

## Did COVID-Related School Building Closures Reduce Student Tobacco Use, Marijuana Use, and Vaping?

The COVID-19 pandemic and related school building closures occurred with little warning and disrupted the day-to-day routines of youth and families throughout California and the nation. In mid-March 2020, as the COVID-19 pandemic was hitting its first peak, the vast majority of California school buildings closed, and nearly all students were consigned to continue their schooling remotely from their homes. Most California students did not return to in-school instruction until Fall 2021 (EdSource, 2021). The pandemic and associated school building closures reduced students' access to basic supports; disrupted interactions and relationships with peers, teachers, and school staff; and adversely affected students' mental health and wellness.

By limiting extracurricular activities and in-person interaction with peers and increasing time spent in proximity to parents, COVID-related school building closures may have reduced students' access to tobacco, marijuana, and vaping products and opportunities to use them (Chaffee et al., 2021; Miech et al., 2021). Prior to the beginning of the pandemic, student cigarette use rates continued their long-term decline between 2015-17 and 2017-19 in California, marijuana use remained relatively steady, and 30-day vaping rates increased (Austin et al., 2020). National studies have shown that youth vaping rates declined significantly during the pandemic (Kreslake et al., 2021; Gaiha et al., 2020; Gentzke et al., 2020) while marijuana use rates remained stable (Miech et al., 2021).

Understanding how the pandemic affected student tobacco and marijuana use and vaping in California is important for informing prevention efforts. The present study provides information on the effects of the COVID-19 pandemic on student cigarette use, marijuana use, and vaping and describes the extent to which student tobacco and marijuana use was associated with the instructional model used by schools (i.e., in-school, hybrid, or remote instruction) in the 2020-21 academic year.

Two sets of data were used to examine the impact of the pandemic on student tobacco and marijuana use. First, statewide results from local administration of the California Healthy Kids Survey (CHKS) in 2020-21 were compared with results from the state representative 2017-19 Biennial State CHKS administered prior to the pandemic. Second, data from schools that administered the CHKS in 2020-21 and in one or more years prior to the pandemic were used to identify a longitudinal sample of schools. Based on this sample, trends were examined to assess whether tobacco use, marijuana use, and vaping significantly declined in 2020-21 across a fixed set of schools. In addition, 2020-21 CHKS data were used to examine differences in cigarette use, marijuana use, and vaping across students who participated in in-person learning at school, hybrid instruction (in-person and remote instruction), and via remote instruction exclusively.

---

### Key Findings

The pandemic was associated with declines in student tobacco use, marijuana use, and vaping in California. Moreover, students who participated in school exclusively via remote instruction reported lower levels of substance use in comparison to their counterparts who were instructed in-person at school or via hybrid instruction. These results hold after accounting for differences in survey response rates, race, ethnicity, gender, and urban/rural status.

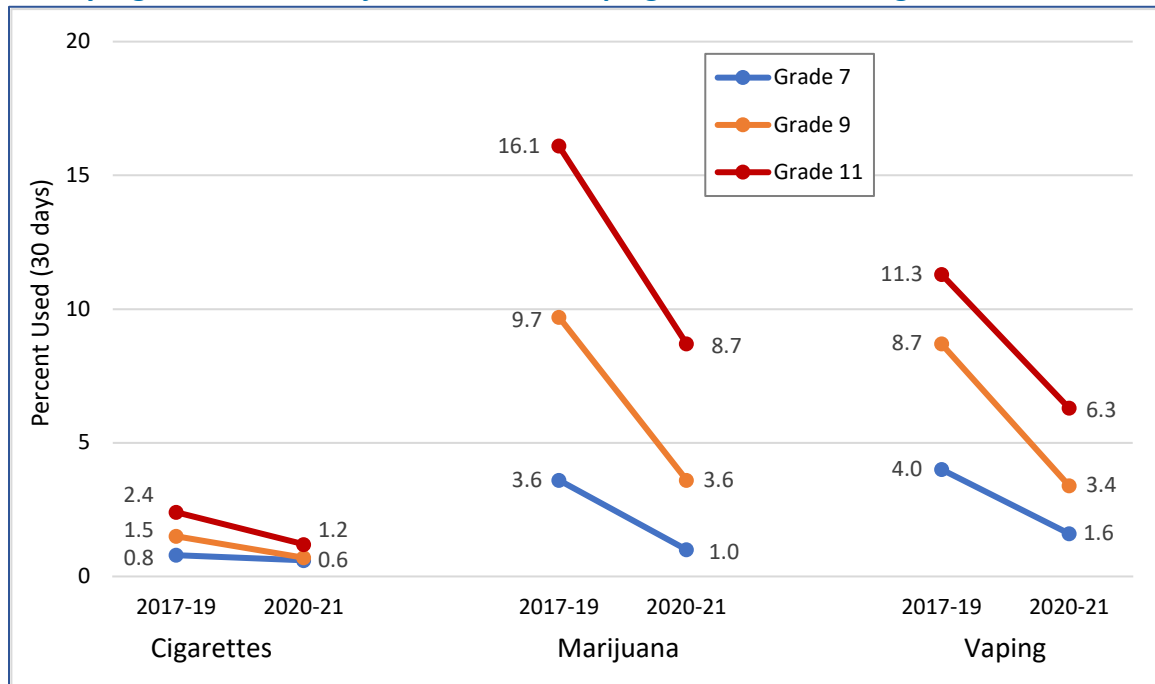
---

## Tobacco Use, Marijuana Use, and Vaping in 2020-21

Compared to a state-representative sample of students surveyed prior to the pandemic, California students who participated in the 2020-21 CHKS reported substantially lower levels of cigarette use, marijuana use, and vaping across all grades (Exhibits 1 and 2). For cigarettes, 30-day and lifetime prevalence rates declined by about 50% in all cases except for 7<sup>th</sup> grade 30-day use, which declined by 25%. Marijuana use rates declined by between 33% (11<sup>th</sup> grade lifetime use, from 29.2% to 19.6%) and 72% (7<sup>th</sup> grade 30-day use, 3.6% to 1%). The declines in vaping rates were similar in magnitude to that of marijuana use rates.

### EXHIBIT 1.

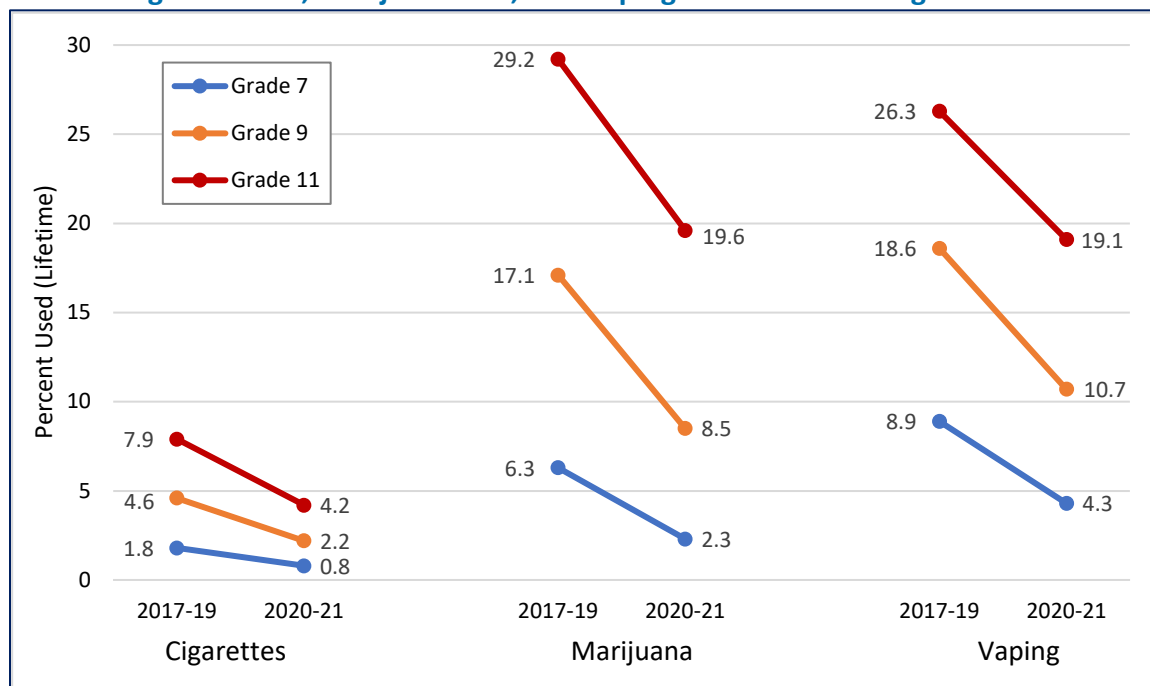
#### 30-Day Cigarette Use, Marijuana Use, and Vaping Before and During Pandemic



Source: Biennial State California Healthy Kids Survey, 2017-19 and aggregated local California Healthy Kids Data, 2020-21.

EXHIBIT 2.

### Lifetime Cigarette Use, Marijuana Use, and Vaping Before and During Pandemic



Source: Biennial State California Healthy Kids Survey, 2017-19 and aggregated local California Healthy Kids Data, 2020-21.

#### Longitudinal School-Level Changes in Use After the Onset of the Pandemic

Although the results above suggest that the pandemic and related school building closures were associated with reductions in student tobacco and marijuana use, there are two reasons why this might not be the case. First, unlike the 2017-19 Biennial State CHKS, the aggregated local 2020-21 CHKS is not representative of the state because it is a convenience sample of districts and schools that chose to participate in the local CHKS during the pandemic year. Second, student-level response rates on the 2020-21 CHKS were substantially lower than in prior years (Appendix Table A1), particularly among the 70% of students who were participating in school remotely at the time they were taking the survey. Student response rates ranged from 56% among 11<sup>th</sup> graders to 72% among 7<sup>th</sup> graders. These rates are 11 to 14 percentage points lower than response rates in 2019-20. With most school buildings closed, use rates may be lower in 2020-21 because students with the highest tobacco and marijuana use rates were less likely to participate in the survey than in prior years.

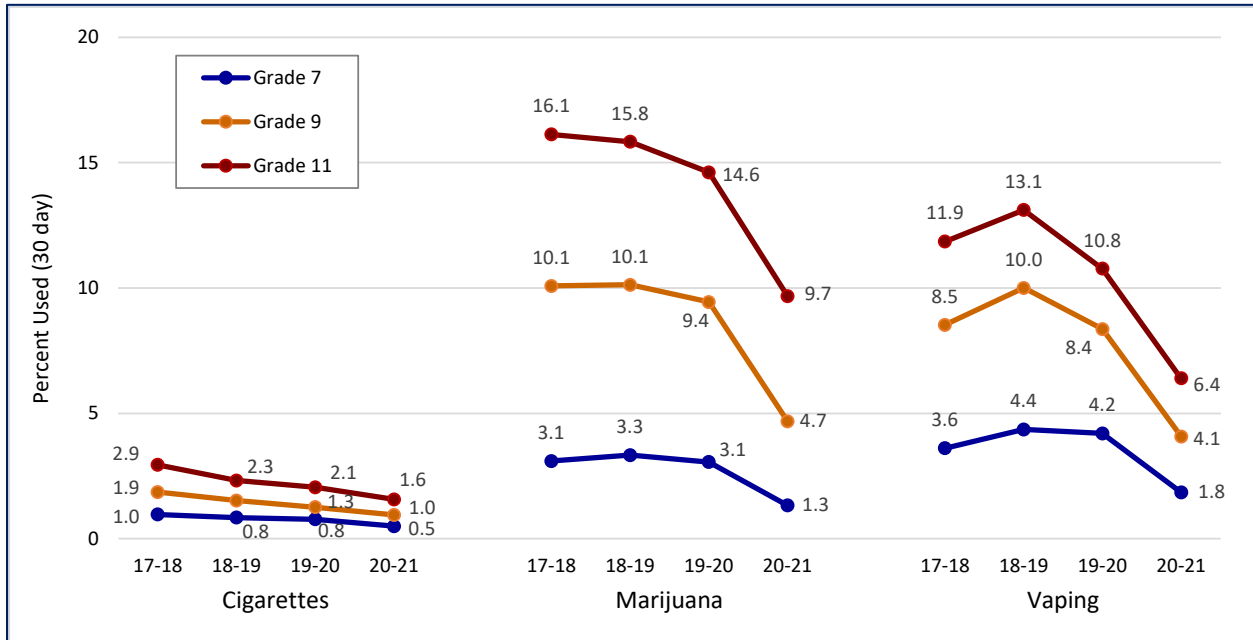
To account for sample differences and differences in survey response rates, a longitudinal sample of schools was identified from the set of schools that administered the CHKS in 2020-21. Schools that administered the CHKS in 2020-21 and in one or more years prior to the pandemic were used to identify a longitudinal sample of schools. Trends in cigarette, marijuana, and vaping rates were examined across this fixed set of schools.<sup>1</sup> To account for the potential effects of lower response rates in the 2020-21 year, mixed-effects regression models were estimated that controlled for gender, race/ethnicity, school

<sup>1</sup> Schools that participated in the 2020-21 CHKS administered the survey across different sets of years beforehand, with 1,318 schools with data from at least one year in the 2017-18 to 2019-20 period and 459 schools with data from every year between 2017-18 and 2020-21 (see Table A2). Results were consistent across all schools with different survey administration histories.

response rates, and the interaction of response rates and academic year.<sup>2</sup> Based on these models, adjusted cigarette, marijuana, and vaping rates were calculated and compared to the unadjusted rates. In no case were the unadjusted and adjusted results meaningfully different. The results presented in Exhibits 3, 4, 6, and 7 would have been unchanged if the the school survey response rate was the same in all schools in all survey years.

EXHIBIT 3.

### School-Level Changes in 30-day Cigarette Use, Marijuana Use, and Vaping Before and After the Onset of the Pandemic



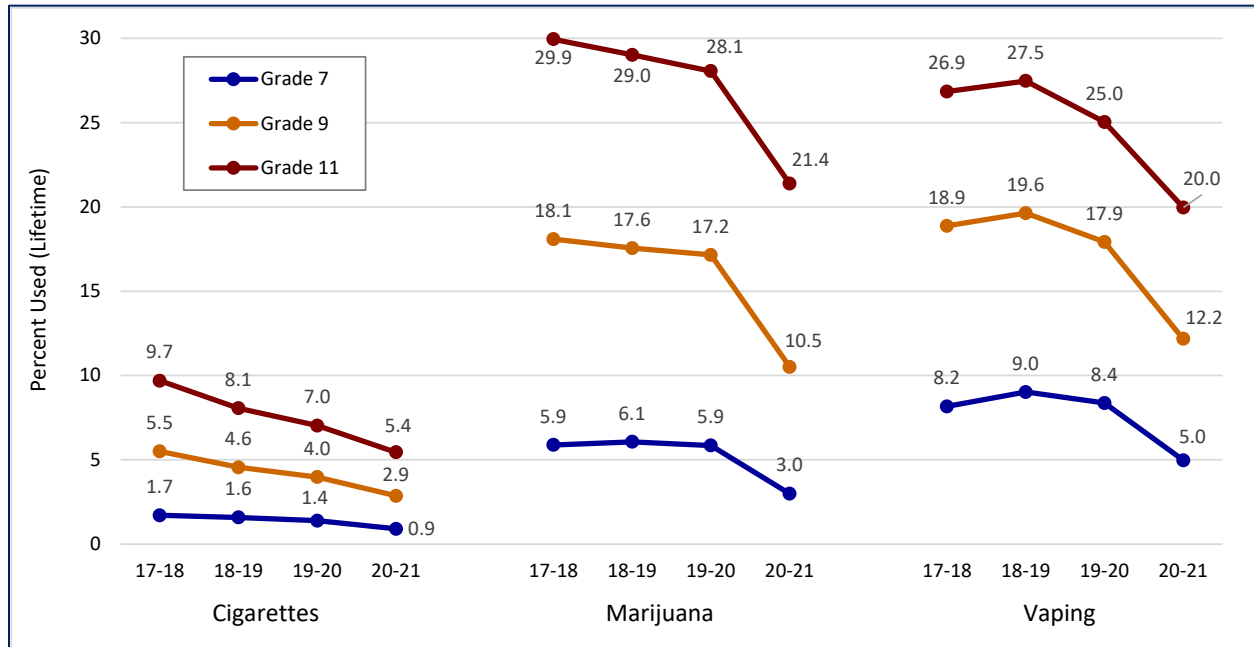
Source: Aggregated local California Healthy Kids Data, 2017-18, 2018-19, 2019-20, and 2020-21.

Schools that participated in the CHKS one or more times prior to 2020-21 exhibited more pronounced declines in student-reported marijuana use and vaping after the onset of the pandemic than was the case in prior years (Exhibits 3 and 4). Pandemic-related declines in cigarette use, however, were smaller than declines in marijuana use and vaping. For cigarettes, 30-day use rates continued their downward trend while lifetime use declined by between 0.3 and 0.5 percentage points more than in the 2019-20 period. Marijuana 30-day prevalence rates declined by 5 percentage points in 2020-21 among high school students (9<sup>th</sup> grade 30-day use, from 9.4% to 4.7%; 11<sup>th</sup> grade 30-day use, from 14.6% to 9.7%), compared to about a 1 percentage point decline in 2019-20 (9<sup>th</sup> grade 30-day use, from 10.1% to 9.4%; 11<sup>th</sup> grade 30-day use, from 15.8% to 14.6%). Similar patterns, though with smaller declines, were evident for 7<sup>th</sup> graders. The pandemic-related declines were even larger for lifetime marijuana use. Vaping rates also declined at a faster rate in 2020-21 than in prior years.

<sup>2</sup> Results indicated that response rates were more positively associated with cigarette use, marijuana use, and vaping in 2020-21 than in prior years, suggesting that students at high risk of substance use were less likely to participate in the CHKS during the pandemic year (with remote learning) than in prior years.

EXHIBIT 4.

### School-Level Changes in Lifetime Cigarette Use, Marijuana Use, and Vaping Before and After the Onset of the Pandemic



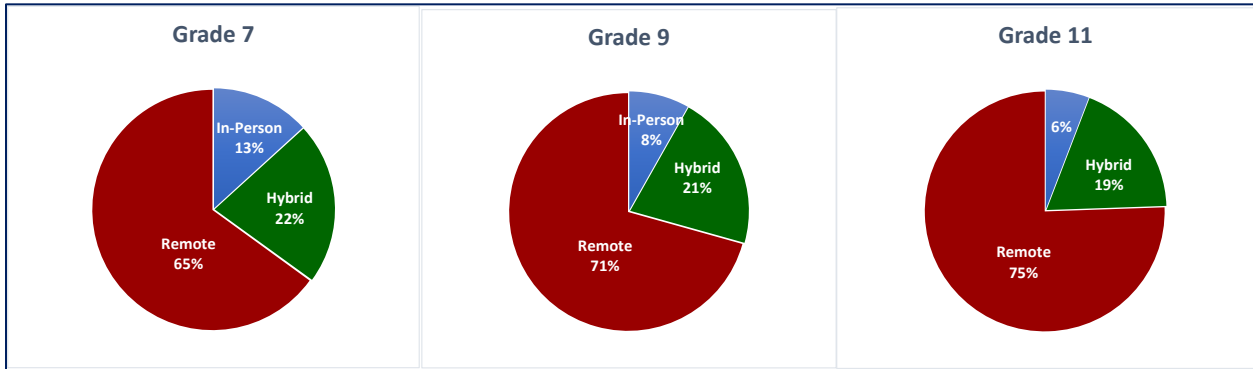
Source: Aggregated local California Healthy Kids Data, 2017-18, 2018-19, 2019-20, and 2020-21.

### School Instructional Models and Student Cigarette Use, Marijuana Use, and Vaping

School building closures associated with the pandemic dramatically altered the learning environments of students in California. In 2020-21, 65% of 7<sup>th</sup> graders, 71% of 9<sup>th</sup> graders, and 75% of 11<sup>th</sup> graders participated in school exclusively via remote instruction at the time of CHKS administration (Exhibit 5). As described above, participating in school exclusively from home likely increased social isolation among youth, disrupted relationships with teachers and peers, and reduced mental health and wellness. At the same time, participation in school exclusively via remote instruction likely reduced time spent with peers who engage in unhealthy behaviors, increased time spent with parents, and reduced access to cigarettes, marijuana, and vaping products (Richter, 2020). For these reasons, students who did not participate in school in-person may have had a reduced risk of initiating and continuing to use tobacco and marijuana.

EXHIBIT 5.

**Distribution of Students Receiving In-Person, Hybrid, and Remote Instruction, 2020-21**

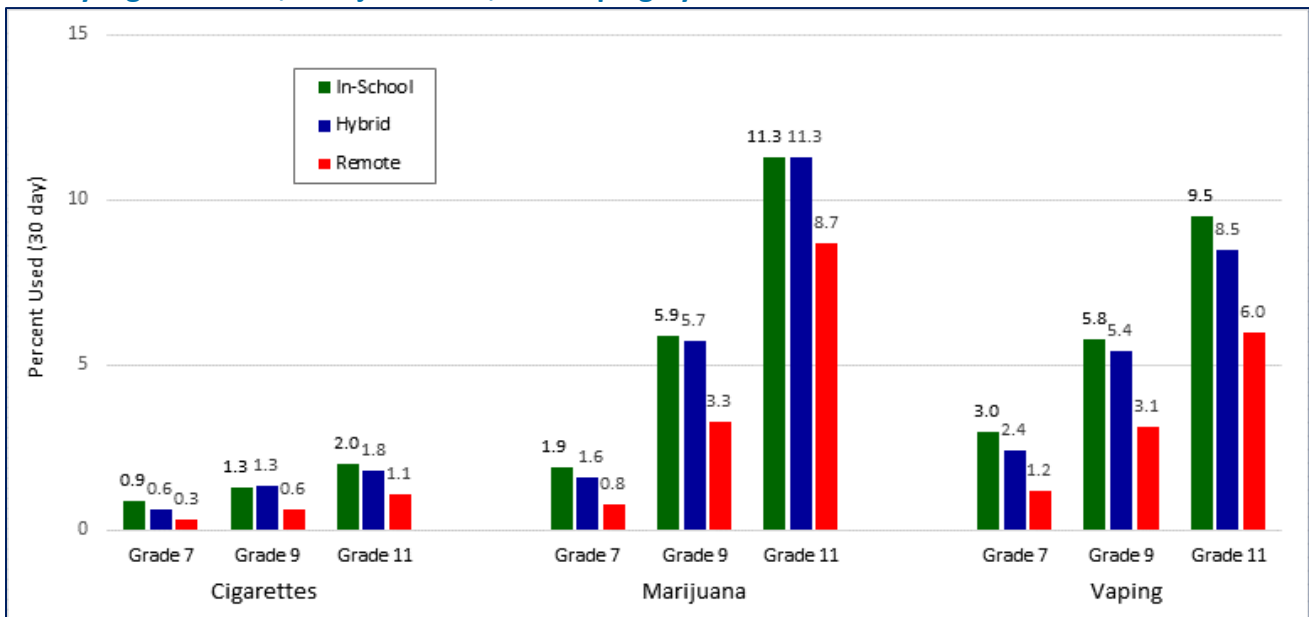


Source: Aggregated local California Healthy Kids Data, 2020-21.

The 2020-21 CHKS data indicate that students who participated in school remotely were less likely to use cigarettes, marijuana, and vaping products (Exhibit 6 and 7). Compared to their counterparts who participated in school in-person, remote learners exhibited substantially lower 30-day and lifetime tobacco, marijuana, and vaping prevalence rates. Only small differences in prevalence rates were evident between students who participated in school via hybrid and in-person instructional models. These results hold after controlling for student gender, race, ethnicity, urbanicity, and school survey response rates.

EXHIBIT 6.

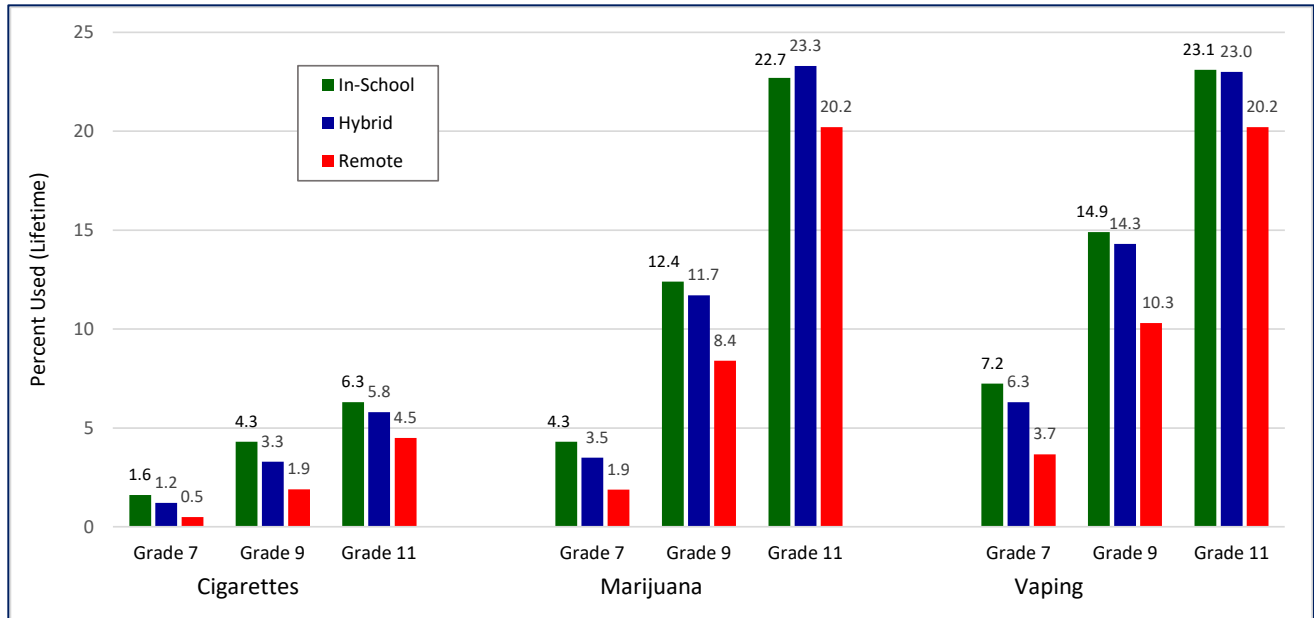
**30 Day Cigarette Use, Marijuana Use, and Vaping by School Instructional Model**



Source: Aggregated local California Healthy Kids Data, 2020-21.

EXHIBIT 7.

**Lifetime Cigarette Use, Marijuana Use, and Vaping by School Instructional Model**



Source: Aggregated local California Healthy Kids Data, 2020-21.

**Summary**

The COVID-19 school shutdown drastically reduced students’ access to basic supports provided by schools. Districts scrambled to provide meals to families and to distribute computers and hotspots to students to replace classroom instruction with remote learning from home. The pandemic and associated school building closures disrupted students’ interactions and relationships with their peers, teachers, and school staff; disrupted family life; exposed students to economic hardship and family illness; reduced student engagement in educational and extracurricular activities; and adversely affected students’ mental health and wellness.

Although the pandemic brought considerable hardship to youth and families, social distancing and COVID-related school shutdowns likely reduced risk factors for substance use. Specifically, school building closures likely increased the amount of time that youth spent with family and decreased the amount of time youth spent with substance-using peers. Social distancing, physical separation from peers, and more frequent proximity to parents likely further limited access to cigarettes, marijuana, and vaping products.

CHKS data suggest that the pandemic was associated with declines in student tobacco use, marijuana use, and vaping across all grade levels. The declines in marijuana use and vaping were substantial and unprecedented. Among high school students, 30-day marijuana prevalence rates dropped by five percentage points in 2020-21. Vaping dropped by four percentage points. Moreover, students who participated in school exclusively via remote instruction reported lower levels of substance use in comparison to their counterparts who were instructed in-person at school or via hybrid instruction. All of these results hold after accounting for differences in survey response rates, race, ethnicity, gender, and urban/rural status. The results suggest that peer and parental influences are important factors for prevention of youth substance use.

*Suggested citation:* Hanson, T., and Puckett, L. (2021). *Did COVID-related school building closures reduce student tobacco use, marijuana use, and vaping? CHKS Factsheet #21.* San Francisco, CA. WestEd

## References

Chaffee, B.W., Cheng, J., Couch, E. T., Hoeft, K.S., & Halpern-Felsher, B. (2021). Adolescents' substance use and physical activity before and during the COVID-19 pandemic. *The Journal of the American Medical Association*, 175(7), 715-722. <http://doi.org/10.1001/jamapediatrics.2021.0541>

EdSource (2021). *Quick guide: Where do things stand on in-person instruction in California?* <https://edsources.org/2021/quick-guide-how-does-gov-newsoms-safe-schools-for-all-plan-work/646111>

Gaiha, S. M., Lempert, L. K., & Halpern-Fisher, B. (2020). Underage youth and young adult e-Cigarette use and access before and during the Coronavirus disease 2019 pandemic. *The Journal of the American Medical Association*, 3(12), <http://doi.org/10.1001/jamanetworkopen.2020.27572>

Gentzke, A.S., Wang, T.W., Jamal, A., Park-Lee, E., Ren, C., Cullen, K., Neff, L. (2020). Tobacco product use among middle and high school students — United States, 2020. *MMWR Morbidity and Mortality Weekly Report*; 69:1881–1888. <http://dx.doi.org/10.15585/mmwr.mm6950a1>

Kreslake, J.M., Simard, B.J., O'Connor, K.M., Patel, M., Vallone, D.M., & Hair, E.C. (2021). E-cigarette use among youths and young adults during the COVID-19 pandemic: United States, 2020. *The American Journal of Public Health*, 111(6), 1132–1140. <https://doi.org/10.2105/ajph.2021.306210>

Miech, R., Patrick, M.E., Keyes, K., O'Malley, P.M., & Johnston, L. (2021). Adolescent drug use before and during the U.S. national COVID-19 social distancing policies. *Drug and Alcohol Dependence*, 226 <https://doi.org/10.1016/j.drugalcdep.2021.108822>

Richter, L. (2020). The effects of the COVID-19 pandemic on the risk of youth substance use. *Journal of Adolescent Health*, 67(4), 467-468. <https://doi.org/10.1016/j.jadohealth.2020.07.014>



## Appendix

TABLE A1.

### School Response Rates by Survey Year

Grade	2017-18	2018-19	2019-20	2020-21
7 <sup>th</sup>	84.4	83.7	83.5	72.3
9 <sup>th</sup>	77.7	78.9	75.4	62.7
11 <sup>th</sup>	72.5	71.9	70.4	56.4

Source: Aggregated local California Healthy Kids Data, 2017-18, 2018-19, 2019-20, and 2020-21.

TABLE A2.

### Years of Survey Administration among Schools in Longitudinal Sample

2017-18	2018-19	2019-20	2020-21	Number of Schools
X	X	X	X	459
0	X	X	X	558
X	0	X	X	558
X	X	0	X	609
0	0	X	X	696
0	X	0	X	894
X	0	0	X	844
All Combinations				1,318

Source: Aggregated local California Healthy Kids Data, 2017-18, 2018-19, 2019-20, and 2020-21.

Notes: X = CHKS Administered

0 = CHKS Not Administered