**Program Design and Evaluation Services**

# Assessment of Factors Related to Youth Tobacco Use in Alaska

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# Table of Contents

# Introduction and Background

The purpose of this report is to review and analyze the tobacco-related data from the Alaska Youth Risk Behavior Survey (YRBS) in order to assist the Alaska Tobacco Prevention and Control Program in program planning.  Youth who engage in multiple problem behaviors generally have more serious levels of each problem and are less likely to improve; they need particular help in finding a new path for their lives.  It is important to consider the co-occurrence of problem behaviors when planning interventions, in order to target prevention appropriately and help all youth live better lives.

The YRBS survey is a school-based survey of high school students administered in cooperation with the Department of Education and Early Development. This anonymous survey examines several categories of adolescent behavior.  The Alaska YRBS survey is administered every other year to randomly selected classes of high school students in a random sample of Alaska's public schools, which are organized within 53 school districts, including 34 city and borough school districts.  However, Alaska has only achieved statewide representative samples in 1995, 2003, and 2007.

Most analyses and publications using Alaska's YRBS data, including the YRBS Results Report (http://www.hss.state.ak.us/dph/chronic/school/YRBSresults.htm) and Alaska Tobacco Facts (http://www.hss.state.ak.us/dph/chronic/tobacco/PDF/Tobacco_Facts.pdf) have presented basic analyses by gender and grade, and sometimes by race/ethnicity. For this study, PDES conducted more in-depth examinations of factors associated with selected tobacco indicators using the 2007 Alaska YRBS dataset.   We also examined associations across time, using the 2003 and 2007 data.

### Studies of Youth Tobacco Use and Related Factors

Nationally, studies show that youth who are using tobacco are also more likely to be involved in other risky behaviors.  In a series of studies conducted by Oregon Research Institute (ORI), the correlation between alcohol, marijuana and other drug use, antisocial behavior, academic failure, and tobacco use was consistent and strong enough to justify creating a single problem behavior construct.  Studies have also predicted the problem behavior construct from measures of family conflict, family involvement, inadequate parental monitoring, and association with peers who also engage in deviant behavior. Later studies replicated this finding across White, Hispanic and American Indian youth.[1]

Another study replicated the problem behavior construct with high-risk sexual behavior added, and other studies have found correlations between most of these behaviors and mood disorders, suicidal ideation, delinquency, physical aggression, and other conduct and emotional problems.[1]  The 2006 National Survey on Drug Use and Health, which interviews respondents age 12 and older, showed strong associations between nicotine dependence and alcohol use (including heavy use and/or binge drinking), and major depressive episodes, both among youth and adults.  About 36% of past month smokers between the ages of 12 and 17 met the criteria for nicotine dependence.[2]

Many studies in addition to the ORI series mentioned above have also examined the relationship between school, community and family factors and tobacco use.  In Canada, Leatherdale, McDonald, Cameron and Brown (2005) noted that high school students are at increased risk for smoking if they have smoking friends, smoking family members, or attend a school with a relatively high senior-student smoking rate.[3]

Mowery, Farelly, Haviland et al (2004) used the National Youth Tobacco Surveys conducted in 1999-2000 to examine predictors of being open to smoking (might try soon, during next year, or if a friend offered) and established smoking (smoking on 20 of the past 30 days).  Factors included exposure to tobacco industry advertising and promotions, smoking prevention education, anti-smoking advertising, parental advice not to smoke, smoking behavior of closest friends and family members, and demographics (age, gender, race/ethnicity).  Among younger adolescents (11-14 years old) exposure to smoking-prevention classes in school and parental advice not to smoke were protective of being open to smoking, but parental advice was not protective among older adolescents.  Being open to smoking was correlated with being receptive to tobacco industry promotions and having friends who smoke.  Among middle and high school students, predictors for established smoking included having bought, received and/or used a tobacco promotional item, having friends who smoke, and being exposed to smoking at home.[4]

### Alaska-specific Studies

Using 2003 Alaska YRBS data, *Tobacco in the Great Land* reported bi-variate associations between youth smoking and several risk behavior and environmental factors.  Youth smoking and frequent smoking (20 or more of the last 30 days) were associated with lower grades; not being involved in after-school activities, sports and/or volunteering; markers of depression; poor body image; other substance use; and sexual activity.  Youth smoking was also related to other risk behaviors and environmental factors, including perceived lack of adult support, easy access to tobacco, violence-related factors (e.g., carrying weapons or being in fights), DUI (driving or riding with a driver who has been drinking), physical inactivity, inadequate nutrition, being overweight or at-risk of overweight, and watching 3+ hours TV per day.[5]

Also in Alaska, Angstman, Patten, Renner et al (2007) conducted a medical records-based study of youth tobacco and other substance use.[6]  The study utilized a sample of 680 Alaska Native children and adolescents ages 6-18 who were seen for Well Child Assessments within the Yukon-Kuskokwim Health Corporation System between 2001 and 2002.  Well Child Assessments are mandated every 2 years for youth ages 7-18 and are conducted in the village clinic.  Assessments last roughly 90 minutes, are conducted by village health aides, and adolescent assessments are usually completed without the parent being present.  Even though the study under-represents adolescents ages 15-18, particularly some who may have high tobacco use rates, it included youth both in school and not in school, all of whom would be eligible for the mandated Assessments every other year.

Prevalence rates of smokeless tobacco (SLT) are particularly high among Alaska Native youth in the Y-K Delta, and because over half of women in this region use tobacco during

pregnancy, many are exposed to tobacco in utero.  In particular, use of Iqmik is normative and socially acceptable.  In this study, 3 out of 5 youth ages 15-18 reported current tobacco use, with whereas less than 1 in 10 reported current alcohol or other drug use. The low alcohol use rates were expected because of concerted community efforts to reduce sales and possession; over half of the villages in the region are "dry" communities.

Among 11-18 year olds in the Angstman study, correlates for current SLT use—and any current tobacco use—included increasing age, being female, maternal use of any tobacco during pregnancy and/or since child's birth. When adjusted for other factors, psychosocial variables and school achievement were not related to current overall tobacco use or SLT use.  Although this study also reviewed other substance use, alcohol and other drug use were not included as independent variables in the regression model.

# Methods

This study examined bi-variate associations between key tobacco indicators and other factors, but also groups these other factors into health risk domains and used multiple logistic regression to identify which risk factor measures show unique contributions to the associations with tobacco (i.e., remain statistically significant in the models).

Below we have listed the study questions, tobacco use or outcome measures, and the other health risk domains that were treated as the independent factors for the study.

## Study Questions

1.  What health risk factors, as measured in the YRBS survey, are related to youth smoking in Alaska?

2.  Do associations vary by demographic factors of gender and race?

3.  Have the associations changed over time?

## Outcome Measures and Independent Factor Domains

Current tobacco use-related items in the YRBS (Outcome Variables)

- Current cigarette smoking

- Current smokeless tobacco use

- Current cigar use

- Any current tobacco use (cigarettes, smokeless, cigars)

- Frequent use (cigarettes, smokeless tobacco, 20 or more of the past 30 days)

- Tobacco use at school (cigarettes, smokeless tobacco in past 30 days)

<u>Health Domains:  Health Risk Behaviors and Other Factors (Independent Factors)</u>

- Demographics (age/grade, gender, race/ethnicity)
- Intentional and unintentional injury (safety, violence, depression/suicide)
- Alcohol and other drug use (alcohol, marijuana, inhalants, hard drugs)
- Sexual activity (initiation and safe practices)
- Weight & dietary behaviors (BMI, body image, weight control practices)
- Physical activity (exercise and sedentary behavior)
- Connectedness (relationships with adults, school, and community)
- Chronic conditions (asthma, diabetes)
- Secondhand smoke exposure

Appendix A presents a list of the specific survey items by domain.  It should be noted that these domains were not developed as units or tested as scales in the development of the survey, although in many cases items within the domain are highly correlated.

The majority of analyses were conducted using the 2007 Alaska Youth Risk Behavior Survey (AK-YRBS) statewide representative sample dataset. Data from both 2003 and 2007 AK-YRBS were used to evaluate potential changes in associations over time.  The 2007 sampling frame included 159 schools, from which 43 were sampled and 41 participated; in 2003 42 schools were sampled and 38 participated.  Overall participation rates were above 60% in both years.  A total of 1,318 respondents are available for 2007, 1,481 respondents in 2003.

Although we had intended to use the 1995 AK-YRBS data as well, the questions in the survey had changed and items found to be significantly associated with youth tobacco use in 2007 were not available for analysis in the 1995 data.  For this reason, analysis of changes in associations focused on 2003 and 2007 data.

## Analysis Strategies

<u>Assessment of health risk factor associations with youth smoking.</u>

The analytic strategy involved three general sets of analyses:  bi-variate associations between each of the tobacco use indicators and the other heath risk-related variables; and then multiple regression for selected tobacco indicators by risk domains, first for each domain alone and then in combination with the other domains.  Grade, race and gender were included in each domain model.

The associations were indexed using odds ratios. Measures that showed no reliable association with any tobacco use were dropped from subsequent analyses.  All the association measures can be seen in Appendices to this report.

We expected that measures within the risk factor domains would exhibit associations of similar magnitude and direction with tobacco use.  Multiple regression identified the

common and unique components of those associations.  This process helped to reduce the number of independent factors and outcome variables (key tobacco use indicators) and focus on those that seemed to have the strongest independent associations.  Risk factor measures that showed unique contributions to the associations with tobacco within a domain (i.e., remain statistically significant in the multiple regression models) were summed into an index for the final models.

As an aid to examining the independence of risk factor items, principle component factor analysis was run within each domain. That analysis summarized associations between domain items irrespective of the tobacco use variables and grouped items into orthogonal sets. Items listed in Appendix D for domain associations were grouped based on that analysis.

Tobacco use measure reduction was developed through examining the associations among the tobacco use indicators. Specifically, we tabled the frequency with which single and multiple tobacco products are being used by youths. Recent data from Washington State suggests that many youth are using multiple types of tobacco.  Because similar results were found in Alaska, a single tobacco use index was considered to be of value in further summarizing the risk factor association results.  Furthermore, a factor analysis of the tobacco use items indicated that a single factor accurately summarizes the majority of the co-variability in these items.

Assessment of health risk factor associations by subgroups and time

We repeated the final overall 2007 multiple logistic regression model found above in four demographic subgroups: White males, White females, Native males, and Native females. The number of students reporting race groups other than White or Alaska Native was too small for these analyses, and we did not feel that grouping all of these, both male and female, under "Other Race Groups" would be appropriate or useful, given the potential heterogeneity among these other groups for tobacco use and other factors.

The sub-group model parameters are presented graphically in the body of the text, with numerical values shown for statistically different coefficients. Similarly, we repeated the final overall 2007 model using 2003 YRBS sample data.  The results are graphically presented in the report, and also as a table of the combined domain association model for 2003 in Appendix F.

Analysis program and statistical specifications.

We used SAS to conduct analyses, using strata and weight variables specified by Alaska staff to take into account the complex survey sampling design and weighting methodology employed by the YRBS.  Simple and multiple logistic regressions were used to conduct regression analyses and t-tests were used to conduct coefficient comparisons. Statistical significance was tested at the 5% level and confidence intervals were calculated at 95%.

# Results

## Patterns of Tobacco Use

Although youth tobacco use has generally decreased in Alaska between 1995 and 2007, nearly 1 in 5 high school students are current smokers, and 1 in 10 use smokeless tobacco. Alaska Native students are twice as likely as White students to smoke cigarettes or use smokeless tobacco, although this disparity has decreased since 2003. Appendix B shows the prevalence of this study's tobacco outcome measures by race groups and gender.

As noted in the Methods section, we reviewed the frequencies for single and multiple tobacco products used by youths. We found that 40% of tobacco using high school students reported using more than one product (see graph). Multiple use is composed fairly evenly of each possible combination of tobacco types.



Multiple use was also fairly high across race and gender groups, as shown in Appendix B. Partly for this reason, later analyses focused on any tobacco use, rather than separate analyses for smokers and smokeless users (or cigarette, cigar, and smokeless users separately).
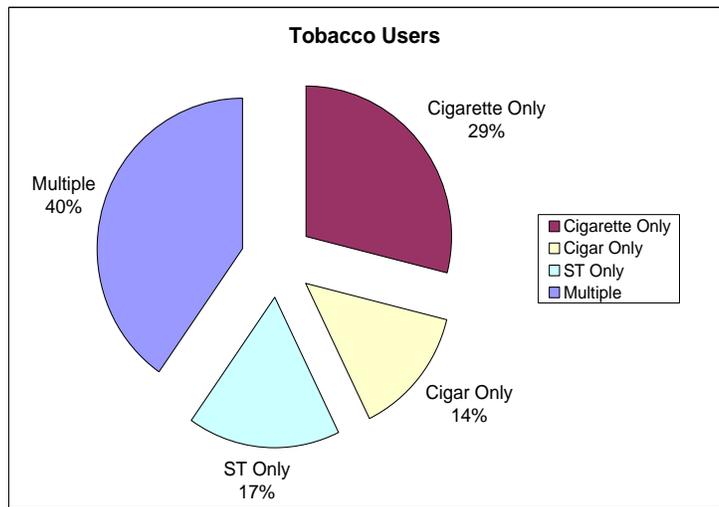
## Bivariate Associations

As expected, youth tobacco use was found to be associated with most risk behavior items, and inversely related to most social connectedness items. Appendix C shows the full list of bivariate associations for nine outcome measures, including cigarette, smokeless, cigar, or any tobacco use in the past 30 days, frequent cigarette use, frequent any tobacco use (cigarette and/or smokeless), and use at school (cigarettes, smokeless, or any).

Tobacco outcomes were for the most part not associated with having asthma or diabetes, being overweight, at risk of overweight, or other body image, nutrition and exercise measures, although there was an association with sedentary behavior (watching TV 3 or more hours a day) and a few unhealthy dietary practices (daily soda drinking and, for general tobacco use, fasting for 24 hours or more in order to lose weight).

## Domain Associations

When variables were grouped by domains, logistic regression was used to model associations for the six key outcome measures: any current tobacco use, cigarette use, smokeless, cigar, frequent tobacco use (cigarette or smokeless), and tobacco use at school (cigarette or smokeless). Criteria for inclusion in the domains included those items with significant associations for one or more of the outcome measures, and items which fairly consistently showed odds ratios of 2.0 or more or 0.5 or less. Also included in each of the domain models were grade, gender and race. Appendix D shows the adjusted odds ratios for items from the domain models.

Notably, many of the social connectedness items did not show associations after controlling for grade, gender, race and other connectedness items. Academic failure, as measured by having mostly D or F grades, was not independently associated with tobacco outcome measures. It should be noted that only 7% of students participating in the survey reported getting mostly D's or F's, and this was the only measure directly related to academic failure or achievement. However, some items indicating connectedness to school or family were significantly associated, even after controlling for other factors in the model. Specifically, any tobacco use was inversely related to the perception that teachers really care about the students and give them encouragement and that the school has clear rules and consequences for behavior. Frequent tobacco use and use at school were inversely associated with reporting that parents talked daily with the student about what they were doing in school, and that teachers really care about them and give encouragement.

## Summary Factors: Common and Unique Associations

When the key items that remained from the factor analyses were combined in one model, three factors remained significant for all tobacco outcome measures: Alaska Native race/ethnicity, current marijuana use (past 30 days), and ever having used other illicit drugs (cocaine, heroin, meth, ecstasy, or steroids). Odds ratios were highest for marijuana use. Current tobacco use (past 30 days) was also associated with driving while drinking, binge drinking (5+ drinks in one occasion), ever having had sex, unsafe sex, and secondhand smoke exposure. Only one connectedness item had a significant inverse or protective relationship; students who agreed that their school has clear rules and consequences for behavior were significantly less likely to be current tobacco users.

Frequent tobacco use was significantly associated with Alaska Native race/ethnicity, current marijuana use, and ever having used other illicit drugs, ever having had sex, regular soda consumption, and heavy TV watching. The one connectedness item with a significant protective relationship was parents talking to the student about what they are doing in school.

In addition to Alaska Native race/ethnicity, current marijuana use, and ever having used other illicit drugs, tobacco use at school was significantly associated with not wearing a seat belt, driving while drinking, and regular soda consumption. None of the connectedness items reached significance, although the pattern was similar to that of

frequent tobacco use; having parents who talked to the student about what they are doing in school appeared protective.

Items were then combined into summary measure indices by domain, as indicated in Appendix E. Items chosen for the summary measure are also marked with a "+" in Appendix D.

The graphs below show summary associations by gender for Alaska Native (AN) and White students. The number of students reporting other race groups was too small for these analyses, and we did not feel that grouping all of these was appropriate or useful. We would have had to combine gender as well as race/ethnicity groups (Black, Asian, Hawaiian/Other Pacific Islander, Hispanic/Latino), and the prevalence of tobacco use and other risk factors among these groups varies greatly.
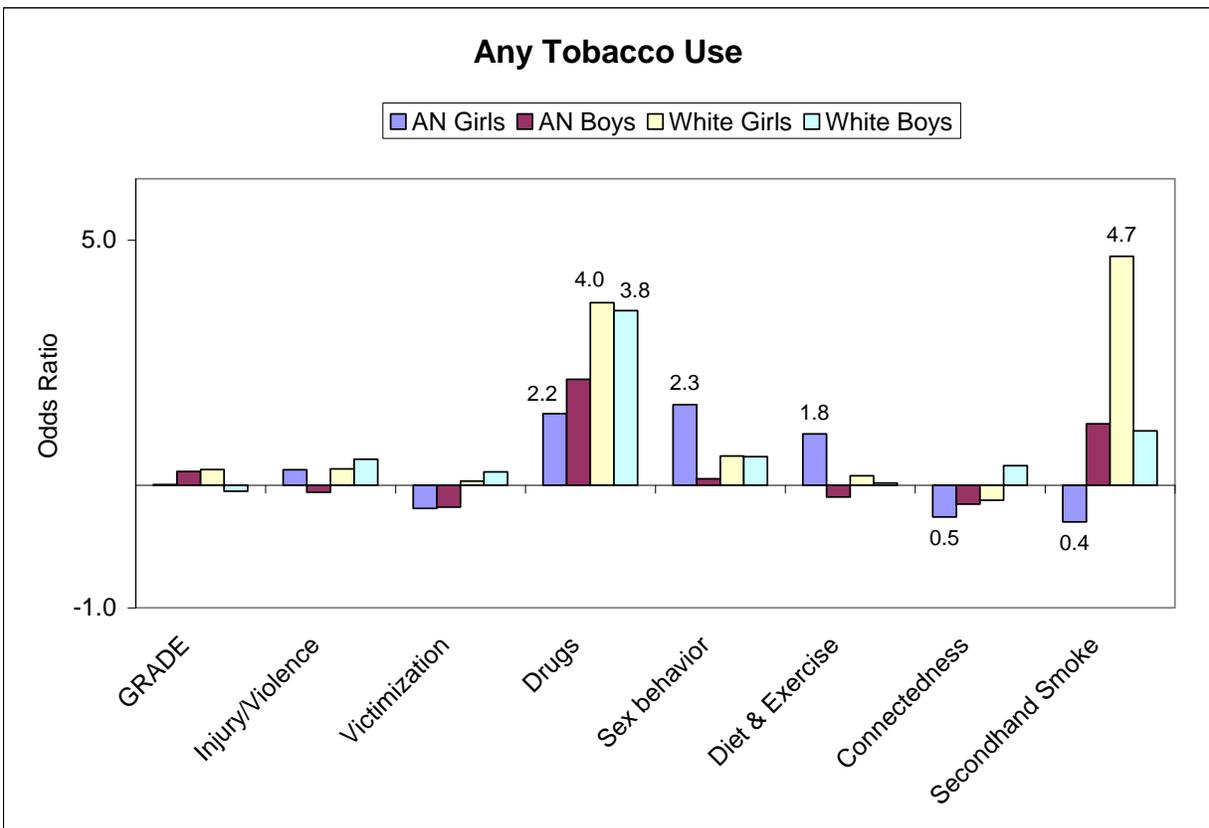


Note: Numbers are shown only for those items which were significant (p < 0.05).

Use of tobacco among high school youth is predicted by other substance use (Drugs) across race and gender, although this fails to reach statistical significance for Alaska Native boys. For Alaska Native girls, secondhand smoke exposure paradoxically appeared protective of tobacco use, in the context of all the other risk factors. This may be due to high secondhand smoke exposure in the group, and the existence of several other factors predicting tobacco use, including substance use, sex behaviors and diet and exercise issues. It is also possible that connectedness to community creates a different reaction to secondhand smoke exposure for Alaska Native girls than for Alaska Native

boys or white boys or girls.  White girls who are exposed to smoke are nearly 5 times more likely to use tobacco than those who are not exposed.  The secondhand smoke exposure relationship for boys is positive, but not statistically significant.

## Frequent Tobacco Use

**Legend:** ■ AN Girls  ■ AN Boys  □ White Girls  □ White Boys

*Y-axis: Odds Ratio (5.0, -1.0)*

Data labels shown on chart:
- GRADE: 0.6, 2.1
- Injury/Violence: 0.4
- Victimization: 0.5
- Drugs: 2.1, 4.1, 1.8, 3.2
- Sex behavior: 4.0
- Diet & Exercise: 2.2
- Connectedness: 0.5
- Secondhand Smoke: 0.4, 3.0
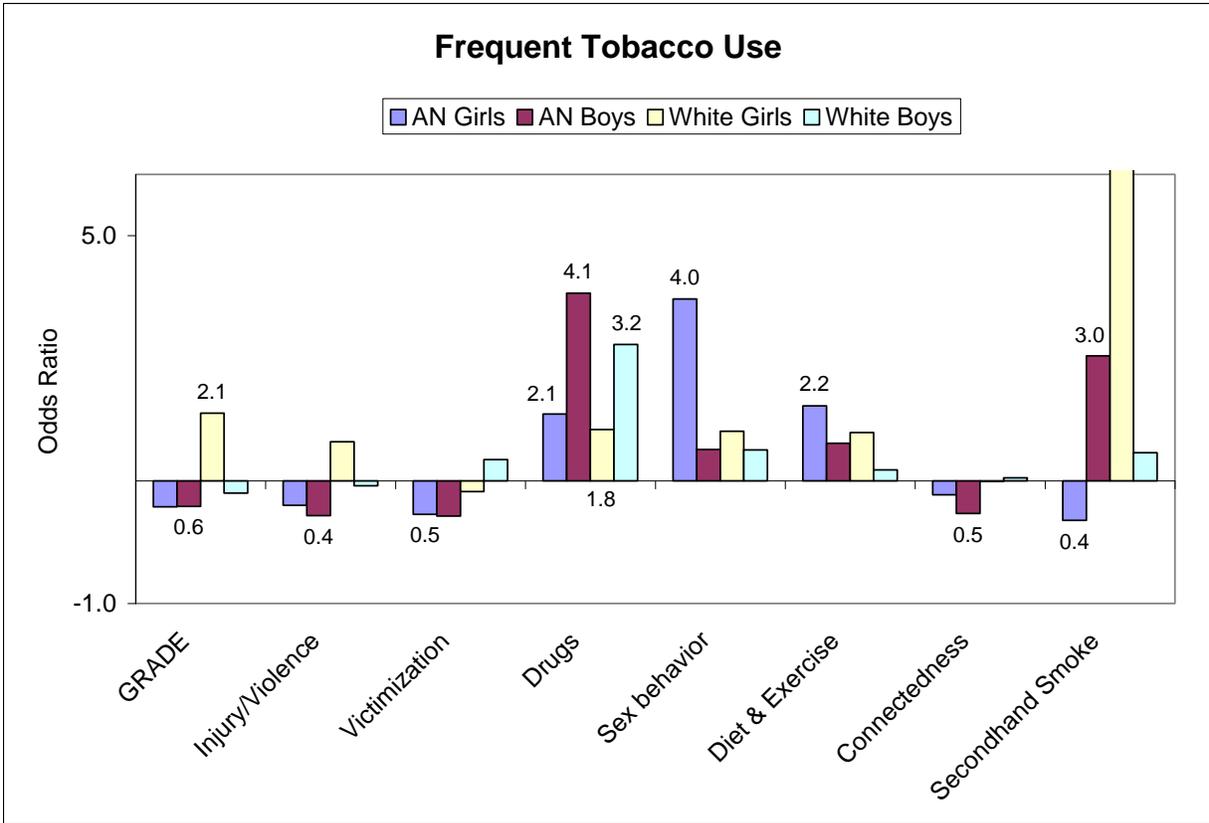
Note: are shown only for those items which were significant (p < 0.05).  All of the white female respondents who reported frequent tobacco use also reported secondhand smoke exposure (SHS). Therefore the odds ratio cannot be calculated, although there is clearly a strong association.

Frequent tobacco use among high school youth is predicted by other substance use (Drugs) across race and gender.  For Alaska Native girls, the pattern for and frequent tobacco use was similar to that of any tobacco use, with sexual activity, poor diet and exercise being additional risk factors and connectedness (and secondhand smoke exposure) being 'protective'.  Another anomaly seen for Alaska Native girls (and boys) was the negative association of the injury/violence and victimization/depression domains with frequent tobacco use, and their tendency to have relatively fewer frequent users in higher grades.  The latter may be due to higher school drop out rates among Alaska Natives, while the former may again be due to differences in Alaska Native reactions to negative contexts. White girls were the only group more likely to be frequent users as grade increased, with other substance use and secondhand smoke exposure also explaining their frequent tobacco use.  (Note:  No number is reported for the odds ratio for secondhand smoke for White girls because *all* of the survey participants who were frequent tobacco-using White girls were also exposed to secondhand smoke.)
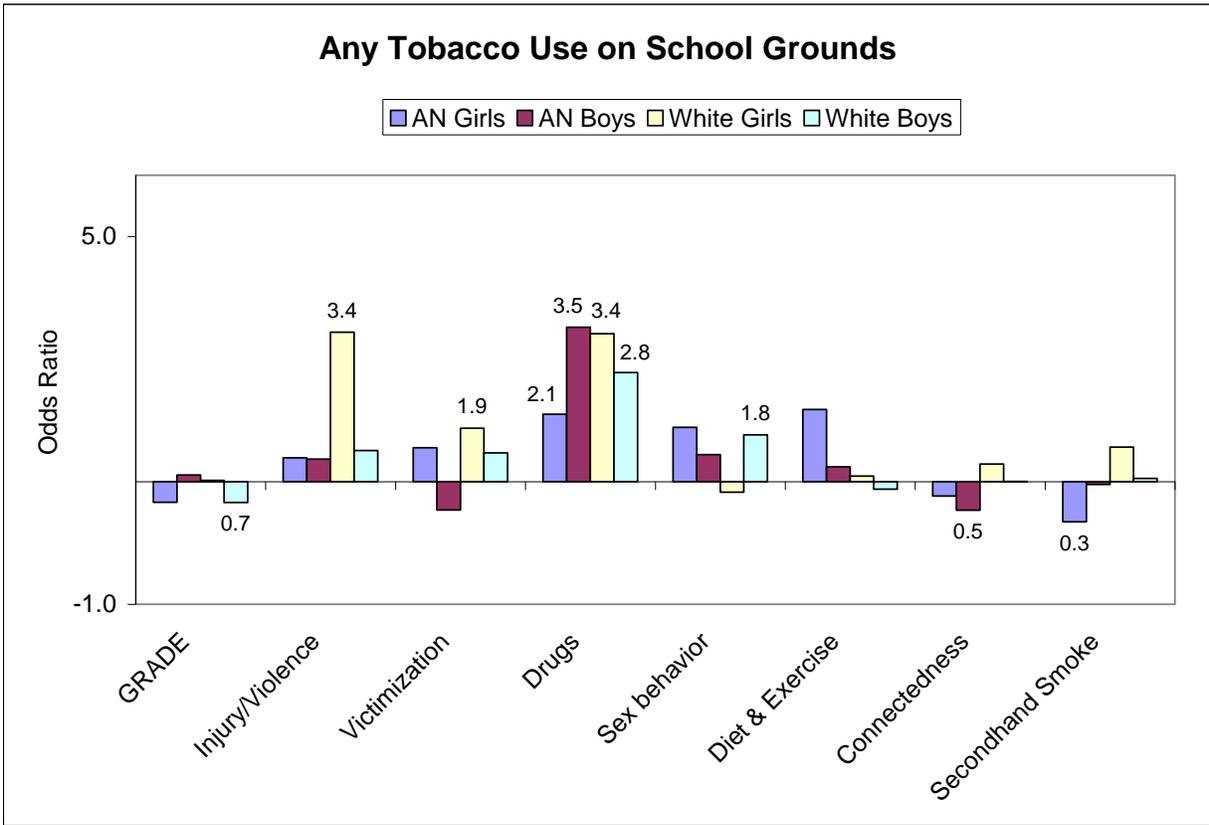
Tobacco use at school among high school youth is predicted by other substance use (Drugs) across race and gender.  For Alaska Native girls, we again see a protective reaction to secondhand smoke exposure.  White girls who used tobacco at school were more likely to be involved in risk behaviors like not using seat belts, fighting, or driving while drinking (Injury/Violence), and more likely to experience victimization or depression (Victimization), in addition to using other substances.  White boys were significantly less likely to use tobacco at school as grade increased, but more likely to be involved in sex behaviors.  Social connectedness factors appeared protective of tobacco use at school in Alaska Native boys.

## Comparison of Summary Factors for 2003 and 2007

The key items and summary measures models from the 2007 data were also applied to the 2003 data for three tobacco outcome measures: any current tobacco use, frequent or heavy use, and use on school grounds.  Two items were removed from the model because they were not asked in the 2003 survey:  secondhand smoke exposure and soda consumption.  Appendix F shows the 2003 key items model results, and provides comparison information for the 2007 findings at an item level. Items were then combined by domain, as listed in Appendix F.  The graphs below show summary associations by year.

As in 2007, Alaska Native race/ethnicity was associated with any tobacco use, frequent use, and use at school (see all 3 figures).  However, in 2003, odds ratios appeared much higher for Alaska Native race/ethnicity compared to the 2007 findings, indicating a generally more rapid decline in tobacco use, albeit still at higher levels, among Alaska Natives than other racial/ethnic groups.

Similarly, in 2003, all 3 tobacco outcome measures were also associated with Injury1, which on closer examination is seen to be largely due to having been in a fight within the past 12 months; and this was not found to be associated in 2007.  Conversely, drug use behavior, notably current marijuana use (past 30 days) shows an *increased* association over time with any tobacco use, frequent use, and use at school.

As noted, injury-related items were significantly associated with any current tobacco use in 2003, but not in 2007 (see graph below).  Social/school connectedness items were inversely associated with any current tobacco use in 2007, but not in 2003.  In both years, Alaska Native race/ethnicity, drug use and sex behavior risk factors were associated with current tobacco use even when controlling for other factors.  However, the odds ratio for tobacco use association with Alaska Native race/ethnicity decreased significantly between 2003 and 2007.
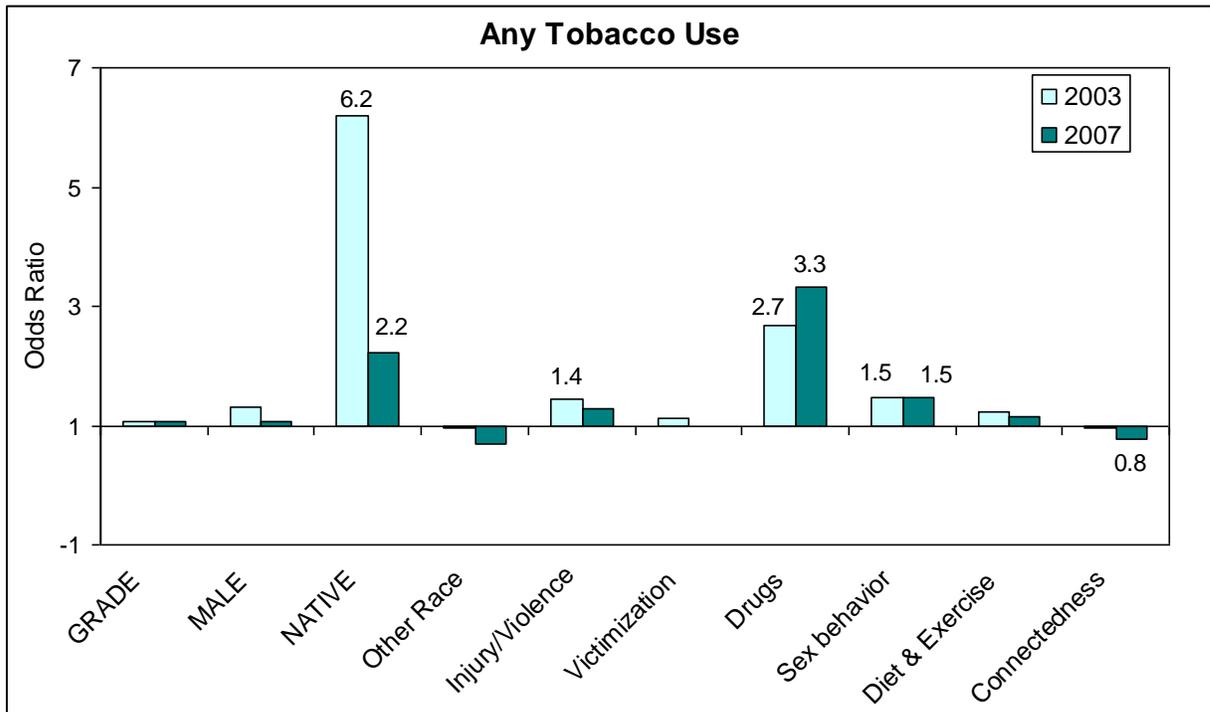


Similar patterns were evident for frequent tobacco use (see graph next page).  In both years, Alaska Native race/ethnicity, drug use, sex behavior, and diet and exercise risk factors were associated with frequent tobacco use even when controlling for other factors.  Injury/violence-related items were associated in 2003, and social/school factors (Connectedness) were somewhat protective in 2007.

**Frequent Tobacco Use**
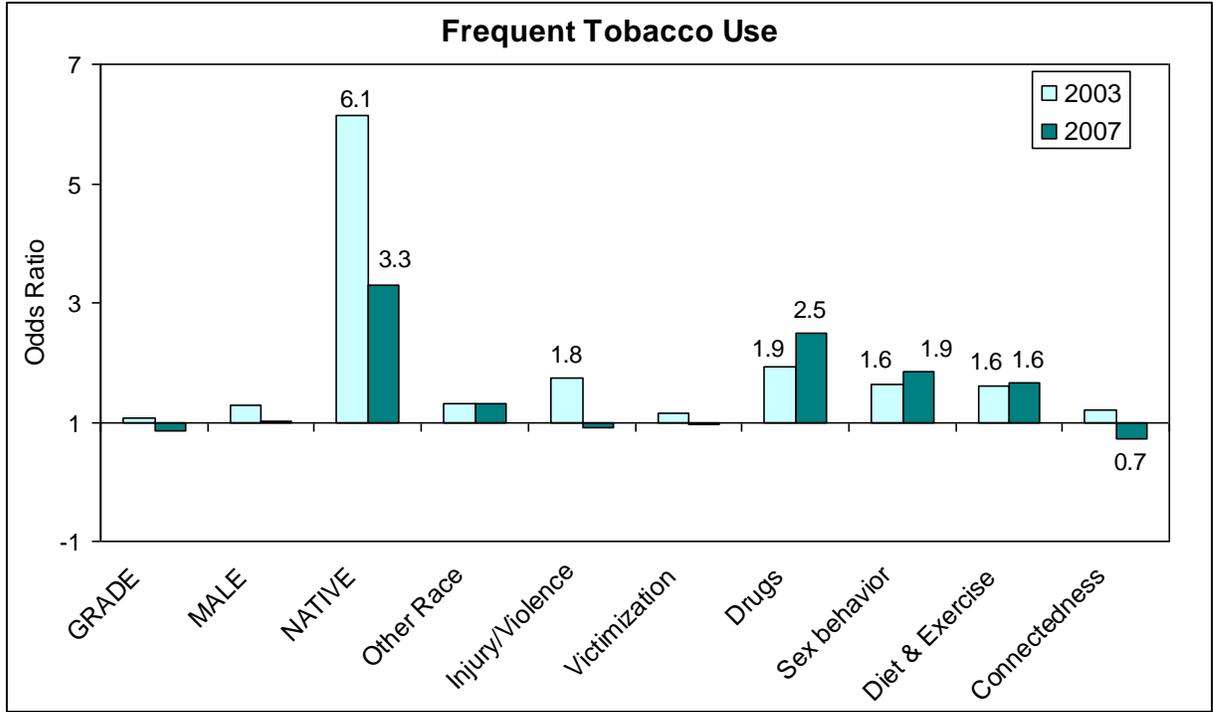


For use of <u>tobacco on school grounds</u>, Alaska Native race/ethnicity, injury/violence-related items, and drug use risk factors were associated in both years.  As with frequent tobacco use, social/school factors (Connectedness) were protective in 2007, but not in 2003.

**Any Tobacco Use on School Grounds**
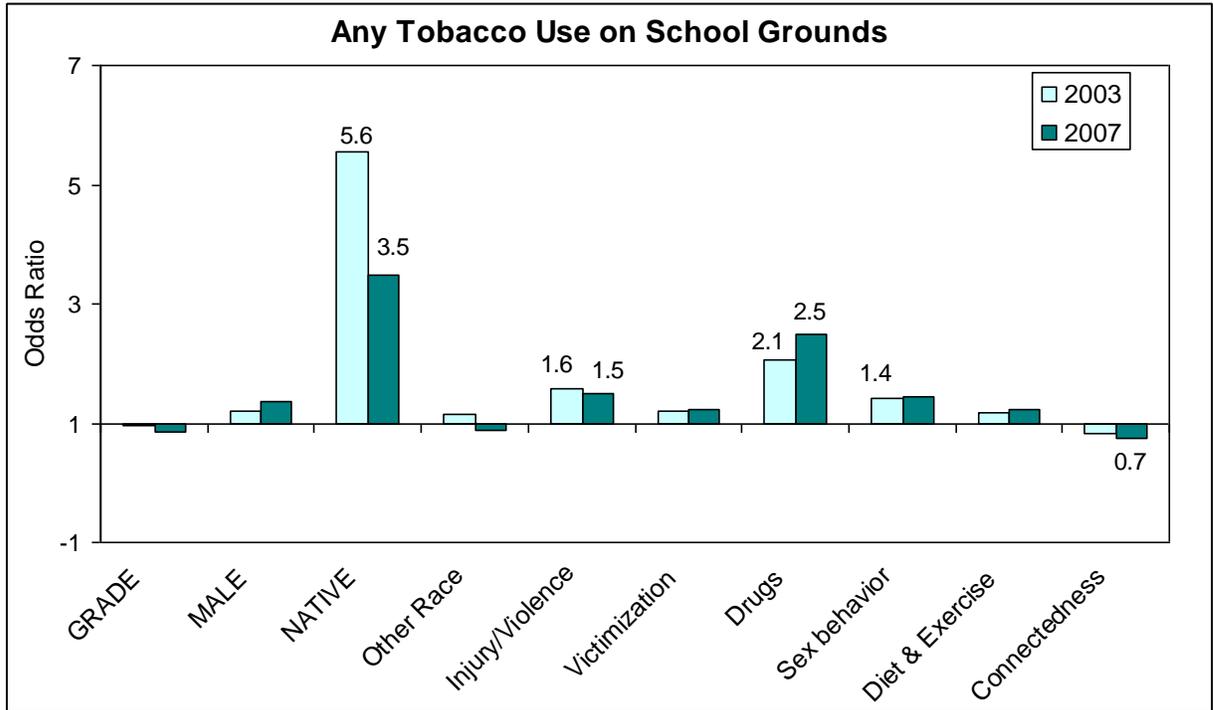
## Limitations

Several factors may limit the scope and representativeness of this study.  While the YRBS sample includes students currently enrolled in public high schools, results do not include youth who have dropped out of school, who may be more likely to use tobacco and exhibit other risky behaviors than those in school.  The annual drop-out rate is 5.8% for 7-12th grades, and Alaska Natives are somewhat more likely to have dropped out than Whites.  While they represent 25% of the overall 7-12th grade enrollment, Alaska Native youth comprise 36% of the drop-outs for those grades.[7]  In addition, the YRBS sample does not include high school age youth who are in private schools, boarding schools, home schooled or enrolled in one of the nine publicly funded correspondence schools.  It is not clear whether these students would exhibit similar behaviors and associations as those in public high schools.

YRBS sampling methods provide a randomly selected group of schools statewide, and consistently include schools representing diverse regions of the state.  However, because sampling methods do not directly include regional representation, data may or may not accurately reflect smoking and smokeless tobacco use – or factors associated with that use – by regional subgroups.  For example, we know from the Alaska Behavioral Risk Factor Survey (BRFSS) data that among Alaska Native adults, smokeless tobacco use is considerably higher for the Southwest and Northern Regions than for Anchorage/Mat-Su, Gulf Coast, Southeast and Fairbanks area, and other studies indicate similar patterns for youth.

In addition, the YRBS survey is very limited in questions which address social connectedness and other risk and protective factors.  The survey does not address many factors that have been found to be associated with youth smoking, such as the behavior and tobacco use of peers, siblings and other family members; exposure to tobacco industry promotional items, family connectedness, parental advice to not smoke, and the respondent's propensity for risk-taking.

## Summary and Discussion

This study examined the associations of a large number of potential health risk or protective behavior factors with tobacco use in Alaska high school youth. Individual items on the YRBS survey from domains of unintentional injury, illegal drug use, sexual behavior, diet, physical activity, and connectedness all showed high associations with tobacco use, as did in demographic factors and exposures to second hand smoke.  The presence of these associations across multiple domains lends strong support to the notion that youth in Alaska who use tobacco exhibit a variety of other health compromising behaviors. This suggests that tobacco use prevention and cessation in youth may not best be considered, or treated, as an isolated activity. Indeed, based on the data observed here, an integrated comprehensive approach to youth health compromising behaviors may serve the needs of many chronic disease prevention programs.

When individual items within more general health behavior domains were simultaneously examined, we were able to identify items with common and unique associations with tobacco use. As a general rule, unique associations are of substantive use because of their additive nature. That is, efforts to reduce (or enhance) each uniquely associated behavior will theoretically maximize the impact on the tobacco use behavior.

### Injury, Violence and Victimization Measures and Tobacco Use

Within safety related questions, not using seat belts, driving or riding while drinking, and fighting appeared independently associated with tobacco use behaviors, with the other items in that set providing relatively redundant associative information. The direct link between these rather aggressive behaviors and tobacco use is somewhat unclear, although these behaviors do suggest elements of risk taking and/or sensation seeking, which have been repeatedly shown to be associated with tobacco and other drug use.

Items tapping victimization and serious depression were also associated with tobacco use. Although the items in this domain later appeared to be somewhat redundant with those in other domains, it never the less important to note that those youth with these problems also tend to use tobacco, perhaps as means of self medication or self destruction.

### Alcohol, Marijuana and Other Drug Use Measures and Tobacco Use

As might have been expected, the use of other drugs was highly associated with tobacco use. The association between the use of marijuana and tobacco was particularly strong, perhaps because of the common means of drug delivery (both are primarily smoked). Somewhat unexpectedly, alcohol, marijuana and harder drug use behaviors were somewhat independently associated with tobacco use. Secondhand smoke exposure was independently associated with tobacco use, perhaps due to modeling effects or simply availability.

### Sexual Activity Measures and Tobacco Use

Ever having sex and having unsafe sex were independently associated with tobacco use. This relationship may be due in part to underlying factors of inappropriate early adoption of adult behaviors, risk taking and sensation seeking, or poor decision making skills.

### Diet, Exercise and Body Weight Measures and Tobacco Use

There was a notable lack of associations of weight, physical activity, and nutrition measures with tobacco use. One might expect a 'healthy' (or unhealthy) lifestyle to carry over into this domain. Exceptions were the independent associations of regular soda consumption and long hours of TV viewing. More information is needed to help explain these associations.

**Social Connectedness Measures and Tobacco Use**

Connectedness to parents, teachers and school generally had independent associations in a direction suggesting a protective effect of these conditions against tobacco use. The role of parents and caring adults appears to be an important one for youth with regards communicating expectations around health compromising behaviors. It is also likely that parents and adults who encourage connectedness with youth possess a host of other parenting skills, such as monitoring, norm and boundary setting that inhibits the development of health-compromising behavior.

**Factors Associated with Tobacco Use by Gender and Race**

As has been seen elsewhere, youth tobacco use was associated with gender and race. The associations with gender are somewhat complex. High school aged males (who are still in school) tend to use cigarettes less than their females counterparts, but use cigars and smokeless more. The use of 'alternative tobacco' products by males is a (unexplained) phenomenon currently being seen in other parts of the western United States.

Alaska Natives generally have higher tobacco use rates that Whites, and other races or ethnicities have lower tobacco use rates that Whites. It is interesting to note that these associations were not reduced in the multivariate models, indicating that these factors are independent of the other measured risk behaviors. Some of that association may be partly explained by socio-economic factors, or other regional or cultural norms not measured in the YRBS.

When the associations with tobacco use were explored within gender and ethnicity, we found that the use of *other drugs* was consistently associated with tobacco use across male and female, Native and White subgroups. Presence of drug use behavior is a key indicator of tobacco use risk, and tobacco addiction should be addressed in any drug prevention or treatment program.

Aggression, victimization, and depression emerged as independent associations for *White females* regarding use of tobacco at school. Second hand smoke exposure, which could be considered a form of victimization, is also highly related for this subgroup to general and frequent use. Interestingly, sexual behavior was not independently associated with tobacco use for White females, but was to some extent in the other subgroups examined. More research is needed to determine why these factors might have emerged differently for these females than for others.

Several somewhat surprising independent factors emerged regarding Alaska Natives. First, the concept of *connectedness* to parents and other adults appeared to play an independent protective role in tobacco use among Alaska Native students, particularly for frequent use or use at school among Alaska Native males. This finding is encouraging for the potential reduction of Alaska Native prevalence rates through programs that address parent and community norms. The *diet and exercise* domain emerged as a particularly potent independent risk factor for Alaska Native females. That factor was comprised of sedentary behavior (excess TV watching) and inappropriate nutritional behaviors (fasting and regular soda drinking). It is possible

that tobacco use is being used by these females as a means of weight control. In any case, programs which address diet and exercise in Alaska Native female youth need to be cognizant of the co-indication of these behaviors with possible tobacco use.

Alaska Native male and female students had what appears to be an unexpected reaction to victimization, depression and risk taking. These factors were associated with <u>less</u> frequent and current use. In addition, Alaska Native females exhibited less use with increased reports of second hand smoke exposures. These findings suggest that Alaska Native youth may have a protective reaction to adverse factors commonly associated with increased risk in other populations. More research is needed to determine why these factors might have emerged differently for this population than for others.

### Association Patterns Over Time

We examined the (overall) pattern of associations across 2003 and 2007.  Generally, we found that the patterns remained stable, with the exception that Alaska Native race <u>decreased </u>its association with tobacco use, indicating that tobacco use prevalence among Alaska Natives decreased at a faster rate than other races. This is a positive sign, especially given recent programmatic efforts directed at reducing disparities in tobacco use and other health-related behaviors.

We also found that the association of tobacco with other drug use increased somewhat between the years, strengthening the notion that drug prevention and treatment programs need to address tobacco use in addition to other addictions and problems.

# Recommendations

Recommendations listed here are primarily directed to the Alaska Tobacco Prevention and Control Program (TPCP) staff, but may also be useful to their community and school partners and grantees.

- **Follow CDC's Best Practices for Comprehensive Tobacco Control Programs.** The community-based model is focused on producing durable changes in social norms and includes evidence-based practices that are most likely to have the greatest population impact.  Interventions specifically aimed at influencing youth are a key component of this model, but they need to happen in concert with local and statewide policies and education, economic approaches, and disparity-eliminating initiatives.[8]

Environmental Approaches
- **Make tobacco (and other substances) harder to get**:  Increase the unit price of tobacco products.  Although Alaska SYNAR data show great progress in reducing sales of tobacco to youth, this is only one step in reducing access.  An equally critical policy step is to increase the cost of tobacco, which has been shown to be one of the most effective tobacco control approaches particularly among younger people.[9]

- **Ensure that school and community efforts are linked and use policy change to strengthen and support education or intervention efforts.** Enforce underage no tobacco use laws and smokefree policies, and enlist cooperation and support from kids, school staff, and parents, as well as other members of the community, including businesses and law enforcement.

- **Consider targeted messaging directed at decreasing the exposure to secondhand smoke in the home environment.**  Although secondhand smoke exposure was not independently related to tobacco use among all groups of students, it clearly is associated for some groups.  In addition, home smoking bans have been shown to be an effective strategy in reducing adult smoking prevalence, and therefore may contribute to social norm changes for youth.[10]

Health Education
- **Continue to promote the integration of tobacco prevention and other health domain program efforts** in schools and communities, at least to the extent that messaging is consistent and appropriately targeted for youth who are likely to be involved in multiple risky behaviors.

- **Coordinate with drug prevention or counseling programs** to ensure that tobacco use prevention and cessation are components of those programs.

- **Continue coordinating with the Department of Education & Early Development (EED) School Health program** and associated groups such as the EED school health and safety committee.
  http://www.eed.state.ak.us/tls/schoolhealth/

- **Ensure that both early and repeated tobacco prevention education occurs.**  It is important to address tobacco prevention education in elementary grades, and to continue providing age-appropriate updates and education through high school, even though competing factors for educational time may put pressure on schools to cut health education time.[11]

- **Provide guidance to schools in selecting or developing appropriate and effective tobacco prevention curricula.** As part of such guidance, the TPCP could encourage use of a standard tool to evaluate the utility and application of existing or potential tobacco prevention curricula. The CDC Health Education Curriculum Analysis Tool (HECAT) includes a module for tobacco curricula (Module T) to evaluate curricula-based tobacco prevention programs, and includes grade-based objectives so that schools can plan appropriately for grades in which curricula should

occur.  This tool is available at http://www.cdc.gov/healthyyouth/HECAT/index.htm and is listed as a resource on the EED School Health website (http://www.eed.state.ak.us/tls/schoolhealth/).

- **Consider the unique racial and gender demographics of the high school population when designing prevention and cessation programs for youth.** Schools may need to tailor programs and messaging to meet the unique needs of segments of the youth population, and the TPCP may need to provide technical assistance.  For example, based on findings in this study, measures of connectedness to parents and other adults appeared independently protective for Alaska Native youth in particular, indicating that integration with community prevention programs and otherwise enlisting community engagement in tobacco prevention may be particularly effective for Alaska Native boys and girls.  In addition, tobacco use was highly correlated with secondhand smoke exposure for White girls, even after controlling for other factors. This finding may indicate that tobacco use plays an important social role (among friends and/or family) for White girls in particular, and social norm change might be a particularly important focus for this group.

Evaluation

- **Improve the collection of information about youth tobacco use** and the factors that play a role in whether and when youth starting using.

  - **Continue monitoring the prevalence of tobacco** use and associated factors using a statewide survey (YRBS).

  - **Continue to encourage the collection of local data** outside the statewide sample using survey items that are comparable to the statewide survey.

  - **Consider question additions**:  Review the social risk and protective factors associated with the health behaviors covered in the YRBS survey, and, in coordination with other programs that support and use the survey, plan an updated evidence-based approach to including questions that would cover those risks and protective factors.[12]

  - **Resume periodic statewide survey of middle school students.** Many youth engage in risk behaviors well before high school, and the middle school survey can help both TPCP and schools by providing additional information from a critical time period for prevention efforts.

  - In order to evaluate the effect of tobacco-related curriculum or community programs, a **special tobacco-focused survey on in-school youth**[13] might be beneficial.  Such a survey could include considerably more information about program content and exposures to school programs.

  - **Conduct a youth survey of those in alternative education settings.** This would focus on schools that are not part of the YRBS frame, such as public correspondence schools, private schools, boarding schools, and

schools with alternative schedules.  Either the YRBS or ideally a survey with more tobacco focus would assist in broadening the TPCP's knowledge about tobacco use among all Alaska youth.[14]

- **Work with the Department of Education (EED) to improve CDC School Health Profiles data** or initiate tobacco specific school personnel surveys such as the **CDC Global School Personnel Survey**[13] so that it could be used to help evaluate school policies and training around tobacco prevention and other health issues. In particular, work toward collection of student and school staff surveys in the same schools to aid in evaluation.

Special Studies
    Future areas for research suggested by this study include:

- **Investigation of potential Alaska Native youth reactance to negative contexts.**  As noted among Alaska Native students, measures of victimization, depression and risk-taking (such as lack of seat belt use, driving or riding while drinking, and fighting) were independently associated with <u>not</u> using tobacco or using it less frequently.  Such factors have typically been associated with increased risk of tobacco use in other studies.  Further examination of these relationships may help identify other co-occurring—and less destructive—factors that could help in addressing tobacco prevention as well as prevention of other risks.

- **Conduct a regional study of smokeless tobacco use** and factors that play a role in whether and when youth starting using, for instance in the Y-K Delta region.

- **Conduct a study of out of school youth** in order to identify the most appropriate strategies for reaching this population, a group likely to have high tobacco use prevalence and potentially less well-served by current tobacco prevention and cessation strategies.[14]

- **Investigate the use of 'alternative tobacco' products such as cigars** (particularly among White boys) and other alternatives such as Iqmik, snus, bidis, and kreteks possibly in partnership with other Western United States tobacco programs.

# Appendix A:  AK YRBS 2007 Variables and Domains

| Variable Information--2007 Alaska YRBS | | | |
|---|---|---|---|
| *Variable* | *Label* | *Prevalence* | |
| **Current Tobacco Use-related Items** | | *Weighted %* | *Unweighted N* |
| v030d | Smoked 1+ past 30 days | 17.8% | 185 |
| qnfrcig | Smoked on 20+ past 30 days | 7.4% | 74 |
| QN31 | 10+ cigarettes/day past 30 days | 0.7% | 9 |
| QN36 | Used snuff/dip 1+ past 30 days | 10.4% | 131 |
| QN38 | Smoked cigars 1+ past 30 days | 10.1% | 139 |
| QN33 | Smoked at school 1+ past 30 days | 7.5% | 81 |
| QN37 | Used snuff/dip at school 1+ 30 days | 6.0% | 73 |
| anytobsch | Cigarette or smokeless tobacco use at school, 1+ past 30 days | 11.6% | 131 |
| qnanytob | Used any tobacco past 30 days | 24.1% | 269 |
| smkls20 | Use smokeless (snuff/dip) on 20+ past 30 days | 3.5% | 41 |
| cigar20 | Smoked cigars on 20+ past 30 days | 0.8% | 10 |
| any2tob20 | Cigarette or smokeless tobacco use on 20 past 30 days | 24.4% | 108 |
| **Demographics** | | % | n |
| Q3 | **In what grade are you** | | |
| | 9th grade | 27.8% | 422 |
| | 10th grade | 26.2% | 256 |
| | 11th grade | 23.8% | 337 |
| | 12th grade | 22.0% | 284 |
| Q2 | **What is your sex** | | |
| | Male | 51.4% | 656 |
| | Female | 48.6% | 654 |
| RACE | **RACE** | | |
| | White | 60.6% | 837 |
| | Alaska Native/American Indian (any mention) | 26.4% | 263 |
| | Other (not White or AK Native/American Indian) | 12.9% | 218 |
| | Hispanic (any mention) | 4.2% | 108 |
| | Black (any mention) | 3.3% | 84 |
| | Asian (any mention) | 7.7% | 102 |
| | Native Hawaiian/Other Pacific Islander (any mention) | 2.9% | 71 |
| **Intentional and Unintentional Injury** | | % | *n* |
| bkhlmt | Never/rarely wore bicycle helmet | 56.5% | 728 |
| QN9 | Never/rarely wore seat belt | 7.0% | 87 |
| QN10 | Rode 1+ times with drinking driver | 23.5% | 322 |
| QN11 | Drove 1+ times when drinking | 9.7% | 118 |
| QN12 | Carried weapon 1+ times past 30 days | 24.4% | 294 |
| QN13 | Carried gun 1+ past 30 days | 8.3% | 98 |
| QN18 | Fought 1+ times 12 mos | 29.2% | 374 |
| QN19 | Injured/treated 1+ times 12 mos | 3.3% | 40 |
| QN14 | Carried weapon school 1+ past 30 days | 8.4% | 104 |
| QN15 | Missed school b/c felt unsafe 1+ 30 days | 5.5% | 77 |
| QN16 | Threatened at school 1+ times 12 mos | 7.7% | 107 |
| QN17 | Property stolen/deliberately damaged at school 12 mos | 29.8% | 415 |
| QN20 | Fought school 1+ times 12 mos | 10.4% | 130 |
| QN21 | Hit by boyfriend/girlfriend 12 mos | 12.4% | 173 |
| QN22 | Forced to have sex | 9.2% | 125 |
| QN23 | Sad 2 weeks past 12 mos | 26.9% | 364 |
| QN24 | Considered suicide 12 mos | 16.5% | 210 |
| QN25 | Made suicide plan 12 mos | 14.2% | 188 |
| QN26 | Attempted suicide 1+ times 12 mos | 10.7% | 113 |
| QN27 | Suicide attempt w/injury 12 mos | 3.2% | 38 |

## Appendix A:  AK YRBS 2007 Variables and Domains – continued

| Variable Information--2007 Alaska YRBS | | | |
|---|---|---|---|
| **Variable** | **Label** | **Prevalence** | |
| **Alcohol and Other Drug Use** | | % | *n* |
| QN40 | Had first drink before 13 | 20.4% | 266 |
| QN41 | Had 1+ drinks past 30 days | 39.7% | 469 |
| QN42 | Five+ drinks 1+ past 30 days | 25.8% | 316 |
| QN46 | Tried marijuana before 13 | 11.9% | 135 |
| QN47 | Used marijuana 1+ times past 30 days | 20.5% | 246 |
| QN50 | Used cocaine 1+ times past 30 days | 2.9% | 40 |
| QN51 | Sniffed glue 1+ times in life | 14.4% | 195 |
| QN56 | Injected drugs 1+ times in life | 2.1% | 30 |
| QN57 | Offered/sold drugs at school 12 mos | 25.1% | 339 |
| ildrug5 | Ever (lifetime) use of any of these: cocaine, heroin, meth, ecstasy, steroids (Q49, 52-55) | 13.8% | 191 |
| **Sexual Activity and Risk Behavior** | | % | *n* |
| QN58 | Had sex ever | 45.1% | 528 |
| QN59 | Had sex before 13 | 4.4% | 61 |
| QN60 | Had sex with 4+ people in life | 13.4% | 152 |
| QN61 | Had sex with 1+ people 3 mos | 30.9% | 362 |
| alcsx | Used alcohol last time had sex (w/in 3 months; from v062d) | 22.1% | 80 |
| brthcntrl | Inadequately safe sex (did not use birth control (pills, condoms, depo) at last recent sex) | 8.2% | 93 |
| qnirrespsx | Irresponsible sexual behavior (never/no current (past 3 months) / use condoms if currently active); recoded from qnrespsx | 12.4% | 144 |
| **Weight and Dietary Behaviors** | | % | *n* |
| bmipct_85 | from bmipct (Q6-7); BMI percentile of 85%+ includes at risk of overweight, and overweight | 27.3% | 347 |
| qnbovwgt | Overweight | 11.1% | 144 |
| qnbrovwgt | At risk of overweight | 16.2% | 203 |
| QN65 | [Think I am] slightly/very overweight | 30.7% | 401 |
| QN66 | Trying to lose weight | 44.3% | 583 |
| QN67 | Exercised to lose weight past 30 days | 62.5% | 808 |
| QN68 | Ate less to lose weight past 30 days | 37.0% | 467 |
| QN69 | Fasted 24 hours or more to lose weight, past 30 days | 12.5% | 157 |
| v070_71d | Used unhealthy methods for weight loss (took pills, vomited), past 30 days | 8.8% | 111 |
| qnbfrvg | Ate 5+ fruits/vegetables 7 days | 15.7% | 213 |
| QN78 | Drank soda 1+ times/day past 7 days | 21.8% | 264 |
| **Physical Activity and Sedentary Behavior** | | % | *n* |
| QN80 | Active 60 min on 5+ past 7 days | 42.5% | 565 |
| qnbdlype | Attended PE class daily | 17.7% | 228 |
| QN83 | Got to PE class 1+ days average week | 47.0% | 605 |
| QN84 | Played on 1+ sports teams 12 mos | 61.7% | 809 |
| QN81 | Watched 3+ hours of TV average day | 23.0% | 296 |
| QN82 | Played video games 3+ hours/day | 23.4% | 313 |
| qnpe3x20 | NOT Exercising 21+ minutes in PE class, 3-5 days/week | 63.0% | 814 |
| **Connectedness (relationships with adults, school, community)** | | % | *n* |
| QN92 | Parent talks about school with student on daily basis | 45.0% | 621 |
| QN93 | Agree teachers care about them | 56.1% | 718 |
| QN94 | Can seek help from 1+ non-parent adult | 87.0% | 1121 |
| QN95 | Volunteer 1+ hrs in avg week | 51.2% | 666 |
| QN96 | Do organized activities 1+ days, avg wk | 55.5% | 729 |
| QN99 | Agree school has rules for behavior | 57.0% | 750 |
| QN98 | Agree they matter to people in community | 50.6% | 669 |
| QN97 | Agree feel alone in life | 16.3% | 222 |
| V109b | Grades were mostly Ds and Fs | 7.4% | 90 |
| **Other Items** | | % | *n* |
| QN89 | Smoke Exposure--In same room with smoking 1+ days in past 7 | 46.1% | 598 |
| QN86 | Told by doctor/nurse they had asthma | 18.2% | 254 |
| QN87 | Currently have asthma | 8.7% | 121 |
| QN91 | Told by doctor have diabetes | 2.8% | 38 |

## Appendix B:  Tobacco Use by Gender and Race/Ethnicity

## Youth Tobacco Use Outcome Measures by Race and Gender
## Alaska YRBS 2007

## Current Tobacco Use

**Cigarette Smoking, Past 30 Days**

|  | Girls | Boys | Total |
|---|---|---|---|
| **Alaska Native** | 35.8% | 27.4% | 31.7% |
| **White** | 15.7% | 13.0% | 14.2% |
| **Other Race Groups** | 4.8% | 7.7% | 6.8% |
| **Total** | 19.7% | 15.9% | 17.8% |

**Use of Smokeless Tobacco, Past 30 Days**

|  | Girls | Boys | Total |
|---|---|---|---|
| **Alaska Native** | 16.4% | 16.7% | 16.5% |
| **White** | 3.9% | 12.2% | 8.2% |
| **Other Race Groups** | 4.2% | 13.4% | 8.9% |
| **Total** | 7.3% | 13.5% | 10.4% |

**Cigar Smoking, Past 30 Days**

|  | Girls | Boys | Total |
|---|---|---|---|
| **Alaska Native** | 4.6% | 11.1% | 7.8% |
| **White** | 7.0% | 15.6% | 11.5% |
| **Other Race Groups** | 5.4% | 9.4% | 7.4% |
| **Total** | 6.1% | 13.6% | 10.1% |

**Any Tobacco Use, Past 30 Days**

|  | Girls | Boys | Total |
|---|---|---|---|
| **Alaska Native** | 42.1% | 32.7% | 37.5% |
| **White** | 18.8% | 23.4% | 21.2% |
| **Other Race Groups** | 7.6% | 17.2% | 12.3% |
| **Total** | 23.4% | 24.9% | 24.2% |

## Frequent Tobacco Use

**Frequent Cigarette Smoking
(20+ of Past 30 Days)**

|  | Girls | Boys | Total |
|---|---|---|---|
| **Alaska Native** | 18.9% | 8.1% | 13.7% |
| **White** | 6.0% | 5.0% | 5.4% |
| **Other Race Groups** | * | 3.7% | 3.4% |
| **Total** | 9.1% | 5.6% | 7.3% |

**Frequent Cigarette Smoking or Smokeless Use
(20+ of Past 30 Days)**

|  | Girls | Boys | Total |
|---|---|---|---|
| **Alaska Native** | 26.9% | 14.1% | 20.7% |
| **White** | 6.0% | 8.0% | 7.0% |
| **Other Race Groups** | 4.4% | 9.1% | 6.8% |
| **Total** | 11.4% | 9.6% | 10.5% |

## Tobacco Use at School or on School Property

**Cigarette Smoking at School, Past 30 Days**

|  | Girls | Boys | Total |
|---|---|---|---|
| **Alaska Native** | 17.4% | 13.5% | 15.5% |
| **White** | 5.1% | 5.0% | 5.0% |
| **Other Race Groups** | * | * | 2.3% |
| **Total** | 8.2% | 6.8% | 7.5% |

**School Tobacco Use (Cigarette or Smokeless)**

|  | Girls | Boys | Total |
|---|---|---|---|
| **Alaska Native** | 25.1% | 20.2% | 22.7% |
| **White** | 5.4% | 10.2% | 7.9% |
| **Other Race Groups** | 3.9% | 7.8% | 5.9% |
| **Total** | 10.6% | 12.4% | 11.5% |

**Smokeless Tobacco Use at School, Past 30 Days**

|  | Girls | Boys | Total |
|---|---|---|---|
| **Alaska Native** | 9.1% | 11.1% | 10.1% |
| **White** | * | 8.4% | 4.5% |
| **Other Race Groups** | * | 7.1% | 4.0% |
| **Total** | 2.8% | 8.9% | 5.9% |

* Indicates number of respondents reporting the behavior is less than 5

**25**

# Tobacco Use by Type:
# Smokeless (ST), Cigar, Cigarette, or Multiple Types, Alaska YRBS 2007



Types of Tobacco Use Among Tobacco Users, by Gender or Race



Types of Tobacco Use Among Tobacco Users, by Race and Gender
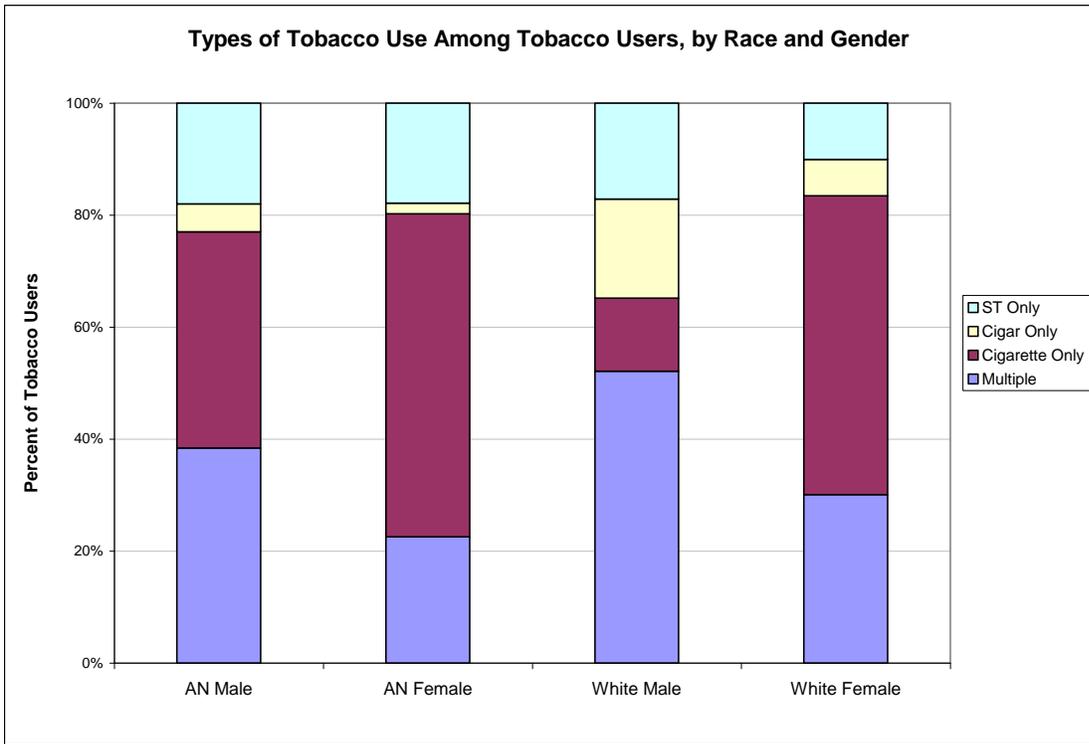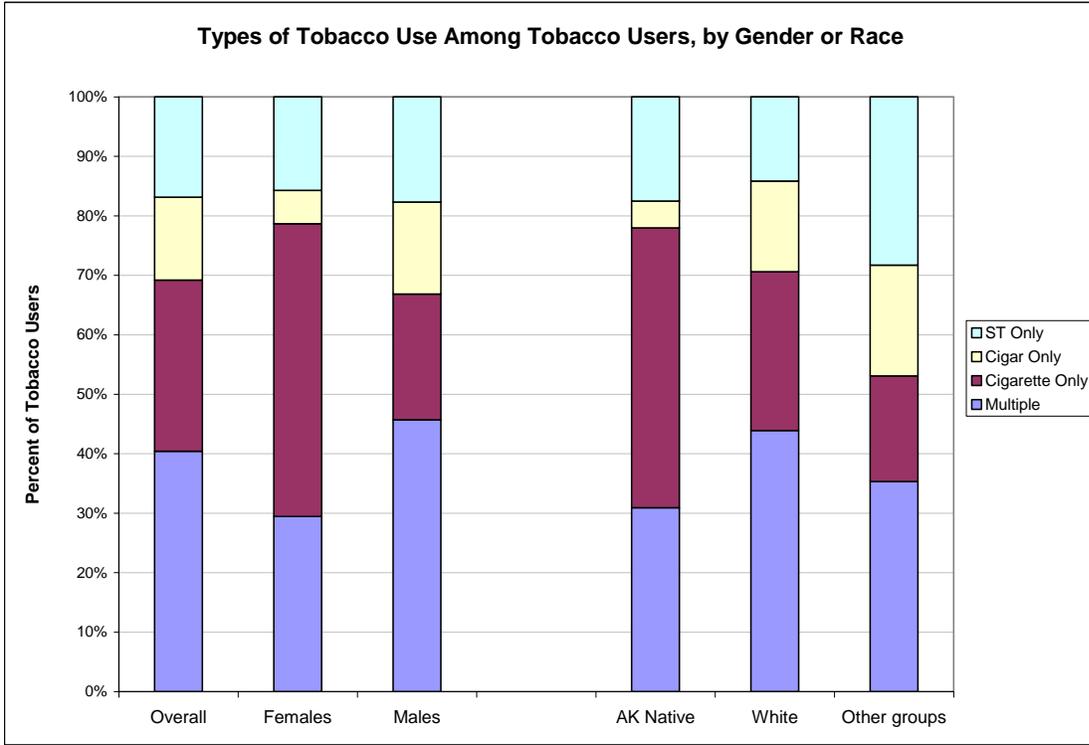
# Appendix C:  Bivariate Associations

| Factors of Interest | | Outcome Variables - Current Use | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Any Tobacco | | Cigarettes | | Cigar | | Smokeless | |
| | | OR | Sig | OR | Sig | OR | Sig | OR | Sig |
| GRADE 10 | | 1.42 | | 1.70 | | 1.28 | | 0.80 | |
| GRADE 11 | | 1.39 | | 1.73 | | 1.27 | | 0.81 | |
| GRADE 12 | | 1.66 | * | 2.13 | * | 1.66 | | 1.06 | |
| MALE | Gender | 1.10 | | 0.77 | | 2.54 | * | 2.03 | * |
| RACE_3C | Alaska Native | 2.24 | * | 2.56 | * | 0.65 | | 2.14 | |
| RACE_3C | Other | 0.62 | * | 0.36 | * | 0.64 | | 1.02 | |
| | | | | | | | | | |
| BKHLMT | Never/rarely wore bicycle helmet | 2.08 | * | 1.85 | * | 2.11 | * | 2.07 | * |
| qnb9 | Never/rarely wore seat belt | 3.39 | * | 3.41 | * | 2.33 | * | 3.35 | * |
| qnb10 | Rode 1+ times with drinking driver | 2.83 | * | 2.68 | * | 3.81 | * | 1.99 | * |
| qnb11 | Drove 1+ times when drinking | 7.43 | * | 4.86 | * | 7.72 | * | 4.22 | * |
| qnb12 | Carried weapon 1+ times past 30 days | 1.99 | * | 1.55 | * | 3.64 | * | 2.43 | * |
| qnb13 | Carried gun 1+ past 30 days | 2.31 | * | 1.54 | | 3.38 | * | 3.19 | * |
| qnb18 | Fought 1+ times 12 mos | 2.44 | * | 2.20 | * | 4.50 | * | 2.45 | * |
| qnb19 | Injured/treated 1+ times 12 mos | 3.81 | * | 2.68 | * | 6.16 | * | 2.83 | * |
| qnb14 | Carried weapon school 1+ past 30 days | 2.43 | * | 1.92 | * | 4.70 | * | 2.79 | * |
| qnb15 | Missed school b/c felt unsafe 1+ 30 days | 1.64 | | 1.85 | | 2.72 | * | 2.06 | * |
| qnb16 | Threatened at school 1+ times 12 mos | 2.53 | * | 1.89 | * | 4.58 | * | 3.78 | * |
| qnb17 | Property stolen/deliberately damaged at school | 1.08 | | 1.00 | | 1.38 | | 1.14 | |
| qnb20 | Fought school 1+ times 12 mos | 2.31 | * | 2.15 | * | 3.09 | * | 2.38 | * |
| | | | | | | | | | |
| qnb21 | Hit by boyfriend/girlfriend 12 mos | 1.67 | * | 1.56 | | 2.33 | * | 2.53 | * |
| qnb22 | Forced to have sex | 1.96 | * | 1.77 | * | 2.61 | * | 1.60 | |
| qnb23 | Sad 2 weeks past 12 mos | 1.71 | * | 1.88 | * | 2.30 | * | 1.66 | * |
| qnb24 | Considered suicide 12 mos | 1.45 | | 2.01 | * | 1.09 | | 1.33 | |
| qnb25 | Made suicide plan 12 mos | 2.06 | * | 2.29 | * | 2.17 | * | 1.49 | |
| qnb26 | Attempted suicide 1+ times 12 mos | 2.85 | * | 3.38 | * | 1.47 | | 1.74 | |
| qnb27 | Suicide attempt w/injury 12 mos | 6.87 | * | 5.79 | * | 3.43 | * | 3.70 | * |
| | | | | | | | | | |
| qnb40 | Had first drink before 13 | 2.34 | * | 2.32 | * | 2.60 | * | 2.22 | * |
| qnb41 | Had 1+ drinks past 30 days | 7.08 | * | 6.99 | * | 25.72 | * | 3.96 | * |
| qnb42 | Five+ drinks 1+ past 30 days | 7.70 | * | 6.58 | * | 16.75 | * | 4.02 | * |
| qnb46 | Tried marijuana before 13 | 5.97 | * | 6.24 | * | 4.63 | * | 3.61 | * |
| qnb47 | Used marijuana 1+ times past 30 days | 13.75 | * | 13.77 | * | 9.07 | * | 6.59 | * |
| qnb51 | Sniffed glue 1+ times in life | 3.22 | * | 3.39 | * | 3.86 | * | 1.72 | |
| qnb56 | Injected drugs 1+ times in life | 4.16 | * | 3.66 | * | 5.86 | * | 9.32 | * |
| qnb57 | Offered/sold drugs at school 12 mos | 2.04 | * | 2.02 | * | 3.56 | * | 1.69 | * |
| ILDRUG5 | ever (lifetime) use of any of these: cocaine, heroin, meth, ecstacy, steroids (Q49, 52-55) | 6.57 | * | 6.27 | * | 6.60 | * | 3.84 | * |
| | | | | | | | | | |
| qnb58 | Had sex ever | 4.78 | * | 4.54 | * | 5.33 | * | 3.52 | * |
| qnb59 | Had sex before 13 | 1.53 | | 1.83 | | 2.21 | * | 1.81 | |
| qnb60 | Had sex with 4+ people in life | 3.78 | * | 3.60 | * | 3.47 | * | 2.45 | * |
| qnb61 | Had sex with 1+ people 3 mos | 3.53 | * | 3.16 | * | 4.14 | * | 2.72 | * |
| ALCSX | Used alcohol last time had sex (w/in 3 months) | 6.45 | * | 6.42 | * | 6.78 | * | 3.68 | * |
| BRTHCNTR | Inadequately safe sex (did not use birth control at last recent sex) | 4.64 | * | 4.48 | * | 4.00 | * | 2.69 | * |
| QNIRRESP | Irresponsible sexual behavior (no condom) | 3.06 | * | 3.27 | * | 3.23 | * | 1.85 | * |

## Appendix C: Bivariate Associations – continued

| Factors of Interest | | Any Tobacco | | Cigarettes | | Cigar | | Smokeless | |
|---|---|---|---|---|---|---|---|---|---|
| | | OR | Sig | OR | Sig | OR | Sig | OR | Sig |
| BMIPCT_8 | BMI percentile of 85%+ (at risk of and overweight) | 0.96 | | 1.00 | | 0.83 | | 1.26 | |
| qnbrovwg | Overweight | 1.07 | | 1.02 | | 0.90 | | 1.45 | |
| qnbovwgt | At risk of overweight | 0.83 | | 1.14 | | 0.72 | | 0.71 | |
| qnb65 | [Think I am] slightly/very overweight | 1.14 | | 1.44 | * | 1.04 | | 0.97 | |
| qnb66 | Trying to lose weight | 0.82 | | 0.96 | | 0.73 | | 0.56 | * |
| qnb67 | Exercised to lose weight past 30 days | 0.90 | | 0.81 | | 0.79 | | 0.93 | |
| qnb68 | Ate less to lose weight past 30 days | 1.02 | | 1.32 | | 0.79 | | 0.56 | * |
| qnb69 | Fasted 24 hours or more to lose weight (30 day) | 2.15 | * | 1.94 | * | 1.55 | | 1.42 | |
| V070_71D | used unhealthy methods for weight loss (took pills, vomited), past 30 days | 1.52 | | 1.36 | | 2.72 | * | 0.96 | |
| qnbfrvg | Ate 5+ fruits/vegetables 7 days | 0.78 | | 0.62 | | 0.83 | | 1.11 | |
| qnb80 | Active 60 min on 5+ past 7 days | 0.76 | | 0.56 | | 0.93 | | 1.14 | |
| qnbdlype | Attended PE class daily | 0.95 | | 1.03 | | 1.19 | | 0.88 | |
| qnb83 | Got to PE class 1+ days average week | 1.18 | | 1.14 | | 1.19 | | 1.13 | |
| qnb84 | Played on 1+ sports teams 12 mos | 1.32 | | 0.98 | | 1.31 | | 1.67 | * |
| qnb81 | Watched 3+ hours of TV average day | 1.42 | * | 1.58 | * | 1.69 | * | 1.97 | * |
| qnb82 | Played video games 3+ hours/day | 0.88 | | 1.03 | | 1.51 | * | 0.78 | |
| qnb78 | Drank soda 1+ times/day past 7 days | 2.25 | * | 2.32 | * | 1.60 | | 2.26 | * |
| QNPE3X20 | NOT Exercising 21+ minutes in PE class, 3-5 days/week | 1.12 | | 1.20 | | 0.93 | | 1.06 | |
| qnb92 | Parent talks about school about daily | 0.68 | * | 0.56 | * | 1.20 | | 0.79 | |
| qnb93 | Agree teachers care about them | 0.55 | * | 0.49 | * | 0.76 | | 0.61 | * |
| qnb94 | Can seek help from 1+ non-parent adult | 0.85 | | 0.93 | | 0.70 | | 0.62 | |
| qnb95 | Volunteer 1+ hrs in avg week | 0.79 | | 0.83 | | 0.57 | * | 0.97 | |
| qnb96 | Do organized activities 1+ days, avg wk | 0.70 | | 0.56 | * | 0.54 | * | 1.06 | |
| qnb98 | Agree they matter to people in community | 0.60 | * | 0.48 | * | 0.81 | | 0.88 | |
| qnb99 | Agree school has rules for behavior | 0.55 | * | 0.50 | * | 0.63 | * | 0.56 | * |
| qnb97 | Agree feel alone in life | 1.27 | | 1.40 | | 1.97 | * | 1.02 | |
| v109b | Grades were mostly Ds and Fs | 1.67 | | 2.18 | * | 2.72 | * | 1.34 | |
| qnb89 | Smoke Exposure--Same room w/smoking 1+ days in past 7 | 3.23 | * | 3.94 | * | 4.63 | * | 2.07 | * |
| qnb86 | Told by doctor/nurse they had asthma | 0.94 | | 1.08 | | 1.48 | | 1.22 | |
| qnb87 | With current asthma | 0.71 | | 0.64 | | 0.82 | | 1.16 | |
| qnb91 | Told by doctor have diabetes | 1.74 | | 1.13 | | 3.26 | * | 2.42 | |

## Appendix C: Bivariate Associations – continued

| Factors of Interest | | Frequent Use (20+ days) | | | |
|---|---|---|---|---|---|
| | | Cigarettes | | Any (Cig/SLT) | |
| | | OR | Sig | OR | Sig |
| GRADE 10 | | 1.92 | * | 1.31 | |
| GRADE 11 | | 2.03 | * | 1.21 | |
| GRADE 12 | | 2.36 | * | 1.23 | |
| MALE | Gender | 0.59 | * | 0.81 | |
| RACE_3C | Alaska Native | 2.58 | * | 3.38 | * |
| RACE_3C | Other | 0.60 | | 0.93 | |
| | | | | | |
| BKHLMT | Never/rarely wore bicycle helmet | 1.86 | * | 2.27 | * |
| qnb9 | Never/rarely wore seat belt | 3.82 | * | 3.26 | * |
| qnb10 | Rode 1+ times with drinking driver | 2.64 | * | 2.19 | * |
| qnb11 | Drove 1+ times when drinking | 4.29 | * | 3.76 | * |
| qnb12 | Carried weapon 1+ times past 30 days | 1.54 | | 1.65 | * |
| qnb13 | Carried gun 1+ past 30 days | 1.43 | | 2.13 | * |
| qnb18 | Fought 1+ times 12 mos | 2.47 | * | 1.99 | * |
| qnb19 | Injured/treated 1+ times 12 mos | 3.41 | * | 3.40 | * |
| qnb14 | Carried weapon school 1+ past 30 days | 2.23 | | 2.60 | * |
| qnb15 | Missed school b/c felt unsafe 1+ 30 days | 2.43 | * | 2.14 | |
| qnb16 | Threatened at school 1+ times 12 mos | 1.54 | | 2.28 | * |
| qnb17 | Property stolen/deliberately damaged at school 12 r | 1.10 | | 0.89 | |
| qnb20 | Fought school 1+ times 12 mos | 1.87 | | 2.28 | * |
| | | | | | |
| qnb21 | Hit by boyfriend/girlfriend 12 mos | 1.58 | | 1.87 | |
| qnb22 | Forced to have sex | 2.80 | * | 2.91 | * |
| qnb23 | Sad 2 weeks past 12 mos | 1.80 | | 1.89 | * |
| qnb24 | Considered suicide 12 mos | 3.21 | * | 2.47 | * |
| qnb25 | Made suicide plan 12 mos | 2.81 | * | 2.75 | * |
| qnb26 | Attempted suicide 1+ times 12 mos | 3.38 | * | 3.00 | * |
| qnb27 | Suicide attempt w/injury 12 mos | 4.65 | * | 5.19 | * |
| | | | | | |
| qnb40 | Had first drink before 13 | 2.70 | * | 2.85 | * |
| qnb41 | Had 1+ drinks past 30 days | 5.30 | * | 4.03 | * |
| qnb42 | Five+ drinks 1+ past 30 days | 4.95 | * | 3.98 | * |
| qnb46 | Tried marijuana before 13 | 7.07 | * | 10.17 | * |
| qnb47 | Used marijuana 1+ times past 30 days | 14.41 | * | 12.87 | * |
| qnb51 | Sniffed glue 1+ times in life | 4.71 | * | 3.79 | * |
| qnb56 | Injected drugs 1+ times in life | 3.99 | * | 6.64 | * |
| qnb57 | Offered/sold drugs at school 12 mos | 1.66 | | 1.76 | * |
| ILDRUG5 | Ever (lifetime) use of any of these: cocaine, heroin, meth, ecstasy, steroids (Q49, 52-55) | 7.18 | * | 6.41 | * |
| | | | | | |
| qnb58 | Had sex ever | 6.53 | * | 5.81 | * |
| qnb59 | Had sex before 13 | 2.15 | * | 2.80 | * |
| qnb60 | Had sex with 4+ people in life | 7.22 | * | 5.58 | * |
| qnb61 | Had sex with 1+ people 3 mos | 5.00 | * | 4.20 | * |
| ALCSX | Used alcohol last time had sex (w/in 3 months) | 7.30 | * | 6.61 | * |
| BRTHCNTR | Inadequately safe sex (did not use birth control at last recent sex) | 5.49 | * | 5.75 | * |
| QNIRRESP | Irresponsible sexual behavior (no condom) | 4.22 | * | 3.67 | * |

## Appendix C: Bivariate Associations – continued

| Factors of Interest | | Frequent Use (20+ days) | | | |
| | | Cigarettes | | Any (Cig/SLT) | |
| | | OR | Sig | OR | Sig |
| BMIPCT_8 | BMI percentile of 85%+ (at risk of and overweight) | 0.81 | | 1.13 | |
| qnbrovwg | Overweight | 1.05 | | 1.28 | |
| qnbovwgt | At risk of overweight | 0.80 | | 1.05 | |
| qnb65 | [Think I am] slightly/very overweight | 1.47 | | 1.79 | * |
| qnb66 | Trying to lose weight | 0.90 | | 0.87 | |
| qnb67 | Exercised to lose weight past 30 days | 0.59 | * | 0.69 | * |
| qnb68 | Ate less to lose weight past 30 days | 1.00 | | 0.80 | |
| qnb69 | Fasted 24 hours or more to lose weight (30 day) | 1.97 | | 1.98 | |
| V070_71D | used unhealthy methods for weight loss (took pills, vomited), past 30 days | 1.03 | | 0.94 | |
| | | | | | |
| qnbfrvg | Ate 5+ fruits/vegetables 7 days | 0.67 | | 0.75 | |
| qnb80 | Active 60 min on 5+ past 7 days | 0.60 | | 0.68 | |
| qnbdlype | Attended PE class daily | 0.93 | | 0.84 | |
| qnb83 | Got to PE class 1+ days average week | 0.95 | | 0.88 | |
| qnb84 | Played on 1+ sports teams 12 mos | 0.91 | | 1.02 | |
| qnb81 | Watched 3+ hours of TV average day | 2.13 | * | 2.52 | * |
| qnb82 | Played video games 3+ hours/day | 0.89 | | 0.85 | |
| qnb78 | Drank soda 1+ times/day past 7 days | 2.83 | * | 3.87 | * |
| QNPE3X20 | NOT Exercising 21+ minutes in PE class, 3-5 days/week | 1.88 | | 1.66 | * |
| | | | | | |
| qnb92 | Parent talks about school about daily | 0.39 | * | 0.37 | * |
| qnb93 | Agree teachers care about them | 0.39 | * | 0.46 | * |
| qnb94 | Can seek help from 1+ non-parent adult | 0.64 | | 0.65 | |
| qnb95 | Volunteer 1+ hrs in avg week | 0.51 | * | 0.72 | |
| qnb96 | Do organized activities 1+ days, avg wk | 0.32 | * | 0.49 | * |
| qnb98 | Agree they matter to people in community | 0.31 | * | 0.50 | * |
| qnb99 | Agree school has rules for behavior | 0.65 | | 0.59 | * |
| qnb97 | Agree feel alone in life | 1.49 | | 1.50 | |
| v109b | Grades were mostly Ds and Fs | 1.65 | | 1.36 | |
| qnb89 | Smoke Exposure--Same room w/smoking 1+ days in past 7 | 4.35 | * | 2.96 | * |
| | | | | | |
| qnb86 | Told by doctor/nurse they had asthma | 1.19 | | 0.97 | |
| qnb87 | With current asthma | 0.85 | | 0.81 | |
| qnb91 | Told by doctor have diabetes | 0.95 | | 1.21 | |

## Appendix C: Bivariate Associations – continued

| Factors of Interest | | Tobacco Use at School | | | | | |
|---|---|---|---|---|---|---|---|
| | | Cigarette | | Smokeless | | Either | |
| | | OR | Sig | OR | Sig | OR | Sig |
| GRADE 10 | | 1.21 | | 0.85 | | 1.16 | |
| GRADE 11 | | 1.31 | | 0.64 | | 1.09 | |
| GRADE 12 | | 1.19 | | 0.64 | | 1.01 | |
| MALE | Gender | 0.81 | | 3.44 | * | 1.19 | |
| RACE_3C | Alaska Native | 3.35 | * | 2.31 | | 3.42 | * |
| RACE_3C | Other | 0.44 | | 0.95 | | 0.77 | |
| | | | | | | | |
| BKHLMT | Never/rarely wore bicycle helmet | 2.11 | * | 3.25 | * | 2.37 | * |
| qnb9 | Never/rarely wore seat belt | 3.34 | * | 3.70 | * | 4.28 | * |
| qnb10 | Rode 1+ times with drinking driver | 3.76 | * | 1.98 | * | 2.74 | * |
| qnb11 | Drove 1+ times when drinking | 9.03 | * | 4.23 | * | 6.82 | * |
| qnb12 | Carried weapon 1+ times past 30 days | 1.69 | | 3.04 | * | 1.89 | * |
| qnb13 | Carried gun 1+ past 30 days | 1.85 | | 3.07 | * | 2.02 | * |
| qnb18 | Fought 1+ times 12 mos | 3.51 | * | 3.18 | * | 3.03 | * |
| qnb19 | Injured/treated 1+ times 12 mos | 5.12 | * | 4.28 | * | 5.67 | * |
| qnb14 | Carried weapon school 1+ past 30 days | 2.68 | * | 3.39 | * | 2.62 | * |
| qnb15 | Missed school b/c felt unsafe 1+ 30 days | 2.89 | * | 2.37 | * | 2.63 | * |
| qnb16 | Threatened at school 1+ times 12 mos | 2.37 | * | 4.58 | * | 3.35 | * |
| qnb17 | Property stolen/deliberately damaged at school 12 mos | 1.03 | | 1.29 | | 1.16 | |
| qnb20 | Fought school 1+ times 12 mos | 3.26 | * | 4.21 | * | 3.51 | * |
| | | | | | | | |
| qnb21 | Hit by boyfriend/girlfriend 12 mos | 2.03 | | 2.55 | * | 2.09 | * |
| qnb22 | Forced to have sex | 1.79 | * | 1.58 | | 1.76 | * |
| qnb23 | Sad 2 weeks past 12 mos | 2.25 | * | 1.95 | * | 2.18 | * |
| qnb24 | Considered suicide 12 mos | 2.05 | * | 0.97 | | 1.56 | |
| qnb25 | Made suicide plan 12 mos | 3.61 | * | 1.80 | * | 3.10 | * |
| qnb26 | Attempted suicide 1+ times 12 mos | 3.49 | * | 1.23 | | 2.79 | * |
| qnb27 | Suicide attempt w/injury 12 mos | 6.58 | * | 3.18 | * | 6.98 | * |
| | | | | | | | |
| qnb40 | Had first drink before 13 | 3.05 | * | 2.18 | * | 2.48 | * |
| qnb41 | Had 1+ drinks past 30 days | 7.25 | * | 3.96 | * | 5.03 | * |
| qnb42 | Five+ drinks 1+ past 30 days | 7.56 | * | 3.62 | * | 5.31 | * |
| qnb46 | Tried marijuana before 13 | 7.31 | * | 5.23 | * | 7.16 | * |
| qnb47 | Used marijuana 1+ times past 30 days | 16.97 | * | 8.34 | * | 12.58 | * |
| qnb51 | Sniffed glue 1+ times in life | 4.82 | * | 1.80 | | 3.53 | * |
| qnb56 | Injected drugs 1+ times in life | 4.34 | * | 10.57 | * | 5.94 | * |
| qnb57 | Offered/sold drugs at school 12 mos | 2.68 | * | 2.85 | * | 2.20 | * |
| ILDRUG5 | Ever (lifetime) use of any of these: cocaine, heroin, meth, ecstasy, steroids (Q49, 52-55) | 8.73 | * | 4.01 | * | 6.74 | * |
| | | | | | | | |
| qnb58 | Had sex ever | 4.66 | * | 4.59 | * | 4.66 | * |
| qnb59 | Had sex before 13 | 3.17 | * | 2.58 | * | 2.90 | * |
| qnb60 | Had sex with 4+ people in life | 4.64 | * | 1.89 | * | 3.71 | * |
| qnb61 | Had sex with 1+ people 3 mos | 4.27 | * | 2.69 | * | 3.87 | * |
| ALCSX | Used alcohol last time had sex (w/in 3 months) | 10.63 | * | 3.28 | * | 7.50 | * |
| BRTHCNTR | Inadequately safe sex (did not use birth control at last recent sex) | 4.56 | * | 2.63 | * | 4.38 | * |
| QNIRRESP | Irresponsible sexual behavior (no condom) | 3.40 | * | 1.93 | | 2.97 | * |

## Appendix C: Bivariate Associations – continued

| Factors of Interest | | Tobacco Use at School | | | | | |
|---|---|---|---|---|---|---|---|
| | | Cigarette | | Smokeless | | Either | |
| | | OR | Sig | OR | Sig | OR | Sig |
| BMIPCT_8 | BMI percentile of 85%+ (at risk of and overweight) | 0.80 | | 1.55 | | 1.08 | |
| qnbrovwg | Overweight | 0.83 | | 1.60 | | 1.10 | |
| qnbovwgt | At risk of overweight | 0.98 | | 1.14 | | 1.10 | |
| qnb65 | [Think I am] slightly/very overweight | 1.73 | * | 1.03 | | 1.37 | |
| qnb66 | Trying to lose weight | 0.92 | | 0.53 | * | 0.77 | |
| qnb67 | Exercised to lose weight past 30 days | 0.70 | | 0.80 | | 0.73 | |
| qnb68 | Ate less to lose weight past 30 days | 1.11 | | 0.40 | * | 0.83 | |
| qnb69 | Fasted 24 hours or more to lose weight (30 day) | 2.01 | | 1.18 | | 1.98 | |
| V070_71D | used unhealthy methods for weight loss (took pills, vomited), past 30 days | 1.54 | | 0.81 | | 1.36 | |
| | | | | | | | |
| qnbfrvg | Ate 5+ fruits/vegetables 7 days | 0.68 | | 0.99 | | 0.86 | |
| qnb80 | Active 60 min on 5+ past 7 days | 0.43 | * | 1.01 | | 0.64 | |
| qnbdlype | Attended PE class daily | 0.98 | | 0.86 | | 0.85 | |
| qnb83 | Got to PE class 1+ days average week | 0.92 | | 1.47 | | 1.08 | |
| qnb84 | Played on 1+ sports teams 12 mos | 0.93 | | 1.57 | * | 1.14 | |
| qnb81 | Watched 3+ hours of TV average day | 1.65 | * | 2.47 | * | 1.70 | * |
| qnb82 | Played video games 3+ hours/day | 1.14 | | 1.05 | | 0.83 | |
| qnb78 | Drank soda 1+ times/day past 7 days | 2.17 | * | 3.43 | * | 3.20 | * |
| QNPE3X20 | NOT Exercising 21+ minutes in PE class, 3-5 days/week | 1.28 | | 0.96 | | 1.20 | |
| | | | | | | | |
| qnb92 | Parent talks about school about daily | 0.41 | * | 0.76 | | 0.47 | * |
| qnb93 | Agree teachers care about them | 0.37 | * | 0.43 | * | 0.36 | * |
| qnb94 | Can seek help from 1+ non-parent adult | 0.55 | * | 0.48 | * | 0.51 | * |
| qnb95 | Volunteer 1+ hrs in avg week | 0.64 | | 1.02 | | 0.83 | |
| qnb96 | Do organized activities 1+ days, avg wk | 0.59 | | 0.98 | | 0.73 | |
| qnb98 | Agree they matter to people in community | 0.37 | * | 0.81 | | 0.48 | * |
| qnb99 | Agree school has rules for behavior | 0.60 | * | 0.51 | * | 0.59 | * |
| qnb97 | Agree feel alone in life | 1.57 | | 1.13 | | 1.40 | |
| v109b | Grades were mostly Ds and Fs | 2.20 | | 1.56 | | 1.70 | |
| | | | | | | | |
| qnb89 | Smoke Exposure--Same room w/smoking 1+ days in past 7 | 3.09 | * | 1.83 | | 2.24 | * |
| | | | | | | | |
| qnb86 | Told by doctor/nurse they had asthma | 1.10 | * | 1.07 | | 0.93 | |
| qnb87 | With current asthma | 0.73 | | 0.79 | | 0.70 | |
| qnb91 | Told by doctor have diabetes | 0.69 | | 2.55 | | 1.52 | |

# Appendix D:  Domain Associations (Logistic Regressions)

| Injury-related Questions Effect | | Cigarette OR   Sig | Cigar OR   Sig | SLT OR   Sig | Any Tobacco OR   Sig | Frequent OR   Sig | School OR   Sig |
|---|---|---|---|---|---|---|---|
| GRADE | (referent is 9th grade) | **1.28** * | 0.99 | 1.17 | 1.16 | 1.06 | 0.93 |
| MALE | (referent is female) | **0.52** * | **1.83** * | 1.53 | 0.82 | 0.62 | 0.87 |
| NATIVE | (referent is White) | **2.83** * | 1.88 | 0.66 | **2.41** * | **3.25** * | **3.58** * |
| Black | " | 0.62 | 0.96 | 1.16 | 0.81 | 1.00 | 0.68 |
| Asian | " | 0.39 | **0.26** * | **0.25** * | **0.32** * | 0.14 | 0.21 |
| NHPI | " | 0.31 | 0.78 | 1.49 | 0.71 | 0.39 | 0.65 |
| Hisp | " | 0.66 | 1.05 | 1.17 | 0.74 | 0.55 | 0.62 |
| BKHLMT | Never/rarely wore bicycle helmet | 1.35 | 1.37 | 1.23 | **1.53** * | 1.42 | 1.33 |
| **qnb9  +** | **Never/rarely wore seat belt** | **3.41** * | **1.88** * | 1.26 | 2.55 | 2.45 | **3.91** * |
| qnb10 | Rode 1+ times with drinking driver | **1.80** * | 1.10 | 1.68 | **1.69** * | 1.28 | 1.43 |
| **qnb11 +** | **Drove 1+ times when drinking** | **3.09** * | **2.81** * | **3.79** * | **4.54** * | **2.20** * | **4.44** * |
| **qnb18 +** | **Fought 1+ times 12 mos** | **1.72** * | 1.53 | **2.43** * | 1.56 | 1.28 | 1.69 |
| qnb20 | Fought school 1+ times 12 mos | 0.88 | 0.71 | 0.63 | 0.88 | 0.96 | 1.22 |
| qnb12 | Carried weapon 1+ times past 30 days | 1.25 | 0.92 | 1.30 | 1.11 | 1.06 | 0.88 |
| qnb13 | Carried gun 1+ past 30 days | 0.69 | 1.60 | 0.84 | 1.01 | 1.04 | 0.53 |
| qnb14 | Carried weapon school 1+ past 30 days | 1.35 | 1.43 | 1.74 | 1.42 | 2.09 | 1.61 |
| qnb19 | Injured/treated 1+ times 12 mos | 0.91 | 1.22 | 1.74 | 1.23 | 1.35 | 1.93 |
| qnb15 | Missed school b/c felt unsafe 1+ 30 days | 1.09 | 0.87 | 1.04 | 0.89 | 1.06 | 0.95 |
| **qnb16 ++** | **Threatened at school 1+ times 12 mos** | 1.45 | **2.18** * | **2.90** * | 1.81 | 1.54 | **2.41** * |

| Injury2 Effect | | Cigarette OR   Sig | Cigar OR   Sig | SLT OR   Sig | Any Tobacco OR   Sig | Frequent OR   Sig | School OR   Sig |
|---|---|---|---|---|---|---|---|
| GRADE | (referent is 9th grade) | **1.35** * | 0.95 | 1.23 | **1.21** * | 1.05 | 1.05 |
| MALE | (referent is female) | 0.76 | **1.91** * | **2.91** * | 1.07 | 0.78 | 1.13 |
| NATIVE | (referent is White) | **2.75** * | 2.12 | **0.46** * | **2.19** * | **3.39** * | **3.56** * |
| Black | " | 1.07 | 1.70 | 1.79 | 1.16 | 1.24 | 0.65 |
| Asian | " | **0.46** | **0.21** * | **0.26** * | **0.28** * | 0.14 | **0.19** * |
| NHPI | " | 0.51 | 0.71 | 1.45 | 0.76 | 0.69 | 1.17 |
| Hisp | " | 0.72 | 1.17 | 0.97 | 0.78 | 0.42 | 0.57 |
| **qnb21 +** | **Hit by boyfriend/girlfriend 12 mos** | 1.40 | **2.20** * | 1.37 | 1.37 | 1.47 | **2.45** * |
| qnb22 | Forced to have sex | 1.02 | 0.88 | 1.63 | 1.16 | 1.54 | 0.66 |
| **qnb23 +** | **Sad 2 weeks past 12 mos** | 1.13 | 1.59 | **3.01** * | 1.30 | 0.90 | 1.31 |
| qnb24 | Considered suicide 12 mos | 0.98 | 1.08 | **0.37** * | 0.69 | 1.26 | 0.50 |
| qnb25 | Made suicide plan 12 mos | 1.48 | 0.56 | 1.73 | 1.33 | 1.64 | **2.33** * |
| qnb26 | Attempted suicide 1+ times 12 mos | 1.61 | 0.65 | 1.09 | 1.46 | 0.96 | 0.99 |
| qnb27 | Suicide attempt w/injury 12 mos | **3.28** * | **5.58** * | 2.58 | **4.51** * | 2.79 | **5.72** * |

Note:  Items with + are ones used in summary measures analyses.  QN16 (Threatened at school 1+ times in the past 12 months) was moved to the "Injury 2" group.

## Appendix D: Domain Associations – continued

| Alcohol and Drug Use Variables Effect | | Cigarette OR Sig | Cigar OR Sig | SLT OR Sig | Any Tobacco OR Sig | Frequent OR Sig | School OR Sig |
|---|---|---|---|---|---|---|---|
| GRADE | (referent is 9th grade) | 1.26 * | 0.99 | 1.14 | 1.12 | 0.94 | 0.91 |
| MALE | (referent is female) | 0.59 * | 2.25 * | 2.42 * | 0.98 | 0.70 | 1.22 |
| NATIVE | (referent is White) | 3.14 * | 2.12 | 0.51 | 2.57 * | 3.22 * | 3.19 * |
| Black | " | 0.31 | 0.72 | 0.90 | 0.48 | 0.61 | 0.19 * |
| Asian | " | 0.67 | 0.34 | 0.47 | 0.46 | 0.31 | 0.43 |
| NHPI | " | 0.32 | 0.79 | 2.33 | 0.76 | 0.62 | 0.96 |
| Hisp | " | 0.63 | 0.76 | 0.87 | 0.52 | 0.42 | 0.45 |
| qnb41 | Had 1+ drinks past 30 days | 2.03 | 1.54 | 4.45 * | 2.04 | 1.20 | 1.46 |
| qnb42 + | Five+ drinks 1+ past 30 days | 1.78 | 1.54 | 3.87 * | 2.30 * | 0.99 | 1.58 |
| qnb47 + | Used marijuana 1+ times past 30 days | 5.45 * | 2.85 * | 2.82 * | 5.80 * | 5.48 * | 4.70 * |
| qnb40 | Had first drink before 13 | 1.09 | 1.21 | 0.89 | 1.01 | 1.14 | 0.79 |
| qnb46 | Tried marijuana before 13 | 2.08 | 1.22 | 1.27 | 1.84 * | 3.01 * | 2.68 * |
| qnb57 | Offered/sold drugs at school 12 mos | 1.10 | 0.99 | 1.57 | 0.99 | 0.87 | 0.93 |
| qnb51 | Sniffed glue 1+ times in life | 1.51 | 0.53 | 1.69 | 1.31 | 1.72 | 1.97 * |
| qnb56 | Injected drugs 1+ times in life | 1.97 | 7.78 * | 2.85 * | 3.23 * | 1.85 | 2.80 |
| ILDRUG5 + | ever use cocaine, heroin, meth, ecstacy, or steroids (Q49, 52-55) | 1.78 * | 1.61 | 1.26 | 1.55 | 2.07 * | 1.90 * |

| Sex Behavior Effect | | Cigarette OR Sig | Cigar OR Sig | SLT OR Sig | Any Tobacco OR Sig | Frequent OR Sig | School OR Sig |
|---|---|---|---|---|---|---|---|
| GRADE | (referent is 9th grade) | 1.13 | 0.96 | 0.96 | 1.04 | 0.86 | 0.83 |
| MALE | (referent is female) | 0.69 * | 2.67 * | 2.84 * | 1.16 | 0.87 | 1.52 |
| NATIVE | (referent is White) | 2.99 * | 2.13 * | 0.77 | 2.40 * | 3.40 * | 3.71 * |
| Black | " | 0.59 | 1.06 | 1.09 | 0.76 | 0.90 | 0.44 |
| Asian | " | 0.26 * | 0.30 | 0.22 * | 0.23 * | 0.15 * | 0.20 * |
| NHPI | " | 0.45 | 0.88 | 1.95 | 0.89 | 0.89 | 1.34 |
| Hisp | " | 0.59 | 0.79 | 0.88 | 0.57 | 0.43 | 0.50 |
| qnb58 + | Had sex ever | 3.52 * | 3.06 * | 3.14 * | 3.82 * | 3.67 * | 2.96 * |
| qnb59 | Had sex before 13 | 1.31 | 1.16 | 1.01 | 0.89 | 1.59 | 2.26 * |
| qnb60 | Had sex with 4+ people in life | 1.32 | 0.92 | 1.20 | 1.31 | 2.08 * | 1.06 |
| qnb61 | Had sex with 1+ people 3 mos | 0.67 | 1.19 | 1.34 | 0.92 | 0.84 | 1.37 |
| ALCSX + | Used alcohol last time had sex (w/in 3 months) | 3.10 * | 2.40 * | 3.20 * | 2.84 * | 2.24 | 3.54 * |
| BRTHCNTRL + | Inadequately safe sex (no birth control at most recent sex) | 2.35 | 1.95 | 1.72 | 2.57 * | 3.51 * | 2.25 |
| QNIRRESPSX | Irresponsible sexual behavior (no condom) | 0.78 | 0.49 | 0.83 | 0.60 | 0.61 | 0.59 |

| Connectedness to School, Community Effect | | Cigarette OR Sig | Cigar OR Sig | SLT OR Sig | Any Tobacco OR Sig | Frequent OR Sig | School OR Sig |
|---|---|---|---|---|---|---|---|
| GRADE | (referent is 9th grade) | 1.34 * | 1.10 | 1.15 | 1.19 * | 1.10 | 1.09 |
| MALE | (referent is female) | 0.74 | 2.47 * | 2.29 * | 1.14 | 0.93 | 1.31 |
| NATIVE | (referent is White) | 2.23 * | 1.71 | 0.63 | 1.94 * | 2.67 * | 2.79 * |
| Black | " | 0.34 | 1.02 | 1.07 | 0.65 | 0.86 | 0.54 |
| Asian | " | 0.25 * | 0.23 * | 0.20 * | 0.23 * | 0.09 * | 0.13 * |
| NHPI | " | 0.39 | 0.66 | 1.45 | 0.71 | 0.50 | 0.70 |
| Hisp | " | 0.88 | 1.34 | 1.24 | 0.90 | 0.66 | 0.71 |
| qnb92 + | Parent talks about school about daily | 0.76 | 0.84 | 1.32 | 0.79 | 0.53 * | 0.64 * |
| qnb94 | Can seek help from 1+ non-parent adult | 1.10 | 0.60 | 0.78 | 0.96 | 0.89 | 0.62 |
| qnb97r | (Dis)Agree feel alone in life | 0.83 | 0.94 | 0.49 * | 0.87 | 0.79 | 0.82 |
| qnb95 | Volunteer 1+ hrs in avg week | 1.06 | 0.93 | 0.72 | 0.87 | 0.90 | 0.98 |
| qnb96 | Do organized activities 1+ days, avg wk | 0.63 * | 1.34 | 0.66 | 0.79 | 0.61 | 0.91 |
| qnb93 + | Agree teachers care about them | 0.57 * | 0.66 * | 0.92 | 0.67 * | 0.56 * | 0.45 * |
| qnb99 + | Agree school has rules for behavior | 0.68 * | 0.67 * | 0.65 | 0.67 * | 0.92 | 1.01 |
| qnb98 | Agree they matter to people in community | 0.75 | 1.10 | 1.00 | 0.83 | 0.72 | 0.67 |
| v109b | Grades were mostly Ds and Fs | 1.88 | 0.93 | 2.09 | 1.34 | 0.83 | 1.15 |

Note:  Items with + are ones used in summary measures analyses.  Injection drug use was not carried forward because of low prevalence, but illicit drug use was substituted in the summary model.

## Appendix D: Domain Associations – continued

| Physical Activity and Nutrition Variables Effect | | Cigarette OR Sig | Cigar OR Sig | SLT OR Sig | Any Tobacco OR Sig | Frequent OR Sig | School OR Sig |
|---|---|---|---|---|---|---|---|
| GRADE | (referent is 9th grade) | 1.33 * | 1.09 | 1.16 | 1.23 * | 1.13 | 1.03 |
| MALE | (referent is female) | 0.73 | 2.43 * | 2.27 * | 1.11 | 0.91 | 1.27 |
| NATIVE | (referent is White) | 2.57 * | 1.71 | 0.62 | 2.05 * | 2.62 * | 2.83 * |
| Black | " | 0.65 | 1.20 | 1.39 | 0.84 | 1.19 | 0.68 |
| Asian | " | 0.30 * | 0.28 * | 0.20 * | 0.28 * | 0.12 * | 0.16 * |
| NHPI | " | 0.56 | 1.01 | 1.79 | 0.95 | 0.96 | 1.37 |
| Hisp | " | 0.66 | 1.12 | 1.12 | 0.76 | 0.63 | 0.80 |
| qnb84 | Played on 1+ sports teams 12 mos | 1.07 | 1.61 * | 1.34 | 1.40 * | 1.15 | 1.19 |
| qnb81 + | Watched 3+ hours of TV average day | 1.48 * | 1.98 * | 1.58 * | 1.40 * | 2.46 * | 1.50 * |
| qnb82 | Played video games 3+ hours/day | 1.02 | 0.62 * | 1.27 | 0.83 | 0.69 | 0.72 |
| qnb78 + | Drank soda 1+ times/day past 7 days | 1.98 * | 2.00 | 1.47 | 2.11 * | 2.95 * | 2.69 * |
| QNPE3X20 | NOT Exercising 21+ minutes in PE class, 3-5 days/week | 1.01 | 1.17 | 1.03 | 1.05 | 1.58 | 1.17 |

| Weight and Body Image Issues Effect | | Cigarette OR Sig | Cigar OR Sig | SLT OR Sig | Any Tobacco OR Sig | Frequent OR Sig | School OR Sig |
|---|---|---|---|---|---|---|---|
| GRADE | (referent is 9th grade) | 1.31 * | 1.05 | 1.16 | 1.23 * | 1.09 | 1.08 |
| MALE | (referent is female) | 0.70 | 2.20 * | 2.60 * | 1.09 | 0.77 | 1.25 |
| NATIVE | (referent is White) | 2.82 * | 1.85 | 0.65 | 2.26 * | 3.34 * | 3.46 * |
| Black | " | 0.63 | 1.32 | 1.45 | 0.93 | 1.34 | 0.86 |
| Asian | " | 0.34 * | 0.24 * | 0.22 * | 0.28 * | 0.12 | 0.16 * |
| NHPI | " | 0.60 | 1.00 | 1.82 | 1.02 | 1.00 | 1.43 |
| Hisp | " | 0.72 | 1.32 | 1.27 | 0.78 | 0.70 | 0.74 |
| qnb65 | [Think I am] slightly/very overweight | 1.52 | 1.45 | 1.64 | 1.26 | 2.03 * | 1.56 |
| qnb66 | Trying to lose weight | 0.64 | 0.68 | 0.73 | 0.67 | 0.72 | 0.61 |
| qnb67 | Exercised to lose weight past 30 days | 0.73 | 1.27 | 0.95 | 0.98 | 0.75 | 0.85 |
| qnb68 | Ate less to lose weight past 30 days | 1.13 | 0.46 * | 0.75 | 0.84 | 0.56 | 0.67 |
| qnb69 + | Fasted 24 hours or more to lose weight (30 day) | 1.99 * | 2.61 * | 1.68 | 2.63 * | 2.74 * | 2.58 * |
| V070_71D | Unhealthy methods for weight loss | 1.16 | 1.04 | 3.12 * | 1.16 | 0.95 | 1.21 |

| Secondhand Smoke Effect | | Cigarette OR Sig | Cigar OR Sig | SLT OR Sig | Any Tobacco OR Sig | Frequent OR Sig | School OR Sig |
|---|---|---|---|---|---|---|---|
| GRADE | (referent is 9th grade) | 1.30 * | 1.01 | 1.12 | 1.19 * | 1.07 | 1.03 |
| MALE | (referent is female) | 0.88 | 2.28 * | 3.06 * | 1.30 | 0.91 | 1.39 |
| NATIVE | (referent is White) | 3.06 * | 2.16 * | 0.71 | 2.50 * | 3.28 * | 3.39 * |
| Black | " | 0.89 | 1.66 | 1.90 | 1.07 | 1.47 | 0.82 |
| Asian | " | 0.43 | 0.35 | 0.31 * | 0.32 * | 0.13 | 0.16 * |
| NHPI | " | 0.57 | 0.87 | 1.89 | 0.94 | 0.94 | 1.31 |
| Hisp | " | 0.59 | 1.11 | 0.88 | 0.63 | 0.60 | 0.69 |
| qnb89 | Smoke Exposure--Same room w/smoking 1+ days in past 7 | 3.97 * | 2.25 * | 5.34 * | 3.40 * | 2.85 * | 2.34 * |

Note:  Items with + are ones used in summary measures analyses.  Physical Activity and Nutrition items were combined with Weight and Body Image Issues items into one domain, called Diet & Exercise in later analyses.

# Appendix E:  Summary Measures Associations

| Alaska YRBS 2007 | | Tobacco Use Measures | | |
| --- | --- | --- | --- | --- |
| | | **Current** | **Frequent** | **School** |
| **Factors of Interest** | | OR        Sig | OR        Sig | OR        Sig |
| GRADE | | 1.03 | 0.86 | 0.83 |
| MALE | | 1.14 | 0.94 | 1.46 |
| **NATIVE** | | **1.85 *** | **2.36 *** | **2.80 *** |
| Black | | 0.70 | 0.78 | 0.25 |
| Asian | | 0.41 | 0.21 | 0.25 |
| NHPI | | 0.83 | 0.46 | 0.90 |
| Hisp | | 0.50 | 0.46 | 0.54 |
| **Injury/Violence Risk Behaviors** | | | | |
| qnb9 | Never/rarely wore seat belt | 1.77 | 1.62 | **2.24 *** |
| qnb11 | Drove 1+ times when drinking | **2.08 *** | 1.13 | **2.34 *** |
| qnb18 | Fought 1+ times 12 mos | 0.89 | 0.66 | 1.04 |
| **Victimization and Sadness/Depression** | | | | |
| qnb16 | Threatened at school 1+ times 12 mos | 1.52 | 1.07 | 2.02 |
| qnb21 | Hit by boyfriend/girlfriend 12 mos | 0.70 | 0.97 | 0.85 |
| qnb23 | Sad 2 weeks past 12 mos | 1.08 | 0.92 | 1.56 |
| **Drugs** | | | | |
| qnb42 | Five+ drinks 1+ past 30 days | **2.59 *** | 0.89 | 1.37 |
| qnb47 | Used marijuana 1+ times past 30 days | **5.15 *** | **6.20 *** | **4.78 *** |
| ILDRUG5 | | | | |
| | Ever use cocaine, heroin, meth, ecstasy, or steroids | **2.13 *** | **2.62 *** | **2.43 *** |
| **Sex Behavior** | | | | |
| qnb58 | Had sex ever | **1.81 *** | **2.36 *** | 1.63 |
| ALCSX | Used alcohol last time had sex (w/in 3 months) | 0.75 | 1.13 | 1.32 |
| BRTHCNTRL | Inadequately safe sex (did not use birth control at last recent sex) | **1.78 *** | 2.20 | 1.40 |
| **Diet & Exercise** | | | | |
| qnb69 | Fasted 24 hours or more to lose weight (30 day) | 1.17 | 1.43 | 1.25 |
| qnb81 | Watched 3+ hours of TV average day | 1.09 | **1.77 *** | 1.04 |
| qnb78 | Drank soda 1+ times/day past 7 days | 1.56 | **2.72 *** | **2.40 *** |
| **Connectedness** | | | | |
| qnb92 | Parent talks about school about daily | 0.78 | **0.44 *** | 0.64 |
| qnb93 | Agree teachers care about them | 0.86 | 0.83 | 0.56 |
| qnb99 | Agree school has rules for behavior | **0.70 *** | 1.15 | 1.26 |
| **Secondhand Smoke Exposure (SHS)** | | | | |
| qnb89 | Same room w/smoking 1+ days in past 7 days | **1.53 *** | 1.27 | 0.80 |

Note:  In developing the summary measures, we started with items for which the odds ratio was 2.0 or higher, or 0.5 and lower, in the domain analyses.  We conducted factor analyses to determine if substitution of items would be justifiable across outcomes even though there were some differences in the domain analyses, by the 3 summary outcomes any tobacco use, heavy use, and use at school.

We also substituted QN23 (sad 2 weeks at a time, in the past 12 months) for item QN27 (Suicide attempt with injury, past 12 months) because of the low prevalence and high missingness on that item.

# Appendix F: Summary Associations and Years

| Alaska YRBS 2003 | Tobacco Use Measures | | | | | |
|---|---|---|---|---|---|---|
| | Current | | Frequent | | School | |
| **Factors of Interest** | OR | Sig | OR | Sig | OR | Sig |
| GRADE | 1.11 | | 1.22 | | 1.08 | |
| MALE | 1.32 | | 1.10 | | 1.12 | |
| **NATIVE** | **6.19** | * | **5.02** | * | **6.06** | * |
| Other | 0.91 | | 1.33 | | 1.28 | |
| **Injury/Violence Risk Behaviors** | | | | | | |
| qnb9 Never/rarely wore seat belt | 1.37 | | **2.36** | * | 1.37 | |
| qnb11 Drove 1+ times when drinking | 1.17 | | 1.09 | | 1.46 | |
| qnb18 Fought 1+ times 12 mos | **1.91** | * | **2.29** | * | **2.03** | * |
| **Victimization and Sadness/Depression** | | | | | | |
| qnb16 Threatened at school 1+ times 12 mos | 1.20 | | 1.75 | | 1.62 | |
| qnb21 Hit by boyfriend/girlfriend 12 mos | 0.94 | | 1.19 | | 1.09 | |
| qnb23 Sad 2 weeks past 12 mos | 1.19 | | 1.20 | | 1.16 | |
| **Drugs** | | | | | | |
| qnb42 Five+ drinks 1+ past 30 days | **2.24** | * | 1.22 | | 1.65 | |
| qnb47 Used marijuana 1+ times past 30 days | **3.23** | * | **3.23** | * | **2.63** | * |
| ILDRUG5 | | | | | | |
| Ever use cocaine, heroin, meth, ecstasy, or steroids | **2.67** | * | 1.70 | | 1.73 | |
| **Sex Behavior** | | | | | | |
| qnb58 Had sex ever | **1.78** | * | 2.01 | | 0.97 | |
| ALCSX Used alcohol last time had sex (w/in 3 months) | 1.16 | | 2.19 | | **3.38** | * |
| BRTHCNTRL Inadequately safe sex (did not use birth control at last recent sex) | 1.54 | | 1.29 | | 1.61 | |
| **Diet & Exercise** | | | | | | |
| qnb69 Fasted 24 hours or more to lose weight (30 day) | 1.59 | | 0.94 | | 1.38 | |
| qnb81 Watched 3+ hours of TV average day | 1.09 | | 1.76 | | 0.98 | |
| **Connectedness** | | | | | | |
| qnb92 Parent talks about school about daily | 0.77 | | 0.92 | | 0.73 | |
| qnb93 Agree teachers care about them | 1.33 | | 1.22 | | 0.83 | |
| qnb99 Agree school has rules for behavior | 0.85 | | 1.63 | | 0.98 | |

Note:  This model is almost the same as the one presented for 2007 AK YRBS in Appendix E.  Two items were not asked in 2003 and are omitted from this model:  soda consumption and secondhand smoke exposure.

# References/Endnotes

[1] Biglan A, Brennan PA, Foster SL, Holder HD. *Helping adolescents at risk: prevention of multiple problem behaviors.* The Guilford Press, NY, NY. 2004.

[2] Office of Applied Studies. Nicotine Dependence: 2006.  Results from the 2006 National Survey on Drug Use and Health.  SAMSHA, January 2008. http://oas.samhsa.gov/2k8/nicotine/nicotine.cfm

[3] Leatherdale ST, McDonald PW, Cameron R, Brown KS. A multilevel analysis examining the relationship between social influences for smoking and smoking onset. *American Journal of Health Behavior* 2005; 29(6):520-530.

[4] Mowery PD, Farrelly MC, Haviland L, Gable JM, Wells HE. Progression to established smoking among US youths. *American Journal of Public Health* 2004; 94(2):331-337.

[5] Peterson E, Fenaughty AM, Eberhart-Phillips JE. *Tobacco in the Great Land, A Portrait of Alaska's Leading Cause of Death.* Anchorage, AK: Section of Epidemiology, Division of Public Health and Social Services; 2004.

[6] Angstman S, Patten CA, Renner CC, Simon A, Thomas JL, Hurt RD, Schroeder DR, Decker PA, Offord KP.  Tobacco and other substance use among Alaska Native youth in western Alaska.  *American Journal of Health Behavior* 2007; 31(3):249-260.

[7] Alaska Department of Education and Early Development.  Public School Dropouts for 2005-2006, Grades 7-12. available at http://www.eed.state.ak.us/stats/DropoutRates/2001-2006DropoutRatesbyEthnicity.pdf

[8] Centers for Disease Control and Prevention.  *Best Practices for Comprehensive Tobacco Control Programs—2007.*  Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; October 2007.

[9] Carpenter C, Cook PJ.  Cigarette taxes and youth smoking: New evidence from national, state, and local Youth Risk Behavior Surveys.  *Journal of Health Economics*, March 2008, 27(2): 287-299.

[10] The Task Force on Community Preventive Services.  Recommendations regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke.  *American Journal of Preventive Medicine*, February 2001, 20(2) Supplement 1: 10-15.

[11] Dobbins M, DeCorby K, Manske S, Goldblatt E. Effective practices for school-based tobacco use prevention.  *Preventive Medicine*, April 2008, 46(4): 289-297.

[12] Cleveland MJ, Feinberg ME, Bontempo DE, Greenberg MT.  The Role of Risk and Protective Factors in Substance Use Across Adolescence.  *Journal of Adolescent Health*, In Press, June 2008.  Available online.

[13] CDC, Global School Personnel Survey, http://www.cdc.gov/tobacco/Global/surveys.htm

[14] Grunbaum JA, Lowry R, Kann L.  Prevalence of health-related behaviors among alternative high school students as compared with students attending regular high schools.  *Journal of Adolescent Health*, November 2001, 29(5): 337-343.