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Substance Use and Suicide in Pacific Islander, American Indian, and Multiracial Youth

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Abstract

Introduction: National estimates of U.S. Native Hawaiian and other Pacific Islander (NHPI), American Indian/Alaskan Native (AIAN), and multiracial adolescent substance use and suicidality are scarce because of their small population sizes. The aim was to estimate the national prevalence of, and disparities in, substance use and suicidality among these understudied adolescents.

Methods: Analyses conducted in 2017 of U.S. adolescents (grades ninth to 12th) from the 1991 – 2015 Combined National Youth Behavioral Risk Surveys estimated (1) prevalence of lifetime and current (past 30-day) substance use, past 12-month depressed mood, and suicidality by racial group; and (2) AORs for depressed mood and suicidality regressed on current alcohol, cigarette, and marijuana use.

Results: Among 184,494 U.S. adolescents, alcohol, cigarettes, and marijuana were commonly used with lifetime prevalence of 75.32%, 58.11%, and 40.55%, respectively, and current prevalence of 44.51%, 24.58%, and 22.01%, respectively. Past 12-month prevalence of suicidal thoughts, suicide planning, and attempted suicide were 18.87%, 14.75%, and 7.98%, respectively. Relative to non-Hispanic whites, NHPI, AIAN, and multiracial adolescents had higher prevalence of using many illicit substances (e.g., marijuana, heroin), depressed mood, and suicidal thoughts, planning, and attempts ($p < 0.05$). Except for NHPIs and current alcohol use, current alcohol and cigarette use were independently associated with 2.0–2.3 times greater AORs ($p < 0.05$) for attempted suicide among the target adolescents.

Conclusions: U.S. NHPI, AIAN, and multiracial adolescents are disproportionately burdened by illicit substance use, depressed mood, and suicidality. Current alcohol and cigarette use may predispose these adolescents toward suicidality, offering potential pathways to alleviate suicide risk.

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SUPPLEMENTAL MATERIAL

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INTRODUCTION

Substance use poses a serious public health problem that affects adolescents of all racial backgrounds. In the U.S., 70% of high school seniors have used alcohol, 34% have used tobacco, and 49% tried illicit drugs,¹ with national studies generally finding higher substance use rates among non-Hispanic white and Hispanic versus African-American and Asian-American adolescents.^{2–4} By comparison, little is known about the national substance use patterns of Native Hawaiian and other Pacific Islander (NHPI), American Indian/Alaskan Native (AIAN), and multiracial adolescents,⁵ who may be at heightened risk for substance use⁵—and related depressed mood and suicide^{6–8}—due to exposure to sizable socioeconomic and health disparities.⁹

Because NHPI, AIAN, and multiracial individuals compose the three smallest U.S. racial groups,¹⁰ adolescents from these groups are rarely captured by major health surveys in sufficient numbers to systematically examine their national substance use patterns, or compare their data against other adolescent groups—particularly non-Hispanic whites. Accordingly, efforts to identify, target, and address their substance use disparities have been hindered by a lack of detailed information. To address this gap, the current study uses pooled data from the 1991–2015 Youth Risk Behavior Surveys (YRBS) to obtain larger sample sizes to examine the national prevalence of substance use among NHPI, AIAN, and multiracial adolescents. These large samples were further leveraged to explore these adolescents' prevalence of depressed mood and suicidality as adolescent suicide is an escalating national problem¹¹ that remains underexplored among NHPI, AIAN, and multiracial adolescents.

NHPIs comprise the smallest (but third fastest growing) U.S. racial group,¹⁰ restricting investigation of their substance use problems. Although persistently combined in health data with Asian Americans—who have very low substance use rates¹²—sparse de-aggregated data suggest that substance use may be prevalent, though understudied, among NHPI adolescents.¹² For example, Native Hawaiian adolescents experience greater alcohol problems compared with non-Hawaiians (i.e., alcohol use, binge drinking, chronic drinking),^{13,14} which increases their odds of violence¹⁴ and risky sexual behavior.¹⁵ Suicide is also a major problem affecting NHPIs. In the Pacific Islands, the adolescent suicide rates of NHPIs are among the world's highest,¹⁶ whereas in Hawaii, Native Hawaiian adolescents have significantly higher lifetime prevalence of attempted suicide (12.9%) than non-Hawaiians (9.6%).¹⁷

Although AIANs comprise the second smallest U.S. racial group,¹⁰ some data suggest that AIAN adolescents endure the highest substance use and suicide rates of all adolescents.^{2,18,19} Nationally, 48% of AIAN adolescents (vs 39% of non-Hispanic whites) have ever used any controlled substances,⁶ whereas AIAN child (aged 5–14 years) and adolescent/young adult (15–24 years) suicide rates are 6.6 and 4.0 times greater, respectively, than their non-AIAN peers.²⁰ Yet, despite their high prevalence, few studies have examined the associations between substance use and suicidality among these vulnerable adolescents.

Multiracial adolescents are the fastest growing U.S. youth group, increasing nearly 50% from 2000 to 2010.¹⁰ Yet, researchers know little about their substance use and suicide problems. Limited research has suggested multiracial adolescents use substances at rates similar to non-Hispanic whites,⁵ but are more likely to initiate alcohol, tobacco, and marijuana use and manifest behavioral problems, including violence, depressed mood, and suicidality, than their monoracial peers.^{7,8,21}

On the basis of prior data from smaller sample sizes that U.S. NHPI, AIAN, and multiracial adolescents may be disproportionately burdened by substance use and suicide, a large nationally representative pooled sample of adolescents (N=184,494) is analyzed to (1) obtain national prevalence estimates of substance use, depressed mood, and suicidality in these understudied minority adolescents; and (2) identify disparities between these estimates relative to non-Hispanic white adolescents. Additionally, because substance use is an important risk factor for depressed mood and suicidality among U.S. adolescents,^{22,23} the associations of current alcohol, cigarette, and marijuana use (the three most commonly used substances by adolescents¹) with depressed mood and suicidality are examined among the target minority adolescents; data that could inform tailored behavioral health prevention approaches for these understudied adolescents.

METHODS

Study Sample

The YRBS is a school-based cross-sectional survey designed to capture the prevalence of health-risk behaviors for the leading causes of adolescent morbidity and mortality (e.g., suicide, vehicle accidents) across time and racial/ethnic populations.²⁴ Using a three-stage cluster sample design, the YRBS draws nationally representative samples of U.S. public and private school students in ninth to 12th grades, while oversampling certain racial minority groups to increase group estimate accuracy²⁴; making YRBS data ideally suited for this investigation. The primary sampling units are large-sized counties or groups of smaller adjacent counties, and student data are weighted to adjust for nonresponse, minority group oversampling, and to match national population projections for each survey year.²⁵

De-identified data of 184,494 adolescents (ninth to 12th grades) from the YRBS Combined National Dataset²⁵ were analyzed upon receiving University of California, Riverside IRB approval as exempt human subjects research. This data set combined all 13 biannually administered YRBS national survey waves from 1991 to 2015—rendering it one of the largest sources of U.S. adolescent substance use and suicide-related prevalence estimates. Participating adolescents self-completed the survey at school using a computer-scannable booklet to facilitate anonymous and voluntary participation, and active or passive parental permission was obtained.²⁴ Variables were standardized across survey waves.

Measures

Participants were coded into racial group using the U.S. Office of Management and Budget's federal race/ethnicity classification standards²⁶: non-Hispanic white, Hispanic, African American, Asian American, NHPI, AIAN, and multiracial. Three dummy variables coded

participant age: 12–14 years (reference category), 15–16 years, and 17–18 years. Survey year was coded by decade into three dummy variables: 1991–1999 (reference category), 2000–2009, and 2010–2015.

Lifetime use of alcohol, cigarettes, marijuana, smokeless tobacco, cigars, cocaine, inhalants, heroin, and methamphet-amines were determined by non-zero responses to items querying how often the target substance had ever been used (e.g., *during your life, how many times have you used marijuana?*). Current use of alcohol, cigarettes, and marijuana were identified by non-zero responses to items soliciting how often the target substance was used in the past 30 days. Items asking the respondent's age when first using alcohol, cigarettes, and marijuana determined initiation at ages <13 years. Binge drinking was defined as consumption of five or more alcohol drinks within a couple of hours in the past 30 days. Past 12-month prevalence of depressed mood, serious suicidal thoughts, suicide planning, and attempted suicide were captured by asking, respectively, whether during this time frame the respondent had (1) feelings of sadness or hopelessness over the past 2 weeks that impacted their usual activities, (2) seriously considered attempting suicide, (3) made a plan about how to attempt suicide, or (4) attempted suicide.

Statistical Analysis

To account for the YRBS multistage cluster design,²⁵ data were analyzed in 2017 via the Stata/SE, version 15.0 SVY program with the *svyset* command identifying the primary sampling units, strata, and population weight design variables. Population weights were divided by 13—the number of pooled biannual YRBS waves—to properly weight the sample to the national population. Descriptive statistics produced the weighted prevalence (and 95% CIs) for assessed substance use, depressed mood, and suicidality variables. To explore the associations between current alcohol, cigarette, and marijuana use on past 12-month depressed mood and suicidality, separate logistic regression models were conducted for each racial/ ethnic group that entered (1) past 12-month depressed mood, suicidal thoughts, suicide planning, and attempted suicide as the respective dependent variables; and (2) current alcohol, cigarette, and marijuana use as the main independent variables. Sex, age, and survey year were entered as additional covariates.

RESULTS

Among all U.S. adolescents in ninth to 12th grades, lifetime prevalence of alcohol (75.32%), cigarette (58.11%), and marijuana (40.55%) use exceeded other substances (range, 2.56%–13.78%; Table 1). Compared with non-Hispanic white adolescents ($n=77,571$):

1. Hispanic adolescents ($n=51,033$) had significantly higher lifetime prevalence of marijuana, cocaine, and heroin use ($p<0.05$) and lower prevalence of all tobacco use ($p<0.05$);
2. African-American ($n=41,567$) and Asian-American adolescents ($n=6,404$) had significantly lower lifetime prevalence of all substance use ($p<0.05$; except marijuana use among African Americans);

3. NHPI adolescents ($n=1,130$) had significantly higher lifetime prevalence of marijuana, cocaine, heroin, and methamphetamine use ($p<0.05$), and lower alcohol use prevalence ($p<0.05$);
4. AIAN adolescents ($n=2,129$) had significantly higher lifetime prevalence of all substance use ($p<0.05$) except alcohol; and
5. multiracial adolescents ($n=4,660$) had significantly higher lifetime prevalence of marijuana and heroin use ($p<0.05$).

Overall, current use of alcohol, cigarettes, and marijuana was prevalent, with 44.51% of U.S. adolescents reporting current alcohol use, 24.58% reporting current cigarette use, and 22.01% reporting current marijuana use. Compared with non-Hispanic white adolescents:

1. Hispanic, African-American, and Asian-American adolescents had significantly lower prevalence of current alcohol and cigarette use and recent binge drinking ($p<0.05$), but higher prevalence of marijuana use ($p<0.05$; except for Asian Americans).
2. NHPI adolescents had significantly lower prevalence of current alcohol and cigarette use ($p<0.05$), and equal prevalence of current marijuana use and recent binge drinking.
3. AIAN adolescents had significantly higher prevalence of current cigarette and marijuana use ($p<0.05$), and equal prevalence of current alcohol use and recent binge drinking.
4. Multiracial adolescents had significantly higher prevalence of current marijuana use ($p<0.05$), and lower prevalence of current alcohol and cigarette use, and recent binge drinking ($p<0.05$).
5. Finally, all minority adolescents (except Asian Americans) had significantly higher prevalence of initiating alcohol and marijuana use at ages < 13 years ($p<0.05$).

During the previous 12 months, 28.46% of adolescents reported depressed mood, 18.87% reported serious suicidal thoughts, 14.75% reported a plan for attempting suicide, and 7.98% had attempted suicide. Relative to non-Hispanic white adolescents, all minority adolescents had significantly higher prevalence of past 12-month attempted suicide ($p<0.05$), whereas NHPI, AIAN, and multiracial adolescents also experienced higher prevalence of past 12-month depressed mood, serious suicidal thoughts, and suicide planning ($p<0.05$).

The associations between substance use with depressed mood and suicide have rarely been studied in NHPI, AIAN, and multiracial adolescents, who demonstrated high prevalence of current alcohol, cigarette, and marijuana use, and depressed mood and suicidality in the data. Thus, their depressed mood and suicidality were regressed on current alcohol, cigarette, and marijuana use.

Tables 2–4 display the AORs for past 12-month suicidal thoughts, suicide planning, and attempted suicide, respectively, by racial/ethnic group. Appendix Table 1 (available online) presents past 12-month depressed mood AORs. For past 12-month depressed mood, after

adjusting for covariates: (1) AIAN and multiracial adolescents who currently used alcohol had 1.5–1.8 times greater AORs ($p<0.05$); (2) multiracial adolescents who currently used cigarettes had a 2.2 times greater AOR ($p<0.05$); and (3) current marijuana use did not generate significantly higher AORs among target adolescents, but did for all other racial groups (i.e., Hispanic, African American, Asian American, non-Hispanic white; $p<0.05$). No age or survey year AORs were significant.

Regarding having serious suicidal thoughts (Table 2), after adjusting for covariates: (1) NHPI, AIAN, and multiracial adolescents who currently used alcohol had 1.6–2.0 times greater AORs ($p<0.05$); (2) AIAN and multiracial adolescents who currently used cigarettes had 1.5–2.0 times greater AORs ($p<0.05$); and (3) again, current marijuana use did not produce significantly greater AORs among target adolescents, but did for all other racial groups (AORs=1.2–1.5, $p<0.05$). For the age covariate, AIAN adolescents 15–16 and 17–18 years had significantly lower AORs versus 12–14 years ($p<0.05$) while for survey year, AIAN and multiracial adolescents in 2001–2009 had significantly lower AORs versus 1991–1999 ($p<0.05$).

With respect to suicide planning (Table 3), after adjusting for covariates: (1) NHPI, AIAN, and multiracial adolescents who currently used alcohol had 1.6–2.0 times greater AORs ($p<0.05$); (2) AIAN and multiracial adolescents who currently used cigarettes had 1.7–2.0 times greater AORs ($p<0.05$); and (3) current marijuana use did not produce significantly greater AORs among target adolescents or Asian Americans, but did for all other racial groups (AORs=1.2–1.4, $p<0.05$). For age, AIAN adolescents 17–18 years had a significantly lower AOR versus 12–14 years ($p<0.05$), and for survey year, AIAN adolescents in 2001–2009 had a significantly lower AOR versus 1991–1999 ($p<0.05$).

Regarding attempted suicide (Table 4), after adjusting for covariates: (1) AIAN and multiracial adolescents who currently used alcohol had 2.0–2.1 times greater AORs ($p<0.05$); (2) NHPI, AIAN, and multiracial adolescents who currently used cigarettes had 2.1–2.3 times greater AORs ($p<0.05$); and (3) current marijuana use did not lead to increased AORs among target adolescents, but did for all other racial groups (AORs=1.4–2.0, $p<0.05$). For age, multiracial adolescents 15–16 and 17–18 years had significantly lower AORs versus 12–14 years ($p<0.05$), whereas no survey-year AORs were significant for the target adolescents.

DISCUSSION

The present investigation analyzed 13 waves of YRBS national data spanning 24 years—comprising one of the largest samples of U.S. adolescent health-risk behaviors—to obtain nationally representative estimates of adolescent substance use, depressed mood, and suicidality for each major U.S. racial/ethnic group, with special focus on understudied NHPI, AIAN, and multiracial adolescents. Overall findings indicated pervasive lifetime substance use among U.S. adolescents in ninth to 12th grades, especially for alcohol, cigarettes, and marijuana. Current substance use was also prevalent with approximately half of adolescents using alcohol, one quarter using cigarettes, and one quarter using marijuana in the past 30 days, although rates of current alcohol and cigarette—but not marijuana—use

trended down by decade from 1991 to 2015. Over the past year, one quarter of U.S. adolescents experienced self-reported depressed mood, approximately 20% experienced serious suicidal thoughts, and 8% attempted suicide.

Examining racial group differences, lifetime and current substance use prevalence among Hispanic, African-American, and Asian-American adolescents was generally lower (aside from marijuana use) than non-Hispanic white adolescents; mirroring past findings that non-Hispanic white adolescents report equal or higher substance use prevalence than most minority adolescents.²⁻⁵ However, prevalence of attempted suicide was significantly higher for Hispanic, African-American, and Asian-American adolescents than non-Hispanic white adolescents.

For NHPI, AIAN, and multiracial adolescents, data revealed substantial substance use, depressed mood, and suicide-related disparities relative to non-Hispanic whites with these groups' disparities frequently exceeding those exhibited by other racial minority groups. This suggests that U.S. NHPI, AIAN, and multiracial adolescents may be especially vulnerable to developing behavioral health problems.

Specifically, NHPI adolescents demonstrated higher lifetime prevalence of cocaine, heroin, and methamphet-amine use than non-Hispanic whites, potentially increasing their likelihood for addiction to these illicit street drugs and consequent negative outcomes (e.g., forensic involvement, homelessness, overdose).^{27,28} Additionally, despite lower prevalence of alcohol use versus non-Hispanic white peers, NHPI adolescents displayed equal prevalence of binge drinking; a concerning pattern of alcohol use previously shown in non-U.S. research to amplify NHPIs' risk for alcohol use disorders and alcohol-related harms.^{29,30} NHPI adolescents also exhibited over two times greater prevalence of attempted suicide than non-Hispanic whites, with current cigarette use predicting greater odds for attempted suicide.

Of all racial groups, AIAN adolescents reported the worst outcomes, evidencing the highest prevalence of lifetime and current use for every substance studied except heroin, and the highest prevalence of attempted suicide (almost three times greater than non-Hispanic whites). Additionally, AIAN adolescents' current alcohol and cigarette use predicted greater likelihood for attempted suicide. These results confirm older reports with smaller sample sizes^{2,18,19} that AIAN adolescents are exceptionally vulnerable to substance use and suicide, placing them at elevated risk for serious harm and mortality.³¹

Finally, multiracial adolescents reported elevated prevalence of lifetime alcohol and cigarette use that equaled non-Hispanic white adolescents, and greater marijuana use. They also suffered comparable prevalence of depressed mood and suicide-related behaviors to AIAN youth, the highest-risk group in this study. These findings align with the scarce existing literature that suggests multiracial youth comprise a high-risk population vulnerable to myriad behavioral health problems, including poor mental health and adjustment, conduct problems, substance use, and suicide.^{21,32}

Paralleling NHPI and AIAN adolescents, multiracial adolescents' current alcohol and cigarette use predicted enhanced likelihood for depressed mood and suicidality. As

multiracial adolescents represent the fastest growing U.S. adolescent group but have rarely been the focus of behavioral health research, exploratory studies are needed to further identify the substance use-related risk factors and pathways—including social influences such as ethnic identification and racial discrimination²¹—that predispose these at-risk adolescents to depressed mood and suicide.

Encouragingly, NHPI and multiracial adolescents had lower prevalence of current alcohol and cigarette use, and multiracial adolescents had lower binge drinking, than non-Hispanic whites, suggesting the possible presence of important cultural protective factors that may usefully inform prevention efforts. Furthermore, findings of NHPI, AIAN, and multiracial adolescents' substance use and suicide-related disparities highlight the need to reduce their elevated risk by tailoring existing substance use^{33,34} and suicide prevention interventions^{35,36} to emphasize these cultural protective factors (e.g., spirituality orientation).³⁷ As these target adolescents' current alcohol and cigarette use were associated with an increased likelihood for suicidal thoughts and behaviors including attempted suicide, screening and preventing ongoing alcohol and cigarette use may further lower the likelihood of suicide when integrated with tailored suicide prevention programs. Finally, because participants were in school, implementing prevention programs in school settings may be effective in reaching at-risk adolescents.³⁸

Limitations

Limitations include NHPI and AIAN samples that mirrored their relative population sizes, cross-sectional data preventing causal inference, and school-based data excluding adolescents not attending school. For example, the absence of high-risk older adolescent dropouts from the sample may explain the lower suicidality in older versus younger AIANs. Like all race-based categories, the multiracial category aggregated heterogeneous adolescents possessing varied racial/ethnic admixtures, potentially masking divergent cultural experiences that may influence behavioral health. As multiracial health data are increasingly collected through national surveys, future studies may isolate the unique substance use and suicide patterns of different multiracial adolescents. Lastly, logistic regressions could not account for additional unassessed demographic confounders, such as family income, poverty, and parent education.

CONCLUSIONS

This large-scale investigation of multi-wave U.S. surveillance data provides national evidence that, relative to non-Hispanic whites, NHPI, AIAN, and multiracial adolescents experience pervasive disparities in substance use (especially for illicit drugs such as marijuana and heroin), depressed mood, and suicidality. Because current alcohol and cigarette use may aggravate these adolescents' alarming prevalence of attempted suicide, health and school officials may consider implementing targeted alcohol and tobacco prevention programming to attenuate this elevated suicide risk. Finally, although present findings illuminate important national patterns in, and linkages between, the substance use and suicide-related behaviors of these neglected adolescents, in-depth exploratory research is

needed to design effective, culturally congruent screening, prevention, and intervention approaches to reduce the substance use and suicide burden on these vulnerable adolescents.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.
Substance Use and Suicidality Prevalence in YRBS Participants (1991–2015) by Race/Ethnicity (Unweighted N=184,494)

Variable	NHPI	AIAN	Multiracial	Hispanic	African American	Asian American	Non-Hispanic white
Unweighted <i>n</i>	1,130	2,129	4,660	51,033	41,567	6,404	77,571
Weighted %							
Sex (female)	46.61	44.15	53.77	49.51	50.55	46.34	48.16
Age							
13 years	0.97	0.99	0.63	0.40	0.23	0.46	0.10
14–15 years	36.66	32.94	38	37.36	34.80	36.38	34.11
16–17 years	49.73	50.98	49.80	48.38	50.06	48.40	51.13
18 years	12.64	15.09	11.57	13.86	14.81	14.76	14.66
Lifetime substance use							
Alcohol	71.61 (67.73, 75.19)	79.38 (76.70, 81.82)	77.32 (75.23, 79.28)	76.90 (76.31, 77.48)	69.58 (68.85, 70.31)	55.71 (53.94, 57.47)	76.76 (76.24, 77.07)
Cigarettes	54.94 (50.83, 58.98)	71.43 (68.36, 74.32)	55.22 (52.71, 57.71)	56.50 (55.82, 57.17)	54.17 (53.40, 54.93)	41.45 (39.74, 43.19)	58.05 (57.58, 58.52)
Marijuana	42.10 (38.18, 46.11)	55.04 (51.74, 58.30)	46.14 (43.67, 48.64)	43.46 (42.80, 44.13)	42.54 (41.77, 43.40)	19.77 (18.46, 21.16)	38.48 (38.03, 38.94)
Smokeless tobacco	9.66 (7.26, 12.74)	14.36 (12.01, 17.09)	7.41 (6.11, 8.97)	4.90 (4.59, 5.24)	2.41 (2.17, 2.69)	3.73 (3.02, 4.59)	10.68 (10.37, 11.00)
Cigars	17.70 (14.57, 21.32)	19.77 (16.88, 23.02)	16.30 (14.49, 18.28)	13.02 (12.53, 13.53)	12.11 (11.54, 12.69)	6.18 (5.30, 7.20)	14.68 (14.30, 15.07)
Cocaine	10.95 (8.62, 13.81)	13.15 (11.19, 15.41)	8.64 (7.22, 10.30)	11.24 (10.83, 11.67)	2.37 (2.16, 2.60)	4.73 (4.06, 5.52)	7.01 (6.78, 7.25)
Inhalant	13.23 (10.69, 16.26)	18.38 (15.82, 21.24)	15.08 (13.29, 17.07)	13.57 (14.09, 14.06)	7.24 (6.83, 7.67)	8.73 (7.67, 9.91)	13.81 (13.46, 14.17)
Heroin	8.19 (6.07, 10.96)	4.91 (3.48, 6.89)	3.57 (2.74, 4.64)	3.28 (3.01, 3.58)	2.00 (1.77, 2.25)	3.04 (2.37, 3.89)	2.23 (2.08, 2.39)
Methamphetamines	9.03 (6.98, 11.61)	10.75 (8.67, 13.27)	7.53 (6.27, 9.03)	6.43 (6.07, 6.82)	2.24 (2.00, 2.50)	4.63 (3.83, 5.58)	6.05 (5.80, 6.32)
Current use							
Alcohol	41.28 (37.22, 45.46)	48.77 (45.30, 52.26)	44.03 (41.50, 46.60)	45.20 (44.50, 45.89)	35.14 (34.37, 35.92)	23.83 (22.37, 25.34)	47.35 (46.87, 47.83)
Cigarette use							
Current	22.70 (19.33, 26.46)	35.61 (32.43, 38.93)	23.28 (21.04, 25.67)	20.45 (19.89, 21.01)	13.57 (13.03, 14.14)	13.85 (12.71, 15.09)	28.12 (27.69, 28.55)
Daily	7.85 (5.89, 10.37)	12.28 (10.03, 14.95)	6.92 (5.57, 8.57)	3.77 (3.48, 4.07)	3.14 (2.85, 3.46)	3.72 (3.12, 4.42)	10.06 (9.77, 10.36)
Marijuana	24.75 (21.43, 28.40)	32.34 (29.37, 35.46)	26.03 (23.94, 28.24)	23.75 (23.17, 24.33)	23.50 (22.84, 24.18)	10.20 (9.21, 11.28)	21.30 (20.92, 21.68)
Use before age 13 years							
Alcohol	30.27 (26.43, 34.40)	36.58 (33.41, 39.88)	30.35 (28.00, 32.81)	28.69 (28.07, 29.32)	28.07 (27.34, 28.82)	20.36 (18.93, 21.87)	24.86 (24.44, 25.28)
Tobacco	18.08 (14.86, 21.82)	29.78 (26.79, 32.96)	18.28 (16.21, 20.55)	16.17 (15.67, 16.69)	13.24 (12.73, 13.78)	11.57 (10.45, 12.79)	19.01 (18.64, 19.39)
Marijuana	14.77 (12.09, 17.91)	18.65 (16.28, 21.28)	12.33 (10.71, 14.15)	11.13 (10.71, 11.56)	10.64 (10.14, 11.17)	4.26 (3.53, 4.99)	7.17 (6.94, 7.41)

Variable	NHPI	AIAN	Multiracial	Hispanic	African American	Asian American	Non-Hispanic white
Binge drinking ^a	27.50 (23.94, 31.37)	30.45 (27.45, 33.63)	24.93 (22.76, 27.23)	26.75 (26.16, 27.36)	14.35 (13.79, 14.93)	11.89 (10.83, 13.03)	30.78 (30.35, 31.22)
Mental health problems (past 12 months)							
Depressed mood	36.09 (32.42, 39.92)	33.77 (30.53, 37.18)	35.64 (33.30, 38.06)	34.85 (34.15, 35.56)	27.37 (26.58, 28.17)	26.50 (24.86, 28.21)	26.21 (25.64, 26.69)
Serious suicidal thoughts	22.91 (19.69, 26.48)	25.43 (22.75, 28.30)	26.16 (23.91, 28.53)	19.11 (18.58, 19.65)	15.21 (14.66, 15.77)	19.56 (18.23, 20.98)	18.88 (18.52, 19.26)
Suicide plan	19.96 (16.88, 23.43)	20.74 (18.23, 23.49)	20.72 (18.71, 22.90)	15.65 (15.16, 16.16)	11.78 (11.28, 12.29)	16.73 (15.47, 18.06)	14.42 (14.10, 14.76)
Suicide attempt	14.95 (11.98, 18.50)	16.77 (14.33, 19.52)	12.96 (11.34, 14.76)	10.86 (10.42, 11.32)	8.09 (7.65, 8.55)	8.51 (7.58, 9.55)	6.71 (6.48, 6.96)

Note: Values are weighted prevalence (95% CI) unless otherwise indicate. Boldface indicates the estimate for the group significantly differed from the estimate of non-Hispanic whites ($p < 0.05$). The sample size is unweighted. All prevalence results are weighted estimates.

^aFive drinks in row, past 30 days.

AIAN, American Indian/Alaskan Native; NHPI, Native Hawaiian and other Pacific Islander; YRBS, Youth Risk Behavior Surveillance.

Adjusted Odds of Serious Suicidal Thoughts Among YRBS Participants (1991–2015) by Race/Ethnicity

Table 2

Variable	NHPI (n=1,130)	AIAN (n=2,129)	Multiracial (n=4,660)	Hispanic (n=51,033)	African American (n=41,567)	Asian American (n=6,404)	Non-Hispanic white (n=77,571)
Sex							
Male (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Female	2.43 (1.52, 3.88)	1.91 (1.32, 2.78)	1.92 (1.43, 2.57)	2.47 (2.28, 2.67)	2.39 (2.14, 2.66)	2.10 (1.75, 2.52)	2.06 (1.96, 2.17)
Age							
12–14 years (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
15–16 years	0.94 (0.46, 1.92)	0.57 (0.33, 0.98)	0.75 (0.53, 1.07)	0.92 (0.80, 1.04)	0.92 (0.80, 1.04)	0.91 (0.76, 1.09)	1.05 (0.78, 1.42)
17–18 years	0.95 (0.45, 1.99)	0.41 (0.24, 0.71)	0.73 (0.50, 1.08)	0.79 (0.69, 0.91)	0.79 (0.69, 0.91)	0.85 (0.70, 1.02)	1.02 (0.76, 1.38)
Survey year							
1991–1999 (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2001–2009	0.80 (0.43, 1.50)	0.61 (0.42, 0.90)	0.71 (0.53, 0.96)	0.70 (0.63, 0.78)	0.70 (0.63, 0.78)	0.63 (0.56, 0.70)	0.64 (0.50, 0.81)
2011–2015	0.55 (0.29, 1.09)	0.74 (0.48, 1.12)	0.78 (0.57, 1.07)	0.80 (0.71, 0.90)	0.80 (0.71, 0.90)	0.79 (0.69, 0.91)	0.69 (0.51, 0.94)
Current alcohol use							
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	2.01 (1.19, 3.40)	1.75 (1.17, 2.60)	1.61 (1.23, 2.11)	1.63 (1.48, 1.81)	1.63 (0.48, 1.81)	1.47 (1.32, 1.63)	1.61 (1.27, 2.04)
Current cigarette use							
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.16 (0.67, 1.99)	1.49 (1.01, 2.18)	2.04 (1.50, 2.78)	1.75 (1.57, 1.95)	1.75 (1.57, 1.95)	1.85 (1.63, 2.11)	1.91 (1.41, 2.59)
Current marijuana use							
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.37 (0.81, 2.33)	1.41 (0.91, 2.18)	1.02 (0.74, 1.41)	1.46 (1.32, 1.62)	1.46 (1.32, 1.62)	1.20 (1.05, 1.35)	1.45 (1.12, 1.86)

Note: Values are AOR (95% CI). Boldface indicates the estimate for the AOR significantly differed from the reference category ($p < 0.05$).

NHPI, Native Hawaiian and other Pacific Islander; AIAN, American Indian/Alaskan Native; YRBS, Youth Risk Behavior Surveillance.

Table 3.
Adjusted Odds of Suicide Planning Among YRBS Participants (1991–2015) by Race/Ethnicity

Variable	NHPI (n=1,130)	AIAN (n=2,129)	Multiracial (n=4,660)	Hispanic (n=51,033)	African American (n=41,567)	Asian American (n=6,404)	Non-Hispanic white (n=77,571)
Sex							
Male (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Female	1.43 (0.88, 2.31)	1.88 (1.20, 2.95)	1.91 (1.43, 2.55)	2.15 (1.94, 2.38)	2.25 (1.98, 2.56)	1.97 (1.60, 2.43)	1.77 (1.67, 1.87)
Age							
12–14 years (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
15–16 years	0.67 (0.29, 1.54)	0.68 (0.35, 1.31)	0.72 (0.49, 1.05)	0.85 (0.74, 0.98)	0.90 (0.74, 1.09)	1.07 (0.78, 1.46)	1.00 (0.90, 1.10)
17–18 years	0.82 (0.35, 1.92)	0.45 (0.24, 0.84)	0.67 (0.44, 1.02)	0.69 (0.59, 0.80)	0.73 (0.59, 0.90)	1.05 (0.78, 1.41)	0.77 (0.69, 0.86)
Survey year							
1991–1999 (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2001–2009	0.74 (0.42, 1.33)	0.55 (0.36, 0.86)	0.83 (0.59, 1.18)	0.73 (0.65, 0.82)	0.67 (0.58, 0.77)	0.80 (0.63, 1.03)	0.75 (0.69, 0.81)
2011–2015	0.41 (0.21, 0.80)	0.80 (0.53, 1.21)	0.97 (0.61, 1.25)	0.91 (0.81, 1.02)	0.86 (0.72, 1.02)	0.70 (0.51, 0.97)	0.89 (0.80, 0.99)
Current alcohol use							
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.73 (1.01, 2.98)	2.04 (1.28, 3.24)	1.59 (1.21, 2.08)	1.52 (1.36, 1.71)	1.59 (1.41, 1.79)	1.52 (1.16, 2.00)	1.46 (1.35, 1.57)
Current cigarette use							
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.33 (0.71, 2.50)	1.70 (1.11, 2.59)	2.10 (1.39, 3.17)	1.85 (1.66, 2.06)	1.91 (1.65, 2.22)	1.84 (1.31, 2.57)	2.02 (1.87, 2.18)
Current marijuana use							
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.52 (0.86, 2.71)	1.49 (0.90, 2.45)	0.94 (0.65, 1.35)	1.42 (1.28, 1.57)	1.24 (1.06, 1.43)	1.32 (0.92, 1.90)	1.43 (1.32, 1.55)

Note: Values are AOR (95% CI). Boldface indicates the estimate for the AOR significantly differed from the reference category ($p < 0.05$).

NHPI, Native Hawaiian and other Pacific Islander; AIAN, American Indian/Alaskan Native; YRBS, Youth Risk Behavior Surveillance.

Table 4.
Adjusted Odds of Suicide Attempts Among YRBS Participants (1991–2015) by Race/Ethnicity

Variables	NHPI (n=1,130)	AIAN (n=2,129)	Multiracial (n=4,660)	Hispanic (n=51,033)	African American (n=41,567)	Asian American (n=6,404)	Non-Hispanic white (n=77,571)
Sex							
Male (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Female	2.39 (1.33, 4.30)	1.83 (1.04, 3.23)	1.61 (1.16, 2.25)	3.09 (2.71, 3.52)	2.40 (1.96, 2.90)	2.67 (1.95, 3.64)	2.69 (2.46, 2.95)
Age							
12–14 years (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
15–16 years	0.92 (0.42, 1.98)	0.52 (0.27, 1.02)	0.59 (0.36, 0.96)	0.87 (0.73, 1.04)	0.77 (0.60, 0.99)	0.84 (0.54, 1.29)	0.88 (0.77, 1.00)
17–18 years	0.85 (0.33, 2.17)	0.34 (0.17, 0.68)	0.37 (0.22, 0.61)	0.63 (0.51, 0.77)	0.66 (0.51, 0.85)	0.98 (0.63, 1.53)	0.49 (0.43, 0.56)
Survey year							
1991–1999 (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2001–2009	0.87 (0.35, 2.13)	0.58 (0.34, 1.00)	1.18 (0.78, 1.79)	0.89 (0.78, 1.02)	1.00 (0.85, 1.17)	0.92 (0.66, 1.29)	0.99 (0.89, 1.11)
2011–2015	0.67 (0.25, 1.78)	0.76 (0.44, 1.32)	1.26 (0.81, 1.97)	1.12 (0.96, 1.31)	1.17 (0.95, 1.44)	1.15 (0.79, 1.67)	1.13 (0.99, 1.29)
Current alcohol use							
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.37 (0.66, 2.88)	2.10 (1.23, 3.58)	2.00 (1.32, 3.02)	1.84 (1.59, 2.13)	1.74 (1.47, 2.05)	1.66 (1.14, 2.43)	1.46 (1.30, 1.63)
Current cigarette use							
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	2.09 (0.97, 4.52)	2.30 (1.39, 3.82)	2.15 (1.45, 3.17)	2.08 (1.80, 2.39)	2.42 (2.01, 2.91)	2.51 (1.62, 3.88)	2.75 (2.44, 3.11)
Current marijuana use							
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.92 (0.98, 3.77)	1.52 (0.85, 2.72)	1.14 (0.80, 1.63)	1.72 (1.50, 1.97)	1.35 (1.14, 1.61)	2.00 (1.35, 2.96)	1.80 (1.61, 2.02)

Note: Values are AOR (95% CI). Boldface indicates the estimate for the AOR significantly differed from the reference category ($p < 0.05$).

AIAN, American Indian/Alaskan Native; NHPI, Native Hawaiian and other Pacific Islander; YRBS, Youth Risk Behavior Surveillance.