Weapon Carrying

and

Oregon High School Students

By

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Presented to the Department of Public Health

and Preventive Medicine

Oregon Health Sciences University

In partial fulfillment of the requirements for the degree of

Master of Public Health

April 1999

School of Medicine
Oregon Health Sciences University

Certificate of Approval

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Acknowledgements

I would like to thank my thesis advisor, Bruce Goldberg, and my committee members, Gary Rischitelli, Michael Freeman and Jodi Lapidus for their academic guidance and support during this project.

I would also like to acknowledge the Oregon State Health Division, Center for Health Statistics for the provision of the 1997 Oregon Youth Risk Behavior Survey Data upon which this thesis was based.

Abstract

With the publication of Healthy People 2000, the reduction of weapon-carrying among adolescents became a national priority (US DHHS, Public Health Service, 1991). Weapon-related violence has become not only a national public health problem, but also a significant cause of mortality among youth. Homicide and suicide are the second and third leading causes of death among young people 15-24 years of age (Singh, 1996). Sixty percent of suicides (Zuckerman, 1996) and 80% of homicides (Jones, 1997) among youth ages 15-19 are completed with a firearm. The mere presence of a firearm increases the probability of unintentional injury, suicide and homicide among youth, yet self-protection remains the most common reason youth report carrying a weapon (Simon, 1997). Last year, one in five high school students nationally (18.3%) reported carrying a weapon during the past month (CDC, 1998). The prevalence of weapon-carrying was very similar among Oregon High School students (OHD, 1998). Healthy People 2000 established a national goal to reduce weapon-carrying among adolescents to 8.6%, (US, DHHS, Public Health Service, 1991), Oregon's goal was a reduction to 15%, by the year 2000 (OHD, 1996).

To better understand the many factors influencing weapon-carrying behavior among youth, an examination of the risk factors was necessary. Many studies have identified African American and Hispanic racial groups at increased risk for weapon-carrying, while other groups of youth have consistently reported lower rates. For example, Asian youth report considerably lower rates of firearm carrying than African-American youth. However, little is known about the risk factors that may differentially affect these groups. Some research suggests the association between race/ethnicity and violent behavior is eliminated when socioeconomic status and environmental conditions are controlled for. The influence of socioeconomic status and environmental factors has not been fully explored and further investigation is warranted.

Due to the generalized lack of information regarding factors affecting Asian adolescents, this analysis focused on distinguishing risk factors for weapon-carrying which are unique to ethnic status. A secondary analysis of the Oregon Youth Risk Behavior Survey (YRBS) data from 1997 was used to assess risk factors for weapon-carrying among high school students. Risk factors assessed included those factors shown by previous research to impact weapon-carrying among youth. These factors were age, sex, race, SES, physical fighting, victimization, substance use, suicidal ideation, and 'having missed school due to fear'. Race and gender-specific predictive models for weapon-carrying were created using these risk factors.

Across the racial groups, students of male gender who reported substance abuse, and physical fighting were at increased risk for weapon-carrying. Race-specific models for weapon-carrying highlighted risk factors of particular influence to individual ethnic groups. For example, American Indian youth, reporting suicidal ideation represented a considerable increased risk for weapon carrying. While, Asian students, who reported having missed school due to fear, were also at increased for weapon-carrying. Successful violence prevention efforts must address numerous risk factors associated with weapon-carrying however, these prevention programs must also allow for more emphasis upon the specific needs of each community.

Introduction

Weapon-related violence as a public health problem

Violence among youth is not a new public health problem, but has become one of increasing concern in recent years. A considerable body of literature has established youth violence as a national public health problem of epidemic proportion. In the United States today, violence involving weapons, including firearms, is an all too common occurrence among youth. Each year homicide and suicide claim the lives of thousands of young people, and firearms are involved in the majority of these violent deaths. Despite the increased efforts of professionals from multiple disciplines including public health, medicine, social work, law enforcement and education, weapon-related violence continues to claim an increasing number of lives each year (OHD, 1996).

Weapon-carrying among youth has been identified as a potential precursor to physical injury but it is also an extreme symptom of the underlying problem of youth violence. Youth today are exposed to violence in the home, in the community and at school. Weapon-carrying is an extreme response to this environmental threat but by no means the only response. Only a fraction of youth exposed to violence respond with such extreme measures as weapon or firearm carrying (Dahlberg, 1998). A more common response by youth to this environmental threat of violence is physical fighting, substance abuse and other delinquent behaviors. Exposure to violence provokes fear and frustration, which in turn motivates youth to defend themselves, to fight back and frequently to self-medicate with alcohol and other drugs.

Application of the public health approach to the problem of youth violence dictates that research first identify and understand the range of factors that place youth at risk. Once risk factors have been identified, prevention specialists then assess how amenable to change each

factor might be, with a focus on primary prevention. However, the prevention of weapon-carrying among youth can only be considered tertiary prevention, as youth that have already been exposed to violence are exhibiting an extreme symptom.

The potential influence of graphic violence in the media on youth violence is under investigation. While these studies may find that violence is indeed common in the media, linking exposure to youth violence seems unlikely, especially considering the lack of control groups. Youth are bombarded daily by portrayals of graphic violence in nearly every form of media and as a result, they may have become desensitized (Dorfman 1997, Sorenson 1998).

Still other reports suggest that youth today are simply more violent, have increased access to firearms and are more willing to use them, however, this view does not take environmental factors into consideration (Dalberg, 1998). We know that youth increasingly choose firearms which are more lethal than other weapons and increase the likelihood of serious injury or death considerably. Due to the high case-fatality rate associated with firearm injuries and the ubiquitous nature of these weapons, firearm-related violence continues to be the leading cause of mortality among youth (Singh, 1996).

Epidemiologic research of youth violence has investigated numerous individual and environmental risk factors. The existing picture of youth violence has most commonly been of an older (ages 15 to 17) black adolescent male, in an urban setting, reporting multiple other high-risk behaviors such as criminality, and illegal drug activity. The epidemiology of youth violence has begun to change somewhat. Today, younger students and female students are increasingly involved in violence, weapon-carrying and other high-risk behaviors. Although the rate of weapon-carrying has remained consistently higher among black

students, violence and related risk factors have increased among all ethnic/racial groups, notably, among Hispanic adolescents.

Background

Mortality due to firearm violence

Firearm-related violence is pervasive, young people ages 15-24 years are at greatest risk of firearm-related mortality. Many youth report they carried a weapon for self-protection, one-third of which carried guns (CDC 1998). Young people are at increased risk for firearm mortality, whether self-inflicted or interpersonal due to ease of access to firearms and a tendency to act impulsively. Youth ages 15-24 account for an increasingly disproportionate number of homicide victims in the US (Singh, 1996), 38% of all homicide victims in 1995 were children and youth under 25 years old (CDC, 1997). Homicide and suicide completed with a firearm are the second and third leading causes of death among persons 15-24 years of age (Singh, 1996). Firearms are the most common weapon used in homicide, 90% of all homicides in the US in 1994 were completed with a firearm (CDC, 1997). Youth are especially likely to be victims of firearm homicide, 80% of all homicide victims ages 15-19 were killed with a firearm (Jones, 1997). In addition to homicide, 60% of 15-19 year olds who commit suicide, also chose a firearm (Zuckerman, 1996). In 1994 alone, there were more than 38,505 firearm-related fatalities (all age groups) in the US (Singh, 1996). Of these fatalities 95% were the result of intentional violence; homicide (17,866) accounted for 46% of deaths, while suicide (18,765) accounted for 49% (Singh, 1996).

Access to firearms

Guns are associated with increased risk of suicide (Brent, 1991), homicide and unintentional firearm injuries (Kellerman, 1993). The presence of a firearm in the home has been found to double the risk of adolescent suicide (Brent, 1991). Private citizens own approximately 200 million firearms in the US (Kleck 1995), and an estimated 40% to 50% of

all households contain a firearm (30% to 50% of which are handguns) (Ash, 1996). Therefore, it should not be surprising that adolescents have ready access to firearms. A survey of 22 states found considerable geographic variation in the prevalence of households with firearms, rates ranged from 12% in New Jersey to 57% in Idaho (Powell, 1998). Overall, the South, Midwest and Western regions of the US were more likely to have firearms in the household than the Northeast (Powell, 1998).

However, the home is by no means the only source of firearms, youth commonly report acquiring firearms "on the streets" or from numerous other sources. A study of incarcerated youth examined gun acquisition and found the majority of offenders reported easy access to guns through a variety of sources and at a young age. Most adolescents who carried firearms obtained their first firearm before the age of 15, and half acquired their first gun passively (without specific intention to do so) (Ash, 1996). When subjects were asked what advice they would give a friend on acquiring a gun, buying a gun on the street was most commonly (57%) recommended by youth, stealing (19%), borrowing (9%) and trading (6%) were recommended less often. Buying a gun through a pawnshop or via an adult was only recommended by 4% of the incarcerated youth (Ash, 1996). With regard to buying guns on the streets, the majority of youth stated that those who sold guns also sold drugs (Ash, 1996).

In the Northwest, an increasing number of youth report easy access to firearms. In a study of Seattle public high schools, more than one third (34%) of adolescents reported easy access to guns, and 6.4% reported owning a handgun personally (Callahan, 1992). More than half (60%) of students reported firearms for them were "easily obtainable" and 35% claimed they could acquire a firearm in "less than one hour" (Harris, 1993). Another study found 42% of students said they "could get a gun if they wanted one", nearly one third had "handled a gun

without adult knowledge or supervision" and 17% carried a concealed gun in the past month (Bergstein, 1996).

Male students reported easy access to firearms twice as often as female students, African-American students were also twice as likely to report easy access, with 59% of African-American male students reporting easy access to firearms (Callahan, 1992). Easy access to firearms was reported by 57% of students in the lowest socioeconomic group compared to 24% of students in the highest socioeconomic group. The same relationship was found with regard to gun ownership, 20% of students in the lowest socioeconomic group and 3.1% of students in the highest socioeconomic group owned guns (Callahan, 1992). Access to firearms is not limited to youth with behavioral or substance abuse problems or to impoverished youth, access and ownership of firearms is widespread.

Youth may initially respond to the threat of violence around them by carrying a knife, club or other less lethal weapon which they felt may provide them some protection. The decision to carry a firearm may represent a behavior of last resort for some individuals or an original behavior among some youth. In an effort to describe the spectrum of weapon-carrying behaviors among youth, this discussion and the following secondary analysis will primarily focus on any weapon-carrying behavior among youth.

Of all weapon-related injuries, firearm injuries have the highest case fatality rate. It has been estimated that if the current trend in firearm-related mortality continues, by the year 2003 death due to firearms will surpass motor vehicles as the leading cause of death for this age group (Ikeda, 1997). Firearm-related death is already the leading cause of death among youth in several states.

Firearm-related violence not only results in death but also in serious injury. For every firearm-related fatality, there were 2.6 non-fatal firearm-related injury in 1995 (Annest, 1995). Others estimate that for every fatal firearm injuries there are between 3 and 6 non-fatal injuries, which often result in permanent disability.

Weapon-carrying among youth

The National Youth Risk Behavior Survey (1991) found that among high school students, more than one quarter (22.1%) had carried a weapon (including firearms) at least one day within the past month (Kann, 1993). The prevalence of weapon-carrying nationwide, among high school students has decreased since the original survey. In 1997, 18.3% of students nationwide carried a weapon during the past month, a decrease from 20% in 1995. There was also a similar decrease in the rate of students nationwide (5.9%), who had carried a gun in the past 30 days, a decrease from 7.6% in 1995 (CDC 1998) (Kann, 1996).

Weapon-carrying among adolescents is alarmingly common and has crossed gender, racial, and socioeconomic lines. Students who carry weapons often report victimization and physical fighting along with other high-risk behaviors. Male students continue to report significantly higher rates of weapon-carrying than their female counterparts, regardless of racial group. Suburban and rural areas have also experienced a dramatic rise in youth violence over the past decade.

Risk factors for weapon-carrying

Previous research indicates there a number of factors, which increase the probability of violence and delinquency among youth. These factors exist in four related domains, 1) factors residing within the individual, 2) familial factors, 3) factors relating to peers and school and, 4) environmental/neighborhood factors (Dahlberg, 1998). This framework

provides a basis for understanding the source of individual risk factors as well as the complex nature of youth violence as a public health problem. However, many risk factors originate within and are influenced by more than one of these domains, illustrating the complexity of youth violence. For example, peer, family and individual factors all influence risk behaviors such as physical fighting and substance abuse.

A considerable body of literature has established a number of risk factors associated with weapon-carrying among adolescents (Dahlberg 1998, Simon, 1998, Webster 1993, Kulig 1998, Durant 1997). An association with demographic factors including age, race and sex have been found in nearly all adolescent violence research, although some have chosen to control for these factors and focus on other factors which place youth at risk. Overall, male students (27.7%) were significantly more likely to have carried a weapon than their female counterparts (7.0%) this relationship remained regardless of ethnic or racial group (CDC, 1998). Although the rate of weapon-carrying has remained consistently higher among black students, violence and related risk factors have increased among all ethnic/racial groups, notably, among Hispanic adolescents. Ethnic groups report different rates of weapon-carrying, for example Hispanic students (23.3%) were more likely to have carried a weapon than Black (21.7%) or White students (17.0%) (CDC, 1998). A greater proportion of female students and students ages 14-16 have reported weapon-carrying in recent years. Young age (15 & 16 years old) and male gender were identified as significant predictors of weapon-carrying in a recent study of urban high school students (Kulig, 1998).

Weapon-carrying has been associated with substance abuse in several studies (DuRant 1997, Sheley 1995, McNabb 1996, Kulig 1998, Callahan 1992, Simon 1998). Involvement in drug activity was associated with carrying a firearm in a crossectional study of suburban

youth, however, drug activity was dichotomized due to the low prevalence (12%) in the study (Sheley, 1995). The definition of drug activity included only cocaine and heroin, which may explain the low prevalence (Sheley, 1995). A prospective study found substance abuse to be significant predictor of handgun carrying, however, the definition of substance abuse included alcohol, tobacco and marijuana use (Simon, 1998). Students who reported selling drugs were 3.7 times as likely to also report handgun carrying (Callahan, 1992). A case-control study of incarcerated youth also found marijuana use, to be associated with carrying a firearm (McNabb, 1996). Tobacco use, alcohol use and being offered or sold an illicit drug were all significantly correlated with weapon-carrying on school property (DuRant, 1997). Overall, the association between substance abuse, despite varying definitions and study designs, has been consistently associated with carrying a weapon or firearm.

Delinquent and or criminal behaviors have also been moderately associated with weapon-carrying among adolescents (Callahan 1992, Bergstein 1996, Kulig 1998, and Webster 1993). Handgun ownership was associated with gang membership, sentencing by a judge, selling drugs, suspension from school and assault and battery (Callahan, 1992). Delinquent behaviors from "skipping school" (Kulig, 1998) to having been arrested were associated with weapon-carrying (Webster, 1993) as well as with firearm carrying (Bergstein, 1996).

A strong association has been found between weapon-carrying and involvement in physical fighting among adolescents (Lowry 1998, DuRant 1997, Webster 1993, Kulig 1998). A study of 7th and 8th grade students found that males who reported starting fights were at increased risk for weapon-carrying (OR 4.57) (Webster, 1993). Analysis of data from the Youth Risk Behavior Survey, a supplement to the 1992 National Health Interview Survey found that youth who carried weapons were significantly (OR=3.3) more likely to have been

in a physical fight (Lowry, 1998). The association between physical fighting and weapon-carrying among females represented a considerably higher risk for females (OR=5.0) than for males (OR=2.9) (Lowry, 1998). Having hit or "beat up" someone was also a predictor of weapon-carrying among urban high school students (Kulig, 1998). A strong association between physical fighting and weapon-carrying has been found consistently although with varying magnitudes.

Measures of victimization such as being threatened, having been injured, being a victim of theft or vandalism, have also been associated with weapon-carrying among youth (DuRant, Webster). Among males, being threatened or attacked with a knife was associated with an odds ratio of 5.74 for weapon-carrying (Webster, 1993). Fear of attending school was also associated with carrying a weapon on school property (DuRant, 1998).

Exposure to environmental violence has been associated with weapon-carrying in several studies (Kulig 1998, McNabb 1996, Callahan 1992, Bergstein 1996, Simon, 1998) while other research has failed to find an association (Sheley, 1995). Witnessing a crime (Kulig, 1998), a shooting (McNabb, 1996) or reporting frequent neighborhood gunfire (Callahan, 1992) was associated with weapon-carrying. Exposure to violence, defined as "having had a family member shot" (yes/no) and "lot of shootings in the neighborhood" (yes/no) was associated with firearm carrying among urban teens (Bergstein, 1996). Higher neighborhood crime was also associated with firearm carrying in a prospective study by Simon (1998). Carrying a weapon in response to environmental violence is reflective of the primary reason youth give for weapon-carrying, self-protection. Four measures of a dangerous environment (threatened with a gun, guns fired at social events, fears violent attack and fears being shot by age 25) were not associated with firearm carrying among suburban youth (Sheley, 1995).

The association between weapon-carrying, environmental violence and socioeconomic status has not been thoroughly explored; most likely as a result of the measurement difficulties these variables present. Environmental and SES measures are generally not included on standardized risk assessment tools, such as the YRBS, (which is commonly used in adolescent risk behavior research). Survey attempts to include self-reported measures of these factors have resulted in a significant amount of missing data. Most adolescent violence research reports rates of high-risk behaviors (i.e. weapon-carrying) by racial group, consistently reporting much higher rates among Black and Hispanic students. An effort is sometimes made to account for these differences by describing the socioeconomic and environmental influences differentially effecting high-risk youth. However, by measuring these factors the differential rates of violence among racial groups has been eliminated in some research (Simon 1998, Centerwall 1984). Recognizing that exposure to environmental violence and poverty contributes to adolescent violence, regardless of race, can help focus prevention efforts on the cause of the problem and not on the stereotypical victim of youth violence.

Suicidal ideation and sexual experience have been identified as risk factors (Kulig 1998) less frequently in the literature. Students who seriously thought about killing themselves were significantly more likely (OR=2.24) to report weapon-carrying than students who did not consider suicide (Kulig, 1998). Being sexually experienced also considerably increased the likelihood of weapon-carrying (OR= 3.38) among high school students (Kulig, 1998).

Youth violence involving firearms was also once considered an urban or inner city problem; this is no longer true. One study of suburban youth found that more than one in four

students (28%) owned a handgun, and a considerable proportion (17%) reported carrying a gun (Sheley, 1995).

Although the majority of adolescent weapon-carrying information is based on crossectional data, research using varying populations and methodological designs (i.e. case-control, prospective) have found similar results. A temporal relationship between the risk factor and outcome is also not provided by crossectional data, however, prospective research has identified similar risk factors. Most knowledge of adolescent weapon-carrying also relies on self-reported behavior. However, survey responses have been assessed for consistency, are anonymous, and are administered outside the student's home to increasing the likelihood that students represent their true behavior. Some studies have even attempted to directly measure weapon-carrying by using "arrest for possession" as a proxy. These studies have also identified similar risk factors.

Violence in the mass media has been suggested to have an influence on the rise in firearm-related violence among youth (Zuckerman, 1996). One study of media violence found stories broadcast about adolescents often involved violence and two thirds of all violence coverage concerned youth (Dorfman, 1997). The concern is that violence portrayed outside of a realistic social setting and without consequences will encourage youth violence. While the field of media research is interesting, the greatest influence violence in the media has on youth and the rest of us, is complacency. We are bombarded daily by portrayals of graphic violence in nearly every form of media and as a result we have become desensitized. We have become so desensitized to violence that to keep our interest, homicides involving an atypical victim were more likely to be broadcast (Sorenson, 1998). The greatest influence

this selective broadcasting has is on the public perception of crime, which is on often inaccurate.

Weapon-carrying as a public health indicator

Weapon-related violence has been established as a significant threat to public health especially among young people. Numerous individual, familial and societal, influences contribute to the multidimensional problem of interpersonal violence. Prevention of violence was established as a priority at the national level in 1991 with the publication of Healthy People 2000. The Healthy People priorities included goals aimed at reducing violence in our society, especially among youth and in schools. Interpersonal violence among youth and young adults has been recognized as a growing problem reflecting effects of poverty, a dangerous environment, substance abuse use, and fear.

Public health prevention efforts must focus on intervention programs to prevent violence and weapon-carrying among youth. Weapon-carrying is an extreme response to the threat of violence either personal or environmental. However, weapon-carrying among youth may also represent and initial behavior, leading to unplanned or impulsive use of the weapon to settle disputes which result in injury or death (Mcnabb, 1996). Therefore, weapon-carrying may serve as both a public health indicator among youth and as a target for tertiary prevention efforts.

Oregon Youth and violence

Violence among youth is also a serious problem in Oregon. Oregon's juvenile crime rate has increased by one third since 1990. Of all arrests made in the state, nearly one third (29% or 49,549) were of youth under 18 years of age (Adarkar, 1998). Physical fighting has also become a common occurrence among Oregon high school students, nearly one in three

(29%) reported being in at least one fight during the past year (Oregon Dept of Education, 1998).

Oregon students are also carrying weapons, including guns at higher rates than the national average (OHD 1998, CDC 1998). Nearly one fifth (18.9%) of Oregon high school students reported carrying a weapon within the past 30 days, more than two-thirds of those students were boys. High school students are also carrying guns, 6% reported carrying a gun as a weapon in the past 30 days (Oregon Dept of Education, 1998). Students have also been injured as a result of weapon-related violence, 7% of high school students reported being injured with a weapon on school property in 1997 (Oregon Dept of Education, 1998).

Many Oregon adolescents have access to firearms right in their own homes. About half (49%) of all Oregon households contain a firearm, nearly one third (30%) of which contain a handgun and an estimated 9% of households with children had a unlocked, loaded firearm in the house (Powell, 1998). Among six other Western states (where data was available), only Idaho with 57% of households containing a firearm had a higher rate than Oregon (Powell, 1998). In Oregon, an estimated 6.2% of households with children also have firearms which are stored unlocked and loaded, resulting in approximately 40,000 children and teens at risk (Nelson, 1996). Oregon adults are modeling weapon-carrying behaviors, more than 20% of adults carried a loaded firearm in the past month, alcohol use was an independent risk factor for living in households where firearms were stored in the least safe manner (Nelson, 1996).

The suicide rate among Oregon youth ages 15 to 19 was nearly one third (29%) higher than the national rate, placing Oregon 17th among the states for suicide deaths in this age group (Oregon Dept of Education, 1998). More than one fifth (22%) of Oregon high school students reported seriously considering suicide; 9% reported actually attempting suicide in

the past year (Oregon Dept of Education, 1998). In Oregon, the use of a gun to commit suicide has increased faster than any other method (Oregon Dept of Education, 1998), in 1996, 330 did so. Oregon students who carried weapons (19%) or guns (6%) were twice as likely to report attempting suicide (16%) than students who did not carry weapons (7%) (Oregon Dept of Education, 1998). The availability of guns in the home has been associated with an increase risk for adolescent suicide (Brent, 1991) and an increased risk of homicide by a family member or intimate acquaintance (Kellerman, 1993).

Socioeconomic Status

The impact of poverty on violent adolescent behavior is not well understood and has proven difficult to measure or study. What is known is that neighborhoods with concentrated poverty also have high crime rates and youth from these communities report increased rates of high-risk behavior. Minorities are disproportionately represented in these neighborhoods, therefore high rates of crime, violence and risky behavior are reported by minority youth, especially African-American and Hispanic youth. Some groups of youth report lower rates of high-risk behavior such as weapon-carrying. For example, Asian youth report considerably lower rates of weapon-carrying than African-American youth, who report the highest rate, yet little is known about the risk factors that may differentially affect these groups. One explanation may be the difference in socioeconomic status that exists between racial and ethnic groups of youth. Socioeconomic status as a risk factor for violence has not been addressed by many studies of adolescent violence and other high-risk behavior (Webster, 1993) (Sheley, 1995) (DuRant, 1997) (Brener, 1998) (Lowry, 1998) (Kulig, 1998). Several studies relied on data from the Youth Risk Behavior Survey (YRBS); a questionnaire designed to assess the high-risk behavior of adolescents. The YRBS does not assess

socioeconomic status or exposure to environmental violence. Studies, which rely solely on YRBS data, simply do not have measures of socioeconomic status or environmental violence available.

Among studies on adolescent violence and high-risk behavior, a measure of socioeconomic status or environmental conditions was assessed by few: Centerwall (1984), Cotton (1994), Shapiro (1998), Simon (1998) each with varying measurement issues. All are crossectional in design with the exception of Simon which was prospective study.

A crossectional study of homicide by Black and White adults found the relative risk of intra-racial domestic homicide for blacks was 5.8. After matching the two populations for rates of household crowding, the relative risk for Blacks was no longer increased. A unique strength of this study was the use of household crowding as a measure of "purchasing power, i.e., the ability to purchase uncrowded housing" rather than the use of income as a measure of socioeconomic status (Centerwall, p.815). The difference between income and actual "purchasing power" among racial groups substantiated the use of household crowding as a measure of socioeconomic status.

A study by Cotten (1994) on aggression among African-American youth, measured differences in socioeconomic status by designating each student as exposed to poverty if they participated in the free school lunch program. With this methodology and population, poverty was not found to be significantly associated with fighting. While free lunch eligibility is a legitimate proxy for socioeconomic status, all students eligible may not have participated due to the social stigma associated with the program. In addition, the student body was already at high risk, 97% of students were African-American and all were from two predominantly low-income middle schools of which only 60% participated in the study. A study of attitudes

toward violence among youth found that lower socioeconomic status was associated with more violence-prone attitudes. This association was found using type of school system (urban, suburban and prepatory schools) as a measure of socioeconomic status and scores on an Attitude Toward Guns and Violence Questionnaire (Shapiro, 1998).

A recent prospective study by Simon (1998) found that African-American youth were more likely to carry handguns, however, this relationship was no longer significant after controlling for gender, family income and perceptions of neighborhood crime. The prospective design was a considerable strength of this study however, the high (45%) attrition rate limits generalizability to those students who stayed in school. African-American and Latino students and youth from lower income neighborhoods were less likely to remain in the sample, these high-risk students may have also been more likely to report handgun carrying.

Overall, the findings by Centerwall (1984) and Simon (1998) support the notion that the correlation between race and violent behavior is eliminated when socioeconomic status and environmental factors are controlled for, as does the study by Shapiro (1998). The study by Cotton (1994), may have come to a different conclusion had the authors included a control school to match on socioeconomic status.

Asian Youth

Asians are the second largest minority group in Oregon, numbering more than 94,000 or 3% of the general population in 1996. Nationally, Asian and Pacific Islanders as a population has grown at a rate faster than any other major racial or ethnic group (CDC, 1997). In Oregon, the population of Asian and Pacific Islanders has increased by more than one third (34.8%) from 1990 to 1996, while the Non-Hispanic White population increased by only

11%. During the same time period the Hispanic population increased by more than 50% to an estimated 171,000 (5.4%) people, constituting the state's largest minority population (OHD vital statistics, 1997). The composition of Oregon public schools is similar, Hispanic youth are the largest minority group (8.1%), followed by Asian/Pacific Islander (3.5%), Black (2.61%) and American Indian youth (2.1%) (OHD vital statistics, 1997).

There is a generalized lack of health research describing Asian Americans and other minority adolescent groups, especially with regard to adolescent high-risk behavior. Because Asian Americans compose such a small percent of the general population, recruiting sufficient numbers of Asian Americans and other minority groups often proves to be difficult and costly (Bagley, 1995). If a sample of sufficient size is acquired, the problem is one of interpretation. There are more than 20 distinct racial groups classified as Asian or Pacific Islander, which makes distinguishing cultural influences impossible. Independent research efforts are often plagued by the same problems and are not able to complete race specific analyses.

National surveillance commonly reports health outcomes for only the two major racial groups in the US, African Americans and Non-Hispanic Whites. For example homicide rates for Non-Hispanic Whites and African Americans are reported in national statistics while rates for ethnic minorities are typically combined and listed as "other" or not reported (Rosenberg, 1991).

Only general national mortality data for the Asian American population was available. The death rate for Asian and Pacific Islanders for youth ages 15-19 years was 53.0 per 100,000 (both sexes) which was half the rate of 104.6 for American Indian youth. The death rate for African American youth was 145.0, double the rate for Non-Hispanic White youth,

76.8 (Elliot, 1994). Stratified analysis for specific cause of death (e.g. intentional injury) was available for African American and Non-Hispanic White populations only.

Although there is limited nationally representative data on Asian adolescents with regard to violence and weapon-carrying behaviors, some information is available about related risk factors. A study of suicide comparing Asian and Caucasian groups found several differences between racial groups. Caucasian youth ages 15-24 committed suicide at nearly three times the rate of Asian American of the same age (Shiang, 1997). The method of suicide differed between racial groups; the majority of Whites chose a firearm while most Asians chose hanging to complete suicide. In addition, Asians, as compared to Whites, used fewer drugs and alcohol at the time of suicide death (Shiang, 1997). In both racial groups, males committed suicide at a considerably higher rate than their female counterparts (Shiang, 1997).

A study of handgun carrying found few differences between Asian and Caucasian groups. A recent study of 12th graders in southern California found a similar proportion of Asian (11.7%) and Non-Hispanic White (11.5%) adolescents carried a handgun (Simon, 98). However, the odds ratio for Asian adolescents was 0.81 after adjustment for gender, income tertile, and perceptions of neighborhood crime. The odds ratio for African Americans was the highest (OR 1.17) with Other (OR 0.95) and Latino (OR 0.92) groups at similar risk (Simon, 1998).

A study comparing social, academic, emotional functioning and social support of Asian American students to Caucasian students found that Asian adolescents exhibited less delinquent behavior and performed better academically. However Asian students were significantly more isolated, more depressed and anxious, less apt to be involved in after

school activities, or seek help for their problems and internalized their social problems. They also reported fewer role models and less social support. (Lorenzo, 1995).

Research on Asian American adolescents is sparse and most reports are of high academic achievement among this group, although, some research has alluded to unique stresses of this group. One study noted that Asian-American adolescents struggle with many issues including conflicts with traditional cultural values (Lorenzo 1995). Asian youth may find themselves pressured to conform to opposing values; the Western notion of individualism and the traditional Asian value of collectivism (Lorenzo, 1995).

YRBS Background

Survey Instrument. The Youth Risk Behavior Survey (YRBS) questionnaire was developed by the Centers for Disease Control and Prevention. The YRBS is a multiple choice, pen and paper, self-administered questionnaire designed to measure health risk behaviors of high school students nationwide. Designed for administration to students in high school, the YRBS was written at the 7th grade reading level. Race/ethnicity was reported as White, Black, Hispanic, Asian or Pacific Islander or American Indian.

Questions on the YRBS relate to the health risks resulting in death and disability among Oregon high school students. The survey contains questions relating to: behaviors that result in intentional and unintentional injuries, tobacco use, alcohol and drug use, sexual behaviors that result in HIV infection and other sexually transmitted diseases, dietary behaviors and physical activity. The answer choices provided for the majority of questions were composed of a numerical gradient (5 to 6 points) for the frequency of the behavior ranging from "0 times" to "40 or more times". Other answer choice scales represented a gradient of behavior ranging from "never" to "always" with intermediate choices of "rarely", "sometimes" and

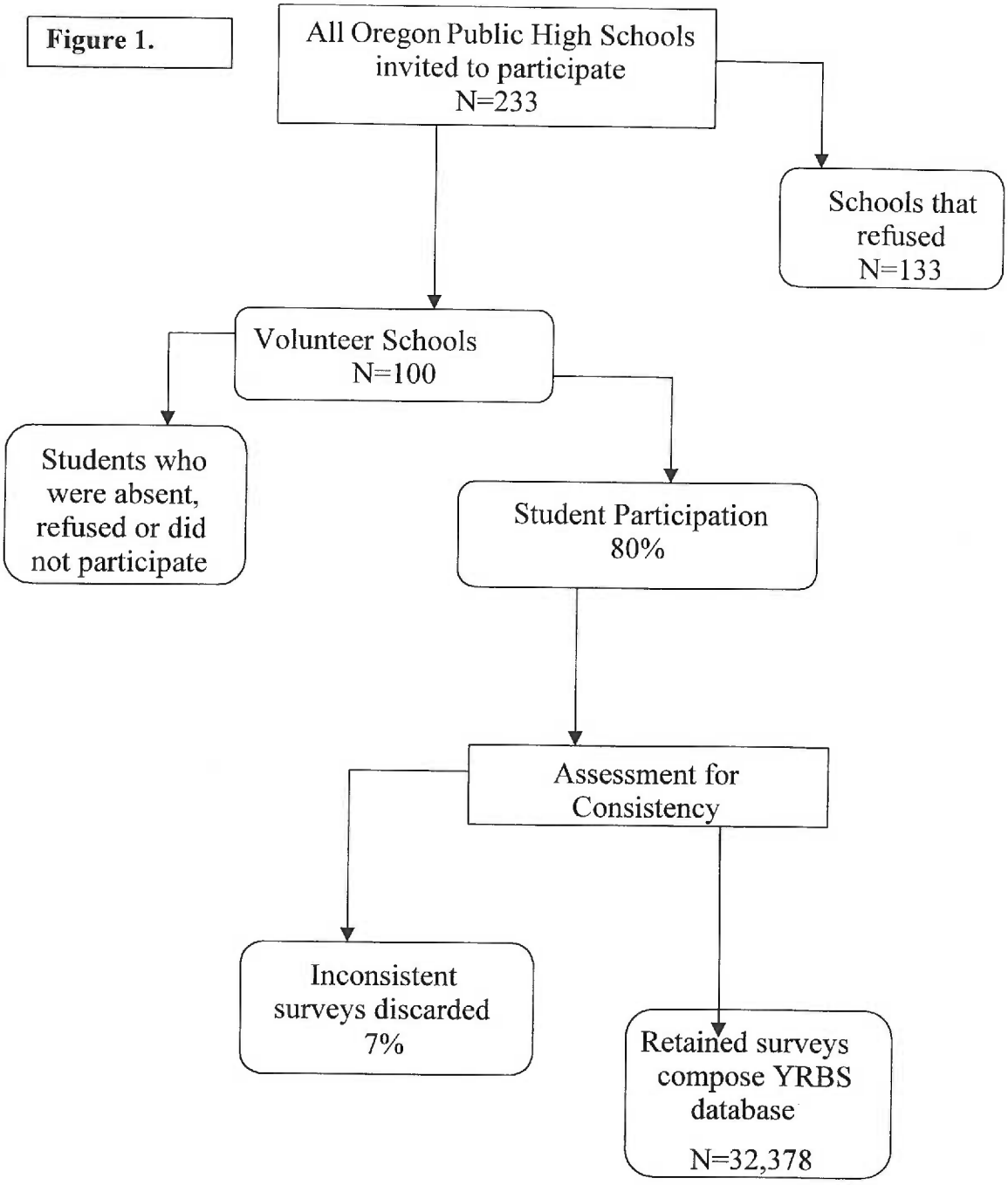
"most of the time". To simplify the survey process there are no skip patterns among the survey questions therefore, each student had the opportunity to respond to all 110 items. At the conclusion of the survey a space for comments was provided.

Use of the YRBS to measure high-risk behavior among adolescents was established in 1991, since then there have been no major revisions or updates on this original survey. Some items researchers would like to see added to the survey are questions regarding gang involvement, source and type of weapon, socioeconomic status, and measures of a dangerous environment. On an individual basis, other states have added questions to the original survey. However, despite poor kappas found for several standard items on the survey, notably for injection drug use and having been told you have a STD, poor questions have neither been removed nor re-written. The reliability of the survey has also not been established among minority groups of students, yet it has become a National and State standard. Overall, the YRBS is a useful assessment tool in need of a few updates and some additional reliability testing to assure the questions are culturally appropriate.

Study population & sampling. Adolescents enrolled in public high schools in the state of Oregon compose the target population. Participation in the survey is voluntary at every level. All district superintendents were initially contacted, invited to participate and permission was requested to contact their school principals. If district approval was obtained the principal of each school was then contacted to for approval. Schools who chose to participate then sent out informational fliers to parents of students regarding the survey. If parents did not wish their child to participate they were instructed to contact the school, this constituted passive permission). Ultimately, students could choose not to participate in the survey or to skip any question they did not want to answer.

Selection of schools. The 1997 sampling goal was to obtain a random sample of 50 schools to participate in the survey. This goal was not obtained as only half of the randomly chosen schools agreed to participate. Due to the low participation rate, 78 additional volunteer schools were added to the 1997 sample. The final 1997 sample consisted of 100 volunteer Oregon public high schools, the survey was administered between February and June (see Figure 1.). The Health Division recommended that participating schools randomize the classrooms in which the survey was administered however, the schools ultimately chose their own sample or chose to sample their entire population. Overall, 80% of the students in the volunteer sample responded to the survey.

Figure 1.


All Oregon Public High Schools invited to participate N=233
Schools that refused N=133
Volunteer Schools N=100
Students who were absent, refused or did not participate
Student Participation 80%
Assessment for Consistency
Inconsistent surveys discarded 7%
Retained surveys compose YRBS database N=32,378

Validity. To increase the likelihood of accurate reporting by students the survey is anonymous, administered in school, voluntary and reviewed for consistency. Several measures of consistency were used to insure to validity of the responses. Surveys were not considered usable for several reasons; answer to a drug-use verification question, additional inconsistencies, out of range answers, multiple answers to one question, missing gender or grade information. In 1997, a total of 7% of the surveys were eliminated due to these problems. Many of the questions on the survey are potentially sensitive, however, most items were found to be reliable. Two questions in particular (injection drug use and having been told you have a STD) received very low kappa scores, which may be due to the especially sensitive nature of these questions.

Reliability. Reliability of each of the items on the YRBS tool was evaluated via test retest methods and kappa statistics computed for each item, by Brener (1995). Using the scale developed by Landis and Koch, the majority of items (72%) had "substantial" or higher kappas (between 61 and 80 percent agreement). More than 90 percent of the items fell in the category deemed "moderate" or higher (Brener, 1995). The kappas for weapon-carrying (76.3%), firearm carrying (65.1%), and physical fighting (68.2%) demonstrated adequate reliability. Only two items had poor reliability, injection drug use (14.5%) and ever having been told one had a sexually transmitted disease (20.3%). The prevalence of risk behavior from the initial survey and the subsequent survey were not significantly different. The authors concluded that while the YBRS has some limitations the widely used adolescent survey has adequate reliability (Brener, 1995).

Methods

For the purposes of this analysis and discussion, risk factors will be grouped as follows:

1. Demographics- sex, race, age, and socioeconomic status
2. Substance abuse- alcohol, smoking, marijuana, cocaine, 'offered/sold illegal drugs'
3. Victimization-'any abuse', 'missed school due to fear', 'victimization at school'
4. Other high-risk behaviors-'ever had sex', suicidal ideation, physical fighting

Table 1. Risk Factors for Weapon Carrying.

Demographics	
Age (less than 14, 15, 16, 17 and older)	
Sex	
Racial/ethnic groups	
Caucasian	
African American	
Hispanic	
Asian	
American Indian	
Socioeconomic Status (high or low)	
Substance Abuse	**Referent Period**
Alcohol use	Within the past 30 days
Cocaine use	Within the past 30 days
Smoking cigarettes	Within the past 30 days
Been offered or sold illegal drugs at school	Within the past 12 months
Marijuana use	Within the past 30 days
Victimization	
Missed school due to fear	Within the past 30 days
Any abuse (physical or sexual abuse)	Ever in the past
Victimization at school (harassed, threatened, property stolen/ vandalized)	Within the past 12 months
Other High-risk behaviors	
Physical fighting (once, two or more times)	Within the past 12 months
Suicidal ideation	Within the past 12 months
Ever had sex	Ever in the past

Data Preparation. The YRBS has been administered in Oregon public schools in odd years beginning in 1991. This secondary analysis will use only 1997 data due to the absence of the weapon-carrying items on the 1991 & 1993 YRBS surveys and the absence of the SES variable on the 1995 file. The 1997 YRBS data was obtained from the Oregon Health Division, Center for Health Statistics. The YRBS is a public use data set, the only identifiers present are those of individual schools, which were removed by OHD staff prior to receipt of the data file.

The total number of respondents (32,378) was considerable, however only 20% of the sample reported the outcome of interest (weapon-carrying) (see Table 2.). The sample size limited both modeling and testing options of this secondary analysis. Initially modeling was conducted on only half of the existing data set, in an effort to reserve the other half for validation of the model. However, due to low numbers in several minority groups, estimates were unstable and many models were unreliable. As a result, all available data was utilized for modeling purposes. While testing the predictive ability of the models created in this analysis was desirable, it was felt that model creation would be the best use of the available data. Testing the validity of the models could be performed using the 1999 YRBS data, which is currently being collected.

Table 2. Frequency and proportion of Weapon Carrying by Race and Gender.

	Weapon Carrying					
	Female		Male		Total	
Racial/Ethnic Group	No.	(%)	No.	(%)	No.	(%)
Caucasian	1028	7.7%	3752	29.4%	4780	18.3%
African American	39	13.0%	79	27.7%	118	20.2%
Hispanic or Latino	90	10.2%	257	29.2%	347	19.7%
Asian or Pacific Islander	32	6.0%	117	23.7%	149	14.6%
American Indian or AK Native	60	15.3%	184	42.2%	244	29.4%
Other	99	14.2%	234	35.6%	333	24.6%
Total	1348	8.4%	4623	29.8%	5971	18.9%

A list of variables was determined from a review of existing literature and a review of items on the YRBS questionnaire. First, the outcome variable was created, 'any weapon-carrying' included firearm and/or other weapon-carrying, and the outcome was converted from a categorical to a dichotomous variable. The answer choices originally ranged from '0 days' to '6 or more days', and was transformed into either '0 days' or '1 or more days'. Then the set of potential risk factors was screened by examining individual correlations with weapon-carrying as measured by Gamma (a test for nominal variable correlation). For comparisons involving race the measure used was uncertainty coefficient. The interpretation of both the Gamma and the uncertainty coefficient are equivalent to Pearson's correlation coefficient for interval level data. Values range between -1 and +1, with values closer to 1 being highly correlated with the outcome. The screening continued with an examination of the correlation matrix between all risk factors. There were several pairs of risk factors that were highly correlated (≥0.8), a choice was made to retain only one variable from each pair (e.g. suicide attempt was dropped and suicidal ideation was retained). Several variables

required recoding from 1=yes and 2= no to 1=no and 2=yes, this was done for consistency in referent group among other variables.

The next step involved an examination of the crosstabulation for adequate numbers in each cell. While cell size was often adequate among the Caucasian groups, minority groups were considerably smaller and as a result all variables that were previously categorical were recoded into dichotomous variables with the exception of fighting (3 categories), and age (4 categories). To further reduce the number of risk factors entered into each model several highly correlated variables were combined, for example: the variable 'any abuse' was a combination of two variables: sexual abuse and physical abuse. The variable 'victimization at school' was also a combination of other variables: having been harassed, threatened, or property stolen or vandalized at school (see Table 1.).

Statistical Analyses.

Univariate logistic models were fit and magnitude of the odds ratios were compared (see Table 3). The majority of risk factors were significant at the univariate level with the exception of Hispanic and African American race and age groups '16 years' and '17 and older'. These variables were used for modeling though they were not statistically significant in the univariate analysis as the aim of this analysis was to examine the differences between races with regard to weapon-carrying.

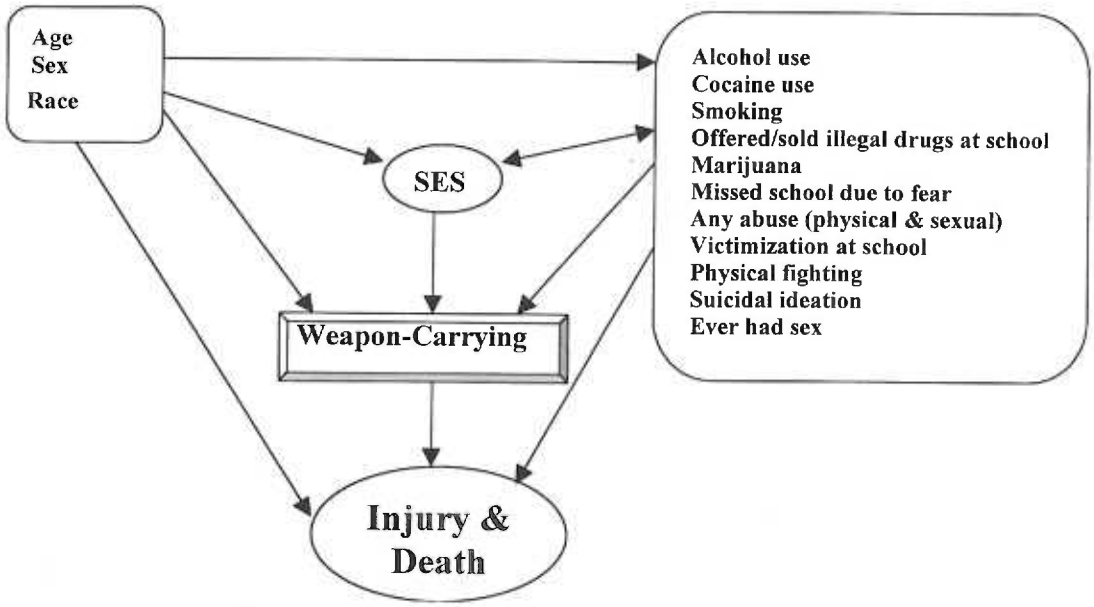
Table 3. Univariate Summary of risk factors related to weapon carrying.

Variable	SE (B)	OR (expB)	95% CI	Significant
Age				
14 and younger*	.0000	1.00		
15	.0498	1.09	0.99-1.21	.0741
16	.0503	1.05	0.96-1.17	.2784
17 and older	.0497	0.92	0.84-1.02	.1056
Race				
Caucasian*	.0000	1.00		
African American	.1043	1.13	0.92-1.38	.2459
Hispanic	.0620	1.09	0.96-1.23	.1546
Asian	.0901	0.76	0.64-.91	.0023
American Indian	.0779	1.86	1.59-2.17	.0000
SES				
Low 1-125*	.0000	1.00		
High 126+	.0286	0.82	0.77-0.86	<.0001
Sex				
Female*	.0000	1.00		
Male	.0332	4.63	4.34-4.94	<.0001
Any abuse				
No*	.0000	1.00		
Yes	.0325	2.00	1.88-2.13	<.0001
Alcohol use				
No*	.0000	1.00		
Yes	.0305	2.44	2.30-2.60	<.0001
Cocaine use				
No*	.0000	1.00		
Yes	.0726	5.06	4.39-5.84	<.0001
Smoking				
No*	.0000	1.00		
Yes	.0332	2.44	2.29-2.60	<.0001
Offered/Sold drugs				
No*	.0000	1.00		
Yes	.0294	2.52	2.38-2.67	<.0001
Ever had sex				
No*	.0000	1.00		
Yes	.0299	2.16	2.04-2.29	<.0001
Physical fighting				
None*	.0000	1.00		
Once	.0409	3.13	2.89-3.39	<.0001
2 or more	.0355	6.76	6.30-7.25	<.0001
Marijuana Use				
No*	.0000	1.00		
Yes	.0311	2.49	2.34-2.65	<.0001
Suicidal ideation				
No*	.0000	1.00		
Yes	.0327	1.82	1.71-1.94	<.0001
Miss school - fear				
No*	.0000	1.00		
Yes	.0648	3.56	3.13-4.04	<.0001
Victimization				
No*	.0000	1.00		
Yes	.0327	1.94	1.82-2.07	<.0001

* Indicates referent group.

Variables were entered according to the theoretical causal model (see Figure 2.) and multivariate modeling was undertaken in steps. An examination of the demographic variables: age, race, SES, and gender led the modeling process. Interaction terms were also explored within this group of variables; the only interaction of significance was the interaction between race and gender (see Table 1.). This interaction was significant for all racial groups with the exception of African Americans, which was also the smallest group. As a result the decision was made to create predictive models not only for each racial group but also for each gender within racial groups where the interaction was significant.

Figure 2. Theoretical causal model for weapon carrying among youth.



Methods for all modeling procedures

Race and gender specific models were then created by entering SES into the model during the first step and then adding the remaining risk factors using a forward selection process. At each step of the forward selection modeling process variables are entered only if they meet the log-likelihood criteria ($p<0.05$). This selection process also gives the model

results after each variable is entered, providing an opportunity to assess the effect of each additional variable upon the previous model. The model was then constructed using a backward elimination method, also forcing SES into the model. The backward elimination process begins with all possible variables in the model and then tests for removal using log-likelihood criteria ($p<0.10$). Hosmer and Lemeshow (1989) advise that variables with a p-value <0.25 should be considered for entrance into the multivariate model and variables with a p-value of <0.30 as a rule for removal. Using these larger levels for variable screening would have allowed variables of questionable significance into the model. Therefore, this analysis maintained a p-value of 0.05 for entrance into the multivariate model and a p-value of 0.10 for removal using backward elimination. These more restrictive criteria were chosen to assure that only highly significant variables entered into the models.

The resulting models from both forward and backward selection procedures were then compared. Several models were identical and a few models varied according to selection process. In the case of differing models, the model was chosen by comparing the log-likelihood difference, to a chi square distribution with the appropriate degrees of freedom. The model that statistically accounted for more variance was chosen. In the event that there was no statistical difference between the models, the forward selection model was chosen. The forward selection models, in general, contained fewer variables and therefore lent themselves more easily to interpretation.

Results Univariate

Table 3. provides a summary of the univariate results including confidence intervals and significance levels. At the univariate level, male gender (OR 4.63), cocaine use (OR 5.06) and fighting two or more times (OR 6.76) represented the largest magnitude of risk for weapon-carrying. American Indian students (OR 1.86) were at highest risk, followed by African American (OR 1.13), Hispanic students (OR 1.09) while Asian students were least likely to report weapon-carrying (OR 0.76) as compared to the referent group: Caucasian students.

Table 4. provides a summary of the multiple logistic modeling results. Models were presented by race in the following order:

1. Caucasian
2. African American
3. Hispanic
4. Asian
5. American Indian

Within each race-specific model, differences with regard to gender were also presented. Models were presented side by side for ease of comparison of risk factors. The variable selection procedure of each final predictive model shown was denoted with a subscript '$_B$' indicating backward elimination, or a subscript '$_F$' indicating forward selection. The absence of a subscript notation indicates that the forward and backward selection models were identical.

Results Multivariate

The following results were presented in the same order as shown in Table 4. and as listed above.

Table 4. Odds Ratios and 95% Confidence Intervals from Logistic Regression Analyses Predicting Weapon Carrying by race and gender & risk factor.

Risk Factor (referent period)	**Caucasian Female** $_F$	**Caucasian Male** $_B$	**African American**	**Hispanic Female** $_B$	**Hispanic Male** $_F$	**Asian Female**	**Asian Male** $_F$	**Am Indian Female**	**Am Indian Male** $_B$
Age 14 and younger								1.00	
15 years old								0.50 (.11-2.16)	
16 years old								1.42 (.33-6.06)	
17 years and older								0.22* (.04-1.11)	
Socioeconomic Status									
Low (1-125)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
High (126+)	0.90 (.74-1.09)	0.82** (.73-.93)	0.57 (.24-1.35)	0.59 (.24-1.42)	1.75* (.98-3.12)	0.87 (.21-3.33)	1.03 (.49-2.16)	2.23 (.80-6.24)	0.98 (.48-2.01)
Sex									
Female	n/a	n/a	1.00	n/a	n/a	n/a	n/a	n/a	n/a
Male	n/a	n/a	3.44* (1.59-7.48)	n/a	n/a	n/a	n/a	n/a	n/a
Alcohol Use (30 days)									
No	1.00	1.00	1.00	1.00	1.00	1.00			
Yes	1.35* (1.07-1.68)	1.45** (1.27-1.65)	5.01* (2.26-11.1)	2.82** (1.06-7.50)	1.93* (1.03-3.49)	3.70* (.97-14.17)			
Cocaine Use (30 days)									
No	1.00	1.00			1.00		1.00		
Yes	2.14* (1.39-3.28)	2.05** (1.32-3.21)			4.84* (1.20-19.5)		4.56 (.91-22.9)		
Smoking (30 days)									
No		1.00							
Yes		1.29** (1.10-1.50)							
Offered/sold illegal drugs at school (12 mo)									
No		1.00					1.00		
Yes		1.20** (1.06-1.36)					2.18* (1.02-4.67)		
Marijuana Use (30 days)									
No	1.00								1.00
Yes	1.45* (1.14-1.85)								4.07** (1.87-8.90)

Table 4. Continued. Odds Ratios and 95% Confidence Intervals from Logistic Regression Analyses Predicting Weapon Carrying by risk factors, race and gender.

Risk Factor (referent period)	**Caucasian Female** $_F$	**Caucasian Male** $_B$	**African American**	**Hispanic Female** $_B$	**Hispanic Male** $_F$	**Asian Female**	**Asian Male** $_F$	**Am Indian Female**	**Am Indian Male** $_B$
Missed school due to fear (30d)									
No		1.00			1.00	1.00			
Yes		1.47**			5.61*	18.5♦	11.90♦		
		(.98-2.22)			(1.26-25.1)	(3.89-87.9)	(1.01-140.4)		
Any abuse (ever)									
No	1.00	1.00		1.00					
Yes	1.75*	1.50**		0.464					
	(1.42-2.16)	(1.31-1.71)		(.18-1.17)					
Victimization at school (12mo)									
No	1.00	1.00		1.00					1.00
Yes	1.48*	1.32**		2.81**					1.90
	(1.21-1.81)	(1.17-1.49)		(1.22-6.43)					(.92-3.91)
Ever had sex (ever)									
No		1.00		1.00	1.00				
Yes		1.14**		2.34**	1.79*				
		(.99-1.30)		(1.0-5.51)	(.99-3.21)				
Suicidal ideation (12mo)									
No	1.00	1.00		1.00	1.00			1.00	1.00
Yes	1.71*	1.22**		2.90**	2.12*			3.27*	2.56**
	(1.39-2.10)	(1.04-1.44)		(1.23-6.43)	(1.03-4.36)			(1.21-8.86)	(1.03-6.41)
Physical Fighting (1 year)									
No	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Once	2.12*	1.94**		2.25	1.69		1.67	0.86	1.05
	(1.60-2.82)	(1.66-2.26)		(.77-6.52)	(.73-3.92)		(.56-5.01)	(.09-7.53)	(.41-2.73)
Two or more times	4.89*	2.85**		6.33**	5.38*		6.14*	9.39*	3.74**
	(3.87-6.19)	(2.46-3.32)		(2.23-17.9)	(2.82-10.3)		(2.73-13.8)	(3.05-28.9)	(1.64-8.57)

* Significant at the p=<.05 level for forward entry selection models. F: Indicates the forward selection model is presented

** Significant at the p=<.10 level for backward elimination models. B: Indicates the backward elimination model is presented

♦ Usafsc was removed from the Asian female and male models because it blocked any other risk factors.

1. Caucasian Predictive Models

The resulting forward selection model for Caucasian female students contained 'any abuse', substance abuse (alcohol, cocaine and marijuana), fighting, suicidal ideation and 'victimization at school'. The only difference in the backward elimination model was the replacement of marijuana use (OR 1.45) with smoking (OR 1.39) and 'having been offered/sold illegal drugs at school' (OR 1.25). Since the two models were not significantly different with regard to model fit (log-likelihood value), therefore the forward selection model was presented. However, these results suggested that regardless of the type of substance use among Caucasian female students, the risk with regard to weapon-carrying was nearly identical.

The forward selection model for Caucasian male students contained 'any abuse', substance abuse (alcohol, cocaine, smoking, and 'having been offered/sold illegal drugs at school'), SES, 'ever had sex', fighting, suicidal ideation, 'missed school due to fear' and 'victimization at school'. The backward selection model included two additional variables ('ever had sex' & 'having missed school due to fear') that did not enter into the forward selection model. However, after assessing the fit of the model, the backward elimination model was statistically better. All other risk factors included in the two models were identical and of very similar magnitude in odds ratio. Models for both Caucasian male and female students contained a greater number of variables as compared to the minority models. This was due in part to the smaller size of minority groups, which resulted in less variability.

2. African American Predictive Model

The race by gender interaction was not significant for African American students, indicating that gender specific models were not necessary. This may have been due to the small size of this minority group in the sample or to the similarities between female and male African American students with regard to weapon-carrying. The resulting model for this racial group contained, male gender (OR 3.44) and alcohol use (OR 5.01). The model was essentially the same regardless of selection procedure, there were only minor changes in the magnitude of odds ratios.

3. Hispanic Predictive Models

The resulting model for Hispanic female students included 'any abuse', alcohol use, 'ever had sex', fighting, suicidal ideation, and 'victimization at school'. The forward selection model did not include two variables; 'ever had sex' and 'any abuse', although the magnitude of the remaining variables remained stable. After assessing for model fit using the log-likelihood values, there was no difference between the two models. The backward model was chosen because the variable: 'ever had sex', remained as a significant risk factor that was not present in the forward selection model.

The model for Hispanic male students contained socioeconomic status (OR 1.75), substance abuse (alcohol & cocaine), 'ever had sex', fighting, suicidal ideation, and 'missed school due to fear'. The model did not change with variable selection method. Interestingly, the odds ratio for SES for Hispanic males was 1.75 (p-value <0.05), which indicated that high SES for Hispanic males represented an increased risk for weapon-carrying. This was the only group for which this was true.

4. Asian Predictive Models

The resulting model for Asian female students included alcohol use and 'having missed school due to fear'. The model was identical regardless of the selection procedure used. The variable 'having missed school due to fear' (OR 18.5) overshadowed any other risk factors and was removed from the variable list. This model was based on only 32 Asian female students who reported weapon carrying and may be somewhat inflated due to limited numbers, however the male model found similar results and was based on 117 students. A closer examination of the number this estimate was based on revealed that only eleven students had reported 'having missed school due to fear', five of which also reported weapon-carrying. After the variable was removed and the regression ran again alcohol entered as the only other significant risk factor (OR 3.70). The number underlying this estimate was also examined; sixteen female students reported both weapon-carrying and alcohol use and eleven students reporting weapon-carrying without alcohol use. The resulting model was identical for both forward and backward selection procedures.

A finding unique to Asian youth was the magnitude of the risk that 'having missed school due to fear' represented in both the female (OR 18.5) and male (OR 11.9) predictive models. This finding may be partially explained by the small numbers which underlie these estimated, however, this risk factor entered into only two other models at a much lower magnitude: African American youth (OR 5.61) and Caucasian Males (OR 1.47). The effect of this risk factor was so large that no other factors were able to enter the model, to explore other factors it was necessary to remove 'having missed school due to fear' from both Asian models.

The model for Asian male students contained cocaine, 'having been offered/sold illegal drugs at school', fighting and 'having missed school due to fear'. Again, it was necessary to remove 'having missed school due to fear' (OR 11.9) from the variable list in order to examine any other risk factors. An examination of the numbers underlying the estimate revealed that only 5 male students had reported 'having missed school due to fear'. The forward and backward selection models for this group were somewhat different. The backward elimination model included two variables ('any abuse' and 'ever had sex') that were not in the forward selection model. However, the predictive ability of the models was not significantly different and the forward selection model was chosen.

5. American Indian Predictive Models

The model for American Indian female students contained age, fighting, and suicidal ideation as risk factors for weapon-carrying. Both the forward and backward regression models were identical. The model for American Indian Male students included fighting, marijuana use, and suicidal ideation as risk factors. The forward selection model contained any 'any abuse' (OR 2.37) as a risk factor while the backward elimination model contained suicidal ideation (OR 2.56). However, an examination of these variables revealed that among American Indian Males, 'any abuse' was highly correlated with suicidal ideation (Gamma 0.604). All other risk factors included in the two models were identical and of very similar magnitude in odds ratio.

Discussion

The prevalence of weapon-carrying among high school students in Oregon in 1997 (18.9%), was nearly identical to the national 1997 YRBS (18.3%). In Oregon less than one in ten (8.4%) female students reported carrying a weapon, while nearly one in three male students reported this behavior (29.8%), these findings were also consistent with the National 1997 YRBS. A significant body of literature has reported an association between weapon-carrying, substance abuse, and other high-risk behaviors (Dahlberg 1998, Simon 1998, Webster 1993, Kulig 1998, Durant 1997, Sheley 1995, Mcnabb 1996). However, the nature of the relationship between weapon-carrying and these multiple interrelated risk factors is still not well understood. The current analysis highlighted some risk factors that increase the risk among some racial groups and while this information will help direct prevention efforts there must also be an examination of potential protective factors.

For example, weapon-carrying among Asian youth (15%) was somewhat less common than among of Caucasian youth (18%) when controlling for socioeconomic status. Asian students were less likely to report substance abuse and other high-risk behaviors, which was consistent with Lorenzo (1995) who found Asian youth less likely to report delinquent behaviors. Asian youth were also more likely to live in a household with both parents, or live in an extended family than Caucasian youth (Lorenzo, 1995) and these factors are generally thought to provide some 'protective effect'. However, despite these potentially protective factors, Asian American adolescents were also more likely be withdrawn, depressed, and anxious, (Lorenzo, 1995) yet the rate with which Asian youth carry weapons has consistently remained lower than Caucasian youth.

Recent research suggests this gap in risk behavior may be closing, a California study found that Asian and Caucasian adolescents reported carrying a handguns at nearly the same

rate, 11.7% and 11.5% respectively (Simon, 1998). In the current analysis, Asian students who reported having missed school due to fear were much more likely to have also carried a weapon. This risk factor may reflect the importance that many Asian cultures place upon education and the extent to which Asian youth are willing to go in order to feel safe at school. The magnitude of the risk represented by this factor was unique to Asian youth, however the interpretation is problematic due to the small numbers underlying the estimates. Small numbers in minority groups is a common problem and may help explain the limited information regarding high-risk behaviors among minority youth groups. A better understanding of weapon-carrying and the associated risk factors of particular influence among Asian youth will help to maximize the effectiveness of future prevention efforts.

Socioeconomic status is an important factor to consider with regard to weapon-carrying as it has been shown to confound the association between weapon-carrying and race (Simon 1998, Centerwall 1984). Confounding by socioeconomic status was not assessed in the current analysis; instead socioeconomic status was forced into each predictive model. Socioeconomic status was only a significant predictor of weapon-carrying for among groups of students: Caucasian and Hispanic males. For Caucasian males, high socioeconomic status was significantly protective (OR 0.82) while for Hispanic males the opposite was true, high socioeconomic status represented a significant increase in risk (OR 1.75). The increased risk represented by high SES for Hispanic youth was unexpected and may be partially explained by the composite nature of the SES measure. The SES measure was based on school characteristics may not have provided an accurate measure when applied to individual students, especially in large schools with both a racially and economically diverse student body. Conversely, the negative association observed among Caucasian males (OR 0.82) was

similar to findings by Simon (1998) who reported an odds ratio of 0.67 for handgun carrying among students in the highest income tertile. This observed association indicates a greater need for weapon-carrying and violence prevention among groups of lower socioeconomic status. However, as the recent events in Littleton, Colorado and Springfield, Oregon a year ago, have recently illustrated, higher socioeconomic status does not provide immunity to weapon-related violence among high school students (Denver Post 1999, The Oregonian 1998).

Students who reported substance abuse were also significantly more likely to report carrying a weapon, this finding was consistent with previous research involving adolescents and high risk behaviors (DuRant 1997, Simon 1998, Kulig 1998, McNabb 1996). Substance abuse was so strongly associated with weapon-carrying in the current analysis that several models retained more than one measure of substance abuse. Alcohol use, the most common substance abuse predictor of weapon-carrying among students ranged from an odds ratio of 1.35 for Caucasian females to 5.01 for African American students. These results were similar to those of DuRant (1997) who reported alcohol use as a significant predictor of weapon-carrying (OR 1.79 all races) and Simon (1998) who reported odds ratios of 1.86 for boys and 3.68 for girls. This differential effect of alcohol use by gender was reflected in the current analysis among Hispanic students. Cocaine use as a risk factor for weapon-carrying was of similar magnitude for Caucasian female and male students with odds ratios just above 2.0 however, the effect of this risk factor was more than double for Hispanic and Asian male students. Smoking entered only the model for Caucasian male students, and the magnitude of risk was comparable to results from DuRant (1997) (OR 1.15). Other research has also reported smoking as a significant risk factor for weapon-carrying, with odds ratios ranging

from 2.22 for boys to 5.12 for girls (Simon, 1998). The increased risk that this factor represented for girls was not supported by the current analysis. 'Having been offered/sold illegal drugs at school' was only a risk factor for Caucasian and Asian Males. Although the magnitude of risk was higher for Asian males, these results were consistent with previous work by DuRant (1997). Marijuana use was a mild risk factor for weapon-carrying among Caucasian females and represented a much greater risk among American Indian males (OR 4.07). A study by Kulig (1998) also reported marijuana use as a significant predictor of weapon-carrying, with odds ratios of 6.5 and 3.2 for two different high schools. However, a study by Simon (1998) reported odds ratios for lifetime marijuana use of very similar magnitude (OR 2.3 to 3.6) to those of the current analysis.

Substance abuse was a significant predictor of weapon-carrying among nearly all groups of youth indicating that risky behavior among youth does not happen in isolation and are often in combination with other high-risk behaviors such as physical fighting and suicidal ideation. Substance abuse prevention is often addressed out of the context in which youth are exposed to and choose to abuse these substances. Research has shown that many of these high-risk behaviors are interrelated and must be addressed within the proper context (Dahlberg, 1998).

Overall, students who reported physical fighting were at highest risk for weapon-carrying with odds ratios ranging from 2.8 for Caucasian males who fought two or more times to more than 9.0 for American Indian females. These results are consistent with the previous findings of several researchers (DuRant 1997, Lowry 1998, Simon 1999, Kulig 1998) who reported odds ratios ranging from 1.56 to 3.3 for physical fighting. The current analysis frequently reported greater odds ratios, for 'having fought two or more times', often this was the only

level of fighting that was significant. This was due to few numbers of 'only having fought once' as compared to a much larger number of students having fought either 'zero' or 'two or more times'. Previous research utilized physical fighting as a dichotomous (no/yes) variable in the analysis. Physical fighting also represented a significantly greater risk for weapon-carrying among female students, notably among American Indian students, female OR 9.39 compared to male OR 3.74. This increased risk for female students was very similar to the findings by Webster (1993) who found the odds ratio for physical fighting among African American girls was double that for African American boys. In this analysis, having been in a physical fight was not a significant predictor of weapon-carrying among African American students; this was most likely due to the low number of students in this racial group. The magnitude of risk for weapon-carrying represented by physical fighting in combination with the proportion of students engaging in this behavior (29%) makes prevention of physical fighting a focal point for violence and weapon-carrying prevention.

Among Caucasian male students 'having missed school due to fear' was a mild risk factor (OR 1.47) yet represented a considerably higher risk among Hispanic male (OR 5.61) and both groups of Asian students (OR 18.5, 11.90). The increased risk represented by 'having missed school due to fear' was so great among Asian students that it prevented any other risk factors from entering the model, regardless of selection procedure. Part of this increased risk may be explained by the small numbers (female n=32, Male n=117) on which these estimates were based. However, these estimates must be interpreted with caution as the confidence limits surrounding these estimates were wide; the OR for Asian female students was 18.5 (95% CI 3.89-87.9) and the OR for Asian male students was 11.90 (95% CI 1.01-140.4). The variable 'having missed school due to fear' was also a significant risk factor for

weapon-carrying (OR 1.31) in a study by DuRant (1997) however the magnitude of risk, based on all students, was more reflective of the odds ratio found in this analysis for Caucasian male students.

Victimization at school (threatened, harassed, or stolen/vandalized goods at school) was a significant risk factor for Caucasian students, Hispanic female students and for American Indian males, the risk was much higher for Hispanic female students (OR 2.81). The variable 'having been threatened at school' was also a significant predictor of weapon-carrying, among all students, in a study by DuRant (1997); the magnitude of risk reflected more closely the odds ratio found for Caucasian youth in the current analysis. When asked why they carry weapons, adolescents report self-protection as the number one reason. It is interesting then, that the risk represented victimization was not of higher magnitude. One would expect those students who have experienced some form of victimization to be more likely to carry weapons. The question regarding physical fighting may obscure this difference between defensive and aggressive behavior as the question only asked about participation in a physical fight.

Reporting any 'any abuse' was a significant risk factor for only the two groups of Caucasian students, and represented a mild to moderate risk with odds ratios of 1.50 for male and 1.75 female students. This finding was not supported in the literature, as neither a history of sexual abuse nor physical abuse has been assessed as risk factors for weapon-carrying.

Being sexually experienced was a significant risk factor for Caucasian male students and both groups of Hispanic students, although the risk for Hispanic females (OR 2.34) was considerably higher than either group of males. These results were consistent with Kulig

(1998) who reported an odds ratio of 3.37 for sexual experience among primarily African American and Hispanic students.

Suicidal ideation was a significant risk factor for weapon-carrying among Caucasian, American Indian, and Hispanic students, although the magnitude of risk for American Indian students was more than double that of Caucasian students. These results were very similar to a study by Kulig (1998) who reported an odds ratio of 2.24 (for a group of primarily African American and Hispanic students) who reported suicidal ideation. In the current analysis, suicidal ideation did not enter into either Asian model or the model for African American students, which may have been due to the low number students or to cultural differences with regard to suicide.

The risk that suicidal ideation represented with regard to weapon-carrying is of particular concern, especially among American Indian youth. Nearly one third, 28% of American Indian high school students reported suicidal ideation, compared to 22% of Caucasian and Hispanic students (OHD, 1998). American Indian youth were also more likely (16%) to have attempted suicide when compared to Hispanic (12%), or African American (10%) students and were twice as likely as Caucasian (8%) students to attempt suicide (OHD, 1998). More American Indian students, 6%, received medical treatment for a suicide attempt than Hispanic (4%), African American (4%) or Caucasian (2%) students (OHD, 1998).

In the current analysis, American Indian youth were more likely to have carried a weapon (29.4%) than African American (20.2%), Hispanic (19.7%) of Caucasian (18.3%) students. The prevalence of weapon-carrying, combined with the high risk for suicide, creates a deadly combination for high school students of all races, especially for American Indian youth. It is

apparent from this analysis that prevention of weapon-carrying among American Indian youth must stress the connection to youth suicide specifically.

Limitations

There are several limitations to this secondary analysis that must be considered when interpreting the findings. First there are limitations of the survey tool: The YRBS is a crossectional survey of self-reported data and contains no direct measure of behavior. No temporal association is established between variables. The YRBS has not been updated since it was originally developed. The YRBS has not been validated for use with minority populations. Exposure to environmental crime and violence outside of school was not assessed. Second, there are limitations of the sampling procedure for the survey: The sample was composed of 100 volunteer schools in 1997, which represented more than 20% of the public high school enrollment for 1997. Not all types of high school students were represented, only Oregon Public high schools were invited to participate in the survey. Students who attend school irregularly were more likely to have been underrepresented, as were those students who were suspended, expelled or dropped out of school.

Measurement may be an issue with regard to socioeconomic status as the variable was a measure of SES based on the school, and was not an individual measurement of each student. Due to the environmental nature of the SES variable, any differences between individual students may have been obscured. The SES measure was a composite index of several factors: highest education of either parent, percent eligible for reduced price or free school lunches, student attendance rate, and student mobility rate. There are also limitations regarding the power of this secondary analysis: only about 20% of the 32,378 thousand students reported the outcome of interest (weapon-carrying). There were not enough numbers within minority groups to both build models for weapon-carrying and to test the predictive ability of the models. Small numbers of students in minority groups limited variability within groups, and resulted in models, with fewer risk factors.

Conclusions

Youth violence is a complex, public health problem with serious consequences for Oregon and the nation as a whole. Adolescents frequently respond to perceived threat by carrying a weapon, which puts them at increased of injury and death. Substance abuse and physical fighting were both strong risk factors for weapon-carrying among high school students in general. However, there were risk factors that were of particular risk for individual racial groups. For example suicidal ideation posed a significant risk for weapon-carrying among American Indian youth and having missed school due to fear was a great risk among Asian youth. There were a number of diverse risk factors significantly associated with weapon-carrying among youth, indicating that a comprehensive violence prevention program for youth is necessary.

Many programs targeting teens provide education regarding one particular issue, such as S.T.A.R.S., an abstinence program or D.A.R.E., a substance abuse education program. These programs and others like them address individual risk factors out of context and do not address the interrelated nature of many high-risk behaviors. To design an effective prevention program, we must know what effect existing programs are having on youth behavior. Evaluation of current programs would allow prevention specialists to choose components from these individual programs to design a more comprehensive and supportive intervention for youth.

A different approach will be necessary for primary prevention of youth violence, although it will also require a comprehensive plan addressing many risk factors. Early intervention programs ideally provide the safe and supportive environment that children need during early development. Early intervention programs often contain several components

including support for parents and promotion of early success in the school environment. In addition to supporting family development, a focus on safety in the home, the community and at school is necessary.

Finally, intervention programs tailored to address the needs of individual populations may be more effective than a generic model. While it is often most cost-effective to create one intervention, flexibility and culturally sensitive interventions may be an important part of a successful violence prevention program. While this analysis described areas of particular risk for individual populations, we do not know enough about the type of interventions needed to address these problems. What is a 'culturally sensitive' intervention and how will prevention specialists design a school-based or community-based program to meet the needs of a diverse population? These are only a few of the questions that must be addressed in the design of future violence prevention programs.

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APPENDIX A:

FREQUENCIES FROM THE 1997 YOUTH RISK BEHAVIOR SURVEY (YRBS)

1997 Oregon
Youth Risk Behavior Survey

HIGH SCHOOL QUESTIONNAIRE

TOTAL SAMPLE = 32,378

		n	%
1.	**How old are you?**		
a.	12 years old or younger	6	0.0
b.	13 years old	360	0.1
c.	14 years old	3,669	11.5
d.	15 years old	9,265	29.0
e.	16 years old	8,850	27.5
f.	17 years old	7,189	22.2
g.	18 years old or older	3,29	59.7
	missing = 68		
2.	**What is your sex?**		
a.	Female	16,418	50.5
b.	Male	15,960	9.5
	missing = 0		
3.	**In what grade are you?**		
a.	9th grade	9,716	29.6
b.	10th grade	8,933	28.3
c.	11th grade	7,413	22.7
d.	12th grade	6,316	19.5
e.	Ungraded or other	NA	0.0
	missing = 0		
4.	**How do you describe yourself?**		
a.	White - not Hispanic	26,342	83.8
b.	Black - not Hispanic	603	1.5
c.	Hispanic or Latino	1,791	4.8
d.	Asian or Pacific Islander	1,042	3.4
e.	American Indian or Alaskan Native	848	2.3
f.	Other	1,379	4.3
	missing = 373		

The next questions ask about safety and violence.

5.	**How often do you wear a seat belt when riding in a car driven by someone else?**		
a.	Never	730	2.1
b.	Rarely	1,634	4.6
c.	Sometimes	3,084	9.0
d.	Most of the time	10,278	31.2
e.	Always	16,531	53.2
	missing = 121		
6.	**During the past 12 months, how many times did you ride a motorcycle?**		
a.	0 times	23,160	73.6
b.	1 to 10 times	5,599	17.1
c.	11 to 20 times	1,158	3.5
d.	21 to 39 times	571	1.8
e.	40 or more times	1,419	4.0
	missing = 471		
7.	**<u>When you rode a motorcycle</u> during the past 12 months, how often did you wear a helmet?**		
a.	I did not ride a motorcycle during the past 12 months	22,857	73.3
b.	Never wore a helmet	1,887	5.5
c.	Rarely wore a helmet	712	2.1
d.	Sometimes wore a helmet	638	1.8
e.	Most of the time wore a helmet	1,301	3.9
f.	Always wore a helmet	4,216	13.4
	missing = 767		
8.	**During the past 12 months, how many times did you ride a bicycle?**		
a.	0 times	7,134	21.5
b.	1 to 10 times	11,899	37.5
c.	11 to 20 times	4,181	13.5
d.	21 to 39 times	2,535	8.4
e.	40 or more times	5,838	19.1
	missing = 791		
9.	**<u>When you rode a bicycle</u> during the past 12 months, how often did you wear a helmet?**		
a.	I did not ride a bicycle during the past 12 months	7,020	21.3
b.	Never wore a helmet	13,389	40.6
c.	Rarely wore a helmet	2,719	8.7
d.	Sometimes wore a helmet	2,081	7.0
e.	Most of the time wore a helmet	2,721	9.5
f.	Always wore a helmet	3,551	13.0
	missing = 897		

10. During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been drinking alcohol?

a.	0 times	22,383	70.0
b.	1 time	3,285	10.2
c.	2 or 3 times	3,321	10.2
d.	4 or 5 times	884	2.7
e.	6 or more times	1,313	3.9
f.	Not sure	1,042	3.0

missing = 150

11. During the past 30 days, how many times did *you* drive a car or other vehicle when you had been drinking alcohol?

a.	0 times	28,383	89.0
b.	1 time	1,706	5.3
c.	2 or 3 times	1,166	3.6
d.	4 or 5 times	263	0.8
e.	6 or more times	421	1.3

missing = 439

12. During the past 30 days, on how many days did you carry a gun as a weapon?

a.	0 days	30,253	94.4
b.	1 day	525	1.6
c.	2 or 3 days	466	1.4
d.	4 or 5 days	190	0.5
e.	6 or more days	784	2.2

missing = 160

13. During the past 30 days, on how many days did you carry a gun as a weapon on school property?

a.	0 days	31,602	98.3
b.	1 day	180	0.5
c.	2 or 3 days	121	0.3
d.	4 or 5 days	37	0.1
e.	6 or more days	269	0.8

missing = 169

14. During the past 30 days, on how many days did you carry a weapon (other than a gun) such as a knife or a club?

a.	0 days	26,447	82.6
b.	1 day	938	3.0
c.	2 or 3 days	1,125	3.5
d.	4 or 5 days	427	1.4
e.	6 or more days	3,187	9.5

missing = 254

15. During the past 30 days, on how many days did you carry a weapon (other than a gun) such as a knife or club on school property?

a.	0 days	28,486	89.0
b.	1 day	588	1.9
c.	2 or 3 days	620	2.0
d.	4 or 5 days	247	0.7
e.	6 or more days	2,162	6.4

missing = 275

16. During the past 30 days, how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?

a.	0 days	31,240	96.8
b.	1 day	515	1.6
c.	2 or 3 days	292	0.9
d.	4 or 5 days	79	0.2
e.	6 or more days	201	0.6

missing = 51

17. During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?

a.	0 times	30,140	93.2
b.	1 time	1,056	3.3
c.	2 or 3 times	584	1.8
d.	4 or 5 times	173	0.6
e.	6 or 7 times	64	0.2
f.	8 or 9 times	46	0.2
g.	10 or 11 times	26	0.1
h.	12 or more times	233	0.7

missing = 56

18. During the past 12 months, how many times has someone stolen or deliberately damaged your property such as your car, clothing, or books on school property?

a.	0 times	21,780	67.3
b.	1 time	5,174	16.3
c.	2 or 3 times	3,588	11.1
d.	4 or 5 times	832	2.6
e.	6 or 7 times	305	0.9
f.	8 or 9 times	125	0.4
g.	10 or 11 times	60	0.2
h.	12 or more times	423	1.2

missing = 91

19. During the past 12 months, how many times were you in a physical fight?

a.	0 times	22,481	71.0
b.	1 time	4,171	12.9
c.	2 or 3 times	2,962	9.2
d.	4 or 5 times	821	2.6
e.	6 or 7 times	351	1.0
f.	8 or 9 times	221	0.7
g.	10 or 11 times	93	0.3
h.	12 or more times	716	2.2

missing = 562

20. During the past 12 months, how many times were you in a physical fight in which you were injured and had to be treated by a doctor or nurse?

a.	0 times	30,939	97.2
b.	1 time	642	2.1
c.	2 or 3 times	134	0.4
d.	4 or 5 times	35	0.1
e.	6 or more times	50	0.2

missing = 578

21. During the past 12 months, how many times were you in a physical fight on school property?

a.	0 times	27,540	86.7
b.	1 time	2,784	8.6
c.	2 or 3 times	1,072	3.2
d.	4 or 5 times	197	0.6
e.	6 or 7 times	85	0.3
f.	8 or 9 times	41	0.1
g.	10 or 11 times	19	0.1
h.	12 or more times	132	0.4
	missing = 508		

22. The last time you were in a physical fight, with whom did you fight?

a.	I have never been in a physical fight	15,235	48.3
b.	A total stranger	1,966	6.4
c.	A friend or someone I know	6,966	21.5
d.	A boyfriend, girlfriend, or date	352	1.1
e.	A parent, brother, sister, or other family member	3,487	11.0
f.	Someone not listed above	2,202	6.9
g.	More than one of the persons listed above	1,566	4.9
	missing = 604		

The next two questions ask about harassment at school. Harassment can include bullying; name calling or obscenities; offensive notes or grafitti; exclusion from groups; and unwanted attention or unwanted touching.

23. During the past 30 days have you been harassed at school by another student?

a.	Yes	9,035	30.8
b.	No	19,805	67.6
c.	Don't know	48	61.6
	missing = 3,052		

24. In the past 30 days, what were you harassed about? (If more than one reason, what was the most upsetting or offensive to you?)

a.	I was not harassed	19,804	67.8
b.	Race or national origin	576	1.9
c.	Unwanted sexual attention or comments	2,213	7.5
d.	Perceived sexual orientation (gay/lesbian/bisexual)	502	1.8
e.	Physical disability	240	0.8
f.	Other not listed	3,796	13.0
g.	Don't know why I was harrassed	2,100	7.1
	missing = 3,147		

The following three questions are about physical abuse.

25. Have you ever been physically abused (hit, kicked or struck by someone when you were not involved in a fight)?

a.	Yes	7,768	27.2
b.	No	19,951	71.9
c.	Don't know	277	1.0
	missing = 4,382		

26. If you have ever been physically abused, when was the last time this happened to you?

a.	I have never been physically abuse	19,978	71.9
b.	Within the past week	1,001	3.4
c.	Within the past month	1,090	3.8
d.	Within the past year	2,129	7.6
e.	Within the past 5 years	1,758	6.2
f.	Over 5 years ago	1,178	4.1
g.	Don't know	890	3.0
	missing = 4,354		

27. If you have ever been physically abused, have you ever talked with someone or tried to get help about this abuse?

a.	I've never been physically abused	19,969	72.0
b.	Yes	2,872	10.2
c.	No	5,146	17.9
	missing = 4,391		

The next three questions are about sexual abuse.

28. Have you ever been sexually abused (For example: touched sexually when you did not want to be, or forced to have sexual intercourse when you did not want to)?

a.	Yes	4,856	15.2
b.	No	25,300	83.6
c.	Don't know	373	1.2
	missing = 1,849		

29. If you have been sexually abused, when was the last time this happened?

a.	I have never been sexually abused	25,370	83.9
b.	Within the past week	314	1.0
c.	Within the past month	375	1.3
d.	Within the past year	1,048	3.3
e.	Within the past 5 years	1,165	3.7
f.	Over 5 years ago	1,853	5.7
g.	Don't know	368	1.2
	missing = 1,885		

30. If you have been sexually abused, have you ever talked with someone or tried to get help about this abuse?

a.	I've never been sexually abused	25,353	83.9
b.	Yes	2,740	8.6
c.	No	3,368	7.5
	missing = 1,917		

Sometimes people feel so depressed and hopeless about the future that they may consider attempting suicide, that is, taking some action to end their own life.

31. During the past 12 months, did you ever *seriously* consider attempting suicide?

a.	Yes	6,897	22.1
b.	No	24,035	77.9
	missing = 1,446		

32. During the past 12 months, how many times did you actually attempt suicide?

a.	0 times	28,170	91.5
b.	1 time	1,446	4.5
c.	2 or 3 times	900	2.7
d.	4 or 5 times	152	0.5
e.	6 or more times	262	0.8
	missing = 1,448		

33. If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?

a.	I did not attempt suicide during the past 12 months	28,073	91.5
b.	Yes	741	2.3
c.	No	1,984	6.2
	missing = 1,580		

The next fourteen questions ask about tobacco use.

34. How old were you when you smoked a whole cigarette for the first time?

a.	I have never smoked a whole cigarette	15,086	53.3
b.	8 years old or younger	1,317	4.2
c.	9 or 10 years old	1,592	5.2
d.	11 or 12 years old	3,310	11.3
e.	13 or 14 years old	4,725	16.6
f.	15 or 16 years old	2,349	8.3
g.	17 years old or more	360	1.2
	missing = 3,639		

35. During the past 30 days, on how many days did you smoke cigarettes?

a.	0 days	21,971	77.2
b.	1 or 2 days	868	3.0
c.	3 to 5 days	704	2.5
d.	6 to 9 days	608	2.1
e.	10 to 19 days	892	3.0
f.	20 to 29 days	1,190	4.1
g.	All 30 days	2,490	8.1
	missing = 3,655		

36. During the past 30 days, on the days you smoked, how many cigarettes did you smoke <u>per day</u>?

a.	I did not smoke cigarettes during the past 30 days	21,967	77.2
b.	Less than 1 cigarette per day	705	2.4
c.	1 cigarette per day	1,049	3.8
d.	2 to 5 cigarettes per day	2,930	9.9
e.	6 to 10 cigarettes per day	1,199	3.9
f.	11 to 20 cigarettes per day	695	2.3
g.	More than 20 cigarettes per day	178	0.6
	missing = 3,655		

37. During the past 30 days, where have you *most often* gotten your cigarettes? (Select only **one** response.)

a.	I did not smoke cigarettes during the past 30 days	20,183	76.3
b.	Friends gave them to me	2,106	7.8
c.	Family members gave them to me	430	1.5
d.	I gave someone else money to buy them for me	1,568	5.5
e.	I bought them from a grocery store	518	1.9
f.	I bought them from a convenience store or gas station	1,128	4.4
g.	I stole them from a store, gas station or convenience store	191	0.8
h.	I got them some other way	516	1.9
	missing = 5,738		

38. During the past 30 days, how many times have you bought cigarettes from any store or gas station?

a.	None	25,053	87.8
b.	1 time	844	2.9
c.	2 times	611	2.1
d.	3 times	440	1.5
e.	4 times	278	0.9
f.	5 times	210	0.8
g.	6 or more times	1,162	4.0
	missing = 3,780		

49. During your life, on how many days have you had at least one drink of alcohol?

a.	0 days	7,844	25.2
b.	1 or 2 days	3,597	11.4
c.	3 to 9 days	4,796	15.5
d.	10 to 19 days	3,697	11.9
e.	20 to 39 days	3,785	12.0
f.	40 to 99 days	3,543	11.3
g.	100 or more days	4,142	12.8
	missing = 974		

50. During the past 30 days, on how many days did you have at least one drink of alcohol?

a.	0 days	16,844	54.1
b.	1 or 2 days	6,259	20.3
c.	3 to 5 days	3,584	11.5
d.	6 to 9 days	2,270	7.4
e.	10 to 19 days	1,684	5.2
f.	20 to 29 days	346	1.0
g.	All 30 days	172	0.5
	missing = 1,219		

51. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?

a.	0 days	21,772	69.4
b.	1 day	3,138	10.1
c.	2 days	2,216	6.9
d.	3 to 5 days	2,339	7.3
e.	6 or 9 days	1,196	3.8
f.	10 to 19 days	650	1.9
g.	20 or more days	190	0.5
	missing = 877		

52. During the past 30 days, on how many days did you have at least one drink of alcohol <u>on school property</u>?

a.	0 days	29,714	94.4
b.	1 or 2 days	1,286	4.0
c.	3 to 5 days	280	0.9
d.	6 to 9 days	120	0.4
e.	10 to 19 days	51	0.2
f.	20 to 29 days	17	0.1
g.	All 30 days	42	0.1
	missing = 868		

The next four questions ask about the use of marijuana, which is also called grass or pot.

53. How old were you when you tried marijuana for the first time?

a.	I have never tried marijuana	17,668	56.2
b.	8 years old or younger	538	1.6
c.	9 or 10 years old	621	1.9
d.	11 or 12 years old	2,322	7.1
e.	13 or 14 years old	6,1741	9.4
f.	15 or 16 years old	3,9611	2.2
g.	17 years old or older	570	1.7
	missing = 524		

54. During your life, how many times have you used marijuana?

a.	0 times	17,809	56.5
b.	1 or 2 times	2,579	7.9
c.	3 to 9 times	2,731	.6
d.	10 to 19 times	1,688	5.3
e.	20 to 39 times	1,722	5.4
f.	40 to 99 times	1,758	5.4
g.	100 or more times	3,614	11.0
	missing = 477		

55. During the past 30 days, how many times did you use marijuana?

a.	0 times	24,488	77.5
b.	1 or 2 times	2,588	8.1
c.	3 to 9 times	1,911	5.8
d.	10 to 19 times	1,101	3.3
e.	20 to 39 times	816	2.5
f.	40 or more times	970	2.8
	missing = 504		

56. During the past 30 days, how many times did you use marijuana <u>on school property</u>?

a.	0 times	29,597	93.1
b.	1 or 2 times	1,030	3.2
c.	3 to 9 times	609	1.8
d.	10 to 19 times	336	1.0
e.	20 to 39 times	172	0.5
f.	40 or more times	152	0.4
	missing = 482		

The next nine questions ask about cocaine and other drug use.

57. How old were you when you tried any form of cocaine, including powder, crack, or freebase, for the first time?

a.	I have never tried cocaine	29,733	93.1
b.	8 years old or younger	74	0.2
c.	9 or 10 years old	54	0.2
d.	11 or 12 years old	178	0.6
e.	13 or 14 years old	798	2.5
f.	15 or 16 years old	931	2.9
g.	17 years old or older	180	0.6
	missing = 431		

58. During your life, how many times have you used any form of cocaine, including powder, crack, or freebase?

a.	0 times	29,524	97.5
b.	1 or 2 times	136	0.5
c.	3 to 9 times	200	0.6
d.	10 to 19 times	148	0.4
e.	20 to 39 times	120	0.3
f.	40 or more times	209	0.6
	missing = 2,041		

59. During the past 30 days, how many times have you used any form of cocaine, including powder, crack, or freebase?

a.	0 times	29,573	97.5
b.	1 or 2 times	441	1.4
c.	3 to 9 times	225	0.7
d.	10 to 19 times	88	0.3
e.	20 to 39 times	19	0.1
f.	40 or more times	42	0.1

missing = 1,990

61. During the past 30 days, how many times have you sniffed glue, or breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?

a.	0 times	30,555	95.3
b.	1 or 2 times	1,047	3.3
c.	3 to 9 times	273	0.8
d.	10 to 19 times	80	0.2
e.	20 to 39 times	35	0.1
f.	40 or more times	67	0.2

missing = 321

62. During your life, how many times have you taken steroid pills or shots without a doctor's prescription?

a.	0 times	29,839	98.3
b.	1 or 2 times	282	0.9
c.	3 to 9 times	121	0.4
d.	10 to 19 times	47	0.2
e.	20 to 39 times	32	0.1
f.	40 or more times	55	0.2

missing = 2,002

63. During your life, how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin?

a.	0 times	26,004	85.3
b.	1 or 2 times	1,946	6.6
c.	3 to 9 times	1,240	4.3
d.	10 to 19 times	501	1.7
e.	20 to 39 times	263	0.9
f.	40 or more times	394	1.3

missing = 2,030

64. During your life, how many times have you used a needle to inject any illegal drug into your body?

a.	0 times	30,068	99.5
b.	1 or 2 times	56	0.2
c.	3 to 9 times	27	0.1
d.	10 to 19 times	16	0.0
e.	20 to 39 times	16	0.1
f.	40 or more times	39	0.1

missing = 2,156

65. During the past 12 months, has anyone offered, sold, or given you an illegal drug <u>on school property</u>?

a.	Yes	9,937	33.1
b.	No	20,369	66.9

missing = 2,072

The next sixteen questions ask about sexual behavior.

66. How concerned are <u>you personally</u> about getting the HIV/AIDS virus?

a.	Not concerned	10,196	32.0
b.	Somewhat concerned	8,643	27.9
c.	Very concerned	4,818	15.1
d.	Extremely concerned	6,640	20.1
e.	Don't know how I feel	1,612	4.9

missing = 469

67. How concerned are <u>you personally</u> about getting a sexually transmitted disease other than AIDS?

a.	Not concerned	11,196	35.4
b.	Somewhat concerned	8,258	26.5
c.	Very concerned	5,131	16.0
d.	Extremely concerned	6,226	18.8
e.	Don't know how I feel	1,114	3.3

missing = 453

68. If a classmate, your same age and gender, asked you for your advice about whether to start having sexual intercourse, what would you probably say?

a.	Wait until you're married	10,110	32.4
b.	Wait until you are older	11,159	36.6
c.	Go ahead and do it	9,658	31.0

missing = 1,451

69. What percentage of your classmates, your same age and gender, have had sexual intercourse? Would you guess:

a.	less than 30%	6,033	19.8
b.	30%-39%	6,109	19.9
c.	40%-49%	5,337	17.2
d.	50%-59%	5,370	16.9
e.	60%-69%	4,673	14.2
f.	more than 70%	4,177	12.0

missing = 679

70. Have you ever had sexual intercourse?

a.	Yes	11,250	35.2
b.	No	19,349	64.8

missing = 1,779

71. How old were you when you had sexual intercourse for the first time?

a.	I have never had sexual intercourse	19,307	64.9
b.	11 years old or younger	841	2.5
c.	12 years old	741	2.3
d.	13 years old	1,360	4.1
e.	14 years old	2,533	7.9
f.	15 years old	2,804	9.0
g.	16 years old	1,962	6.3
h.	17 years old or older	955	3.1

missing = 1,875

83. Can you tell if people are infected with HIV (the AIDS virus) just by looking at them?

a.	Yes	923	2.9
b.	No	28,314	90.2
c.	Not sure	2,272	6.9
	missing = 869		

84. Is it safe to have unprotected sex (no condom used) with a person who has tested negative for HIV?

a.	Yes, it is safe	3,008	9.3
b.	No, not safe	25,783	82.4
c.	Not sure about safety	2,625	8.3
	missing = 962		

85. Can a person get AIDS/HIV infection from being bitten by mosquitoes or other insects?

a.	Yes	3,239	10.0
b.	No	21,283	68.4
c.	Not Sure	6,908	21.5
	missing = 948		

86. Can a person get AIDS/HIV infection from donating blood?

a.	Yes	12,694	40.5
b.	No	14,465	46.9
c.	Not sure	4,123	12.6
	missing = 1,096		

87. If you wanted them, where would you go to get condoms? (Select only **one** response.)

a.	Parent or other family member	1,563	4.8
b.	Friend	2,725	8.7
c.	Pharmacy or store	13,630	44.4
d.	Vending machine	2,545	8.4
e.	School health center	1,112	2.9
f.	County or Community Health Center	2,604	8.2
g.	Other community program or place	290	1.0
h.	Not sure; haven't really thought about it	6,677	21.6
	missing = 1,232		

88. If you thought you were exposed to the HIV/AIDS virus, where would you go to be tested?

a.	School health center	2,364	6.9
b.	County or community health center	6,816	21.6
c.	Doctor's office	12,815	41.6
d.	Red Cross	1,067	3.4
e.	Other place not listed	1,529	4.9
f.	Don't know where I would go to get tested	6,575	21.7
	missing = 1,212		

The next six questions ask about body weight.

89. How do you describe your weight?

a.	Very underweight	750	2.3
b.	Slightly underweight	4,706	15.3
c.	About the right weight	16,359	53.0
d.	Slightly overweight	8,250	26.0
e.	Very overweight	1,114	3.4
	missing = 1,199		

90. Which of the following are you trying to do about your weight?

a.	**Lose** weight	13,323	42.1
b.	**Gain** weight	5,018	16.3
c.	**Stay the same** weight	5,943	19.2
d.	I am **not trying to do anything** about my weight	6,881	22.5
	missing = 1,213		

91. During the past 30 days, did you diet to lose weight or to keep from gaining weight?

a.	Yes	8,799	27.5
b.	No	22,191	72.5
	missing = 1,388		

92. During the past 30 days, did you exercise to lose weight or to keep from gaining weight?

a.	Yes	16,957	54.4
b.	No	14,110	45.6
	missing = 1,311		

93. During the past 30 days, did you vomit or take laxatives to lose weight or to keep from gaining weight?

a.	Yes	1,697	5.3
b.	No	29,313	94.7
	missing = 1,368		

94. During the past 30 days, did you take diet pills to lose weight or to keep from gaining weight?

a.	Yes	1,743	5.3
b.	No	29,092	94.8
	missing = 1,543		

The next four questions ask about food you ate yesterday. Think about all meals and snacks you ate yesterday from the time you got up until you went to bed. Be sure to include food you ate at home, at school, at restaurants, or anywhere else.

95. Yesterday, how many times did you eat fruit or drink fruit juice?

a.	0 times	4,870	15.2
b.	1 time	6,473	20.7
c.	2 times	8,153	26.6
d.	3 times	6,216	20.5
e.	4 times	2,727	9.0
f.	5 or more times	2,501	8.0
	missing = 1,438		

96. Yesterday, how many times did you eat raw or cooked vegetables (including green salad)?

a.	0 times	8,180	25.8
b.	1 time	10,944	36.0
c.	2 times	7,191	23.6
d.	3 times	3,003	9.6
e.	4 times	824	2.7
f.	5 or more times	764	2.4
	missing = 1,472		

97. Yesterday, how many times did you eat hamburger, hot dogs, sausage, french fries or potato chips?

a.	0 times	12,647	42.3
b.	1 time	11,452	36.6
c.	2 times	4,559	14.3
d.	3 times	1,472	4.4
e.	4 times	376	1.2
f.	5 or more times	418	1.3
	missing = 1,454		

98. Yesterday, how many times did you eat cookies, doughnuts, pie, or cake?

a.	0 times	11,922	38.4
b.	1 time	11,240	36.9
c.	2 times	4,913	15.9
d.	3 times	1,666	5.3
e.	4 times	498	1.5
f.	5 or more times	605	1.9
	missing = 1,534		

The next 3 questions ask about exercise and sports.

99. On how many of the past 7 days did you exercise or participate in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activities?

a.	0 days	5,232	16.9
b.	1 day	2,732	8.9
c.	2 days	2,982	9.8
d.	3 days	3,701	12.4
e.	4 days	3,041	10.0
f.	5 days	4,730	15.0
g.	6 days	2,888	9.8
h.	7 days	5,430	17.2
	missing = 1,642		

100. In an average week when you are in school, on how many days do you go to physical education (PE) classes?

a.	0 days	16,228	54.1
b.	1 day	554	1.8
c.	2 days	1,120	3.9
d.	3 days	4,260	14.0
e.	4 days	1,464	4.9
f.	5 days	6,850	21.2
	missing = 1,902		

101. During the past 12 months, on how many sports teams run by your school or by an organization outside your school, did you play? (Do not include PE classes.)

a.	0 teams	13,527	44.7
b.	1 team	7,166	24.0
c.	2 team	4,891	16.0
d.	3 or more teams	4,795	15.3
	missing = 1,999		

The last questions ask about health care and community resources.

102. When did you last go to a doctor or nurse practitioner?

a.	During the past 12 months	23,487	77.6
b.	Within the past two years	3,401	11.0
c.	Within the past five years	962	3.1
d.	More than five years ago	441	1.4
e.	Never been to doctor	266	0.8
f.	Don't know	1,958	6.1
	missing = 1,863		

103. When did you last go to a dentist?

a.	During the past 12 months	23,222	77.8
b.	Within the past two years	4,044	12.5
c.	Within the past five years	1,547	4.8
d.	More than five years ago	880	2.7
e.	Never been to dentist	436	1.3
f.	Don't know if I've been to dentist	311	0.9
	missing = 1,938		

104. During the past 12 months, did you have any of the following health care needs? (On your answer sheet **MARK ALL THAT APPLY.**)

a.	Check-up or sports physical	12,065
b.	Injury or accident	8,310
c.	Illness	12,165
d.	Immunization	5,229
e.	Reproductive health services (exam or birth control/condoms)	2,458
f.	Pregnancy test or sexually transmitted disease test	1,586
g.	Alcohol or other drug problem	599
h.	Personal or emotional problem	1,875
i.	Other need not listed	4,231
j.	I had no health care needs	2,951

105. During the past 12 months, where did you go to meet your health care needs? (On your answer sheet **MARK ALL THAT APPLY.**)

a.	Emergency room	4,992
b.	Family doctor	16,554
c.	County or community health clinic	4,834
d.	School-based health center	2,452
e.	Other place not listed	2,732
f.	I needed care, but didn't see anyone	610
g.	I did not need care during the past 12 months	2,859

106. Does your school have a School Based Health Center?

a.	Yes	9,791	38.0
b.	No	6,831	23.9
c.	Don't know	9,663	38.2
	missing = 6,093		

107. Have you used the School Based Health Center at this school?

a.	Yes	5,949	21.8
b.	No	14,732	54.4
c.	Don't have a School Based Health Center	6,940	23.8
	missing = 4,757		

108. What's the <u>most important reason</u> for going to the School Based Health Center.

a.	**Not applicable** - Don't have a School Based Health Center	12,555	47.5
b.	**For treatment** of illness, injury, or a physical health problem	6,135	25.5
c.	**To talk** about an emotional or mental health problem	891	3.5
d.	**Ease of access** (the hours are good, it's easy to get there, it's easy to get an appointment)	1,062	4.0
e.	**Financial reasons** (I do not have to pay, I don't have insurance)	419	1.6
f.	**Privacy is protected** (confidential, feels safe, my parents don't have to know)	1,015	3.8
g.	**Good care received** (I like the staff, they understand my needs and problems)	552	2.2
h.	**Other reason** not listed	2,924	11.9
	missing = 6,825		

109. What's the <u>most important reason</u> you have <u>not</u> used the School Based Health Center.

a.	**Not applicable** - Don't have a School Based Health Center	12,257	46.3
b.	**No need for care** (I don't need to go, I have no health reasons to go)	7,694	32.1
c.	**Difficult to access** (I couldn't get an appointment, teachers wouldn't let me out of class, clinic wasn't open)	434	1.7
d.	**I go somewhere else** (I already have a doctor, I use another kind of primary care provider)	1,818	7.6
e.	**Concern for privacy** (it does not feel safe, my parents might find out, others will see me there)	344	1.3
f.	**Poor care received there** (I didn't like the staff, they don't understand my needs and problems)	108	0.5
g.	**No qualified provider** (mental health counselor, drug & alcohol counselor)	74	0.3
h.	**Other reason** not listed	2,581	10.3
	missing = 7,068		

110. When you are scared, worried, or concerned about yourself or your friends, is there a caring adult you can talk to?

a.	No, there is no adult	4,660	16.0
b.	Yes, 1 adult	5,391	18.8
c.	Yes, 2 or 3 adults	10,062	35.6
d.	Yes, 4 or more adults	8,546	29.7
	missing = 3,719		