

Trends and Racial/Ethnic Group Differences in Cigarette, E-cigarette, and Marijuana Use among High School Students¹

Introduction

The use of vaping devices and marijuana in adolescents is of growing public health concern due to mounting evidence of the adverse effects of vaping a variety of substances and the statewide legalization of recreational marijuana use for adults. Vaping devices (also known as e-cigarettes, e-cigs, vapes, etc.) are believed to produce harmless water vapor and have a reputation as being safer than smoking cigarettes and marijuana. Studies have shown, however, that these devices produce aerosols with harmful chemicals and frequently contain addictive substances like nicotine². The harmful effects of nicotine in adolescents have been well documented and include changes to the brain that increase the risk of life-long addiction as well as increases the risks of cancer and heart disease². Studies have also

shown marijuana/THC use in adolescents and young adults is associated with several negative physical and socio-emotional outcomes³. Furthermore, there is a body of growing evidence suggesting inequities in the use of vaping devices and marijuana amongst different racial/ethnic groups⁴.

The present brief summarizes trends in use of cigarettes, marijuana, and vaping devices in high school students using data from the last four administrations of the Biennial State California Health Kids Survey (CHKS). The Biennial State CHKS collects data from a representative state sample of secondary school students⁵. The data in the current analysis cover the 2011-2019 academic school years and include 135,392 responses from 9th and 11th grade students combined.

Key Takeaways

- Strong headway has been made in decreasing cigarette use among high school students.
 - Progress has been made in combating the use of e-cigarettes, but that progress has stalled in the last two years. They remain more popular than cigarettes and may be gaining popularity in some racial/ethnic groups.
 - Of the delivery systems and substances examined, marijuana is still the most popular overall and amongst different racial/ethnic groups. Additionally, decline in use may be slowing for many racial/ethnic groups and for this age group as a whole.
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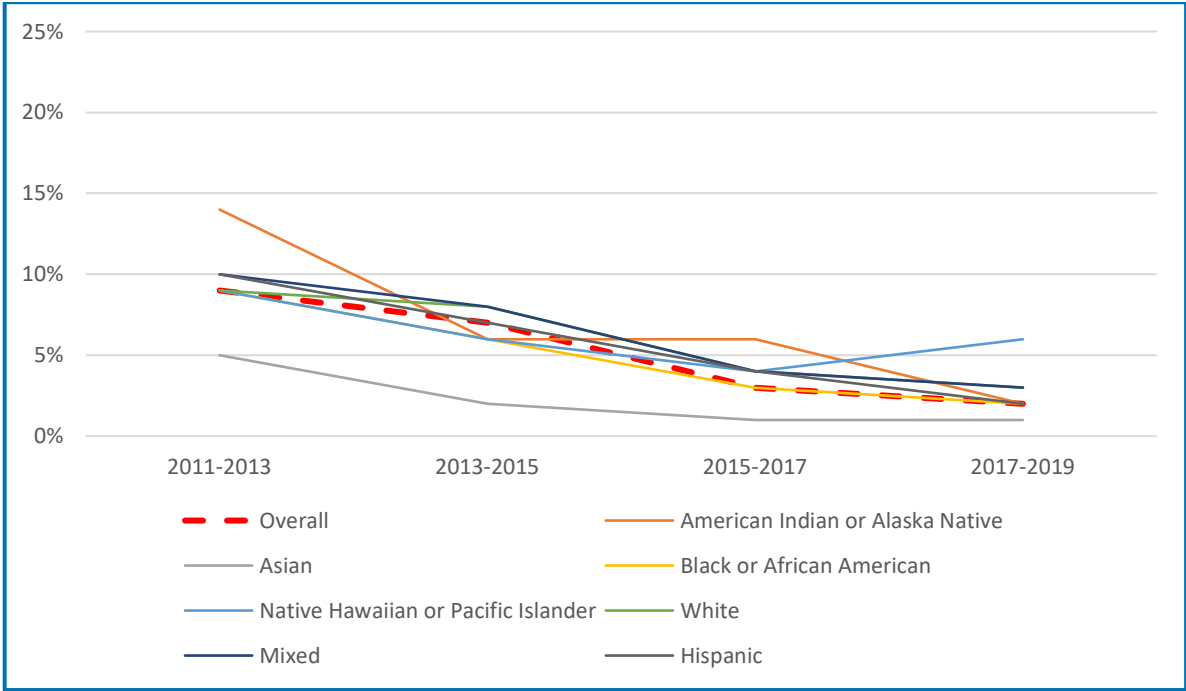
Scope of the Problem

Trends in Cigarette Smoking.

From 2011-2019, the overall percentage of high school students reporting any current use of cigarettes in the past 30-days has declined (9% in 2011-2013 to 2% 2017-2019). All racial/ethnic groups saw declines in current cigarette use except Native

Hawaiian/Pacific Islander, which saw a slight increase in cigarette use (4% to 6%). The greatest decline in current cigarette use was seen in American Indian/Alaska Native students (14% to 2%).

EXHIBIT 1.
Trends in past 30-day use of cigarettes among high school students by race/ethnicity



Source: Biennial State CHKS Data, 2011-19.

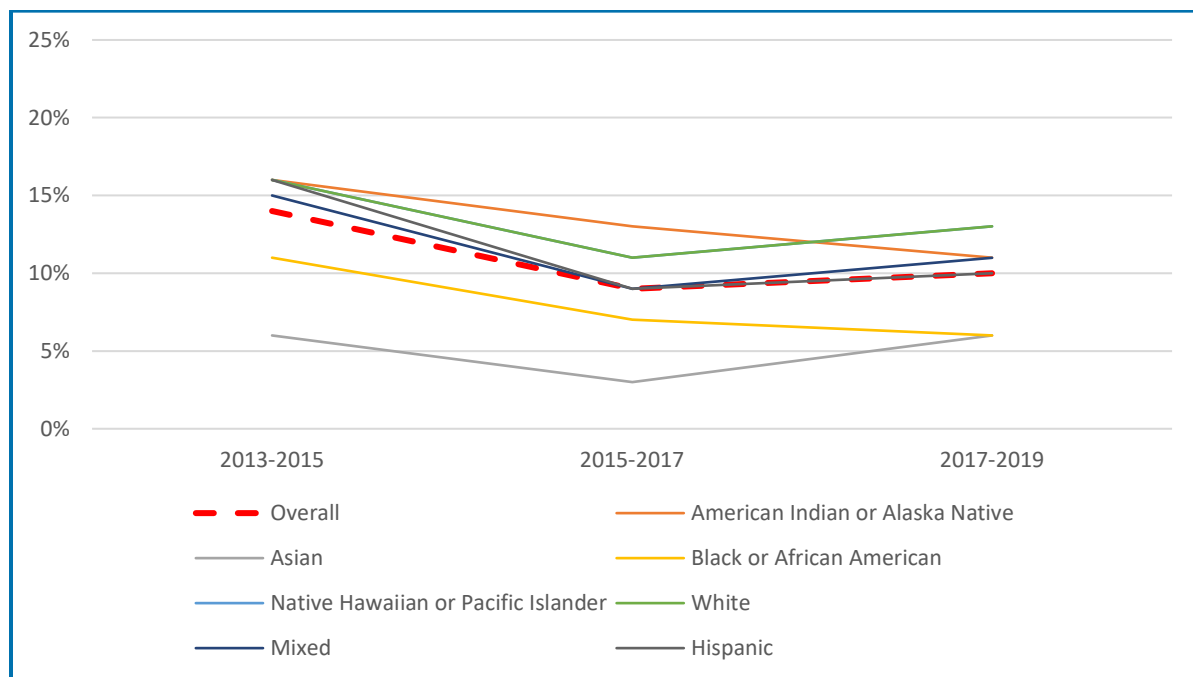
Trends in E-cigarette Use

High school students exhibited an overall decrease in past 30-day use of e-cigarettes (14% in 2013-2015 to 10% in 2017-2019) but their popularity for ingesting nicotine or tobacco products now exceeds that of cigarette smoking. They are even more widely used to consume marijuana (6%) and flavored products without nicotine or other drugs (6%). Of the students reporting using e-cigarettes to consume nicotine, about half also reported using e-cigarettes to consume marijuana/THC (43%) and flavored products

without drugs (52%). The trends in use varied by racial/ethnic group. Over the past two years, Asians, Whites, Mixed, and Hispanics showed slight increases in e-cigarette use. In contrast, American Indian/Alaska Natives and Black/African Americans showed consistent declines. One reason for the recent increase in vaping among the majority of groups may be the popularity of these devices for consuming multiple substances, including marijuana as discussed further below.

EXHIBIT 2.

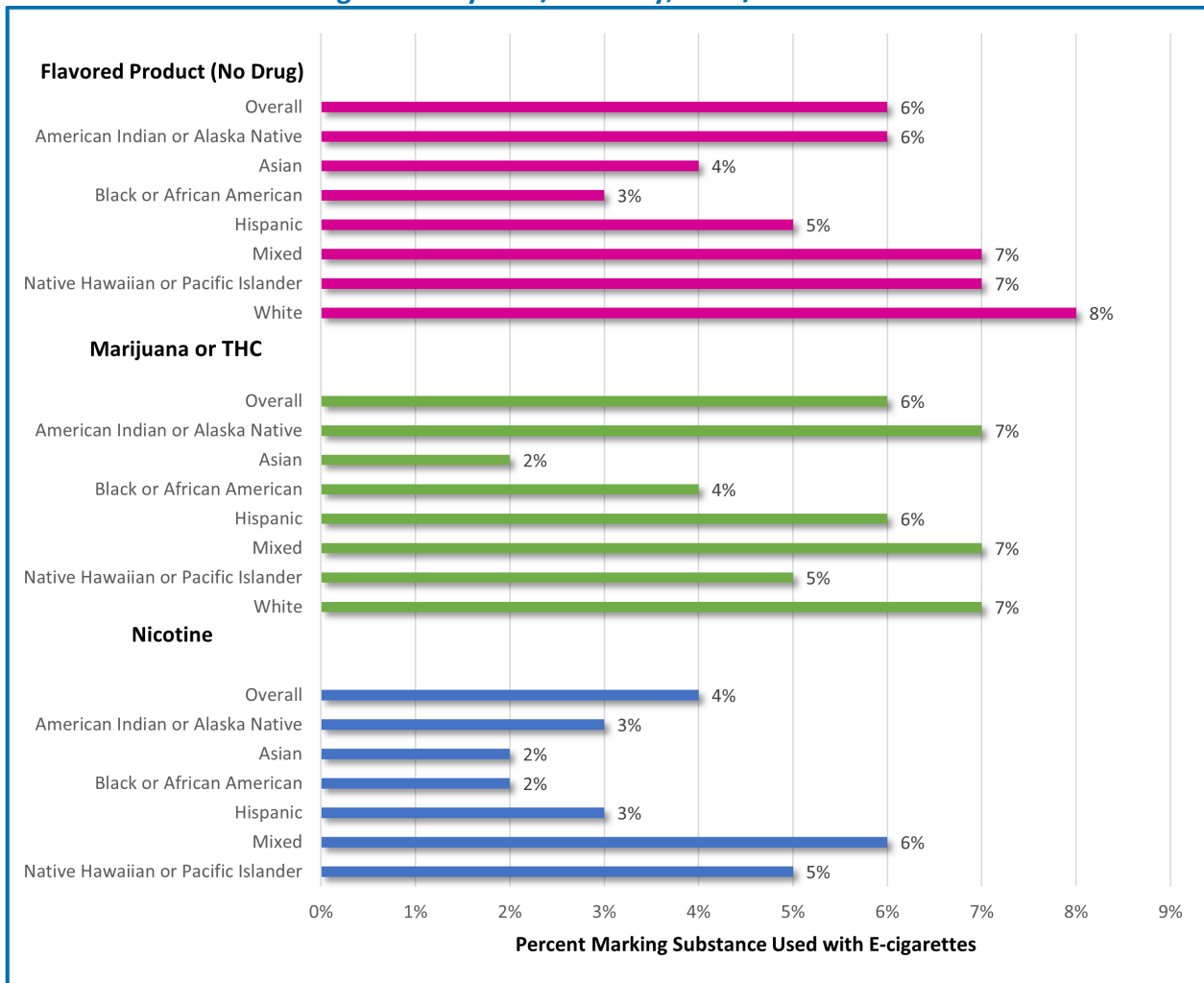
Trends in past 30-day use of e-cigarettes among high school students by race/ethnicity



Source: Biennial State CHKS Data, 2011-19.

EXHIBIT 3.

Substances used with e-cigarettes by race/ethnicity, 2017/19



Source: Biennial State CHKS Data, 2011-19.

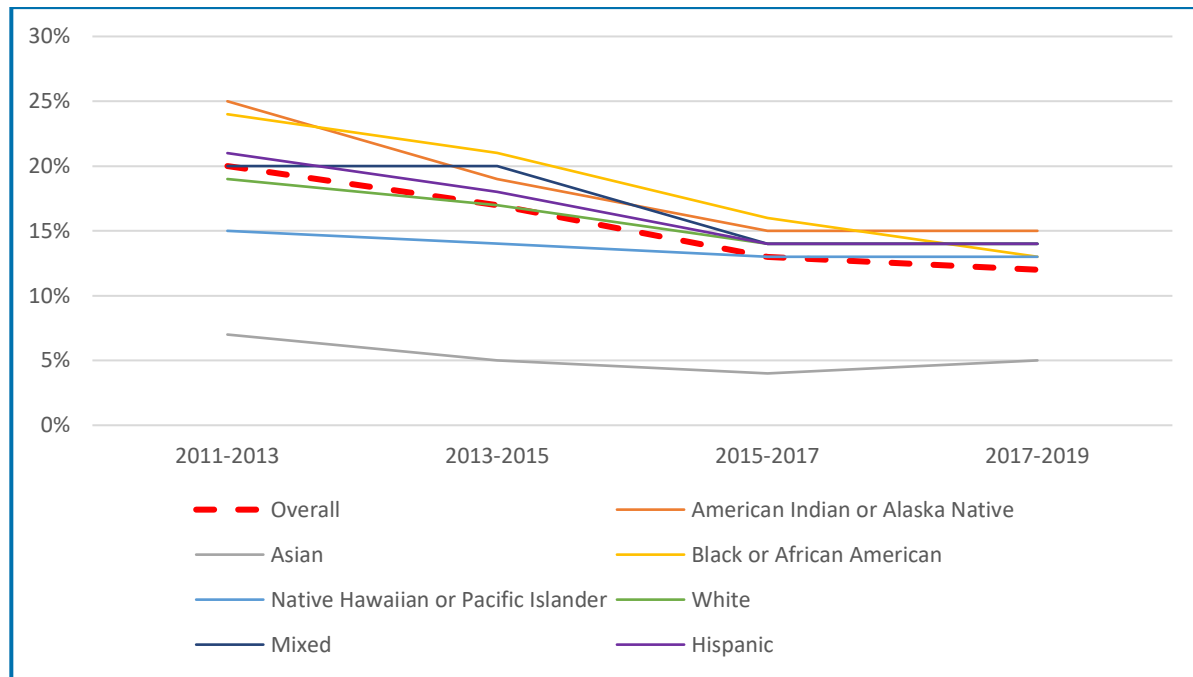
Trends in Marijuana Use

Overall use of marijuana by high school students declined from 2011-2019 (20% to 12%) but it is still the most popular substance used by this age group, with current use now equivalent to alcohol drinking. Trends suggest the decline in rates of any marijuana use in the past 30 days may be slowing overall and across racial/ethnic groups, with the exception of a continued decline among Blacks/African Americans in the last two years. Diverse methods of administration were used. The

most common way of consuming marijuana was smoking (20%), followed by vaping (17%), and oral ingestion by eating or drinking (15%). The common methods for consuming marijuana also differed by racial/ethnic group. Additionally, many students indicated they consumed marijuana using multiple methods. Almost 80% of those who had smoked marijuana also indicated that they had consumed it with e-cigarettes.

EXHIBIT 4.

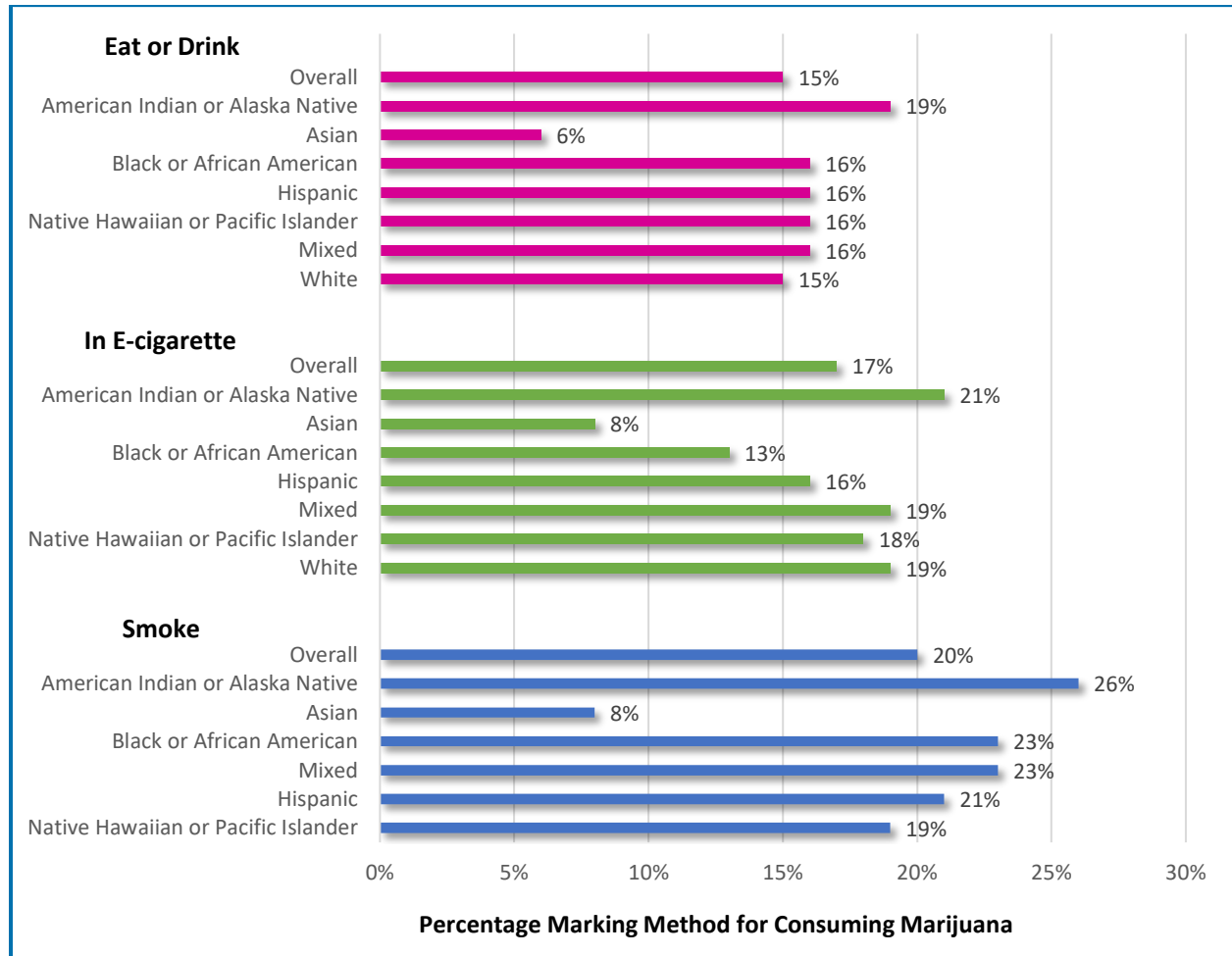
Trends in past 30-day use of marijuana among high school students by race/ethnicity



Source: Biennial State CHKS Data, 2011-19.

EXHIBIT 5.

Methods for consuming marijuana by racial/ethnic group.



Source: Biennial State CHKS Data, 2011-19.

Implications

Progress has been made in drastically reducing the use of cigarettes and, to a lesser extent, marijuana among high school students, but more work needs to be done to combat the popularity of e-cigarettes for consuming both nicotine/tobacco and, especially, marijuana products. The levelling off of marijuana use in general in this age demographic, and the rising diversity in ways in which it is consumed, also

warrants attention in the context of the legalization of recreation use among adults. Analyzing aggregated data for substance use may not paint a complete picture. Trends in cigarette, e-cigarette, and marijuana use vary by racial/ethnic group with most groups exhibiting higher use than the overall trends suggest.

List of Selected Measures

Construct	Measure(s)	Operationalization
Student Race/Ethnicity	<p>“What is your race?”</p> <p>“Are you of Hispanic or Latino origin?”</p>	Determined by responses marked by student. Race and ethnicity were treated as mutually exclusive categories (i.e., “White” refers to “Non-Hispanic White”).
Past 30-day cigarette use	<p>“During the past 30 days, on how many days did you use ...”</p> <p>“cigarettes?”</p>	% of students responding \geq “1 day”
Past 30-day e-cigarette use	<p>“During the past 30 days, on how many days did you use ...”</p> <p>“...an electronic cigarette or any other nicotine delivery device?”</p>	% of students responding \geq “1 day”
Substances used in e-cigarettes	<p>“Have you ever used an e-cigarette to consume the following?”</p> <p>“Nicotine or tobacco substitute”</p> <p>“Marijuana or THC”</p> <p>“Flavored product without nicotine, alcohol, or other drugs”</p>	% of students who marked response
Past 30-day marijuana use*	<p>“During the past 30 days, on how many days did you use ...”</p> <p>“Marijuana (pot, weed, grass, hash, bud)”</p> <p>“Marijuana (smoke, vape, eat, or drink)”</p>	% of students responding \geq “1 day”
Methods of marijuana use	<p>“During your life, how many times have you used marijuana in any of the following ways:”</p> <p>“Smoke it?”</p> <p>“In an electronic or e-cigarette or other vaping device?”</p> <p>Eat or drink it in products made with marijuana?”</p>	% of students who marked response

*Question wording changed between survey administrations so questions may not measure identical constructs.

¹ Suggested Citation: Murphy, E., Hanson, T., & Austin, G. (2021). *Trends and Racial/Ethnic Group Differences in Cigarette, E-cigarette, and Marijuana Use in High School Students*. San Francisco, CA: WestEd.

² “Risks of E-Cigarette and Vape Pen Use.” Tobacco Prevention Toolkit Division of Adolescent Medicine, Stanford University

³ Ellickson, P. L., Martino, S. C., & Collins, R. L. (2004). Marijuana Use From Adolescence to Young Adulthood: Multiple Developmental Trajectories and Their Associated Outcomes. *Health Psychology, 23*(3), 299–307.

⁴ Odani, S., Armour, B. S., & Agaku, I. T. (2018). Racial/Ethnic Disparities in Tobacco Product Use Among Middle and High School Students - United States, 2014-2017. *MMWR. Morbidity and mortality weekly report, 67*(34), 952–957.

⁵ Austin, G., Hanson, T., Zhang, G., & Zheng, C. (2020). School climate and student engagement and well-being in California, 2017/19. Results of the Seventeenth Biennial State California Healthy Kids Survey, Grades 7, 9, and 11. WestEd.