obesity			
Medical costs	68	1990	85
Weight-reduction programs	30	1989	40
Alcohol and illicit drugs			
Alcohol	148	1992	172
Drugs	98	1992	116
Injuries			
Non-substance abuse-related MVA	91	1990	114
Non-substance abuse-related firearm	10	1990	13
Sexual behaviors			
Pregancy	25	1990	31
HIV	15	1995	16
PID	4	1990	5
Total costs		1998	702

Source: Viking A. Hedberg, et al., 1999. Printed with permission from author per phone conversation on September 13, 2000.

Hospitalization

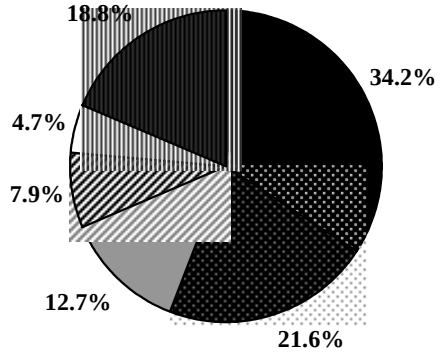
Figure 7 presents discharge data for leading causes of hospitalization for persons aged 15-19 in Minnesota. Pregnancy-related complications are the leading cause of hospitalization (34%); followed by mental disorders (22%); injury and poisoning (13%); diseases of the digestive system (8%); and diseases of the respiratory system (5%), (9).

Mortality and Injury

In the United States and Minnesota, adolescent deaths rates have declined for all causes since 1985 (10). However, unintentional injury remained the leading cause of death in 1998 among adolescents age 10-14 in the US and Minnesota, accounting for 39% and 35% of all deaths in this age group, respectively. Other leading causes in Minnesota include: malignant neoplasms, suicide, congenital anomalies, and diseases of the nervous system and sense organs (**Figure 8**) (11). Unintentional injury was also the leading cause of death among adolescents age 15-19 in the US and Minnesota, accounting for 46% and 54% of all deaths in this age group, respectively. Other leading causes in Minnesota include: suicide, homicide, malignant neoplasms, and diseases of the heart.

Table 3 shows adolescent death rates per 100,000 due to unintentional and intentional injury in Minnesota. Among 10-14 year olds, there was not much change from 1985 to 1998 across causes of injury. Given the small numbers of adolescent deaths in the 10-14 year age group, rates were not calculated for that age group. In the 15-19 age group, the death rate due to unintentional injuries decreased from 38.9 in 1985 to 29.3 in 1998, and that due to motor vehicle injury decreased 32.4 in 1985 to 22.4 in 1998. There appeared to be a slight downward trend in suicide from 12.7 in 1985 to 11.2 in 1998, but an increase in homicide from 2.6 in 1985 to 8.4 in 1998 among 15-19 year olds (11).

Figure 7. Five Leading Causes* of Hospitalization as a Percent of All Discharges, Persons Aged 15-19, Minnesota*** 1998**

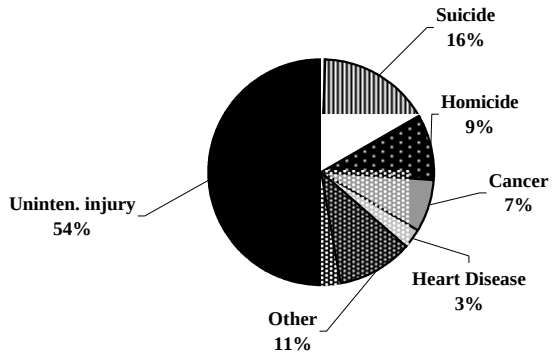


Source: Minnesota Hospital and Healthcare Partnership (MHHP).
*As defined by the Clinical Classifications for Health Policy Research, Chapter 2.
**Excludes births.
***The MHHP database represents more than 90% of all hospitalizations in the state. Not every hospital in the state is currently in the database. Data presented do not include discharges of Minnesota residents from hospitals in other states.

Among 10-14 year old adolescents, there were 72 total deaths in 1998. Of these, 26 (36%) were due to unintentional injury, the major cause of which was motor vehicle injury. Cancer, suicide and homicide contributed nine, eight and three deaths, respectively. It is striking to notice that unintentional injury is the leading cause of death for both 10-14 and 15-19 year olds, but also that there is a major increase from 36% of deaths among 10-14 year olds to 54% of deaths among older adolescents.

Combined 1990 to 1998 Minnesota data (**Figure 9**) show disparities in death rates due to injury by race/ethnicity. Hispanic youth have the highest death rate due to unintentional injury, including motor vehicle injury. Native American youth have the highest death rate due to suicide, and African American youth have the highest death rate due to homicide (11). For unintentional injury, including motor vehicle, African American and Asian-Pacific Islander youth have the lowest rates. The disparity in suicide deaths between African American, Asian-Pacific Islander and white youth as compared to Native American and Hispanic youth is striking, with Native American youth having 2-3 times the rates as those with lower rates. Also striking is the disparity between the death rate due to homicide among African American youth compared to all other groups.

Figure 8. Leading Causes of Death, Age 15-19 Minnesota Residents, 1998



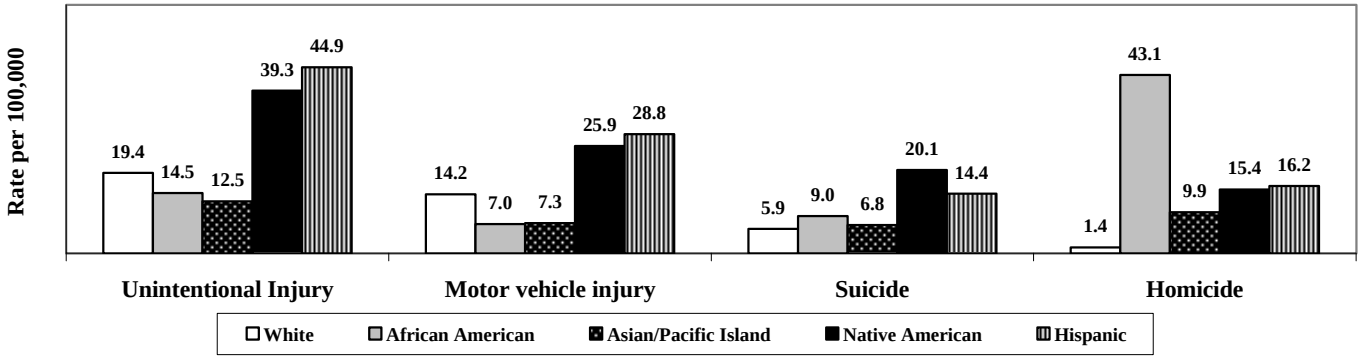
Source: MDH Center for Health Statistics

Table 3. Death rate per 100,000 due to Injury, Age 15-19 Minnesota Residents, 1985-1998

	1985	1990	1995	1998
All Unintentional Injury	38.9	37.0	29.2	29.3
Motor vehicle	32.4	28.9	22.5	22.4
Suicide	12.7	14.8	8.9	11.2
Homicide	2.6	4.0	5.1	8.4

Source: MDH Center for Health Statistics

Figure 9. Death Rate Due to Injury by Race/ Ethnicity, Aged 10-19, Minnesota 1990-1998



Source: MDH Center for Health Statistics

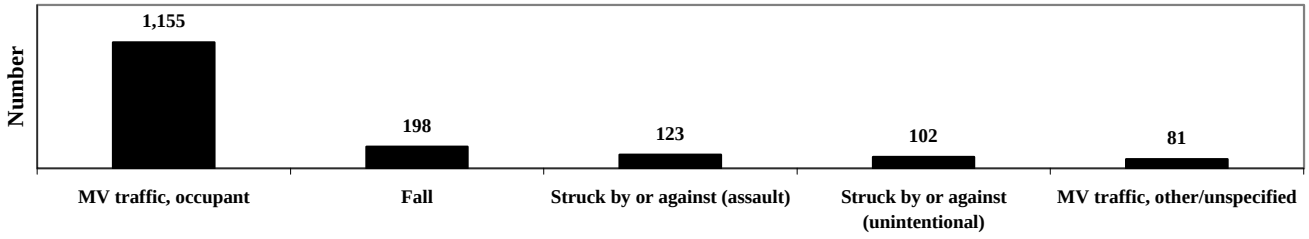
Table 4 lists the ten leading causes of non-fatal hospitalized injury among adolescents, by gender. Among 10-14 year old males, unintentional falls were the leading cause of non-fatal hospitalized injury; motor vehicle-occupant (unintentional) was the leading cause for males aged 15-19. Self-inflicted poisoning was the leading cause for adolescent females in both age groups (12). During 1993-1997, there were 2,324 traumatic brain injuries among youth aged 15-19 in Minnesota. The leading causes **(Figure 10)** were motor vehicle, falls, being struck (intentional and unintentional), and motor vehicle traffic (other/unspecified motor vehicle). The leading causes of spinal cord injuries (n=171) in this age group were motor vehicle occupancy, falls, and firearms (assault) (**Figure 11**) (13).

Table 4. Ten Leading Causes of Nonfatal Hospitalized Injury by Age Group and Gender, Minnesota 1998

Mechanism	Intent	N	%	Mechanism	Intent	N	%
Male 10-14				**Female 10-14**			
Fall	Unintentional	104	22	Poisoning	Self-inflicted	84	26.2
Pedal cyclist, other	Unintentional	60	12.7	Fall	Unintentional	50	15.6
Struck by/against	Unintentional	60	12.7	Struck by/against	Unintentional	26	8.1
MV traffic, occupant	Unintentional	34	7.2	Cut/pierce	Self-inflicted	24	7.5
MV traffic, pedal cyclist	Unintentional	19	4	MV traffic, occupant	Unintentional	17	5.3
ATV rider	Unintentional	17	3.6	Transport, other	Unintentional	14	4.4
Cut/pierce	Unintentional	15	3.2	Poisoning	Unintentional	12	3.7
Overexertion	Unintentional	14	3	Cut/pierce	Unintentional	11	3.4
MV traffic, pedestrian	Unintentional	12	2.5	MV traffic, pedestrian	Unintentional	10	3.1
Bites and stings	Unintentional	12	2.5	Pedal cyclist, other	Unintentional	10	3.1
All others combined		126	26.6	All others combined		63	19.6
TOTAL		473	100	TOTAL		321	100
Male 15-19				**Female 15-19**			
MV traffic, occupant	Unintentional	176	18.7	Poisoning	Self-inflicted	290	38.7
Fall	Unintentional	107	11.4	MV traffic, occupant	Unintentional	167	22.3
Poisoning	Self-inflicted	82	8.7	Cut/pierce	Self-inflicted	69	9.2
Struck by/against	Unintentional	81	8.6	Fall	Unintentional	44	5.9
Struck by/against	Assault	46	4.9	Struck by/against	Unintentional	19	2.5
Cut/pierce	Self-inflicted	37	3.9	Poisoning	Unintentional	18	2.4
Overexertion	Unintentional	37	3.9	Unspecified	Unintentional	16	2.1
Firearm	Assault	32	3.4	Overexertion	Unintentional	13	1.7
Cut/pierce	Assault	30	3.2	Transport, other	Unintentional	11	1.5
Cut/pierce	Unintentional	27	2.9	Firearm	Assault	7	0.9
All others combined		284	30.2	All others combined		95	12.7
TOTAL		939	99.8	TOTAL		749	99.9

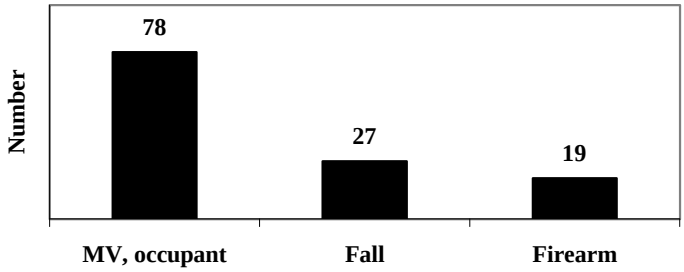
Source: Injury and Violence Prevention Unit, Minnesota Department of Health

Figure 10. Number of Traumatic Brain Injuries (Fatal and Hospitalized) Among Adolescents Aged 15-19, by Leading Cause, Minnesota 1993-1997



Source: Injury and Violence Prevention Unit, Minnesota Department of Health

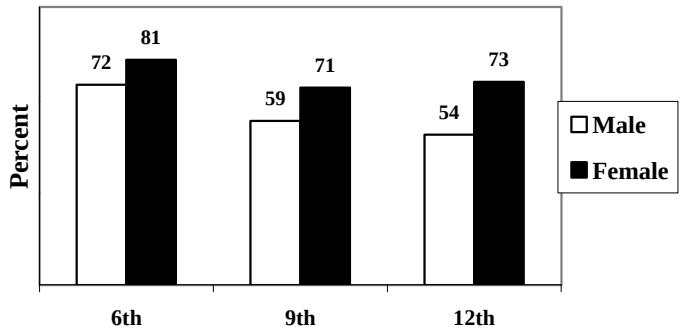
Figure 11. Number of Spinal Cord Injuries (Fatal and Hospitalized) Among Adolescents Aged 15-19, by Leading Cause, Minnesota 1993-1997



Source: Injury and Violence Prevention Unit, Minnesota Department of Health

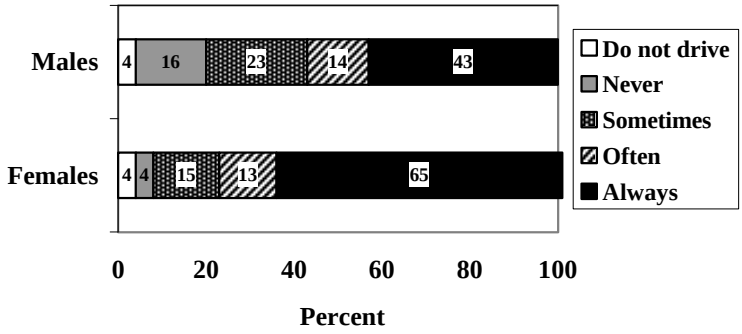
Major risk factors that contribute to motor vehicle deaths and injuries include drinking and driving (**Figure 16**), non-use of restraints, and speed. **Figure 12** shows the percent of students who reported always or often using seat belts when they rode in a car, by grade level and gender. Among 6th graders, there were differences by gender, with 72% of males compared to 81% of females reporting consistent use of seat belts. The gap between genders is wider among older students. Fifty-nine percent of 9th grade males reported consistent use, compared to 71% of same grade females. In 12th grade, 54% of males compared to 73% of females reported using seat belts consistently. When *driving* a car, 54% of 12th grade males compared to 78% of 12th grade females reported consistent use of a seat belt (**Figure 13**).

Figure 12. Percent of Students Who Reported Use of Seat Belts Often/Always When Riding in a Vehicle, by Grade Level and Gender



Source: Minnesota Student Survey, 1998

Figure 13. Seat Belt Use Among 12th Grade Drivers, by Level of Use and Gender, Minnesota Student Survey 1998



Substance Use

Some trends in alcohol, tobacco and other drug use by Minnesota adolescents are encouraging while others are cause for concern. Among 9th graders, alcohol and other drug use appears to have decreased from 1992 to 1998, but use of tobacco and marijuana have increased (**Figure 14a**). Among 12th graders, alcohol use and other drug use has also decreased from 1992 to 1998 while tobacco and marijuana use increased (**Figure 14b**).

In general, alcohol use continues to be the most commonly used substance, with 54% of 9th graders and 70% of 12th graders reporting alcohol use in the last 12 months in 1998. Binge drinking remains a significant problem. **Figure 15** shows that 24% of 9th and 42% of 12th grade males and 18% and 27% of 9th and 12th grades females reported binge drinking behavior in the past 2 weeks.

Figure 16 presents alcohol or other drug use in the last 12 months while driving or riding in a car with someone who had been using. Twelve percent of 9th grade males reported having driven a vehicle while under the influence, compared to 6% of same grade females. However, 39% of males and 41% of females reported riding with friends who had been under the influence. Among 12th graders, 40% of males and 30% of females reported driving while under the influence; and 54% of males and 48% of females reported riding with someone who had been using alcohol or other drugs.

The top reasons 9th and 12th graders used substances (alcohol and drugs other than tobacco) were: to relax, to get high or smashed, to have fun at parties, or because they like the taste. The top reasons for substance non-use were: one or both parents would object, have no desire to use, and it could affect performance in school, sports, or other activities (2).

Figure 14a. Percent of 9th Graders Who Reported Substance Use*, by Type of Drug, Minnesota Student Survey 1992-1998

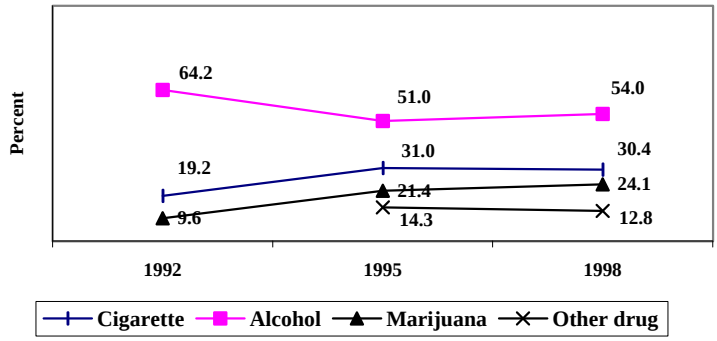
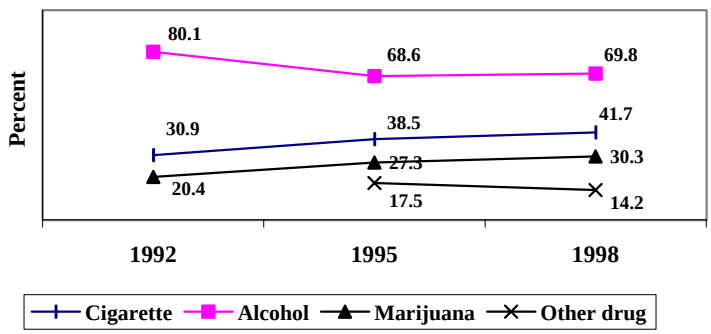
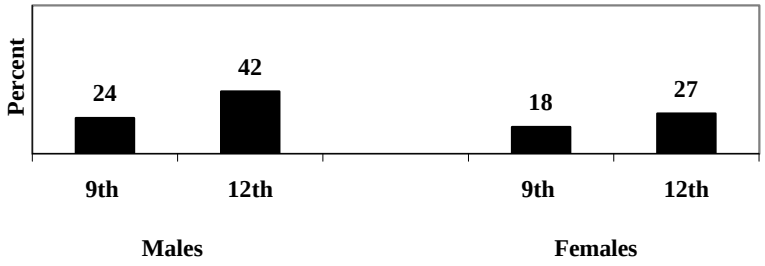


Figure 14b. Percent of 12th Graders Who Reported Substance Use*, by Type of Drug, Minnesota Student Survey 1992-1998



*Any cigarette use in past 30 days; or alcohol, marijuana, or other drug use in the past 12 months. "Other drug" information was not collected in 1992.

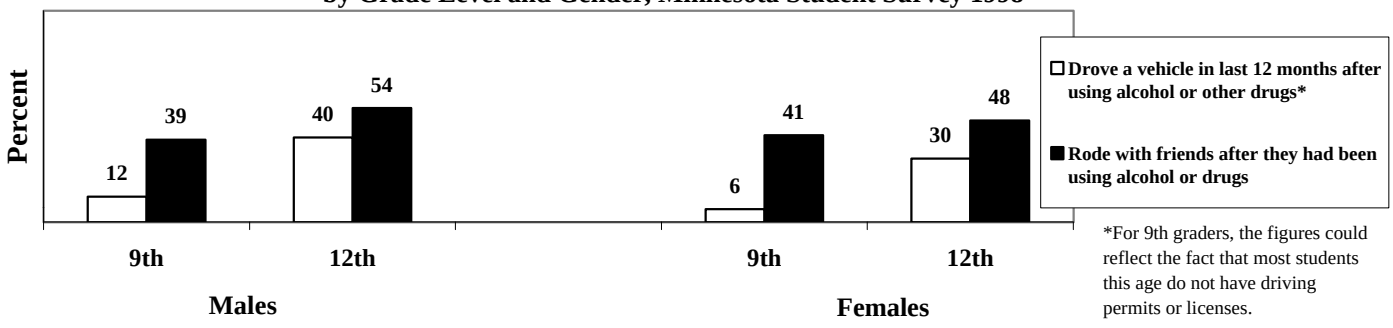
Figure 15. Percent of Students Who Reported Binge* Drinking, by Grade Level and Gender, Minnesota Student Survey 1998



*Students were asked "Over the last 2 weeks, how many times (if any) have you had 5 or more drinks in a row?"

In 1999-2000, cigarettes were by far the most commonly used tobacco product, with 32.4% of high school students and 9.1% of middle school students smoking cigarettes in the previous 30 days (14). Among high school students, there is also substantial use of cigars (13.0%) and smokeless tobacco prducts, such as chewing tobacco and snuff (10.2%). **Table 5** shows that well over one-third of high school students (38.7%) and one of every eight middle school students (12.6%) were "current" tobacco users, defined as anyone who used tobacco products on one or more days in the past 30 days.

Figure 16. Percent of Students Who Reported Risky Motor Vehicle Use Related to Substance Use, by Grade Level and Gender, Minnesota Student Survey 1998



*For 9th graders, the figures could reflect the fact that most students this age do not have driving permits or licenses.

Figure 17. Percent of Students Who Used Tobacco on One or More Days in Past 30 Days, Minnesota Youth Tobacco Survey 2000

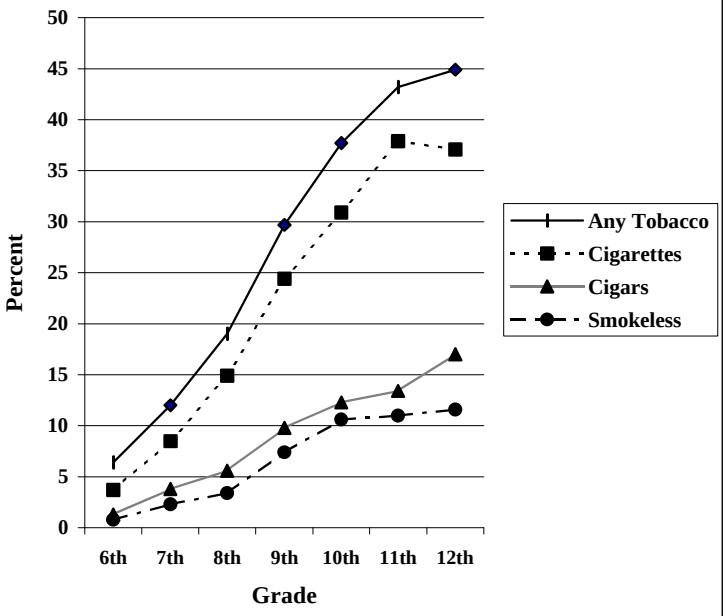


Table 5. Current Tobacco Users (Used tobacco on one or more days in past 30 days) Minnesota Youth Tobacco Survey 2000

	Middle School* (%)	High School* (%)
Any Tobacco Use	12.6	38.7
Cigarettes	9.1	32.4
Smokeless tobacco	2.2	10.2
Cigars	3.7	13.0
Pipe	2.7	5.0
Bidis	2.8	4.8

*Middle school students include grades 6-8. High school students include grades 9-12.

Figure 17 looks at tobacco use by grade level in 1999-2000. For most tobacco products, the percentage of students who use the product in the past 30 days increases steadily in the middle school and high school grades before starting to level off among 12 graders. Current use of any tobacco product ranges from 6.4% in sixth grade to 44.9% in 12th grade. The largest difference in tobacco use prevalence is seen between 8th and 9th grades.

Violence

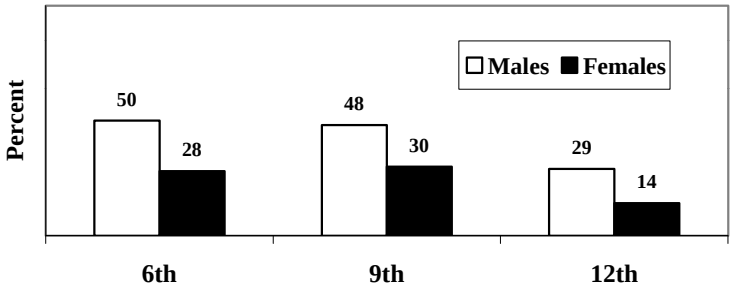
Nationally, youth ages 12-17 were at greater risk of violent victimization in 1995 and 1996 than any age groups of adults (15). Minnesota teens experienced violence in a number of ways, both as victims and perpetrators of violence. This includes physical fighting, vandalism, family violence, relationship violence, sexual assault, and homicide.

Males were more likely to be involved in physical fights across grade levels (**Figure 18**). Sixth and ninth grade students, both male and female, were more likely than 12th graders to be involved in physical fights.

Figure 19 illustrates that males were more likely to be involved in vandalism. Across all grade levels, males were at least twice as likely as females to report vandalism, with a peak of 42% of males reporting in ninth grade. Ninth graders, both males and females, were more likely than sixth and 12th graders to vandalize.

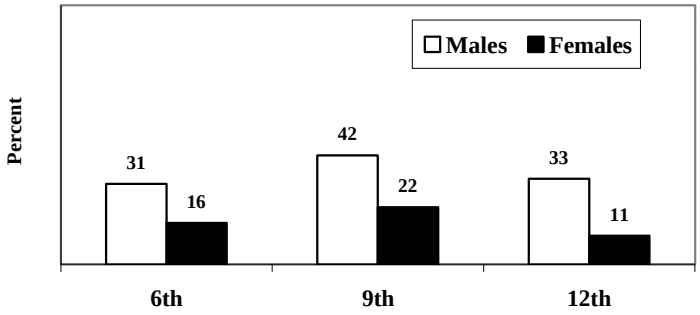
While males were more likely to report engaging in aggressive behavior, females were more likely to have been victims of domestic physical abuse (**Figure 20**), witness domestic physical abuse (**Figure 21**), or have been sexually abused by a family member or person outside the family (**Figures 22** and **23**). Native American females reported the highest levels of physical abuse and family violence. White males reported the lowest levels of both physical abuse and family violence. Overall, all students reported higher levels of family violence, which includes violence towards others in the family, than physical abuse that occurred to them personally.

Figure 18. Percent of Students Who Reported Physical Fights*, by Grade Level and Gender, Minnesota Student Survey 1998



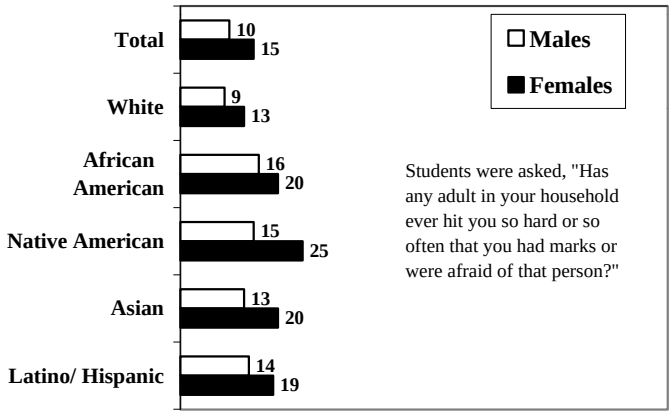
*Students were asked, "During the last 12 months, how often have you hit or beat up another person?"

Figure 19. Percent of Students Who Reported Vandalism*, by Grade Level and Gender, Minnesota Student Survey 1998



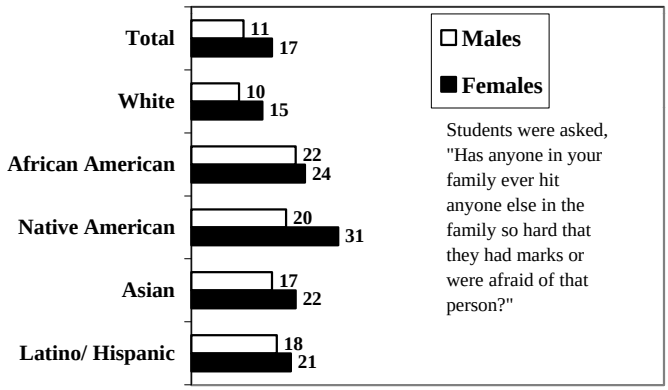
*Students were asked, "During the last 12 months, how often have you damaged or destroyed property at school or somewhere else?"

Figure 20. Percent of 9th Graders Who Reported Physical Abuse*, by Gender and Race/ Ethnicity, Minnesota Student Survey 1998



Students were asked, "Has any adult in your household ever hit you so hard or so often that you had marks or were afraid of that person?"

Figure 21. Percent of 9th Graders Who Reported Family Violence*, by Gender and Race/Ethnicity, Minnesota Student Survey 1998



Students were asked, "Has anyone in your family ever hit anyone else in the family so hard that they had marks or were afraid of that person?"

Figure 22. Percent of Ninth Graders Who Reported Sexual Abuse by a Family Member*, by Gender and Race/ Ethnicity, Minnesota Student Survey

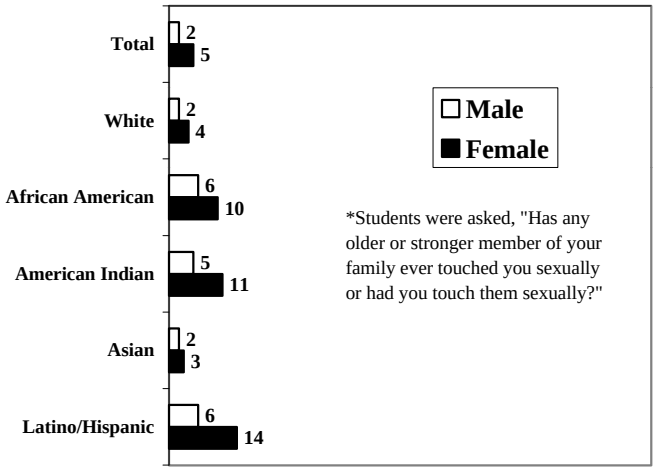
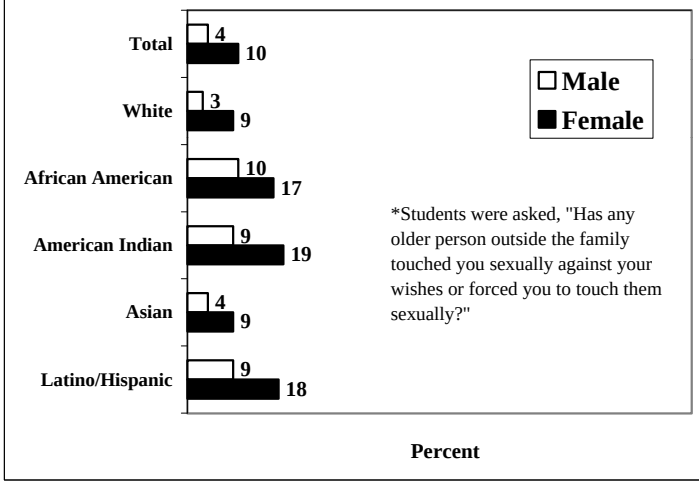


Figure 23. Percent of Ninth Graders Who Reported Sexual Abuse by a Person Outside the Family*, by Gender and Race/ Ethnicity, Minnesota Student Survey 1998



Youth homicide victims and offenders tend to be male. **Table 6** illustrates gender disparities with respect to homicide among those aged 15-19. In 1997, males accounted for 86% of homicide victims, and for 85% of the offenders (16).

Of all homicide victims in 1997, 20% were aged 10-19. **Figure 24** presents the 1997 distribution of homicide victims and offenders by age in Minnesota. Those aged 15-19 were at greatest risk of being homicide victims and offenders. In 1997, 17% of all homicide victims, and 28% of all offenders were aged 15-19 (16).

Table 6. Homicide Victims and Offenders Aged 15-19, by Gender, Minnesota 1997

	Male		Female	
	Number	%	Number	%
Victim	19	(86%)	3	(14%)
Offender	39	(85%)	7	(15%)

Source: Minnesota Department of Public Safety

Figure 24. Homicide Victims and Offenders as a Percent of Total Homicides, by Age, Minnesota 1997

	<10	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	>64
Victims	3.0	2.0	17.0	16.0	13.0	9.0	13.0	10.0	5.0	5.0	1.0	1.0	5.0
Offenders	0.0	0.0	27.5	16.8	14.4	7.8	6.6	3.4	1.2	1.2	0.6	0.0	1.2

Source: Minnesota Department of Public Safety.

Thornton et al. describe youth violence as "...a complex public health problem with many risk factors, including individual beliefs and behaviors, such as early aggression and use of alcohol or other drugs; family characteristics, such as spousal abuse and lack of parental supervision; peer and school influences, such as associating with delinquent friends; and environmental factors, such as access to firearms" (17). Public debate remains about potential risk factors, such as media influence. For example, a three-year study of television violence by Strasburger et al. found high levels of television violence, with 66% of children's programs containing violent scenes (18). Their study illustrates the pervasiveness of violence on television, however future research is needed to clarify the extent to which media violence influences behavior among youth.

Sexual Behavior, Pregnancy and Sexually Transmitted Diseases

There was a downward trend in the percentage of Minnesota students who have **ever** had sex (sexual intercourse) from 1989 to 1998 (**Figure 25**). Fewer 9th grade females reported having had sex than 9th grade males, but there was almost no difference between the genders in 12th grade. **Figure 26** presents the percent of students who reported they had had sex by race/ethnicity. Among 9th grade males, African American males were more likely to have had sex (59%). African American and American Indian 12th grade males were most likely to report having had sex (74%). Ninth and 12th grade American Indian females were most likely to have reported having had sex (47% and 75%, respectively).

Figure 27 describes use of any birth control method by grade level. Seventy-five percent of sexually active 12th graders reported they usually or always use birth control, compared to 50% of 9th graders.

Figure 25. Percent of Students Who Reported They Have Had Sexual Intercourse, by Grade Level and Gender, Minnesota Student Survey 1989-1998

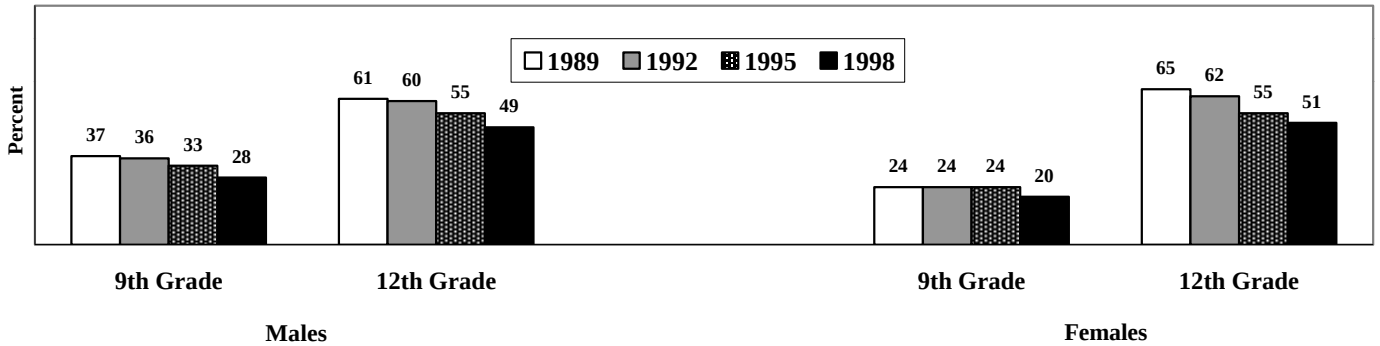


Figure 26. Percent of Students Who Reported They Have Had Sexual Intercourse, by Race/ Ethnicity, Minnesota Student Survey 1998

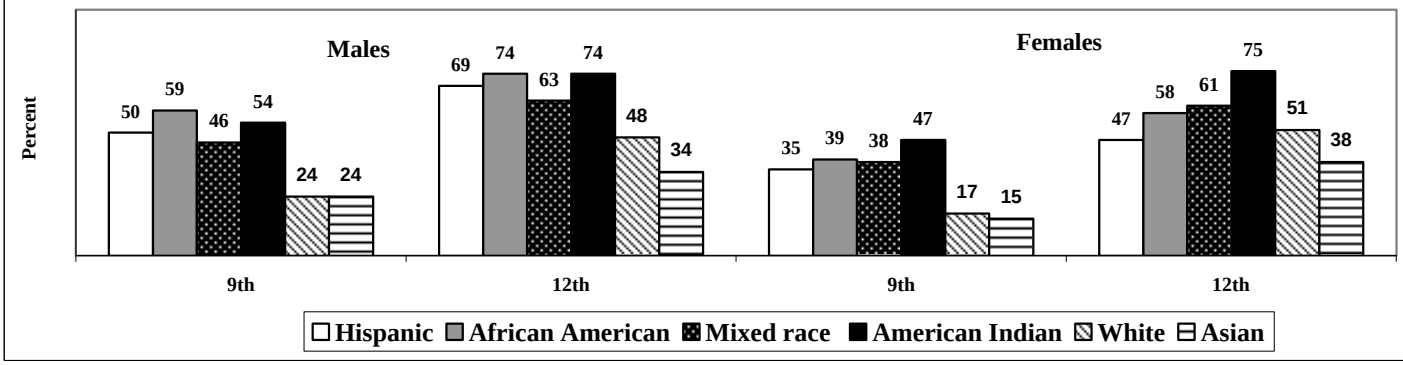


Figure 27. Percent Response Among Sexually Active Students to Question: How often do you and/or your partner use any Birth Control Method? Minnesota Student Survey, 1998.

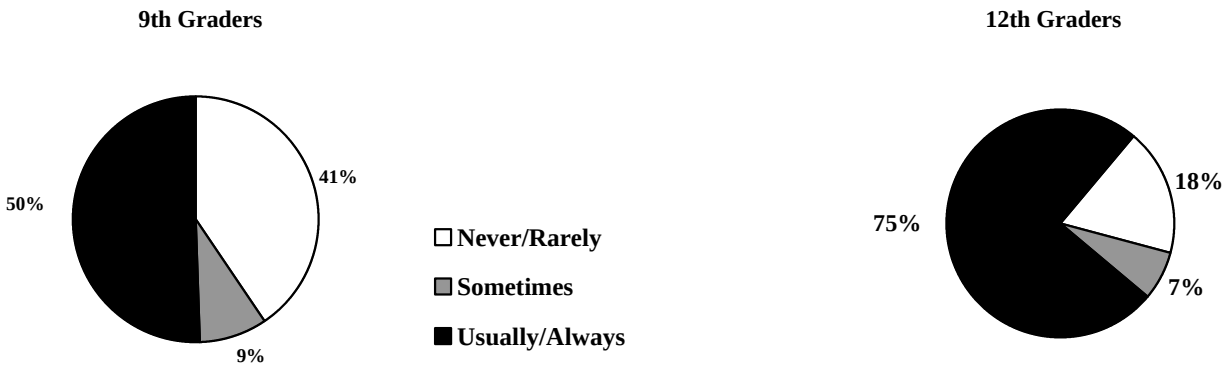


Figure 28. Percent of Sexually Active Students Who Reported Always Using Any Birth Control Method, by Grade Level, Gender, and Race/ Ethnicity, Minnesota Student Survey 1998

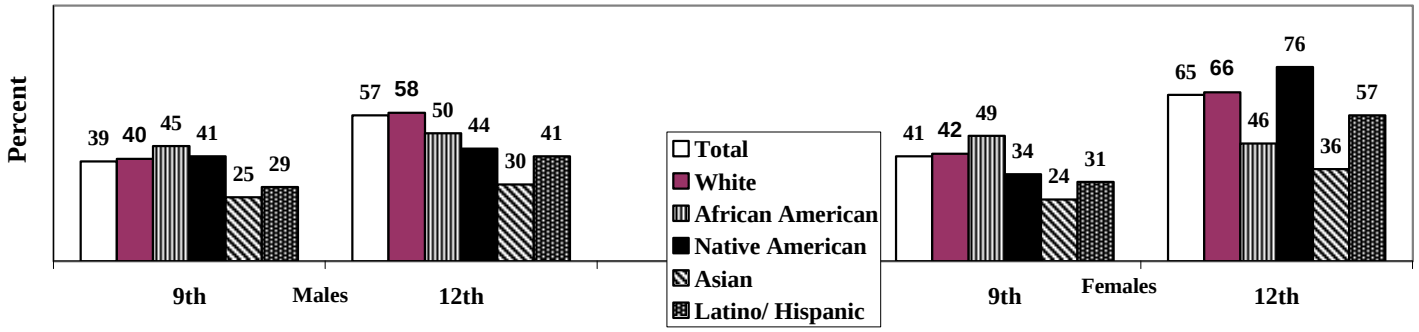


Figure 28 highlights disparities among students who always use contraception by gender and race/ethnicity. Sexually active white and American Indian 9th and 12th grade males were most likely to always use contraception. This pattern was similar for 12th grade females. African American and white populations were most likely to use contraception among 9th grade females. For all grades and genders represented, Asian youth were least likely to report always using contraception.

Figure 29 shows that 9th grade students were more likely to always use condoms than were 12th graders, and 12th grade males were more likely to use condoms than same grade females. This may be due to the use of condoms as a method of birth control rather than to prevent sexually transmitted disease, i.e., as older students gain access to other methods of contraception, condom use decreases. Overall, except for 9th grade males, condom use increased slightly from 1992 to 1998. By race/ethnicity, white and African American youth, for all grades and gender categories, were most likely to report always using a condom. Asian and Latino/Hispanic males were least likely to report always using a condom. Among 12th grade females, Native American and Latino/Hispanic were least likely to report always using a condom.

Figure 29. Percent of Sexually Active Students Who Reported Always Using Condoms, by Grade Level, Gender and Race/ Ethnicity, Minnesota Student Survey 1998

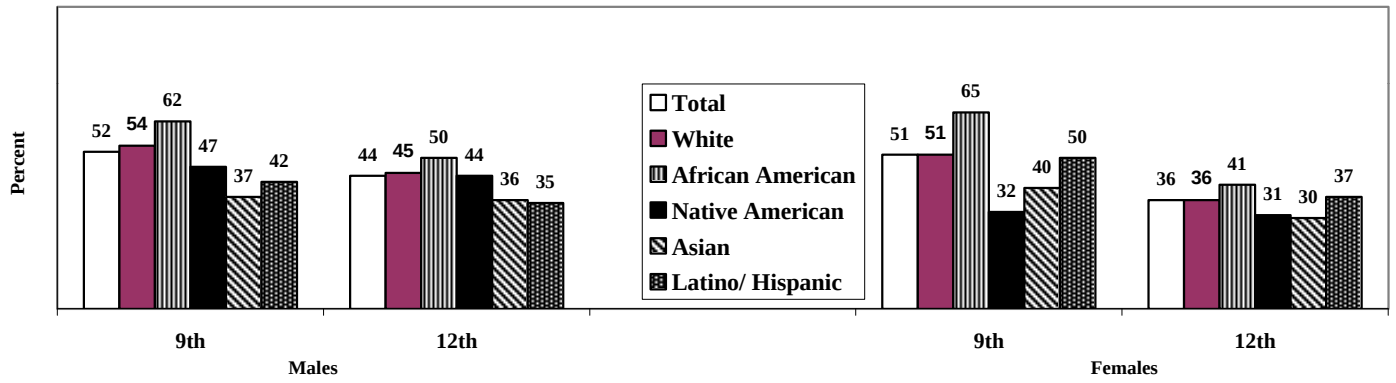
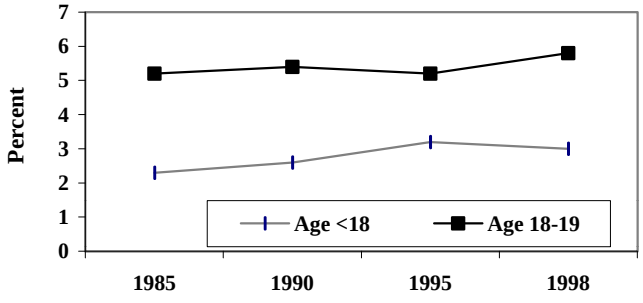


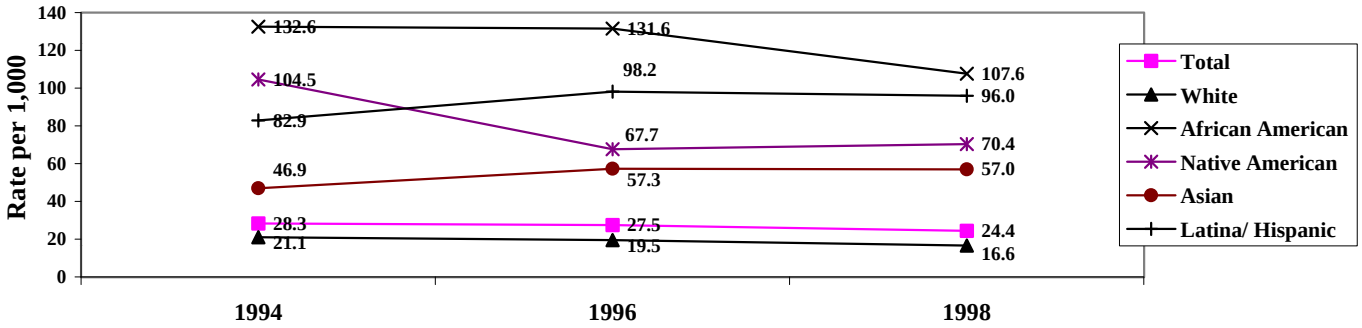
Figure 30 shows that the percent of births to adolescents in Minnesota has remained relatively stable from 1985 to 1998 (11). **Figures 31** and **32** present an overall downward trend in adolescent pregnancy rates from 1994 to 1998. However, when broken down by race/ethnic group, disparities emerge. For African American teens age 15-17, pregnancy rates decreased from 1994 to 1998. For African Amercian teens age 18-19, rates decreased from 302 per 1,000 in 1994 to 257 per 1,000 in 1996, but then increased in 1998 to 277 per 1,000. Among Native Americans age 15-17, there was a decrease in pregnancy rates from 1994 to 1998, but an increase among women age 18-19. Among Asians and Latinas/Hispanics, there was an increase in pregnancy rates from 1994 to 1998 in both age groups (11).

Figure 30. Births to Adolescents as a Percent of All Births, Minnesota Residents 1995-1998



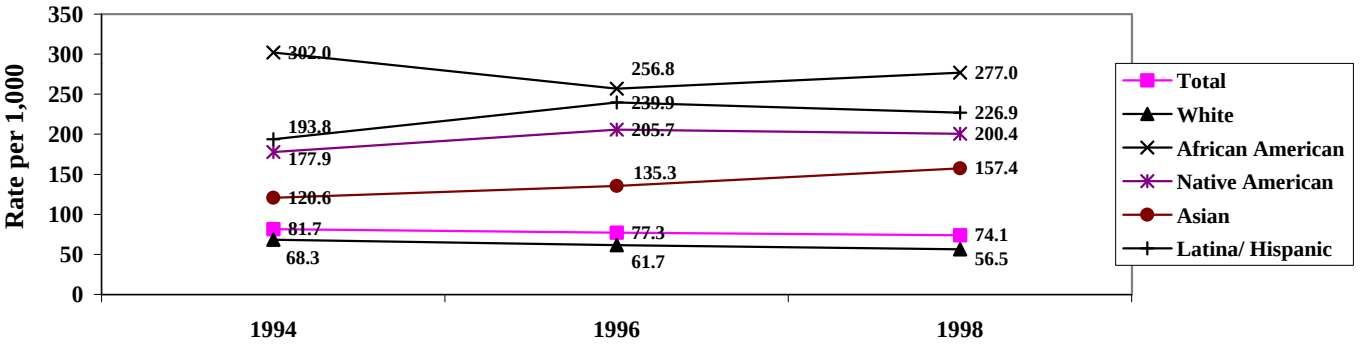
Source: MDH Center for Health Statistics

Figure 31. Age 15-17: Annual Pregnancy Rate per 1,000 by Race/ Ethnicity, Minnesota 1994, 1996, 1998



Source: MDH Center for Health Statistics

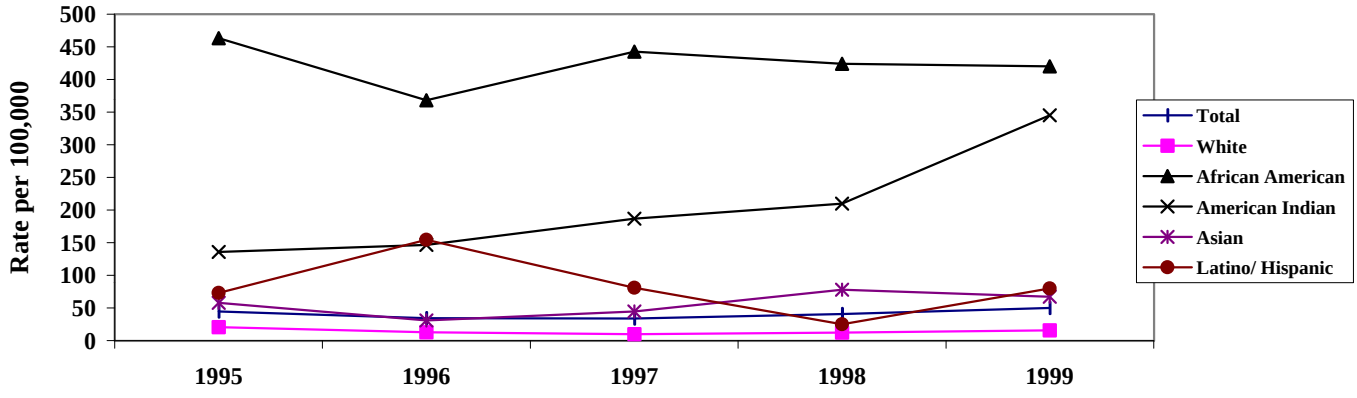
Figure 32. Age 18-19: Annual Pregnancy Rate per 1,000 by Race/ Ethnicity, Minnesota 1994, 1996, 1998



Source: MDH Center for Health Statistics

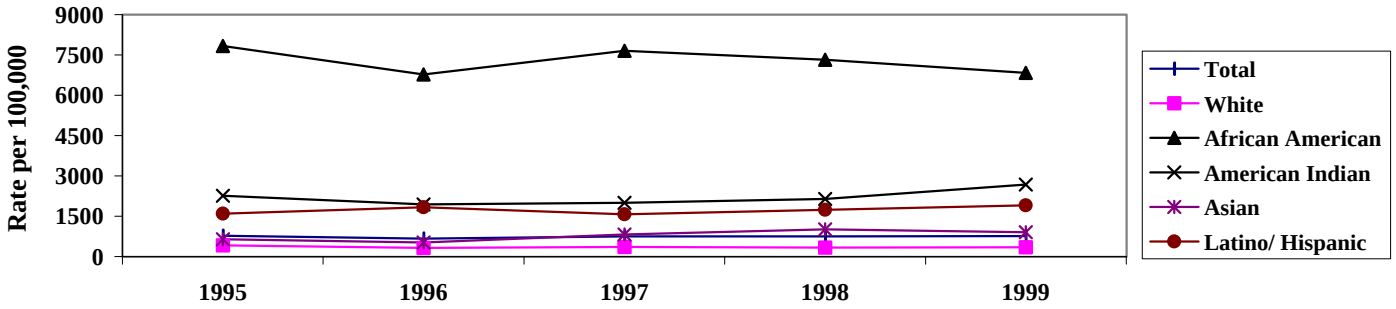
Figures 33 and **34** depict the rate per 100,000 population of chlamydia infection in the 10-14 and 15-19 age groups, by race/ethnicity for the time period 1995-1999 (19). Differences in rates by age may likely reflect an increase in sexual activity as adolescents get older. There was a steady increase in the rate of chlamydia among American Indians age 10-14 from 1995 to 1999, and a slight increase for those 15-19. In both age groups, African Americans had the highest rates of chlamydia. An overall increase in the chlamydia rate has occurred for Latino/Hispanics aged 15-19. **Figures 35** and **36** show the rates per 100,000 population of gonorrhea in the 10-14 and 15-19 age groups, by race/ethnicity from 1995 to 1999 (19). Overall in both age groups, gonorrhea rates decreased. Among African Americans, gonorrhea rates have decreased in both age groups, but as a population subgroup, they continued to bear the greatest burden of this disease.

Figure 33. Age 10-14: Rate (per 100,000) of Chlamydia by Race/ Ethnicity, Minnesota 1995-1999



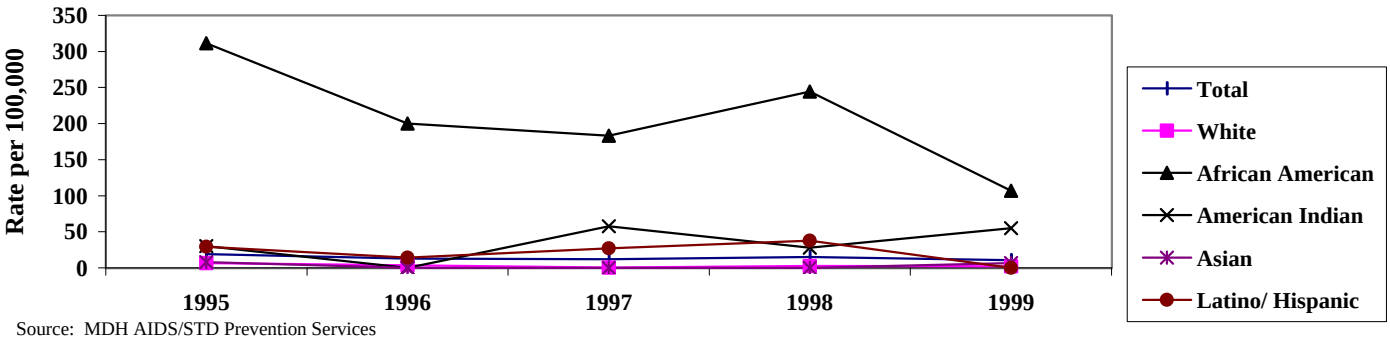
Source: MDH AIDS/STD Prevention Services

Figure 34. Age 15-19: Rate (per 100,000) of Chlamydia by Race/ Ethnicity, Minnesota 1995-1999



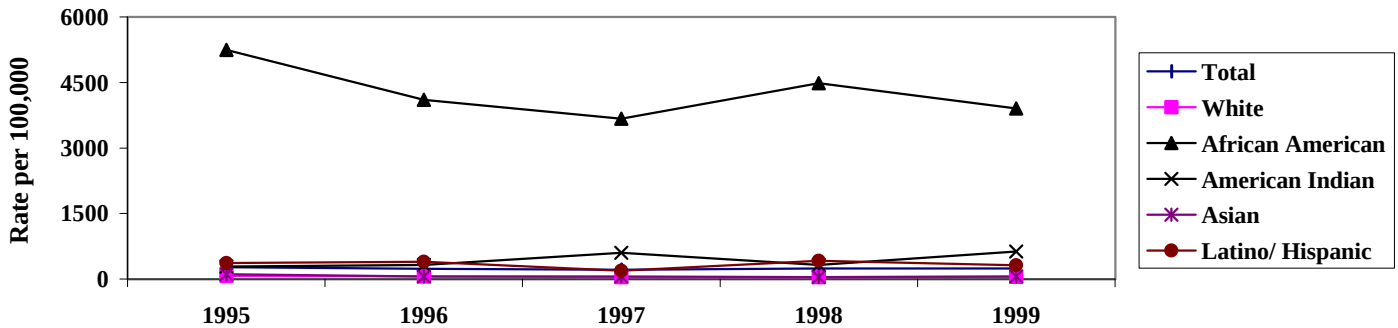
Source: MDH AIDS/STD Prevention Services

Figure 35. Age 10-14: Rate (per 100,000) of Gonorrhea by Race/ Ethnicity, Minnesota 1995-1999



Source: MDH AIDS/STD Prevention Services

Figure 36. Age 15-19: Rate (per 100,000) of Gonorrhea by Race/ Ethnicity, Minnesota 1995-1999



Source: MDH AIDS/STD Prevention Services

There are differences in HIV infection by gender and race/ethnicity (20). **Table 7** lists the cumulative (as of July 1, 2000) number of HIV (non-AIDS) infected adolescents age 13-19, by gender and race/ethnicity. Of the 87 infected teens, 46 are males, and 41 female. Within race/ethnic groups, an equal number (n=21) of HIV infected White males and African American males have been reported. African American females comprise the largest number (n=22) of infected teens. **Table 8** provides data on HIV infected (non-AIDS and AIDS) adolescents by exposure category as of July 1, 2000 (20). There have been 76 infected males reported, as compared to 46 females. Sixty-one percent of males were infected by having sex with men. In contrast, 57% of infected females contracted HIV by heterosexual contact.

Table 7. Cumulative* Number of Non-AIDS Cases of HIV Infection, Aged 13-19, by Gender and Race/ Ethnicity, Minnesota**

	Males	Females	Total
All groups	46	41	87
White	21	14	35
Black	21	22	43
Hispanic	3	1	4
Asian/ Pacific Islander	0	0	0
American Indian/ Alaskan Native	1	4	5

*As of July 1, 2000.
**Age at test date.

Source: MDH Acute Disease Epidemiology

Table 8. Adolescent (Aged 13-19) Cases of HIV Infection (non-AIDS and AIDS), by Exposure Category, reported as of July 1, 2000

	MALE		FEMALE		TOTAL	
EXPOSURE CATEGORY*	**Number**	**(%)**	**Number**	**(%)**	**Number**	**(%)**
Men Who Have Sex with Men	46	(61)	-	-	46	(38)
Injecting Drug Use (IDU)	2	(03)	2	(04)	4	(03)
Men Who Have Sex with Men and IDU	8	(11)	-	-	8	(07)
Hemophilia/Coagulation Disorder	13	(17)	1	(02)	14	(11)
Heterosexual	2	(03)	26	(57)	28	(23)
Transfusion, Blood/Components	0	(00)	1	(02)	1	(01)
Other/Undetermined**	5	(07)	16	(35)	21	(17)
TOTAL	76	(100)	46	(100)	122	(100)

*Exposure Category data are missing or pending for 4 males and 6 females.
**Includes 1 male and 4 females formerly reported as Heterosexual-Pattern-II associated.

Source: MDH Acute Disease Epidemiology

Weight Management, Nutrition, Physical and Leisure Activity

Story et al. discussed how healthy nutrition and physical activity are important for the prevention of chronic disease in adulthood, as well the clustering of youth behaviors. The authors found that "*Students in the 8th grade who reported making less healthy food choices, also had lower physical activity patterns and were more likely to smoke cigarettes, and these behaviors persisted in grade 12.*" The authors also found health problems, such as iron deficiency, obesity, eating disorders, undernutrition, and dental caries, related to dietary behaviors (21).

Table 9 compares students by grade level and gender with regard to weight management, physical activity, leisure activities, and nutrition. Ninth and 12th grade females were more likely than same grade males to report unhealthy behavior related to weight management. Almost a third of 9th and 12th grade females believed they were overweight, and almost half skipped meals. Eleven percent of ninth grade and almost a quarter of 12th grade females reported use of tobacco to control weight. About an equal proportion of same grade males and females reported eating fewer than 5 servings of fruits and vegetables per day although there was a difference between grade levels. Almost 20% of ninth graders reported eating five or more servings compared to about 10% of 12th graders.

Table 9. Weight Management, Physical Activity, and Nutrition, by Gender and Grade Level, Minnesota Student Survey 1998

	Percent of Students Who Reported Behavior					
	6th		9th		12th	
Behavior	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
Weight management						
Think they are overweight	*	*	16	30	15	34
Fast or skip meals	*	*	13	43	15	43
Smoke cigarettes to control weight	*	*	10	16	11	21
Use diet pills or speed to control weight	*	*	2	8	2	11
Physical Activity						
No physical activity during a typical week during the school year	16	19	18	18	21	23
Not active enough (less than 5 days per week for a total of 30 minutes per day)	51	60	41	54	53	69
Participate in the following activities three or more hours per week:						
playing sports on a school team	31	23	48	48	42	34
other physical activities	53	42	58	43	55	43
watching television	75	65	80	60	75	64
Students enjoy:						
playing sports	80	72	69	61	64	44
doing things outdoors	82	79	73	66	74	67
creative activities	39	67	26	51	28	46
building, making, or fixing things	50	32	38	14	38	13
Nutrition						
Eat less than 5 servings of fruit and vegetables on a given day	79	78	86	86	88	90

*Not available.
Source: MDH Nutrition and Physical Activity Unit

Table 9 depicts that females across all grade levels were more likely to have reported lack of physical activity, but males were more likely to report watching television three or more hours per week. There were some similarities and differences in what students enjoy doing. In 6th and 9th grade, males and females enjoy playing sports almost equally, but in 12th grade, a decrease is observed among females. There was almost no difference between genders in regard to enjoying outdoor activities. However, younger students were more likely to report enjoying the outdoors. Females were more likely to enjoy creative activities, while males were more likely to enjoy building, making or fixing things.

Figure 37. Adolescent Emotional Well-Being/Distress, by Grade Level and Gender, Minnesota Student Survey 1998

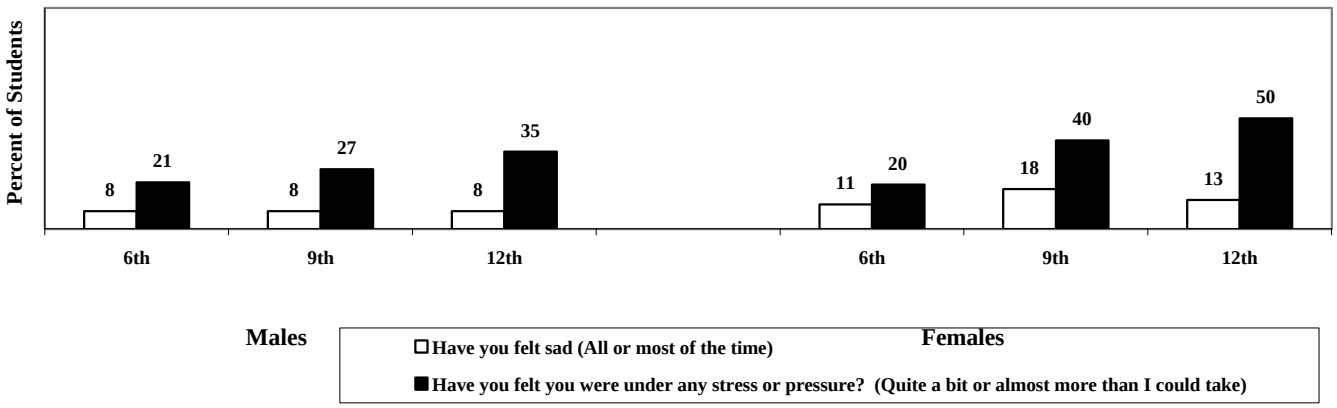


Table 10. Mental Health Risk and Protective Factors for Adolescents

Note: Current trends are moving away from consideration of individual risk factors and moving toward identifying measurable risk factors and their combinations.

Risk Factors

Genetic - inherited predisposition to develop a mental disorder

Biological - low birth weight, prenatal damage to central nervous system caused by injury, infection, malnutrition during pregnancy, and exposure to toxins (lead, alcohol, illegal drugs, and tobacco); nonspecific forms of mental retardation; specific chromosomal syndromes

Psychosocial - absence of caring primary relationship, difficult temperament (impulsivity, anger, aggression), poverty, abuse and neglect, family history of mental and substance abuse disorders, exposure to stressful or traumatic events, peer and sibling influences

Protective Factors

Individual - social skill development in communication, self-control, decision-making, empathy, tolerance, limit-setting, wellness and self-care (exercise, nutrition, coping); positive view of self; spiritual/religious/finds meaning; affiliates with prosocial youth; motivation; optimism

External - familial support/nurturance, familial restraint/focus on wellness, supportive adults, access to resources/services/treatment, involved and safe communities/religious institutions/schools, supervised recreational/athletic activities

Sources: U.S. Department of Health and Human Services (1999). Mental Health: A Report of the Surgeon General; and Mark D. Weist et al. (1999).

An article focused on adolescent mental health by Weist et al. found that an estimated 8% to 22% of adolescents in the U.S. have psychiatric problems[3] (22). According to Mental Health: A Report of the Surgeon General (23), there is good evidence that both genetic and environmental factors influence adolescent mental health. Reseach demonstrates that risk factors can be reduced and protective factors can be enhanced through the promotion of positive adaptation and socio-emotional well-being in adolescents (**Table 10**).

Figure 37 compares self-reported emotional well-being/distress by grade level and gender. Females in grades 9 and 12 were more likely to report feeling high levels of sadness and stress or pressure than males, however, over one fourth of 9th and over one third of 12th grade males reported feelings of emotional distress.

The 1998 MSS randomly matched adolescents age 12-20 in juvenile correctional facilities (24), residential behavioral treatment facilities[4] (25), and alternative education centers (26) by age and gender with public school students. **Table 11** compares results for indicators related to feelings of emotional distress. For all indicators, students in correctional facilities reported more emotional distress than their counterparts in public schools. The same is true for students in residential behavioral treatment and alternative education centers, except for the "bad or very bad mood" category, where they seem comparable to public school students.

Fulkerson et al. also found that students in juvenile correctional facilities (24), residential behavioral treatment programs (25), and alternative learning centers (26) were more likely to: be students of color; come from single-parent homes; have witnessed physical violence in their homes; be victims of physical and sexual violence; have substance abuse problems in the family; report psychological distress and suicide attempts; be sexually active, been pregnant or gotten a partner pregnant; not used condoms during recent sexual intercourse; exhibit antisocial behavior; and used substances than public school students.

Figure 38 looks at daily smoking behavior by educational site. Twenty-two percent of students in public schools reported smoking cigarettes on a daily basis, compared to 72% in alternative education centers, 43% in residential behavioral treatment centers, and 42% in juvenile correctional facilitites.

[3]In their review, the authors used the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV).

[4]Includes youth diagnosed with severe emotional disturbance by a mental health professional prior to placement, and youth in group homes that provide a type of care not available through traditional foster families or institutions but do not need specialized diagnoses prior to admission.

In addition to the data presented in **Table 11**, 46% of students in juvenile correctional facilities, 45% of those in residential behavioral treament facilities, and 29% in alternative learning centers reported having been in special classes for learning problems, compared to 21%-25% of students in regular public schools.

Table 11. Feelings of Emotional Distress Between Adolescents Aged 12-20, by Educational Setting, Minnesota Student Survey 1998

	Juvenile Correctional Facilities (n=1,065) %	Residential Behavioral Treatment (n=381) %	Alternative Education Centers (n=3,791) %	Regular Public Schools* (n=5,237) %
Have you felt sad (All or most of the time)	30	28	19	13-14
Have you felt so discouraged or hopeless that you wondered if anything was worthwhile? (Extremely or quite a bit)	25	27	20	14-15
Have you felt nervous, worried, or upset? (All or most of the time)	30	29	23	15-19
Have you felt satisfied with your personal life? (Somewhat or very dissatisfied)	36	34	30	22-24
How has your mood been? (Bad or very bad)	10	7	7	5-7
Have you felt you were under any stress or pressure? (Quite a bit or almost more than I could take)	45	44	45	33-39

*The "regular public schools" category includes 3 samples of students as each education site randomly matched a student with a regular public school student by age and gender. This explains why the "regular public schools" category presents a larger n (1,065+381+3,791=5,237), and a range of values.

Weist et al. found that co-morbidities are common among adolescents with mental health problems, and that there are gender differences with respect to the type of disorder. The authors write: "*Epidemiologic studies...indicate that rates of co-morbidity are high. Among adolescents, the most common comorbid disorders are anxiety disorder and depressive disorder, attention deficit hyperactivity disorder (ADHD) and conduct disorder, autism and mental retardation, and Tourette's syndrome and ADHD...Gender differences also have been reported in the prevalence of psychiatric disorders with adolescent girls found to have higher rates of depression and anxiety disorders compared to boys. In contrast, adolescent boys are more often diagnosed with oppositional defiant and conduct disorders and ADHD compared to adolescent girls.*" (22).

Figure 38. Percent of Students Who Reported Smoking Cigarettes on a Daily Basis, by Educational Site, Minnesota Student Survey 1998

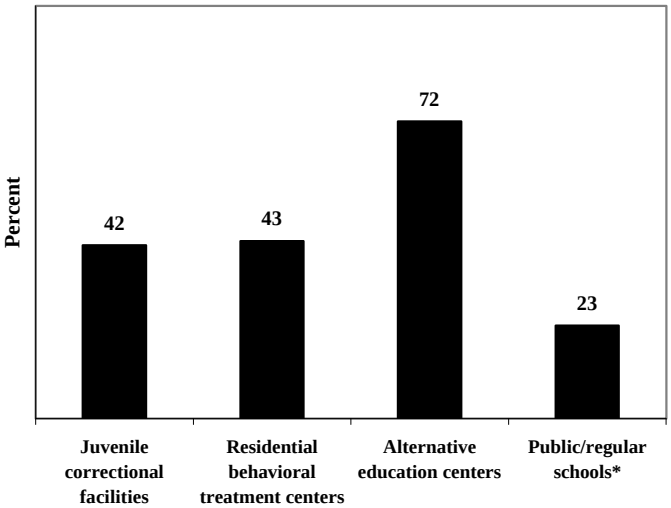


Table 12. Comparison of Adolescents Who Reported Health Concerns* vs. "Typical" Students on Selected Health-Related Indicators, Minnesota Student Survey, 1998.

	Students with Special Health Concerns (n=16,080) %	"Typical" Students (n=117,920) %
Had physical exam within last year	52%	43%
Suicide attempt in last year	12.9%	4.6%
Felt safe at school (disagree or strongly disagree)	13%	6.3%
Felt sad in last 30 days (all or most of the time)	21.1%	9.8%
Felt they were under stress or pressure in last 30 days (Yes, almost more than I could take)	23%	9.8%

*6th, 9th and 12th graders who self-identified as having a mental or physical condition or other problem that lasted at least 12 months. "Typical" students included those in public schools.
Source: MDH Children with Special Health Needs Section

In 1997, there were an estimated 130,472 children in Minnesota with special health care needs (CSHN) age 10-19 who met the criteria for a moderate disability. A moderate disability in children is defined as a health condition that is virtually certain to last for at least one year which cause either: 1) a limitation in function, activity or social role; or 2) dependency on medication, special diet, medical technology, assistive devices or personal assistance to compensate for or minimize limitation of function; or 3) the need for medical care or related services over and above the usual for the child's age (27).

Results from the 1998 MSS show that 12% of 6th, 9th and 12th graders self-identified as having a mental or physical condition, or other health problems that lasted at least 12 months. **Table 12** compares these students with "typical" students on selected indicators. The data indicate health disparties in regard to having had a physical exam in the past year, and across selected indicators of feelings of emotional well-being/distress. Students who self-identified with special health concerns were more likely than their "typical" peers to have reported a suicide attempt in the last year, not felt safe at school, felt sad, and felt pressure or stress.

The World Health Organization (WHO) emphasized the important role of adolescent development in promoting health. For special populations, the WHO notes: *"Adolescence is a time in which various developmental tasks must be completed. The consolidation of identity, dependence on parents, establishment of intimate relationships outside the immediate family, and selection of a vocation are major tasks of adolescence. These tasks may take longer to accomplish in younger people who are chronically ill or disabled because of deprivations suffered earlier. Programmes for adolescents can enhance the development process in a variety of ways. Factors that influence the growth and development of young people with disabilities or chronic illness include: family support that is not overprotective; a network of friends with and without disabilities; having at least one friend of the same age and one adult to talk to; domestic and/or community responsibilities; having successfully completed a task; the belief that despite the physical limitation they can accomplish their goals."* (28).

In Back to School on Civil Rights: Advancing the Federal Commitment to Leave No Child Behind, the National Council on Disability (NCD) presented recommendations aimed at improving the educational outcomes of children with disabilities and their families. The NCD found that *"Every state was out of compliance with IDEA requirements to some degree..."* The IDEA (Individuals With Disabilities Education Act) is federal law which gives *"...all children with disabilities have a federally protected civil right to have available to them a free appropriate public education that meets their education and related services needs in the least restrictive environment."* NCD recommended that the federal government *"...advance a federal approach to enforcement that results in improved compliance and better outcomes for children and families..."* (29).

The National Research Council and Institute of Medicine described the adolescence as: *"...one of the most fascinating and complex transitions in the life span: a time of accelerated growth and change, second only to infancy; a time of expanding horizons, self-discovery, and emerging independence; a time of metamorphosis from childhood into adulthood...The events of this crucial formative phase can shape an individual's life course - and, by extension, an entire society."* (30).

References

1. Hedberg VA, Bracken AC, Stashwick CA. Adolescent Medicine: State of the Art Reviews, 1999. 10(1):137-151.

2. Minnesota Student Survey, 1998. Minnesota Department of Children, Families and Learning.

3. Healthy People 2010 Goals. www.health.gov/healthypeople/Document/HTML/Volume1/goal.htm.

4. Information Technology Data Management. Minnesota Children, Families and Learning. August 2000.

5. Food and Nutrition Service. Minnesota Children, Families and Learning. September 2000.

6. Covering Kids. www.coveringkids.org.

7. Faces of the Future. Minnesota Population Projections 1995-2025. Minnesota Planning State Demographic Center.

8. Bell DL, Ragin DF, Cohall A. Cross-Cultural Issues in Prevention, Health Promotion, and Risk Reduction in Adolescence. Adolescent Medicine: State of the Art Reviews, 1999. 10(1):57-69.

9. Five Leading Causes of Hospitalization (Excluding Births) by Age: Statewide, 1998. Minnesota Hospital and Healthcare Partnership.

10. Guyer B, Hoyert DL, Martin JA, Ventura SJ, MacDorman MF, Strobino DM. Annual Summary of Vital Statistics 1998. Pediatrics, 1999. 104(6): 1229-1246.

11. Vital Records and Health Statistics. Center for Health Statistics. Minnesota Department of Health.

12. Nonfatal Injury in Minnesota, 1998: Hospitalized and Emergency Department Treated. Injury and Violence Prevention Unit. MDH.

13. Traumatic Brain and Spinal Cord Injury in Minnesota 1993-1997: Fatal and Hospitalized. Injury and Violence Prevention Unit. Minnesota Department of Hea Minnesota Department of Health.

14. Minnesota Youth Tobacco Survey 2000. Center for Health Statistics. Minnes Department of Health.

15. Snyder HN, Sickmund M. Juvenile Offenders and Victims: 1999 National Report. National Center for Juvenile Justice, Office of Juvenile Justice and Delinquency Prevention. September 1999.

16. Minnesota Crime Information 1997. Criminal Justice Information Systems. Bureau of Criminal Apprehension, Minnesota Department of Public Safety.

17. Thornton TN, Craft CA, Dahlberg LL et al. Best Practices of Youth Violence Prevention: A Sourcebook for Community Action. Atlanta: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, 2000.

18. Strasburger VC, Donnerstein E. Children, Adolescents, and the Media in the 21st Century. Adolescent Medicine: State of the Art Reviews, 2000. 11(1): 51-68.

19. Sexually Transmitted Disease Statistics 1995-1999. AIDS/STD Prevention Services Section. Minnesota Department of Health.

20. HIV/AIDS Surveillance Reports, July 1, 2000. HIV and Emerging Infections Unit, Minnesota Department of Health.

21. Story M, Neumark-Sztainer D. Promoting Healthy Eating and Physical Activity in Adolescents. Adolescent Medicine: State of the Art Reviews, 1999. 10(1):109-123.

22. Weist MD, Ginsburg G, Shafer M. Adolescent Medicine: State of the Art Reviews, 1999. 10(1):165-174.

23. U.S. Department of Health and Human Services. Mental Health: A Report of the Surgeon General. 1999.

24. Fulkerson JA, Harrison PA, Hedger SA. Minnesota Student Survey 1998: Juvenile Correctional Facilities. Minnesota Department of Children, Families and Learning. September 1999.

25. Fulkerson JA, Harrison PA, Hedger SA. Minnesota Student Survey 1998: Residential Behavioral Treatment Facilities. Minnesota Department of Children, Families and Learning. July 1999.

26. Fulkerson JA, Harrison PA, Hedger SA. Minnesota Student Survey 1998: Alternative Schools and Area Learning Centers. Minnesota Department of Children, Families and Learning. July 1999.

27. Minnesota Children With Special Health Needs. Division of Family Health. Minnesota Department of Health. August 2000.

28. Programming for Adolescent Health and Development. Report of a WHO/UNFPA/UNICEF Study Group on Programming for Adolescent Health. WHO Technical Report Series, 1999. Geneva.

29. Back to School on Civil Rights: Advancing the Federal Commitment to Leave No Child Behind. National Council on Disability. Letter of Transmittal to the President of the United States. January 25, 2000.

30. National Research Council and Institute of Medicine. (1999). Risks and opportunities: Synthesis of studies on adolescence. Forum on Adolescence. Michele D Kipke, Ed. Board on Children, Youth and Families. Washington D.C., National Academy Press. Pp. 7-8.

This report was funded by the Federal Centers for Disease Control and Prevention (CDC) Assessment Initiative Grant (Award #U82/CCU514903).

121 East Seventh Place
P.O. Box 64975
Saint Paul, Minnesota 55164-0975
www.health.state.mn.us/divs/chs/chs.html

Please email michele.seeley@health.state.mn.us, or call (651) 296-8422 to receive this newsletter regularly.

Upon request, this publication can be made available in alternative formats such as large print, Braille or cassette tape.