Tobacco Use Among High School Students in Humboldt County: Findings from the 2019–20 California Student Tobacco Survey

Shu-Hong Zhu, Ph.D.
Nora Satybaldiyeva, M.P.H.
Katherine Braden, M.P.H.
Dennis R. Trinidad, Ph.D.
Yue-Lin Zhuang, Ph.D.
Shuwen Li, M.P.P.

Principal Investigator: Shu-Hong Zhu, Ph.D.
Institution: Regents of the University of California, San Diego
Address: 9500 Gilman Drive #0905
La Jolla, CA 92093-0905
Phone: (858) 300-1056
Fax: (858) 300-1099
E-mail: szhu@health.ucsd.edu

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INTRODUCTION

Humboldt County is located in Northern California and consists of 2.3 million acres, most of which are forest lands including protected redwoods and recreational areas.[1] With approximately 135,000 residents, Humboldt County makes up about 0.3% of the state's population.[2] The three largest racial/ethnic groups in the County are White (73.8%), Hispanic or Latino (12.1%), and American Indian or Alaska Native (6.4%).[2]

Just under 20% of Humboldt County's population is under the age of 18. In the 2019–2020 school year, 9,585 students enrolled in grades 6-12 were attending 74 schools from 32 districts.[3] Although the racial/ethnic composition of this student population is similar to the County's general population, the proportions differ with the three largest racial/ethnic groups being: White (58.2%), Hispanic or Latino (18.2%) and American Indian or Alaska Native (9.1%).[3] The racial/ethnic composition of youth can foreshadow the County's racial/ethnic distribution in the future.

This report presents the main results from a school-based survey: the 2019–2020 California Student Tobacco Survey (CSTS). It reports findings that are specific to Humboldt County, including results based on the statewide survey as well as additional questions specifically requested by the Tobacco-Free Humboldt Program. The report is intended to serve a broad spectrum of the tobacco-control community. It aims to facilitate the understanding of adolescent tobacco use behavior in the current, rapidly changing tobacco landscape—wherein the use of cigarettes, vapes, and their co-use with marijuana is in flux. The findings presented in this report can assist the development of tobacco-control interventions to reduce tobacco use and secondhand exposure among youth in Humboldt County.

EXECUTIVE SUMMARY

This report summarizes the main findings from the 2019–20 California Student Tobacco Survey (CSTS) for Humboldt County. The survey was administered to 10th and 12th grade students from September 2019 to March 2020. Humboldt County was not considered its own region in the statewide survey sampling design; it was combined with other counties to create a larger region (Region 1). Schools were randomly selected within this region. Survey administration was planned to end in April 2020 but ended in March 2020 as schools across the state began to close due to the COVID-19 pandemic. While closures occurred on different dates, most schools closed between March 13-18, 2020.[4] Despite school closures, administration of the survey was considered complete as the majority of schools sampled for the survey had completed it prior to the closures. Throughout the 2019-20 academic year, 814 students from four high schools in Humboldt County participated in the survey. The survey was administered online during the school day at each of the schools by the University of California San Diego (UC San Diego).

The survey was designed to assess the use of, knowledge of, and attitudes towards cigarettes and other tobacco products, including vapes, little cigars or cigarillos (LCC), big cigars, hookah, smokeless tobacco, and heated tobacco products (HTP). The survey included questions that assessed the use of each tobacco product, the use of flavors, perceptions of vaping and smoking, social and environmental exposure to products, access to vapes, and factors known to be associated with use. Marijuana was also included in the survey since the co-use of marijuana and tobacco products is common, and potentially of concern given the intersection of vaping nicotine and vaping marijuana.

Key Findings

Tobacco Use Behavior

- In 2019-20, 39.2% of high school students in Humboldt County had ever used a tobacco product and 17.4% had used tobacco in the last 30 days.
- The current cigarette smoking prevalence rate in Humboldt was low, as only 3.2% of students reported smoking cigarettes in the past 30 days.
- The use of all other combustible tobacco products among high school students was also very low. In 2019-20, the prevalence of current use was 5.4%, 0.7%, and 0.5%, for little cigars or cigarillos (LCC), hookah, and big cigars, respectively.
- Vapes were the most popular tobacco product, with almost one-third (30.1%) of high school students having ever used them and 11.8% being current users.
- Almost all (97.8%) current vapers reported using a flavored vape product, with *fruit* being most frequently used flavor (65.0%).
- Two-thirds of vapers were infrequent users: 66.1% of current vapers reported using vapes on either 1-2 days or 3-5 days in the last 30 days. About one in 12 (8.6%) current vapers used vapes on 20 or more days in the past 30 days.

- Use of multiple tobacco products was common, representing almost one-third (31.6%) of current tobacco users.
- Current tobacco use prevalence was higher among students who rated their mental health as poor versus good to excellent (22.6% and 16.0%, respectively).

Perceptions of Vaping and Smoking

- The large majority of students (84.7%) believed that the reason people their age used vapes with nicotine or just flavoring was because their friends did.
- Almost all students perceived that adults important to them would feel negatively about the student vaping (95.2%) or smoking cigarettes (94.9%).
- While most students believed their close friends or other students at school viewed smoking cigarettes negatively (86.7% and 71.8%, respectively), fewer students believed that vaping was viewed negatively by close friends and other students (67.6% and 38.8%, respectively).

Secondhand Exposure and Other Environmental Influences

- Most high school students in Humboldt County reported having a complete home ban on vaping (80.4%) and tobacco smoking (81.1%).
- Despite high rates of home bans, the rate of exposure to secondhand vapor was still high: almost one-third of students (31.2%) were exposed to secondhand vapor in a room in the last 2 weeks. The rate of secondhand tobacco smoke exposure in a room was lower (15.9%).
- Only about one-quarter of students reported that their parent or guardian had talked to them about the risks of vape (27.2%) and cigarette use (23.4%) in the last 30 days.
- A substantial percentage of students were exposed to advertisements related to vapes (68.0%) and cigarettes (56.3%) in the past 30 days. About one in four of those ads were perceived by students as promoting the use of these products and two in four were perceived as discouraging their use.

Access to Vapes

- Among current vapers, about two-thirds (65.6%) reported not paying for their vapes and one-third (34.4%) reported paying for them.
- Out of those who did not pay for their vapes, about two-thirds (64.5%) reported being given vapes. Out of those who did pay for their vapes, 52.2% bought vapes from someone and 28.1% asked someone to buy them.
- More than one-third (35.2%) of all students reported being offered a vape in the last 30 days, with nearly a quarter (24.2%) of those who had never used vapes having been offered one.

Marijuana Use and Tobacco Co-Use

- Over two-fifths (44.9%) of high school students in Humboldt County reported having tried marijuana, while 25.5% reported using it in the last 30 days.
- The rate of currently using marijuana (25.5%) was greater than that of all tobacco products (17.4%).
- Over half of current marijuana users (54.5%) co-used marijuana with a tobacco product.

LIST OF TERMS

Tobacco Products and Marijuana

Vapes: Electronic devices like vape pens, e-cigarettes, e-hookah, hookah pens, e-vaporizers, tanks, pods, or mods used to inhale a vapor. Can be used to vape many things, like nicotine, marijuana, or just flavoring. Popular brands are Juul, Suorin, SMOK, Starbuzz E-Hookah, Zodiac Constellation, Stiiizy, Brass Knuckles, and Heavy Hitters. Questions about hookah pens were asked separately to ensure that students who reported using a hookah pen, but not a vape were captured. For prevalence estimates in this report, vape use included students who reported vaping or using a hookah pen with nicotine or just flavoring (not vaping marijuana).

Cigarettes: Sold in packs and cartons. Popular brands include Marlboro, Newport, Pall Mall, Camel, and Winston.

Little cigars or cigarillos (LCC): Tobacco wrapped in tobacco leaf or brown paper, about the size of a cigarette. May be flavored. Popular brands are Swisher Sweets, Backwoods, Dutch Masters, Captain Black, Prime Time, White Owl, and Black & Mild. Little cigars or cigarillos were abbreviated to LCC throughout this report.

Big cigars: Tobacco wrapped in a tobacco leaf, much larger than LCC. Popular brands are Romeo Y Julieta, Cohiba, Davidoff, and Ashton.

Hookah: Water pipe used to smoke tobacco (shisha) or something else. Popular brands are Starbuzz, Al Fakher, Samba, Fumari, Nakhla, and Social Smoke.

Smokeless tobacco (chew, dip, snuff, or snus): Loose leaf or ground tobacco leaves that come in a large pouch (bag) or in tins. Popular brands are Red Man, Copenhagen, Grizzly, Skoal, Swedish Match, and Klondike. Snus comes in a small pouch (like a tea bag). Popular brands are General, Marlboro, and Camel. Smokeless tobacco was abbreviated to smokeless throughout this report.

Heated tobacco products (HTP; also known as heat-not-burn tobacco products): Tobacco in the form of heat-sticks or capsules that is heated, instead of being combusted or burned, using an electronic device. These are different from vapes because they include tobacco. Popular brands include IQOS, glo, and Ploom Tech. For prevalence estimates in this report, HTP use was limited to students who reported the use of a known HTP brand because of 1) the possible confusion among respondents in differentiating HTP from vapes; and 2) the limited and identifiable number of HTP brands at the time of survey administration. Heated tobacco products were abbreviated to HTP throughout this report.

Marijuana (including joints, blunts, vapes, and edibles): Commonly known as cannabis, weed, pot, hash, grass, THC, or CBD. It can be smoked (joint, blunt, bong), vaped, eaten (baked goods, candies), drank (tea, cola, alcohol), or dabbed. For prevalence estimates in this report, marijuana use included students who reported using marijuana in any of these ways. It also included those who reported using marijuana “in some other way.”

Product Use

Ever use: Used within a lifetime.

Current use: Used within the last 30 days.

Poly use: Used two or more tobacco products within the last 30 days.

Flavored tobacco product use: Used a flavored tobacco product within the last 30 days.

Co-use: Used marijuana and at least one tobacco product within the last 30 days. For this report, co-use was not limited to the simultaneous use of products.

Never user: A student who reported never using the tobacco product(s).

Former user: A student who reported ever using the tobacco product(s), but not within the last 30 days (this included those who had quit using).

Current user: A student that who reported using the tobacco product(s) within the last 30 days.

Other Terms

Identified in another way: Respondents who reported their gender identity as:

- *female-to-male (FTM)/transgender male/trans man*;
- *male-to-female (MTF)/transgender female/trans woman*;
- *genderqueer, neither exclusively male nor female*; or
- *additional gender category or other*.

Sexual and/or gender minority (SGM): Respondents who were categorized as identifying their gender in another way (see above definition) and/or reported their sexual orientation as:

- *lesbian, gay, or homosexual*;
- *bisexual*;
- *something else*; or
- did not know their sexual orientation.

Non-SGM: Respondents who reported:

- their gender identity as *male* / *female;* and
- their sexual orientation as *straight or heterosexual*.

Unclear SGM status: Respondents who did not provide enough information about their gender identity and/or sexual orientation to classify their SGM status. This included those who:

- identified as binary (*male* / *female*) / chose not to disclose their gender identity, and did not know / chose not to disclose their sexual orientation; or
- chose not to disclose their gender identity, and identified their sexual orientation as *straight or heterosexual*.

Hispanic: Responded *yes* to the ethnicity question: "Are you of Spanish or Hispanic (Latino or Latina) origin?", regardless of race(s) reported.

Non-Hispanic single race (American Indian or Alaska Native [AI/AN]; Asian; African American/Black; Native Hawaiian or Other Pacific Islander [NHOPI]; White): Responded *no* to the ethnicity question (see above definition) and reported one of the following races: *American Indian or Alaska Native*; *Asian*; *Black or African American*; *Native Hawaiian or Other Pacific Islander*; or *White*, when asked "How do you describe yourself?"

Multiple race: Responded *no* to the ethnicity question and reported two or more races.

Other race: Responded *no* to the ethnicity question and reported *Other* race. Non-Hispanic AI/AN and NHOPI were also categorized as Other race due to the small sample sizes.

General mental health: Responded good to excellent (*good*, *very good*, or *excellent*), *fair*, or *poor* to the question: "In general, how would you rate your mental health?"

Complete home ban on vaping: Indicated that *vaping is not allowed anywhere or at any time inside my home* when asked about the rules about vaping inside their home.

Complete home ban on tobacco smoking: Indicated that *smoking cigarettes or other tobacco products is not allowed anywhere or at any time inside my home* when asked about the rules about smoking cigarettes or other tobacco products inside their home.

Exposure to secondhand vapor in a room: Indicated being in a room *when someone was using a vape* in the last 2 weeks.

Exposure to secondhand vapor in a car: Indicated being in a car *when someone was using a vape* in the last 2 weeks.

Exposure to secondhand tobacco smoke in a room: Indicated being in a room *when someone was smoking a cigarette, little cigar, or cigarillo* in the last 2 weeks.

Exposure to secondhand tobacco smoke in a car: Indicated being in a car *when someone was smoking a cigarette, little cigar, or cigarillo* in the last 2 weeks.

Offers of tobacco products: Responded *yes* to the question: "In the last 30 days, has ANYONE offered you" tobacco products (vapes).

Exposure to tobacco ads: Indicated having seen ads that either promoted or discouraged the use of a tobacco product (vapes or cigarettes) in the last 30 days.

A Word of Caution on Interpreting Rates and Proportions

All estimates of rates and proportions should be interpreted in reference to their 95% confidence intervals. Although estimates are roughly the median of this interval, the range of the confidence interval is the best descriptive measure for statistical accuracy. Therefore, estimates with wide confidence intervals should be interpreted with caution. Data that are statistically unreliable because the coefficient of variation (also known as relative variance) is greater than 30% are marked with a dagger symbol (†) in the tables. Please pay special attention when estimates are based on small sample sizes.

CHAPTER 1 – Tobacco Use Behavior

Highlights

- Among high school students in Humboldt County, 39.2% had ever used a tobacco product in their lifetime, with 17.4% classified as current users (i.e., used in the last 30 days).
- Vapes were the most popular tobacco product, with almost one-third (30.1%) of students having ever used them and 11.8% being current users.
- About one in eight (12.2%) students reported ever smoking cigarettes, with 3.2% currently smoking them.
- LCC were the most used combustible tobacco product, with 5.4% of students reporting currently using the product.
- Current use of all other tobacco products was low (4% or less).
- Two-thirds of current vapers reported using vapes infrequently.
- Almost all (97.8%) current vapers reported using a flavored vape product. Among these students, *fruit* flavor was reported most frequently (65.0%).
- Almost one-third (31.6%) of current tobacco users reported using more than one tobacco product.
- Students who rated their mental health as poor had higher current tobacco use prevalence (22.6%) compared to those who rated their mental health as good to excellent (16.0%)

Tobacco Product Categories

Since the previous survey in 2017-18, e-cigarette devices and the language used to refer to these devices changed rapidly. To increase the validity of these questions, the term "e-cigarette" was replaced with "vape" in the 2019-20 CSTS. The accompanying image and definition of vapes were also updated to include common devices and brands. Since these devices can be used to vape different substances, the survey included separate questions on vaping nicotine, marijuana, and just flavoring (i.e., without nicotine or marijuana) to determine prevalence estimates. Some questions asked about vapes more generally (e.g., questions about perceptions, exposure to secondhand vapor). Questions about hookah pens were asked separately to ensure that students who reported using a hookah pen, but not a vape were captured. For the prevalence estimates included in this report, vape use included students who reported vaping or using a hookah pen with nicotine or just flavoring. Due to the changes to this measure, vape data presented in this report are not directly comparable to e-cigarette data from earlier CSTS cycles.

Heated tobacco products (HTP), new to the U.S. market in 2019, were included in the 2019-20 CSTS for the first time. Only those users who reported the use of a known HTP brand were defined

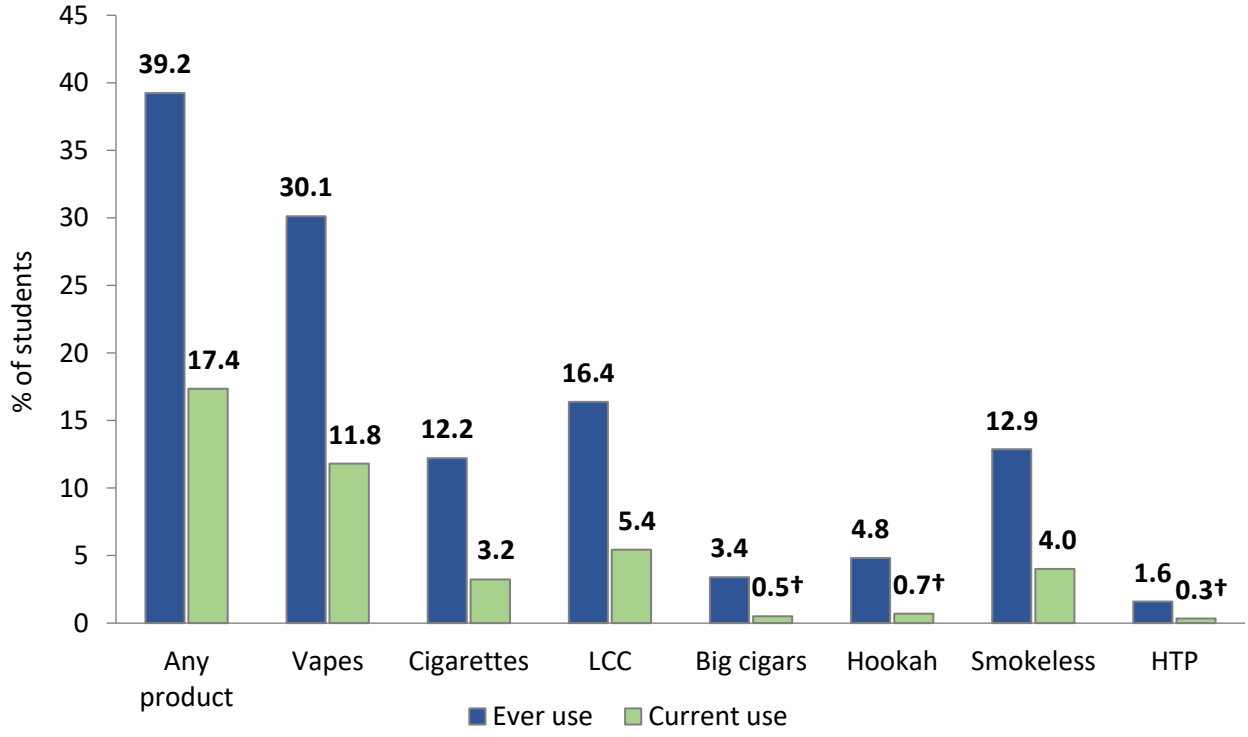
as HTP users because of 1) the possible confusion among respondents in differentiating HTP from vapes; and 2) the limited and identifiable number of HTP brands at the time of survey administration.

Tobacco Product Use Among High School Students

Figure 1 presents ever and current use of tobacco products among high school students. *Ever* use is defined as use within a lifetime and *current use* is defined as use within the last 30 days. In Humboldt County, 39.2% of high school students have used any tobacco product in their lifetime, while 17.4% reported currently using a tobacco product. In both cases, most of the use was attributed to vapes, with 30.1% and 11.8% of students reporting ever and currently using the product, respectively. By contrast, only 12.2% of students had ever tried cigarettes and 3.2% reported currently smoking them. LCC was the most commonly used combustible tobacco product, with 5.4% of students reporting currently using the product. The current use rates for all other tobacco products were 4% or less.

Due to the low prevalence of use for all tobacco products besides vapes and the resulting instability of estimates, subgroup analyses in this report were limited. Specifically, HTP was not reported in subgroup analyses and, in some cases, only vape data were reported. However, HTP use was included in the overall estimates of tobacco use.

Figure 1. Prevalence of ever and current use of tobacco products among high school students



Note: Refer to Table A in Appendix B – Supplementary Tables to view estimates with confidence intervals.
Abbreviations: LCC = little cigars or cigarillos; HTP = heated tobacco products.
†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Demographic Categories

For race/ethnicity, survey participants were first grouped by whether they were of Spanish or Hispanic (Latino) origin (ethnicity). Those classified as *non-Hispanic* were further divided into specific races with which they identified. If respondents selected more than one race, they were classified as *Multiple* race. There was also an option for *Other* race. Due to the small sample sizes for some of the racial/ethnic groups in the survey, *Native Hawaiian or other Pacific Islander*, *American Indian or Alaska Native*, and non-standard entries were all combined in the *Other* category in this report.

For the question on gender, the following response options were provided in addition to *male* and *female*: *female-to-male (FTM)/transgender male/trans man*; *male-to-female (MTF)/transgender female/trans woman*; *genderqueer, neither exclusively male nor female;* and *additional gender category or other*. Students could also select *choose not to disclose*. For this report, response options other than *male* or *female* were combined and classified as *identified in another way* due to the small sample sizes. Approximately 5.5% of participating students in Humboldt County indicated that they identified their gender in a way other than *male* or *female*, and 2.5% declined to answer the gender-identity question.

It should be noted that the previous, 2017-18 CSTS included an option for *I prefer not to answer* throughout the survey, with the percentages of students endorsing this option varying considerably. In the 2019-20 CSTS, this response option was removed from all questions except those asking about students' gender identity and sexual orientation. As a result, data on demographic subgroups presented in this report are not directly comparable to those from the 2017-18 CSTS.

Prevalence of Tobacco Use by Demographics

Tobacco use among high school students in Humboldt County was examined across participant demographics. Table 1 shows that there were no significant differences in use behavior between male and female students, with 15.1% of male and 15.9% of female students currently using any tobacco product. Students who identified their gender in another way or declined to answer tended to have higher rates of tobacco use.

By racial/ethnic demographics, African American/Black students in Humboldt County had the highest rate of current use of tobacco products compared to all other racial/ethnic subgroups (41.7%). Those who identified as Multiple race/ethnicity, which is the third-largest race category, had the second-highest rate of current use (29.8%). Students who identified as Asian or White had the lowest rates of current use (9.5% and 11.1%, respectively).

Although tobacco use was higher among 10th graders (18.0%) compared to 12th graders (16.5%), this difference in tobacco use by age was not statistically significant.

Table 1. Prevalence of tobacco use by gender, race/ethnicity, and grade among high school students

	N	Ever use % (95% CI)	Current use % (95% CI)
Overall	814	39.2 (36.8-41.7)	17.4 (14.7-20.0)
Gender			
Male	378	34.2 (29.9-38.5)	15.1 (12.6-17.6)
Female	362	40.9 (37.8-44.0)	15.9 (11.6-20.3)
Identified in Another Way	43	56.3 (42.1-70.4)	26.0 (15.7-36.4)
Declined to Answer	18	60.1 (50.3-69.8)	56.9 (44.8-69.1)
Race/Ethnicity			
White	331	30.8 (26.9-34.7)	11.1 (7.5-14.7)
African American/Black	16	59.4 (38.5-80.4)	41.7 (22.5-61.0)
Hispanic	218	47.4 (41.4-53.4)	17.2 (11.7-22.7)
Asian	61	28.4 (21.9-35.0)	9.5 (6.7-12.3)
Other	69	40.3 (36.9-43.7)	19.7 (16.8-22.5)
Multiple	106	45.0 (34.8-55.3)	29.8 (25.9-33.7)
Grade			
Grade 10	483	37.7 (32.6-42.8)	18.0 (16.3-19.7)
Grade 12	331	41.1 (37.8-44.4)	16.5 (11.8-21.3)

Note: With the exception of Hispanic, all ethnicities are classified as Non-Hispanic. Race/Ethnicity category Other includes Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, and non-standard entries.

Use of Specific Tobacco Products by Demographics

Table 2 shows the use of specific tobacco products by gender, in addition to the rate of overall tobacco use. Among high school students, males and females had no significant difference in the current use of specific tobacco products. Students who identified their gender in another way reported significantly higher rates of smokeless tobacco use (17.7%) than males and females. Those who declined to answer reported using vapes at significantly higher rates (31.7%) compared to male (10.1%) and female students (12.2%).

Table 2. Prevalence of current tobacco product use by gender among high school students

	Male N=378 % (95% CI)	Female N=362 % (95% CI)	Identified in Another Way N=43 % (95% CI)	Declined to Answer N=18 % (95% CI)
Any of the below	15.1 (12.6-17.6)	15.9 (11.6-20.3)	26.0 (15.7-36.4)	56.9 (44.8-69.1)
Vapes	10.1 (8.5-11.8)	12.2 (8.7-15.7)	11.2 (6.8-15.6)	31.7 (28.1-35.2)
Cigarettes	2.6 (1.2-3.9)	2.8 (2.0-3.5)	4.5 (0.9-8.1)†	19.8 (0.0-40.0)†
LCC	4.9 (3.2-6.5)	4.5 (3.2-5.8)	6.2 (0.6-11.8)†	19.4 (2.5-36.2)†
Big cigars	0.6 (0.0-1.3)†	0.0	4.5 (0.9-8.1)†	0.0
Hookah	0.6 (0.0-1.3)†	0.2 (0.0-0.5)†	4.5 (0.9-8.1)†	0.0
Smokeless	5.3 (1.7-8.9)†	0.9 (0.2-1.7)†	17.7 (10.8-24.6)	4.0 (0.0-9.9)†

Abbreviations: LCC = little cigars or cigarillos.
†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Table 3 presents the current use of tobacco products by race/ethnicity. Differences in the use of specific tobacco products tended to replicate differences in the overall rates of use, with some exceptions. For example, although students who reported Multiple race/ethnicity had the second highest current use rate (29.8%) across all subgroups, they reported the highest use of vapes (22.2%).

Table 3. Prevalence of current tobacco product use by race/ethnicity among high school students

	White	African American/Black	Hispanic	Asian	Other	Multiple
	N=331	N=16	N=218	N=61	N=69	N=106
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Any of the below	11.1 (7.5-14.7)	41.7 (22.5-61.0)	17.2 (11.7-22.7)	9.5 (6.7-12.3)	19.7 (16.8-22.5)	29.8 (25.9-33.7)
Vapes	6.8 (3.2-10.4)	9.9 (0.0-21.0)†	13.1 (10.5-15.7)	7.9 (5.8-10.0)	12.8 (9.1-16.5)	22.2 (15.2-29.3)
Cigarettes	2.6 (2.1-3.0)	5.0 (0.0-10.5)†	3.5 (2.0-5.0)	1.7 (0.0-4.6)†	4.8 (3.2-6.4)	3.1 (0.2-6.1)†
LCC	3.3 (2.1-4.5)	36.8 (18.2-55.3)	5.2 (4.6-5.7)	1.7 (0.0-4.6)†	4.6 (2.2-6.9)	7.6 (6.1-9.1)
Big cigars	0.2 (0.0-0.5)†	5.0 (0.0-10.5)†	0.3 (0.0-0.7)†	1.7 (0.0-4.6)†	0.0	1.1 (0.0-2.7)†
Hookah	0.2 (0.0-0.5)†	0.0	0.3 (0.0-0.7)†	4.9 (3.2-6.7)	0.0	1.1 (0.0-2.7)†
Smokeless	2.7 (2.1-3.3)	28.5 (6.3-50.7)†	2.6 (0.1-5.1)†	3.3 (1.1-5.5)†	8.3 (5.1-11.5)	3.4 (2.0-4.8)

Note: With the exception of Hispanic, all ethnicities are classified as Non-Hispanic. Race/Ethnicity category Other includes Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, and non-standard entries.

Abbreviations: LCC = little cigars or cigarillos.

†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Table 4 presents current tobacco product use by grade among high school students. Vapes were consistently the most popular product used by both 10th and 12th grade students, and the prevalence of use of other tobacco products was low. Contrary to what was expected, current use of tobacco products tended to decrease with grade. More specifically, 10th graders had significantly higher current use rates of cigarettes and LCC compared to 12th graders. The only tobacco product that increased in prevalence with grade was smokeless tobacco. However, this increase was not statistically significant.

Table 4. Prevalence of current tobacco product use by grade among high school students

	Grade 10 N=483 % (95% CI)	Grade 12 N=331 % (95% CI)
Any of the below	18.0 (16.3-19.7)	16.5 (11.8-21.3)
Vapes	12.6 (10.9-14.4)	10.8 (7.8-13.7)
Cigarettes	4.5 (3.3-5.7)	1.7 (0.6-2.8)†
LCC	6.6 (5.8-7.3)	4.0 (3.2-4.8)
Big cigars	0.6 (0.1-1.1)†	0.4 (0.0-0.9)†
Hookah	0.8 (0.2-1.3)†	0.6 (0.0-1.4)†
Smokeless	2.6 (1.4-3.7)	5.8 (1.9-9.7)†

Abbreviations: LCC = little cigars or cigarillos.
†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Use of Specific Tobacco Products by Sexual and/or Gender Minority Status

Students were asked to indicate their sexual orientation and gender identity in two separate questions. Using responses from these questions, three groups were created: a sexual and/or gender minority (SGM) group, a non-SGM group, and an unclear SGM status group (see List of Terms). Table 5 presents tobacco product use by SGM status. Students of unclear SGM status had a higher rate of overall tobacco use (28.0%) than students who identified as SGM (18.0%) and those who did not identify as SGM (15.7%). Consistent with previous results, vapes were the most commonly used product across all groups.

Table 5. Prevalence of current tobacco product use by SGM status among high school students

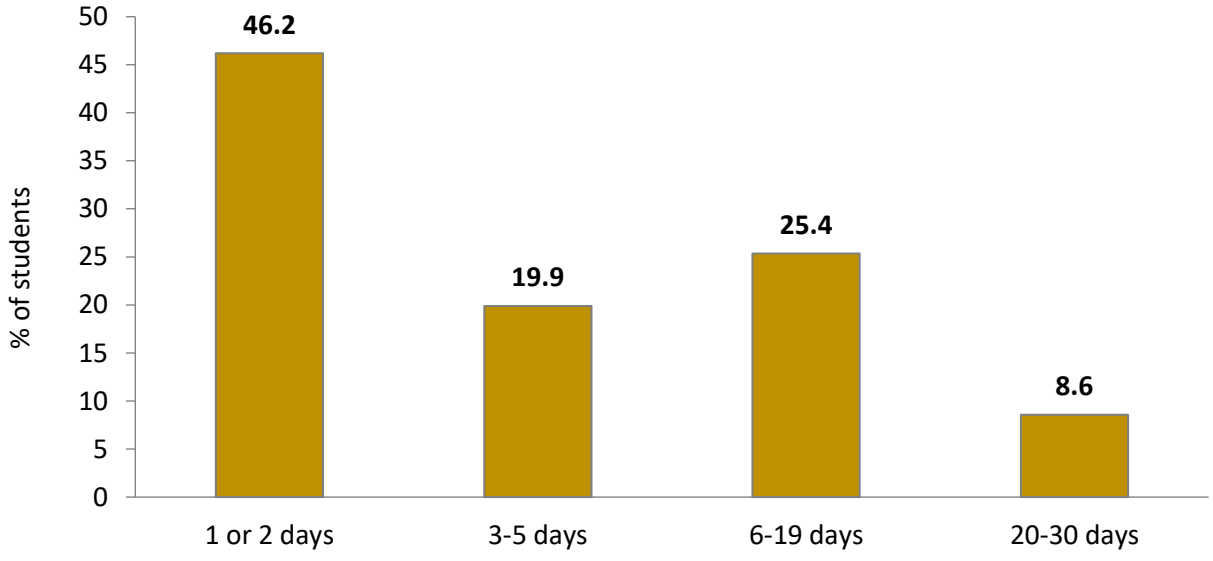
	SGM N=132 % (95% CI)	Non-SGM N=591 % (95% CI)	Unclear SGM Status N=74 % (95% CI)
Any of the below	18.0 (17.0-19.0)	15.7 (12.3-19.0)	28.0 (22.2-33.7)
Vapes	10.7 (7.8-13.5)	11.2 (9.9-12.5)	18.3 (15.6-20.9)
Cigarettes	5.6 (3.8-7.4)	2.0 (0.8-3.3)†	8.1 (3.5-12.7)
LCC	6.7 (4.1-9.3)	4.0 (3.2-4.7)	11.9 (6.6-17.1)
Big cigars	1.4 (0.2-2.7)†	0.4 (0.0-0.8)†	0.0
Hookah	1.4 (0.2-2.7)†	0.5 (0.0-1.1)†	0.0
Smokeless	5.8 (3.8-7.8)	4.0 (1.4-6.5)†	1.1 (0.0-2.8)†

Abbreviations: LCC = little cigars or cigarillos.
†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Frequency of Current Vape Use

The 2019-20 CSTS asked current users of a tobacco product to indicate how many days they used the product within the last 30 days. Figure 2 presents the frequency of vape use among current vapers. Data were restricted to vapes due to the small sample size and resulting instability of estimates for other tobacco products. About two thirds of current vapers reported infrequent usage: 66.1% reported using vapes on either 1–2 days or 3–5 days (46.2% + 19.9% = 66.1%). Approximately one in 12 (8.6%) current vapers used vapes on 20 or more days of the past 30 days.

Figure 2. Frequency of current vape use among those high school students who were current vapers

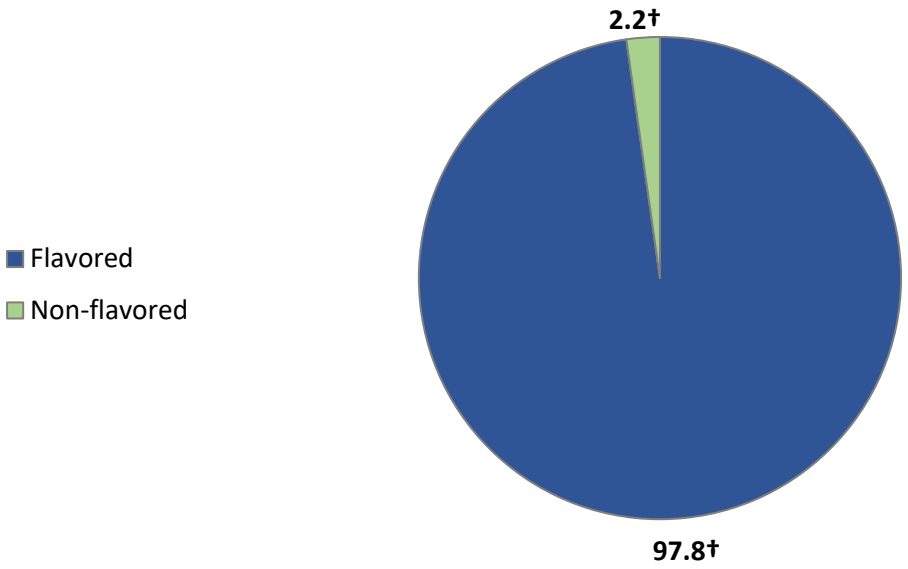


Note: Refer to Table B in Appendix B – Supplementary Tables to view estimates with confidence intervals.

Flavored Vape Use

Among current vape users, 97.8% reported using flavored vapes in the last 30 days (Figure 3). It should be noted that flavored vape use included students who reported using flavored vapes with nicotine or vapes with just flavoring. Only the flavored vape data were presented due to the small sample sizes and resulting instability of estimates for other tobacco products.

Figure 3. Proportion using flavored vapes among those high school students who were current vapers



Note: Refer to Table C in Appendix B – Supplementary Tables to view estimates with confidence intervals.
†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Use of Specific Vape Flavor Types

Students who used flavored vapes in the last 30 days were asked to indicate the flavor type they used most often. Possible flavor types included *fruit*, *candy or sweet, mint*, *liquor*, *tobacco*, and *other*. Due to the small sample sizes, *alcohol or liquor* and *other* flavors were combined.

As shown in Table 6, *fruit* (65.0%) was by far the most popular flavor used by vapers in Humboldt County. The second most popular flavor was *candy or sweet* (19.8%). Very few students reported using *tobacco* flavored vapes (1.6%).

Table 6. Proportion using flavored vapes among those high school students who were current vapers, by flavor type

	Vapes N=94 % (95% CI)
Fruit	65.0 (50.7-79.4)
Candy or sweet	19.8 (8.7-30.9)
Mint	9.5 (6.2-12.9)
Tobacco	1.6 (0.0-3.8)†
Other*	4.0 (0.0-8.4)†

Note: Students who (1) vaped just flavoring, (2) vaped nicotine, or (3) used a hookah pen with nicotine or just flavoring, were asked about their use of flavor for each product. If students used at least two of the above, their flavor type was considered in the following order: the flavor type they used when they (1) vaped just flavoring, (2) vaped nicotine, (3) used a hookah pen with nicotine or just flavoring.
**Alcohol or liquor* and *other* flavors were combined.
†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Multiple Tobacco Product Use

Table 7 presents the current use of multiple products, often referred to as poly use, by participant demographics. Overall, 5.5% of students reported using two or more tobacco products, representing almost one-third (31.6%) of current users. Differences in poly use by demographic characteristics varied in ways one would expect based on tobacco use behavior (i.e., those who had higher rates of using specific products were also the ones who had higher rates of poly use). For example, those who declined to answer had the highest rate of poly use (13.8%) among gender subgroups.

Table 7. Prevalence of current use of at least one product and of multiple tobacco products by gender, race/ethnicity, and grade among high school students

	N	Used at least one product % (95% CI)	Used two or more tobacco products % (95% CI)
Overall	814	17.4 (14.7-20.0)	5.5 (4.2-6.8)
Gender			
Male	378	15.1 (12.6-17.6)	6.2 (3.7-8.8)
Female	362	15.9 (11.6-20.3)	3.9 (2.6-5.2)
Identified in Another Way	43	26.0 (15.7-36.4)	4.5 (0.9-8.1)†
Declined to Answer	18	56.9 (44.8-69.1)	13.8 (3.5-24.2)†
Race/Ethnicity			
White	331	11.1 (7.5-14.7)	3.1 (1.8-4.4)
African American/Black	16	41.7 (22.5-61.0)	23.5 (2.8-44.3)†
Hispanic	218	17.2 (11.7-22.7)	5.1 (2.6-7.6)
Asian	61	9.5 (6.7-12.3)	4.9 (3.2-6.7)
Other	69	19.7 (16.8-22.5)	9.4 (7.9-10.9)
Multiple	106	29.8 (25.9-33.7)	5.6 (1.2-9.9)†
Grade			
Grade 10	483	18.0 (16.3-19.7)	5.8 (5.0-6.6)
Grade 12	331	16.5 (11.8-21.3)	5.1 (3.0-7.3)

Note: With the exception of Hispanic, all ethnicities are classified as Non-Hispanic. Race/ethnicity category Other includes Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, and non-standard entries.

†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Tobacco Use by General Mental Health

Table 8 presents students ever and current tobacco use according to reported general mental health (see List of Terms). Students who rated their mental health as poor had the highest rate of current tobacco use (22.6%). Students who rated their mental health as good to excellent had a significantly lower current use rate (16.0%).

Table 8. Prevalence of tobacco use by general mental health among high school students

	N	Ever use % (95% CI)	Current use % (95% CI)
Good to excellent	515	36.4 (32.9-39.9)	16.0 (13.0-19.0)
Fair	171	43.7 (40.2-47.3)	16.7 (13.2-20.3)
Poor	116	42.6 (39.9-45.3)	22.6 (19.1-26.1)

CHAPTER 2 – Perceptions of Vaping and Smoking

Highlights

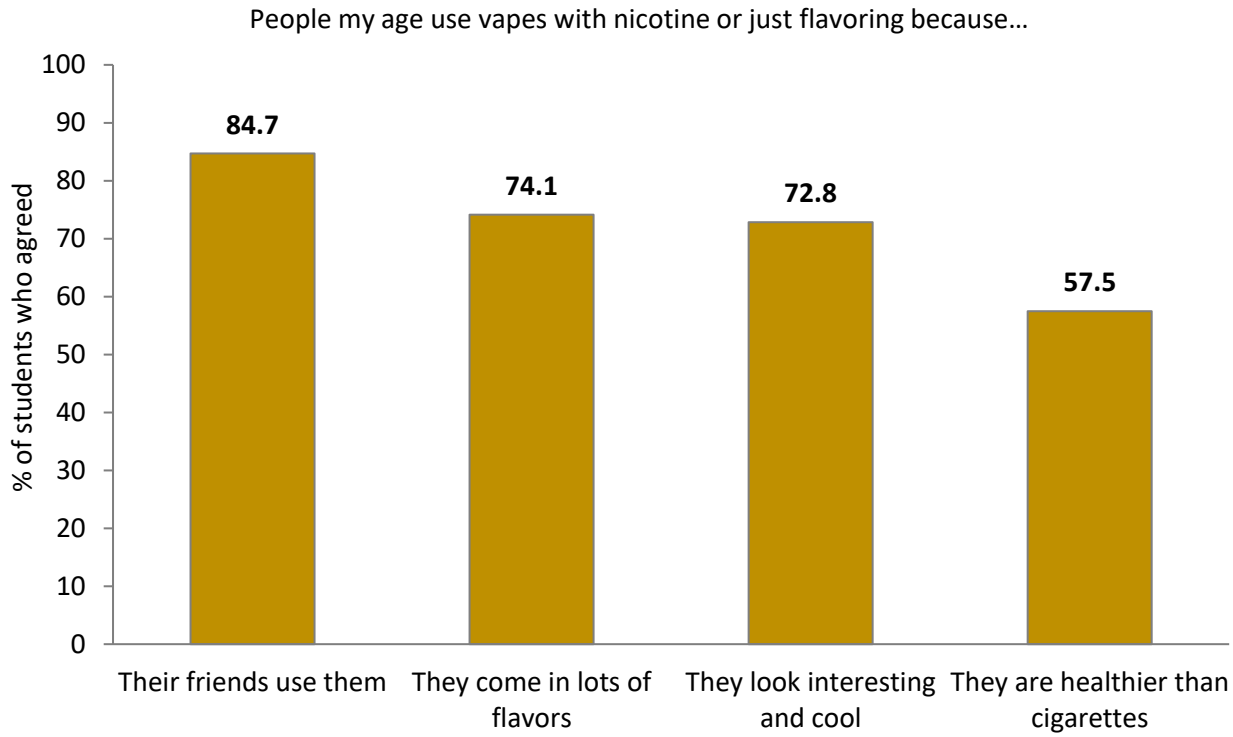
- The majority of students (84.7%) believed that people their age used vapes with nicotine or just flavoring because their friends did.
- Almost all students believed that adults important to them would feel negatively about the student vaping (95.2%) or smoking cigarettes (94.9%).
- While the large majority of students believed their close friends and other students at school viewed smoking cigarettes negatively (86.7% and 71.8%, respectively), fewer students believed that vaping was viewed negatively by their close friends and other students at school (67.6% and 38.8%, respectively).
- About three-quarters of students agreed that vaping companies were part of the tobacco industry (78.1%) and that tobacco companies targeted youth through flavored product advertisements (75.3%).

Perceived social norms have an important influence on tobacco use behavior, particularly among youth. Perceptions of peer and adult attitudes towards tobacco use can influence a student's use. The following chapter presents data on the perceived reasons for vaping among students. It also presents data on how students believed adults, peers or classmates, and friends perceived vaping and smoking cigarettes. Finally, students' opinions of the tobacco industry are reported. It should be noted that the questions about vapes reported in this chapter specified the type of substance in the vape (e.g., nicotine or just flavoring).

Perceived Reasons for Vaping

Students were asked about their level of agreement with four reasons why people their age used vapes with nicotine or just flavoring. Figure 4 shows the percentage of students who *strongly agreed* or *somewhat agreed* with each reason. The majority of students (84.7%) agreed that people their age used vapes with nicotine or flavoring because their friends did. Many students also agreed that people their age used vapes because they came in lots of flavors (74.1%) and looked interesting and cool (72.8%). Over half (57.5%) of students agreed that people their age used vapes because they were healthier than cigarettes.

Figure 4. Perceived reasons for vaping among high school students



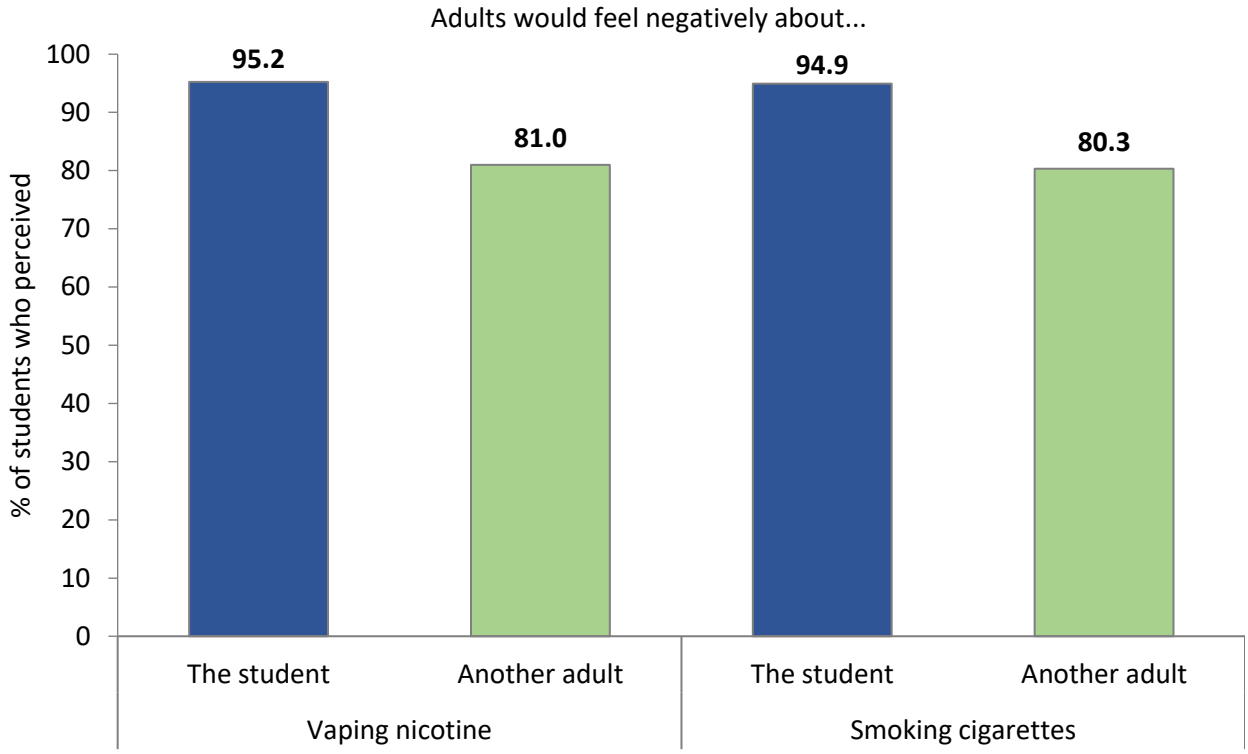
Note: Refer to Table D in Appendix B – Supplementary Tables to view estimates with confidence intervals.

Perceptions of Adults' Views on Vaping and Smoking

Students were asked how adults who were important to them (such as parents, teachers, coaches, or relatives) would feel about the student vaping nicotine. They were also asked how the same adults would feel about another adult vaping nicotine. Response options included *very positive*, *positive*, *negative*, and *very negative*. The same questions were asked about smoking cigarettes.

Figure 5 presents the percentage of students who reported that adults important to them would feel negatively (*negative* and *very negative*) about their own or another adults vape or cigarettes use. Almost all students believed adults important to them would feel negatively about the student vaping (95.2%) or smoking cigarettes (94.9%). Smaller percentages of students believed adults important to them would feel negatively about another adult vaping (81.0%) or smoking cigarettes (80.3%).

Figure 5. Percentage of high school students who believed that adults would feel negatively about them or another adult if they vaped or smoked



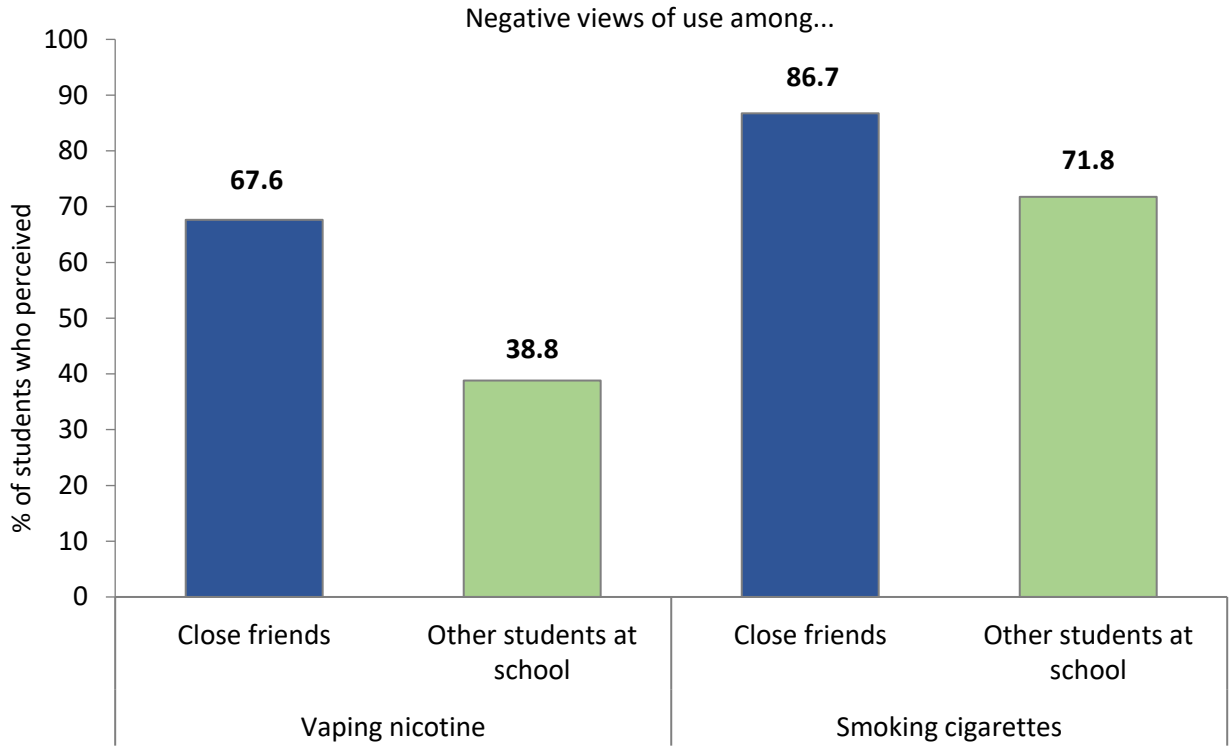
Note: Refer to Table E in Appendix B – Supplementary Tables to view estimates with confidence intervals.

Perceptions of Peers' Views on Vaping and Smoking

Students were asked how they would describe their close friends' views on using vapes with nicotine. They were also asked to describe the views of students at their school. Response options included: *very positive*, *positive*, *negative*, and *very negative*. The same questions were asked about smoking cigarettes.

Figure 6 presents the percentage of students who believed that their close friends or other students at their school would view vaping nicotine or smoking cigarettes negatively (*negative* and *very negative*). Approximately two-thirds (67.6%) of students perceived that their close friends would view vaping negatively. While less than two in five (38.8%) thought other students at school viewed vaping negatively. Greater percentages of students thought their close friends (86.7%) and other students at their school (71.8%) viewed smoking cigarettes negatively relative to vaping.

Figure 6. Percentage of high school students who believed that their close friends or other students at their school would view vaping or smoking negatively



Note: Refer to Table F in Appendix B – Supplementary Tables to view estimates with confidence intervals.

Opinions of the Tobacco Industry

Table 9 shows the percentage of students who *strongly agreed* or *somewhat agreed* with three statements about the tobacco industry. About three-quarters of students agreed that vaping companies were part of the tobacco industry (78.1%) and that tobacco companies targeted youth through flavored product advertisements (75.3%). Almost two-thirds of students (63.2%) agreed that tobacco companies targeted youth by selling their products near schools.

Table 9. Opinions of the tobacco industry by use status among high school students

	Agreed N=801 % (95% CI)
Vaping companies are part of the tobacco industry	78.1 (74.3-81.8)
Tobacco companies target people my age by advertising flavored cigarettes, LCC, or vapes in stores and on social media	75.3 (73.9-76.7)
Tobacco companies target people my age by selling cigarettes, LCC, or vapes in stores near schools	63.2 (59.3-67.0)

CHAPTER 3 – Secondhand Exposure and Other Environmental Influences

Highlights

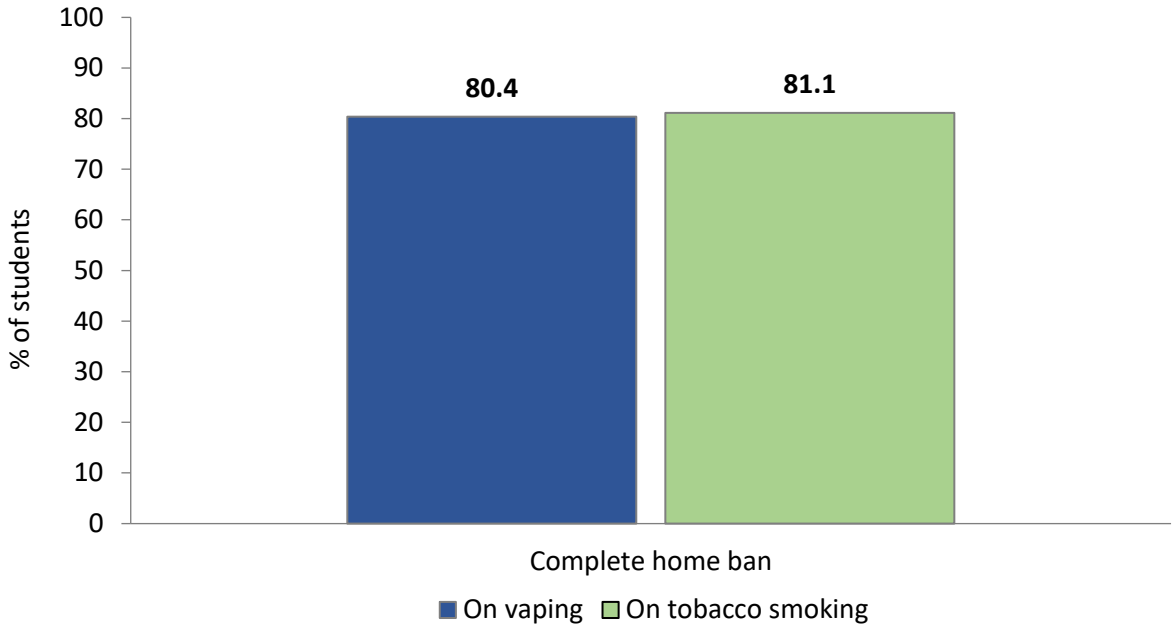
- Most high school students reported living in a home that had complete bans on tobacco smoking (81.1%) and vaping (80.4%).
- Almost one in three students (31.2%) were exposed to secondhand vapor in a room within the last 2 weeks. Secondhand exposure to tobacco smoke in a room (15.9%) was lower. Exposure to vapor and tobacco smoke in a car in the last 2 weeks (23.9% vs. 12.2%, respectively) was also concerning.
- Only about one-quarter of students reported that their parent or guardian had talked to them about the risks of vape (27.2%) and cigarette use (23.4%) in the last 30 days.
- Most high school students were exposed to vape (68.0%) and cigarette ads (56.3%) in the past 30 days, with a greater percentage of students reporting ads they perceived to discourage rather than promote the use of the products.
- About two-fifths (43.4%) of students reported never or rarely hearing about new kinds of vapes.

This chapter focuses on several key environmental influences of tobacco use, all of which have been shown to affect use among youth.[5–7] It presents whether students had home bans on vaping and tobacco smoking and their exposure to secondhand vapor and tobacco smoke. It also presents the prevalence of exposure to advertisements (ads) promoting or discouraging vape and cigarette use in the last 30 days. It should be noted that the questions about vapes reported in this chapter asked about vapes generally and did not specify the substance in the vape (e.g., nicotine, marijuana, or just flavoring). As a result, responses could include exposure to vapes with marijuana.

Home Bans on Vaping and Tobacco Smoking

Home bans indicate whether the student's home environment explicitly discourages vaping and smoking cigarettes or other tobacco products. Using two separate questions, students were asked to indicate which statement best described the rules about *vaping* or *smoking cigarettes or other tobacco products* in their home (see List of Terms). Figure 7 shows that the large majority of students had a complete home ban on vaping and on tobacco smoking (80.4% and 81.1%, respectively).

Figure 7. Prevalence of complete home bans on vaping and tobacco smoking among high school students



Note: Refer to Table G in Appendix B – Supplementary Tables to view estimates with confidence intervals.

Table 10 provides data on the rates of complete home bans on vaping and tobacco smoking by race/ethnicity. The percentage of students who reported a complete home ban on tobacco smoking and vaping was similar across racial/ethnic groups. Only those students who reported Other race/ethnicity had a significantly higher rate of complete home bans on tobacco smoking compared to vaping.

Table 10. Prevalence of complete home bans on vaping and tobacco smoking by race/ethnicity among high school students

	Vaping ban		Tobacco smoking ban	
	N	% (95% CI)	N	% (95% CI)
Overall	799	80.4 (75.3-85.5)	802	81.1 (77.6-84.6)
White	329	85.6 (84.4-86.8)	330	85.3 (83.8-86.8)
African American/Black	16	76.3 (55.7-96.9)†	16	95.0 (89.5-100.0)†
Hispanic	218	78.0 (65.5-90.5)	217	77.5 (68.8-86.1)
Asian	60	80.9 (75.6-86.1)	61	80.0 (74.7-85.3)
Other	69	77.0 (76.0-78.1)	69	82.5 (79.7-85.3)
Multiple	104	74.1 (70.9-77.4)	106	74.8 (68.6-80.9)

Note: With the exception of Hispanic, all ethnicities are classified as Non-Hispanic. Race/Ethnicity category Other includes Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, and non-standard entries.

†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

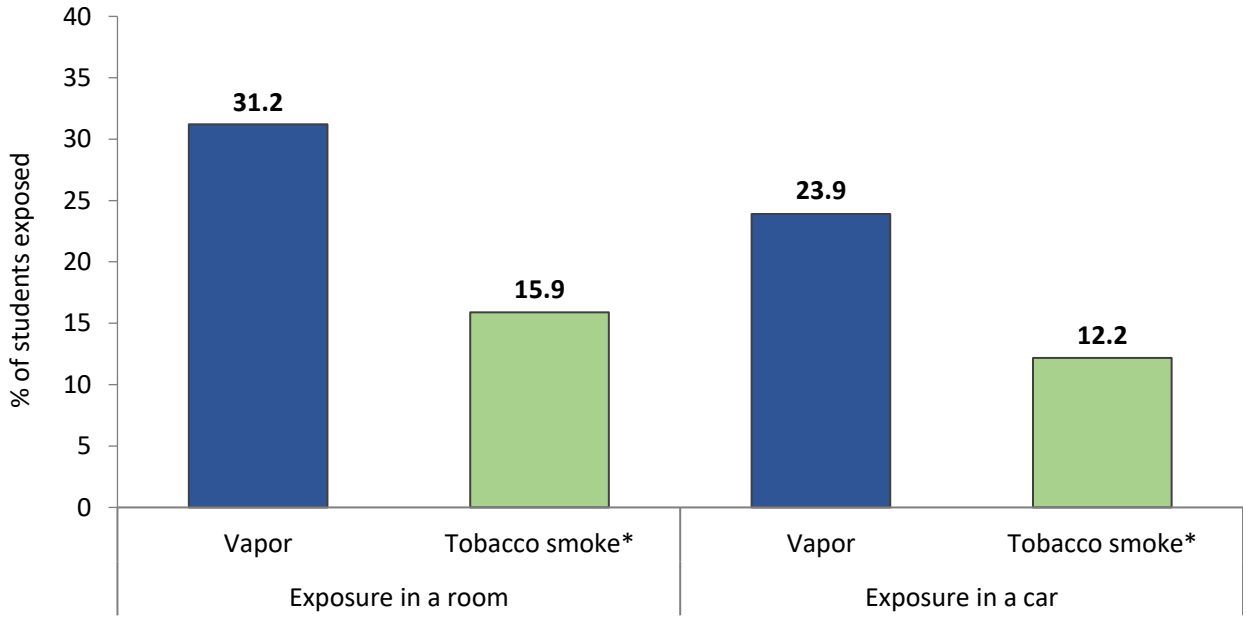
Exposure to Secondhand Vapor and Tobacco Smoke in the Last 2 Weeks

A primary avenue for achieving social norm change is through enactment of tobacco control policies, such as creating smoke-free environments. Creating smoke-free environments helps to change social norms, which reduces the chances of youth starting to smoke while encouraging smokers to quit or reduce their tobacco use.[8,9] Secondhand exposure to tobacco products is an important issue in Humboldt and the County has taken precautionary steps to reduce exposure to secondhand tobacco smoke through the development of smoke-free housing policies and helping multi-unit housing properties to adopt no-smoking rules.[10] However, 45.7% of students had still been exposed to secondhand vapor or tobacco smoke, in a room or in a car, within the last 2 weeks (data not shown in figure).

The 2019–20 CSTS asked students about secondhand exposure to vapor in a room: "In the last 2 weeks, were you in a room when someone was using a vape?" Another question asked about secondhand exposure to tobacco smoke in a room: "In the last 2 weeks, were you in a room when someone was smoking a cigarette, little cigar, or cigarillo?" Students were asked whether they had been exposed in a car in the same way. It should be noted that the timeframe referenced in the question was changed in 2019-20, from "in the last 30 days" to the "in last 2 weeks." As a result, rates of secondhand exposure are not directly comparable to those of earlier CSTS surveys.

As shown in Figure 8, secondhand exposure in a room within the last 2 weeks was higher for vapor (31.2%) than tobacco smoke (15.9%). Similarly, students reported being exposed to vapor at a higher rate than tobacco smoke in a car (23.9% vs. 12.2%, respectively).

Figure 8. Prevalence of last 2-week exposure to vapor and tobacco smoke* in a room and car among high school students



Note: Refer to Table H in Appendix B – Supplementary Tables to view estimates with confidence intervals.
*Two products: Cigarettes and little cigars or cigarillos (LCC)

Exposure to Vape and Cigarette Prevention Messages at Home in the Last 30 Days

Table 11 presents students who reported that their parent or guardian had talked with them about the risks of vape and cigarette use in the last 30 days, by use status. Overall, only about one-quarter of students reported that their parent or guardian had talked to them about the risks of vape (27.2%) and cigarette use (23.4%). Current users reported that their parent or guardian talked to them about the risks of vape and cigarette use at the highest rates.

Table 11. Percentage of high school students whose parent/guardian talked to them about the risks of vape and cigarette use in the last 30 days, by use status

	Vapes		Cigarettes	
	N	% (95% CI)	N	% (95% CI)
Overall	793	27.2 (20.0-34.4)	793	23.4 (19.0-27.8)
Never users of the product	547	24.5 (16.4-32.5)	703	23.3 (20.8-25.8)
Former users of the product	155	32.9 (28.7-37.1)	65	21.4 (3.6-39.3)†
Current users of the product	91	34.9 (24.9-44.9)	25	30.1 (0.0-70.1)†

†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Exposure to Vape and Cigarette Ads in the Last 30 Days

Participants were asked whether they had seen ads that either promoted or discouraged the use of vapes or cigarettes within the last 30 days. Table 12 shows students' overall exposure to vape and cigarette ads. Significantly more high school students in Humboldt County were exposed to vape ads (68.0%) than cigarette ads (56.3%) in the past 30 days.

Table 12. Exposure to vape and cigarette ads in the last 30 days among high school students

	Overall exposure to tobacco-related ads N=800 % (95% CI)
Vapes	68.0 (65.4-70.6)
Cigarettes	56.3 (54.1-58.6)

Those students who reported having seen ads for either of these products were asked whether the ads they saw *mostly promoted*, *mostly discouraged*, or *neither promoted nor discouraged* their use. There was also a response option for *I don't know*. Table 13 shows that ads perceived to be anti-tobacco were the most common ad type seen for both products. There were no significant differences in perceived ad type by product.

Proportionally, about one in four vape-related ads were perceived to promote vape use (19.5% / 68.0% = 28.7%), while half were considered to be discouraging its use (36.0% / 68.0% = 52.9%). The rest of the ads were not clearly perceived as either for or against the product. Similarly, about one in five cigarette-related ads were perceived to promote smoking cigarettes (14.5% / 56.3% = 25.8%), while half were considered to be discouraging their use (29.5% / 56.8% = 51.9%).

Table 13. Exposure to perceived types of vape and cigarette ads in the last 30 days among high school students

	Exposure to...			
	Pro-tobacco ads	Anti-tobacco ads	Neutral ads	I don't know
N=799	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Vapes	19.5 (14.5-24.4)	36.0 (32.3-39.7)	3.3 (1.5-5.2)	9.2 (7.1-11.3)
Cigarettes	14.5 (11.9-17.2)	29.5 (25.3-33.7)	3.9 (2.9-5.0)	8.3 (5.7-11.0)

Frequency of Hearing About New Kinds of Vapes

Students in Humboldt were asked how often they heard about new kinds of vapes. Table 14 presents the frequency of hearing about new kinds of vapes by use status. Overall, about two-fifths of the students (43.4%) reported never (15.1%) or rarely (28.3%) hearing of new kinds of vapes. The frequency of hearing about new kinds of vapes was largely similar by use status.

Table 14. Frequency of hearing about new kinds of vapes among high school students, by use status

	Overall N=798 % (95% CI)	Never vapers N=549 % (95% CI)	Former vapers N=155 % (95% CI)	Current vapers N=94 % (95% CI)
Never	15.1 (12.8-17.4)	17.5 (14.7-20.4)	7.4 (1.9-12.9)†	12.7 (9.3-16.1)
Rarely	28.3 (24.9-31.6)	28.0 (23.6-32.4)	32.2 (19.3-45.2)	23.5 (6.9-40.2)†
Sometimes	32.5 (29.5-35.5)	32.1 (27.2-37.0)	32.6 (23.6-41.7)	35.0 (26.3-43.7)
Often	17.4 (15.8-19.0)	16.4 (12.1-20.7)	21.6 (18.9-24.2)	17.2 (0.0-34.6)†
All the time	6.7 (3.2-10.2)	6.0 (1.5-10.5)†	6.2 (1.3-11.1)†	11.5 (1.5-21.6)†

†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

CHAPTER 4 – Access to Vapes

Highlights

- Among current vapers, two-thirds (65.6%) reported not paying for their vapes and about one-third (34.4%) reported paying for them.
- Out of those who did not pay for their vapes, about two-thirds (64.5%) reported being given vapes. Out of those who paid for their vapes, more than half (52.5%) bought vapes from someone and 28.1% asked someone to buy them.
- More than one-third of students (35.2%) were offered a vape in the last 30 days, with nearly a quarter (24.2%) of those who had never used vapes being offered one.

Limiting access to tobacco products among youth reduces opportunities to use such products, and age restrictions are intended to make it difficult for students to access tobacco products. The legal age to purchase tobacco products in California is 21 years old. Because of this, it is important to monitor how underage students obtain tobacco products, particularly through social sources. This chapter presents data on how students accessed vapes and student offers of vapes. Students who were current vape users were asked whether they paid for their own vapes (or pods or e-liquid). They were then asked subsequent questions on how they obtained the product. Vape offers were measured by use status (e.g., never, former, and current users).

It should be noted that the questions about the acquisition of vapes reported in this chapter asked about vapes with nicotine or just flavoring specifically; whereas the question about offers asked about vapes generally. As a result, responses to the question on offers could include vapes with marijuana. Data on access to tobacco products other than vapes were not presented due to the small sample size and resulting instability of estimates.

Acquisition of Vapes

Of current vapers, approximately two-thirds (65.6%) reported not paying for their vapes (or pods or e-liquid) and 34.4% reported paying for them (data not shown in table). Table 15 shows how those 65.6% of students usually got vapes (or pods or e-liquid) from social sources. About two-thirds (64.5%) of these students reported being given vapes. Another fifth (19.2%) of them reported asking someone for vapes.

Table 15. Acquisition of vapes (or pods or e-liquid) among those high school students who were current vapers, by social source

Did not pay for own vapes (or pods or e-liquid)	Current vapers N=58 % (95% CI)
Someone gives them to me	64.5 (57.9-71.1)
I ask someone for them	19.2 (13.6-24.8)
I take them from someone	4.5 (0.4-8.6)†
I get them some other way	11.8 (7.4-16.2)

†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Table 16 presents the methods of purchase among those 34.4% of students who paid for their vapes (or pods or e-liquid). More than half of them reported buying vapes from someone else (52.5%), and 28.1% reported asking someone to buy vapes for them. Few students reported buying vapes from the Internet (6.9%) or from the store themselves (1.9%).

Table 16. Acquisition of vapes (or pods or e-liquid) among those high school students who were current vapers, by purchase source

Paid for own vapes (or pods or e-liquid)	Current vapers N=39 % (95% CI)
I buy them from the store myself	1.9 (0.0-4.4)†
I buy them from someone	52.5 (40.0-64.9)
I ask someone to buy them for me	28.1 (19.2-37.0)
I buy them from the Internet (including apps)	6.9 (3.5-10.4)
I buy them some other way	10.7 (5.0-16.3)

†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Offers of Vapes in the Last 30 Days

The 2019-20 CSTS assessed whether high school students were offered vapes in the last 30 days. Overall, more than one-third of students (35.2%) in Humboldt County were offered a vape in the last 30 days (Table 17). Significantly more current vapers (76.1%) reported vape offers relative to never (24.2%) and former vapers (51.2%).

Table 17. Prevalence of offers of vapes in the last 30 days among high school students, by use status

		Vapes
	N	% (95% CI)
Overall	803	35.2 (32.3-38.0)
Never vapers	554	24.2 (20.3-28.1)
Former vapers	156	51.2 (45.8-56.6)
Current vapers	93	76.1 (71.5-80.7)

CHAPTER 5 – Marijuana and Tobacco Co-Use

Highlights

- Over two-fifths (44.9%) of high school students in Humboldt County reported having tried marijuana and 25.5% reported using it in the last 30 days.
- The rate of currently using marijuana (25.5%) was greater than that of all tobacco products (17.4%).
- Over half (54.5%) of current marijuana users co-used marijuana with a tobacco product.

The legalization of both medicinal and recreational marijuana in California can present increased opportunities for youth to use marijuana, even though they have not reached the legal age to use it. Marijuana can be used alone and in conjunction with tobacco products. This chapter presents the use of marijuana and co-use of marijuana and any tobacco among high school students in Humboldt County.

Marijuana Use

Table 18 presents the prevalence of ever and current marijuana use among high school students by demographic characteristics. In Humboldt County, the rate of currently using marijuana (25.5%) was higher than the current use rates for all tobacco products (17.4%). There was no difference when comparing current use rates of marijuana by gender, though students who declined to answer the gender-identity question used marijuana at the highest rates. African American/Black students had the highest rate (61.7%) of current marijuana use, followed by Hispanic students (31.5%). Asian students had the lowest rate of marijuana use (9.0%) of all racial/ethnic groups. There was no significant difference in the prevalence of marijuana use among 10th grade students (24.9%) relative to 12th grade students (26.2%).

Table 18. Prevalence of marijuana use by gender, race/ethnicity, and grade among high school students

	N	Ever use % (95% CI)	Current use % (95% CI)
Overall	814	44.9 (41.2-48.5)	25.5 (22.7-28.3)
Gender			
Male	378	41.0 (38.4-43.5)	24.3 (21.5-27.1)
Female	362	46.9 (40.8-53.0)	25.1 (18.5-31.7)
Identified in Another Way	43	54.3 (37.0-71.5)	19.5 (9.5-29.5)
Declined to Answer	18	56.7 (25.2-88.1)†	56.7 (25.2-88.1)†
Race/Ethnicity			
White	331	37.3 (35.1-39.5)	19.9 (18.6-21.1)
African American/Black	16	75.2 (54.9-95.6)†	61.7 (34.6-88.9)†
Hispanic	218	54.0 (44.9-63.0)	31.5 (21.8-41.2)
Asian	61	25.1 (19.8-30.3)	9.0 (6.4-11.6)
Other	69	46.0 (42.1-50.0)	24.3 (21.1-27.4)
Multiple	106	49.7 (39.0-60.4)	29.6 (27.3-31.8)
Grade			
Grade 10	483	43.5 (37.8-49.3)	24.9 (22.1-27.8)
Grade 12	331	46.5 (38.4-54.7)	26.2 (19.7-32.8)

Note: With the exception of Hispanic, all ethnicities are classified as Non-Hispanic. Race/Ethnicity category Other includes Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, and non-standard entries.
†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Marijuana and Tobacco Co-Use

Table 19 further categorizes current marijuana use based on whether students used marijuana only or used marijuana and any tobacco product (i.e., co-use). Overall, 11.6% used marijuana only and 13.9% co-used marijuana and any tobacco product. In other words, just over 50% of current marijuana users also used at least one tobacco product (13.9% / 25.5% = 54.5%).

Similar to the overall pattern, the rate of tobacco co-use across demographics tended to be higher than that of marijuana only use. Exceptions to this included students who were male, White, Hispanic, and in the 12th grade, though differences were not statistically significant.

Table 19. Prevalence of current marijuana only use and co-use of marijuana/any tobacco product by gender, race/ethnicity, and grade among high school students

	N	Marijuana only use % (95% CI)	Co-use of marijuana and any tobacco product % (95% CI)
Overall	814	11.6 (9.1-14.2)	13.9 (11.0-16.7)
Gender			
Male	378	13.0 (9.0-17.0)	11.3 (9.6-13.0)
Female	362	10.7 (8.2-13.1)	14.4 (9.5-19.4)
Identified in Another Way	43	6.4 (2.1-10.6)†	13.1 (7.3-18.9)
Declined to Answer	18	13.3 (2.7-23.9)†	43.4 (21.9-65.0)
Race/Ethnicity			
White	331	11.6 (8.8-14.4)	8.3 (4.5-12.0)
African American/Black	16	20.0 (0.0-40.2)†	41.7 (22.5-61.0)
Hispanic	218	16.9 (10.2-23.6)	14.6 (9.9-19.3)
Asian	61	4.3 (1.7-6.9)†	4.7 (2.9-6.4)
Other	69	9.1 (5.9-12.4)	15.1 (14.0-16.2)
Multiple	106	5.6 (4.7-6.6)	24.0 (22.6-25.3)
Grade			
Grade 10	483	9.5 (7.3-11.7)	15.5 (12.8-18.1)
Grade 12	331	14.3 (9.5-19.1)	11.9 (8.2-15.6)

Note: With the exception of Hispanic, all ethnicities are classified as Non-Hispanic. Race/Ethnicity category Other includes Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, and non-standard entries.

†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

CONCLUSION

The most encouraging result from the 2019-20 CSTS is that current cigarette smoking (i.e., use in the last 30 days) among Humboldt youth has reached a low of 3.2%. This is lower than most reports of adolescent current smoking prevalence in recent years.[11] The low rate of current cigarette smoking suggests that 30 years of campaigning against smoking since Proposition 99 have succeeded in changing the social norms against smoking. This is further evidenced by the overwhelming percentage of high school students (86.7%) who believed that their close friends viewed smoking cigarettes negatively. Thus, there is potential for this to be the first generation of Humboldt youth who will be essentially smoke-free when they reach adulthood.

Much work remains, however, as almost forty percent (39.2%) of high school students in Humboldt have experimented with at least one type of tobacco. Most of those experimenters tried vaping (30.1%), with 11.8% of high school students currently using vapes. More than a third (35.2%) of students were offered a vape in the last 30 days, with nearly a quarter (24.2%) of those who had never used vapes having been offered one. Being offered these products through a youth's social framework could increase the rate of experimentation or the rate of transition from experimentation to regular use. The social norm for vaping is different from that of cigarette smoking, with vaping being more popular and acceptable. About three-fifths (61.2%) of the high school students in 2019-20 believed that their fellow students did not view vaping negatively.

There are interesting developments in student perceptions that suggest adolescents have grouped vaping with tobacco use when it comes to industry promotion. Three-quarters of high school students believed that vaping companies were part of the tobacco industry and that tobacco companies targeted their age group by advertising flavored tobacco products in stores and on social media. The perception of a vaping company as part of the tobacco industry may mobilize youth against the use of their products because of the negativity associated with the latter, as an industry that has manipulated the facts to addict young people.[12,13]

The intersection of vaping nicotine and vaping marijuana is a concern. Marijuana use in general was much higher than vaping nicotine or just flavoring among high school students in Humboldt. New products for marijuana, including those using new vaping devices, can be appealing to youth. The public health community must be particularly vigilant in monitoring the impact of new vaping devices on the use of both nicotine and marijuana among adolescents.

In summary, findings from the 2019–20 CSTS reveal significant achievements, while also raising new questions about the next phase of the public health campaign. The low smoking prevalence among high school students suggests that an end-game for the use of combustible tobacco is within sight. Vaping remains a challenge, and the public health community will have to be creative in developing new strategies in order to succeed in the next phase of tobacco control.

RESOURCES

- Find the *California Student Tobacco Survey Biennial Report 2019-2020* on the California Department of Public Health, California Tobacco Control Branch's website: https://www.cdph.ca.gov/Programs/CCDPHP/DCDIC/CTCB/Pages/Data.aspx
- Learn about Tobacco-Use Prevention Education (TUPE) resources, news, and partnerships near you: https://tupeca.org/
- View anti-tobacco commercials at http://www.tobaccofreeca.com
- Connect students to the California Smokers' Helpline (1-844-8-NOVAPE, 1-800-NO-BUTTS) for free, evidence-based telephone counseling and online support to help quit vaping or smoking. Help is available for tobacco users and the people who care about them. Visit http://www.nobutts.org/youthvaping for more information.
- Learn about *Youth Vaping Alternative Program Education (YVAPE)*, an alternative to suspension program with telephone counseling and educational materials for California middle and high school students facing disciplinary action for vaping at school. Visit https://yvape.org/ for more information.
- Download free, print-ready tobacco education materials through the Tobacco Education Clearinghouse of California at: www.tecc.org

APPENDIX A – Survey Methodology

Survey Administration

The California Student Tobacco Survey (CSTS) is funded by the California Department of Public Health (CDPH) and has been conducted biennially since 2001–02. The 2015–16 CSTS was the first to be administered by the University of California San Diego (UC San Diego). For the 2019–20 CSTS, Local Lead Agencies (LLA) of the California Tobacco Control Program (CTCP) were given the opportunity to subcontract with UC San Diego to analyze survey data within the LLA's health jurisdiction.

The main goal of the survey is to obtain statewide prevalence estimates for various tobacco products used by middle and high school students in California. The survey samples students from 8th, 10th, and 12th grades, similar to the well-known Monitoring the Future Survey. However, the CSTS focuses mainly on high school students, with 8th grade students sampled in smaller numbers. This appendix provides a brief overview of survey methodology for the 2019–20 CSTS specific to Humboldt County. Additional details of the statewide report can be found in the *Results of the Statewide 2019–20 California Student Tobacco Survey* Report by S-H. Zhu, et al.[14] Statewide survey methods can be found in the *Technical Report on Analytical Methods and Approaches Used in the California Student Tobacco Survey 2019–20* by S-H. Zhu, et al.[15]

Survey Content

The survey was designed to assess the use of, knowledge of, and attitudes toward cigarettes and emerging tobacco products (e.g., vapes, hookah, little cigars or cigarillos [LCC]). It also included questions about the use of and attitudes toward marijuana and alcohol. The survey contained 160 questions, including topics such as: awareness of and use of different tobacco products; history and patterns of tobacco use; tobacco purchasing patterns; knowledge of and participation in school tobacco prevention or cessation programs; perceptions of tobacco use (i.e., social norms); awareness of advertising; and susceptibility to future tobacco use. Humboldt County augmented the survey with additional county-specific questions.

Similar to previous years, the 2019-20 CSTS included images and product definitions with examples of common brands of tobacco products. The 2019-20 survey also referred to "e-cigarettes" as "vapes" to be consistent with changes in devices and the language used by youth to refer to these devices. The survey included separate questions on vaping nicotine, marijuana, and just flavoring to determine prevalence estimates; although, some questions asked about vapes more generally. Questions about hookah pens were also asked separately to ensure that students who reported using a hookah pen, but not a vape were captured.

Another major change in the 2019-20 survey was the removal of the *I prefer not to answer* response option. This response option was removed for all questions except for those that asked about students' gender identity or sexual orientation.

Participation

To increase participation in the CSTS, schools were provided a $500 Amazon gift card for administering the survey. Participating schools also received a brief report highlighting their school's results. Teachers primarily acted as proctors for the survey, and, in some cases, other school staff proctored. UC San Diego provided proctors for schools that required additional support. Teachers and proctors were provided with directions for administering the survey. UC San Diego staff were available to answer questions from teachers and proctors.

The 2019–20 CSTS was administered online during the school day. The online survey included programmed skip logic to reduce participant burden and took a median of 21 minutes to complete. A few questions in the survey were mandatory, these asked about the respondents' 1) willingness to participate in the survey; 2) school verification; and 3) grade level. The remaining survey questions were not mandatory, although an error message of "Oops, you didn't answer" appeared if the question was unanswered. The student was allowed to move forward and skip the question if desired.

Student participation was voluntary and anonymous. Consent procedures were consistent with school district guidelines. In a passive consent protocol, parents could opt their children out of the survey if they did not want them to participate. In an active consent protocol, only students who returned a consent form signed by the parent could participate in the survey. All participating districts accepted passive consent. Consent forms were distributed to parents via the students one week before the survey. Spanish forms were available as needed. In addition to obtaining consent from parents, students were also asked to give their assent to participate in the survey.

Survey Sample 2019–20 CSTS

The total sample from Humboldt County included 814 students in 10th and 12th grade from four high schools. No middle schools from the county participated in the 2019-20 CSTS.

Sampling Strategy

The statewide sampling strategy used a two-stage sampling design, in which stage 1 was the random sampling of schools within regions and stage 2 was the sampling of classrooms within schools. Sampling used the probability proportional to size (PPS) method and stratified by region with oversampling of schools in less densely populated (and more rural) regions, with higher African American enrollment, and with funding from the California Tobacco-Use Prevention Education (TUPE) program. Middle schools were sampled using simple statewide random sampling without stratification by region or county. High schools were stratified by region. For high schools, the state was divided into 35 regions based on geographic contiguity and cultural similarity. Participating middle schools were encouraged to survey all 8th graders, while high schools were encouraged to survey all 10th and 12th graders. For the minority of schools that

chose not to survey all students in the eligible grades, five class sections within a grade were randomly sampled for participation.

Humboldt County did not conform to the 2019–20 CSTS sample for this report. This is because the county was not considered its own region; it was combined with other counties to create a larger region (Region 1). One high school from Humboldt County was represented in the final statewide sample. The remaining three high schools that were analyzed for this report were sampled as part of the regional, not statewide, survey design. No middle schools were surveyed as part of the statewide survey design. Participating high schools in Humboldt County chose to survey all 10th and 12th graders, as opposed to a random sample of class sections.

Analysis

The CSTS design utilized stratified random sampling and proper weighting to provide stable statewide prevalence rates. However, the data may not be representative at the county-level because it was part of a region (Region 1) in the statewide sampling strategy. Additionally, three of the high schools in this county were not sampled as part of a statewide survey design and were not randomly selected at the county-level. Therefore, the data for 10th and 12th grade students may not be representative of the high schools in this county and must be interpreted cautiously. The estimates for students in Humboldt County are weighted by student response rates by grade level. Variances have been adjusted for clustering by school. In addition, as more than 5% of the county's students participated in the survey, a finite population correction was applied in the analyses. All estimates include 95% confidence intervals in the report. A difference test was performed for two estimates with overlapping confidence intervals to determine a significant difference (i.e., $p<0.05$) as needed.

Race/Ethnicity

The racial/ethnic background of students was determined using two primary questions. The first asked about Spanish or Hispanic (Latino) origin (i.e., ethnicity), and the second asked participants to indicate how they describe themselves (i.e., race) by marking all that apply: *American Indian or Alaska Native*, *Asian*, *Black or African American*, *Native Hawaiian or Other Pacific Islander*, *White*, or *Other*. The *Other* category included non-standard entries (such as Middle Eastern or Italian). Due to the small sample sizes of Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, and Other groups, these groups were combined to form the *Other* category. In line with other surveys, students who identified as *Hispanic* were labeled as such regardless of the other races selected. Students who selected multiple races were grouped as *Multiple* in tables that included racial/ethnic categories.

Race/ethnicity categories of the CSTS are similar to those used by the California Department of Education (CDE), allowing us to compare the percentage of each race/ethnicity (Table 20). In many cases, the percentage of each race/ethnicity was similar between the CSTS and CDE enrollment data. Of note, the percentage of *Multiple* race/ethnicity was higher in the CSTS than reported by the CDE (13.2% vs. 8.0%, respectively). One possible reason for the difference is that

CSTS is based on student self-reporting, whereas the CDE is based on parent reporting of the child's race/ethnicity. Students and parents may not have the same perspective regarding multi-racial identification. Because of the differences in how race/ethnicity was identified between the CSTS and CDE, student responses were not weighted by race/ethnicity. Given the ethnic diversity of Humboldt County, and the increasing number of people who identify themselves as two or more races, the issue of how to analyze race/ethnicity data will continue to be relevant for the CSTS.[16]

Table 20. Percentage of race/ethnicity categories in the CSTS and CDE enrollment data

	CSTS Sample		CDE Enrollment	
	N=801	**(%)**	**N=1780**	**(%)**
NH-White	331	41.3	1037	58.3
NH-African American/Black	16	2.0	18	1.0
Hispanic	218	27.2	296	16.6
NH-Asian	61	7.6	103	5.8
NH-AI/AN	47	5.9	165	9.3
NH-NHOPI	14	1.7	12	0.7
NH-Other	8	1.0	7	0.4
NH-Multiple	106	13.2	142	8.0

Note: CDE enrollment data were restricted to schools that were considered eligible to participate in the CSTS. Race/ethnicity data above are unweighted and should not be compared with weighted estimates throughout the report.
Abbreviations: NH = Non-Hispanic; AI/AN = American Indian or Alaska Native; NHOPI = Native Hawaiian or Other Pacific Islander.

There are limitations with this method of classifying race/ethnicity. To provide a greater understanding of the impact of this classification of race/ethnicity, Table 21 compares how individuals were labeled using usual methods as to whether they endorsed a given race at all. It is clear that students tended to endorse multiple responses, and in particular, underrepresented races. For example, under the usual classification of labeling, the number of African American/Black students was 16 (i.e., non-Hispanic African American/Black who did not endorse any other racial identity). However, there were more than three times as many students (59) who indicated their race was African American/Black (including those who also indicated they were Hispanic or who selected at least one other racial category). This phenomenon was also striking for Whites (n=331 vs. 497, depending on the categorization strategy), Native Hawaiian or Other Pacific Islanders (n=14 vs. 37), American Indian or Alaska Natives (n=47 vs. 141) and for those of Other race/ethnicity (n=8 vs. 135).

Table 21. Percentage of labeled and endorsed race/ethnicity

	Labeled		Endorsed	
	N=801	(%)	N=801	(%)
White	331	41.3	497	62.8
African American/Black	16	2.0	59	7.4
Hispanic	218	27.2	218	27.2
Asian	61	7.6	90	11.4
AI/AN	47	5.9	141	17.8
NHOPI	14	1.7	37	4.7
Other	8	1.0	135	17.0
Multiple	106	13.2	--	--

Note: The percent in endorsed does not add up to 100% because students could select more than one response. Race/ethnicity data above are unweighted and should not be compared with weighted estimates throughout the report.

Abbreviations: AI/AN = American Indian or Alaska Native; NHOPI = Native Hawaiian or Other Pacific Islander.

APPENDIX B – Supplementary Tables

Table A. Prevalence of ever and current use of tobacco products among high school students

	Ever use N=814 % (95% CI)	Current use N=814 % (95% CI)
Any of the below	39.2 (36.8-41.7)	17.4 (14.7-20.0)
Vapes	30.1 (25.5-34.7)	11.8 (10.6-13.0)
Cigarettes	12.2 (9.8-14.6)	3.2 (3.0-3.5)
LCC	16.4 (14.1-18.7)	5.4 (4.7-6.2)
Big cigars	3.4 (2.1-4.7)	0.5 (0.0-1.0)†
Hookah	4.8 (3.3-6.4)	0.7 (0.1-1.3)†
Smokeless	12.9 (7.6-18.2)	4.0 (2.0-6.0)
HTP	1.6 (1.3-1.9)	0.3 (0.1-0.6)†

Abbreviations: LCC = little cigars or cigarillos; HTP = heated tobacco products.
†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Table B. Frequency of current vape use among those high school students who were current vapers

	Current vape use N=97 % (95% CI)
1 or 2 days	46.2 (40.7-51.7)
3-5 days	19.9 (13.9-25.9)
6-19 days	25.4 (18.6-32.1)
20-30 days	8.6 (4.0-13.1)

Table C. Proportion using flavored vapes among those high school students who were current vapers

	Current vape use N=97 % (95% CI)
Flavored	97.8 (95.9-99.6)†
Non-flavored	2.2 (0.4-4.1)†

†Data are statistically unreliable because relative variance is greater than 30%. Interpret with caution.

Table D. Perceived reasons for vaping among high school students

People my age use vapes with nicotine or just flavoring because…	Overall	
	N	% (95% CI)
their friends use them	805	84.7 (82.8-86.6)
they come in lots of flavors	805	74.1 (70.2-78.1)
they look interesting and cool	804	72.8 (71.7-73.9)
they are healthier than cigarettes	804	57.5 (52.6-62.4)

Table E. Percentage of high school students who believed that adults would feel negatively about them or another adult if they vaped or smoked

Adults would feel negatively about…	Vaping nicotine		Smoking cigarettes	
	N	% (95% CI)	N	% (95% CI)
the student	799	95.2 (93.7-96.8)	801	94.9 (93.1-96.8)
another adult	797	81.0 (74.4-87.6)	799	80.3 (75.2-85.5)

Table F. Percentage of high school students who believed that their close friends or other students at their school would view vaping or smoking negatively

Negative views of tobacco product use among…	Vaping nicotine		Smoking cigarettes	
	N	% (95% CI)	N	% (95% CI)
close friends	798	67.6 (61.9-73.4)	799	86.7 (82.1-91.4)
other students at school	799	38.8 (32.2-45.4)	798	71.8 (64.5-79.1)

Table G. Prevalence of complete home bans on vaping and tobacco smoking among high school students

	Complete home ban	
	N	% (95% CI)
On vaping	799	80.4 (75.3-85.5)
On tobacco smoking	802	81.1 (77.6-84.6)

Table H. Prevalence of last 2-week exposure to vapor and tobacco smoke* in a room and car among high school students

	Vapor		Tobacco smoke*	
	N	% (95% CI)	N	% (95% CI)
Exposure in a room	802	31.2 (26.1-36.3)	803	15.9 (11.5-20.3)
Exposure in a car	804	23.9 (19.7-28.1)	803	12.2 (10.6-13.7)

*Two products: Cigarettes and little cigar or cigarillos (LCC).

REFERENCES

1. County Profile | Humboldt County, CA - Official Website. Accessed June 24, 2021. https://humboldtgov.org/1209/County-Profile

2. U.S. Census Bureau QuickFacts: Humboldt County, California. Accessed June 23, 2021. https://www.census.gov/quickfacts/fact/table/humboldtcountycalifornia/PST045219

3. California Department of Education. Enrollment by School - Student & School Data Files (Downloadable). Published Apr 13, 2020. Accessed February 8, 2021. https://www.cde.ca.gov/ds/ad/filesenr.asp

4. Johnson S. List of California K-12 districts closed for in-person instruction due to coronavirus. EdSource. Accessed November 16, 2020. https://edsource.org/2020/california-k-12-schools-closed-due-to-the-coronavirus/624984

5. Chen JC, Das B, Mead EL, Borzekowski DLG. Flavored E-cigarette Use and Cigarette Smoking Susceptibility among Youth. *Tob Regul Sci*. 2017;3(1):68-80. doi:10.18001/TRS.3.1.7

6. Villanti AC, Johnson AL, Ambrose BK, et al. Flavored Tobacco Product Use in Youth and Adults: Findings From the First Wave of the PATH Study (2013-2014). *Am J Prev Med*. Published online 2017. doi:10.1016/j.amepre.2017.01.026

7. Leventhal AM, Goldenson NI, Cho J, et al. Flavored E-cigarette Use and Progression of Vaping in Adolescents. *Pediatrics*. 2019;144(5):e20190789. doi:10.1542/peds.2019-0789

8. Pierce JP, Shi Y, Hendrickson EM, et al. Tobacco control in California compared with the rest of the USA: trends in adult per capita cigarette consumption. *Tob Control*. 2018;27(e2):e112-e117. doi:10.1136/tobaccocontrol-2017-053895

9. CDCTobaccoFree. Smokefree Policies Reduce Smoking. Centers for Disease Control and Prevention. Published October 7, 2020. Accessed June 24, 2021. https://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/protection/reduce_smoking/index.htm

10. Tobacco-Free Humboldt | Humboldt County, CA - Official Website. Accessed June 24, 2021. https://humboldtgov.org/662/Tobacco-Free-Humboldt

11. Ma C, Xi B, Li Z, et al. Prevalence and trends in tobacco use among adolescents aged 13-15 years in 143 countries, 1999-2018: findings from the Global Youth Tobacco Surveys. *Lancet Child Adolesc Health*. 2021;5(4):245-255. doi:10.1016/S2352-4642(20)30390-4

12. Niederdeppe J, Farrelly MC, Haviland ML. Confirming "truth": more evidence of a successful tobacco countermarketing campaign in Florida. *Am J Public Health*. 2004;94(2):255-257. doi:10.2105/ajph.94.2.255

13. Sutfin EL, Szykman LR, Moore MC. Adolescents' responses to anti-tobacco advertising: exploring the role of adolescents' smoking status and advertisement theme. *J Health Commun*. 2008;13(5):480-500. doi:10.1080/10810730802198961

14. Zhu S-H, Braden K, Zhuang Y-L, et al. *Results of the Statewide 2019-20 California Student Tobacco Survey.* San Diego, California: Center for Research and Intervention in Tobacco Control (CRITC), University of California San Diego; 2021.

15. Zhu S-H, Gamst A, Zhuang Y-L, et al. *Technical Report on Analytic Methods and Approaches Used in the California Student Tobacco Survey 2019-2020.* San Diego, California: Center for Research and Intervention in Tobacco Control (CRITC), University of California San Diego; 2021.

16. Jones N, Bullock J. The Two or More Races Population: 2010. The United States Census Bureau. Accessed June 23, 2021. https://www.census.gov/library/publications/2012/dec/c2010br-13.html