Maryland Cannabis Use Baseline Study

Statutory Authority and Requirements: Maryland's Health-General Article, Title 13, Subtitle 44: Cannabis Use Baseline Study, requires the Maryland Medical Cannabis Commission to conduct a comprehensive baseline study of cannabis use in the state that includes a survey of patterns of use, perceptions, public health and safety, and cannabis-related healthcare utilization, and report findings to the Maryland Governor and the General Assembly. The appendices to this report provide detailed data for the required indicators.

3-1-2023

Acknowledgements

The Maryland Medical Cannabis Commission ("MMCC" or the "Commission") would like to extend its appreciation to the following state agency partners for consulting with the Commission and providing data for this baseline study:

- The Maryland Department of Health's Behavioral Health Administration
- The Maryland Department of Health's Prevention and Health Promotion Administration
- The Governor's Office of Crime Prevention, Youth, and Victim Services
- The Maryland Poison Center
- The State's Designated Health Information Exchange
- The Maryland Hospital Association
- The Maryland Department of Transportation
- The Maryland Department of Human Services

This publication was prepared by MMCC in partnership with MD THINK's Center for Applied Analytics (CAA).

MMCC

Dawn Berkowitz, MPH, CHES, Deputy Executive Director
Christine Boyd, MPH, Director, Public Health Research and Education
Rebecca Jackson, Senior Research and Education Specialist

CAA

Marianne Gibson, MS
Sharmin Hossain, PhD, MPH
Kim Stinchcomb, MPH

Contact Us

Maryland Medical Cannabis Commission
849 International Drive, 4th Floor
Linthicum, MD 21090
publichealth.mmcc@maryland.gov
https://mmcc.maryland.gov/

Suggested Citation

Maryland Medical Cannabis Commission. Maryland Cannabis Use Baseline Study: March 1, 2023

MMCC
MARYLAND
MEDICAL
CANNABIS
COMMISSION

Executive Summary

During the 2022 General Assembly, multiple bills were passed regarding the regulation and research of cannabis use in the State. **HB837 – Cannabis Reform** laid the groundwork for a legal adult use cannabis program and required the Maryland Medical Cannabis Commission to take several actions, including to conduct a baseline study of cannabis use in the State. The companion bill, **HB1 Constitutional Amendment – Cannabis – Adult Use and Possession** required a constitutional amendment to be placed on the ballot during the November 2022 General Election for voters to determine legalization of broader, non-medical adult usage of cannabis in the State, effective July 1, 2023. This amendment was passed with approximately 67 percent of Marylanders voting in favor of legalization of adult use.

This report provides a "first look" at cannabis use in Maryland prior to legalization. As directed in statute, data was collected from multiple state agencies and includes large population-based surveys, surveys of special populations (e.g., medical cannabis patients), as well as program-level data (e.g., treatment services data), poison center and hospital-based data. Key indicators are "patterns of use", including frequency of use, method, and dosing; "perceptions" including the perceived risk with cannabis use; "public health and safety" including cannabis and driving, cannabis-related poisonings and adverse events, and cannabis use in pregnant and breastfeeding persons; hospitalizations and emergency department encounters, as well as problem cannabis use. Key findings and their implications for policy and programmatic efforts are summarized below.

Key Findings

More than 25 percent of Maryland high school students have used cannabis.

- During the 2021-2022 school year, 26 percent of high school students reported ever using cannabis. By 12th grade, nearly 40 percent of high school students tried cannabis at least once and 22 percent used an electronic vapor product to "smoke" cannabis.
- About four (4) percent of middle and 15 percent of high school students used cannabis in the prior month (i.e., current use).
- Current use was slightly higher in females than males and more than 50 percent higher in students who identify as lesbian, gay, bisexual, or transgender.
- About five (5) percent of high school students tried cannabis for the first time before age 13. Age of initiation is an important measure, since early use of cannabis is associated with adverse outcomes, including problem cannabis use and addiction[1],[2].

[1] KC Winters et al., *Likelihood of developing an alcohol and cannabis use disorder during youth: Association with recent use and age.* Drug Alcohol Depend. 2008;92(1-3):239-247. https://doi.org/10.1016/j.drugalcdep.2007.08.005.
[2] CY Chen et al., *Who becomes cannabis dependent soon after onset of use? Epidemiological evidence from the United States: 2000-2001*. Drug Alcohol Depend 2005; 79 (1):11-22. https://doi.org/10.1016/j.drugalcdep.2004.11.014.

- Nationally, about 50 percent of 10th graders and 70 percent of 12th graders said that obtaining cannabis was "very easy" or "fairly easy." Population-level data on youth access has not been collected in Maryland.

Nearly ten percent of Maryland adults currently use cannabis.

- In 2021, nine (9) percent of Maryland adults reported use of cannabis in the past month.
- Current cannabis use was highest in men, younger adults, those with less than a high school diploma, Black/African American residents, and residents of Baltimore City and Worcester counties.
- Thirty percent of adults (not necessarily medical card holders) who currently use cannabis said that they do so for medical reasons.
- The number of certified Maryland medical cannabis patients has increased each year, with over 162,000 in 2022. Half of medical cannabis patients report chronic pain as their qualifying condition (i.e., physician-designated reason for obtaining a medical cannabis card). A large proportion of patients report "Other" and specify anxiety and depression as their qualifying condition.
- About 12 percent of medical cannabis patients report using cannabis to reduce, replace, or stop use of opioids.[3]

Many Marylanders who currently use cannabis consume it regularly.

- In 2021-2022, about a third of high school students who used cannabis did so at a high frequency (i.e., 10 or more times in the past month).
- Of adults who used cannabis in the past month, nearly half did so daily or near daily.
- Most medical cannabis patients use cannabis on a daily or near daily basis.
- Over 30 percent of medical patients increased their cannabis use during the COVID-19 pandemic. This data is not available at the population-level for Maryland youth and adults.

"Poor" mental health may be associated with increased cannabis consumption.

- In 2021-22, Maryland middle and high school students who currently used cannabis were 50 percent more likely to describe their mental health as poor, compared to students who did not report current cannabis use.
- Current cannabis use was nearly five (5) times greater in Maryland adults with 21-30 days of poor mental health in the prior month, compared to adults with no reported days of poor mental health.
- Many patients reported obtaining medical cannabis certification for conditions related to mental health, including PTSD, anxiety, and depression.

[3] A similar percentage of patients report using cannabis to reduce, replace, or stop use of benzodiazepines.

Smoking is the most common method of cannabis consumption.

- Smoking is the most common method of consumption for Maryland youth, adults, and medical cannabis patients (including patients who are pregnant or breastfeeding).
- However, from 2018-2021, smoking decreased overall among Maryland adults who use cannabis (from 79 to 67 percent, respectively).[4]
- Edible consumption has increased since 2018, a trend seen in both non-medical and medical cannabis patients. (Note: edible cannabis products were not available through the medical cannabis program prior to April 2021).

Measurement of dose is "novel".

- Dose has not been well-studied, and data is not available in Maryland at the population-level.
- Among medical cannabis patients, dose was measured for the first time in the 2022 Maryland Medical Cannabis Patient Survey (MMCPS-22). Patients were asked to identify their primary method (e.g., smoking flower, vapes, edibles, concentrate) and the typical THC potency and quantity consumed per sitting (i.e., session). The estimated dose per sitting was lowest with edible products and highest with concentrates.
- Across all consumption methods, the estimated median dose was 22.5 mg/THC per sitting. Importantly, this is <u>not</u> a recommended dose, as definitive dose recommendations have not been established for medical or nonmedical purposes.

Cannabis use is generally not perceived as a "great risk".

- The perception of "great risk" from smoking cannabis once a month was lowest among young adults (18 to 25 years) and has also trended down since 2015 among both adolescents (ages 12 to 17) and adults (26 years and older).
- At all ages, Marylanders perceived a lower risk with monthly cannabis use compared to regular alcohol consumption and cigarette smoking.
- About half of young adults believed there was "no risk" or a "slight risk" of harm when drinking alcohol in combination with cannabis.

[4] Changes in usual method among youth and medical patients is not yet available. Usual method was asked for the first time in the most recent survey cycles for youth and medical patients.

Many Marylanders have driven after consuming cannabis.[5]

- The percent of cannabis-positive assessments among Maryland drivers by drug recognition experts (DREs) has remained steady at about 20 percent from 2017 to 2021. This rate is consistent with findings from recent surveys that examined cannabis use and driving behaviors.
- About 20 percent of young adults (18 to 25 years) reported driving within three (3) hours of consuming cannabis in the past month. A similar percentage of medical cannabis patients reported driving within three (3) hours of consuming cannabis or while under the influence of cannabis in the past month.
- Data on cannabis use and driving behaviors is not available at the population-level (i.e., among Maryland adults of all ages).

Cannabis-related calls to poison control have increased, particularly for youth exposures.

- Total cannabis-related calls for youth ages five (5) and under increased eight-fold from 2018 to 2021 (10 to 86 calls, respectively). In 2021, more than half of calls for youth under age five (5) were for edible cannabis products.
- Beginning in 2020, there were more cannabis-related calls attributed to edible consumption versus all other methods. In addition, more edible cannabis calls were due to unintentional versus intentional consumption.
- Medical cannabis patients with children in the home always securely store or lock their cannabis about 78 percent of the time. Patients without children in the home safely store cannabis about half of the time.

Few people are hospitalized due to cannabis use.

- In each year, 2018 to 2021, fewer than 250 residents were hospitalized due to cannabis (i.e., cannabis was the primary diagnosis for that hospital encounter).
- Just one (1) percent of medical cannabis patients reported any emergency department (ED) or urgent care visit related to cannabis use in 2021.

Data on problem cannabis use in Maryland is limited.

- Population-level data on problem cannabis use in Maryland is not available.
- Eight (8) percent of medical cannabis patients reported feeling that they were not in control of their cannabis consumption and 12 percent devoted a great deal of time to getting, using, or recovering from cannabis. However, the MMCPS-22 measured only a subset of indicators of

[5] Standard CDC and other surveys commonly use "three hours" as a proxy measure for cannabis-impaired driving. Duration of cannabis intoxication/impairment can vary widely and is dependent of several factors, such as method of consumption, individual metabolism, other food, and drink consumed, etc. Recent guidelines recommend waiting at least six hours after consuming cannabis to drive.

problematic use, therefore specific conclusions about the scope of problematic use among medical patients cannot be made.

- Substance use disorder (SUD) treatment admissions due to cannabis use disorder (CUD) have decreased since 2018. It is unknown what impact COVID-19 may have had on SUD treatment admissions and health services utilization for problem cannabis use.

The impact of the COVID-19 pandemic on data trends is not clear.

- The extent to which COVID-19 impacted the data sources in this report is unclear. Additional trend data will help clarify potential impacts.

Moving Forward

Study findings suggest that the following actions may be warranted to enhance public health and safety.

- Improve statewide and jurisdiction-level surveillance by adding cannabis-related questions to existing surveys (e.g., Maryland YRBS/YTS, BRFSS, PRAMS) and identifying other data monitoring tools. Specific areas with surveillance gaps include youth access to cannabis, including usual source, risk perceptions, knowledge and attitudes, driving behaviors, and problem cannabis use.

- Establish key measures to evaluate the success of public health protections in reducing use among youth, pregnant, and breastfeeding persons, as well as in reducing potential harms associated with adult consumption.

- Fund mass reach media campaigns to (1) delay the age of initiation and frequency of use among Maryland youth and young adults (2) correct harmful perceptions, including the perceived harms of using cannabis and alcohol together (3) reduce public safety risks, including risks associated with cannabis-impaired driving, accidental poisonings, and indoor smoking/vaping, particularly around children (4) reduce use and/or frequency of use among high-risk populations, including youth and adults reporting poor mental health, LGBTQ youth and adults, and pregnant and breastfeeding persons.

- Support training programs for retailers/dispensaries to comply with sales laws to reduce youth access. Implement a "secret shopper" program to monitor retailer compliance with sales age laws.

- Continue to study the association between cannabis use and mental health and develop appropriate education and/or treatment resources.

- Increase the availability of resources for problem cannabis use and support for Marylanders who would like help quitting cannabis use, including pregnant or breastfeeding persons and those who are experiencing problem cannabis use or addiction.

- Strengthen public health and public safety collaborations to align education efforts, including training programs (i.e., driver's education, responsible retailer training, drug recognition expert training).

- Provide funding to local jurisdictions and/or community-based organizations to strengthen the capacity of local public health education and outreach efforts.

- Continue to study "dose" to provide Marylanders who choose to use cannabis with a mechanism by which to better monitor their use.

- Support health care provider training on topics including cannabis "dose," potential contraindications, signs of problem cannabis use, and key messages on safe storage and responsible use.

- Provide consumer education at the cannabis point-of-sale, covering topics such as delayed onset, safe storage, and driving under the influence.

Table of Contents

List of Figures

List of Tables

About This Report

Introduction

Section 1 Subtitle 44 of Chapter 26 of the Acts of 2022 requires the Commission to consult with specified agencies to conduct a comprehensive baseline study of cannabis use in the State that includes the following: a survey of patterns of use, including frequency of use and dosing, methods of consumption, and general perceptions of cannabis among individuals in specified age groups, pregnant and breastfeeding persons; incidents of impaired driving including arrests, accidents, and fatalities related to cannabis use; hospitalizations related to cannabis use; calls to the Maryland Poison Center related to cannabis use, including calls related to individuals younger than age 21; and diagnoses of cannabis use disorder and problem cannabis use.

To develop this baseline study, the Commission: (1) consulted with the agencies named in the statute, as well as several additional state agency partners, including: The Maryland Department of Health's Behavioral Health Administration, The Governor's Office of Crime Prevention, Youth and Victim Services, The Maryland Poison Center, The State's Designated Health Information Exchange, The Maryland Hospital Association, The Maryland Department of Transportation, The Maryland Department of Health's Prevention and Health Promotion Administration, and The Department of Human Services; (2) conducted a survey of more than 13,000 Maryland medical cannabis patients to inform patterns of use, as well as attitudes and perceptions among medical cannabis patients; (3) collected aggregate-level data on measures of interest for the specified age groups and populations, beginning in 2018, the first year of medical cannabis sales in Maryland through 2021; and (4) synthesized the data sources to provide a comprehensive assessment of cannabis use in the State. The Commission worked with MD Think's Center for Applied Analytics to analyze the data, develop visualizations, and create this report.

This comprehensive cannabis use baseline report summarizes patterns of use in Chapter I, attitudes and perceptions in Chapter II, public health and safety considerations including driving, poisonings, and adverse events in Chapter III, and hospitalizations and healthcare utilization in Chapter IV.

Data Sources

The following data sources were used in the baseline study. Brief descriptions of each dataset follow. Note: Tests of statistical significance were not performed for data analyzed in this report. Results are reported as descriptive statistics without confidence intervals.

National Survey of Drug Use and Health (NSDUH)

The National Survey on Drug Use and Health (NSDUH) is an annual nationwide survey of approximately 70,000 people aged 12 and older that assesses use of tobacco, alcohol, cannabis, and other substances. The Substance Abuse and Mental Health Services Administration (SAMHSA), an agency in the U.S. Department of and Human Services sponsors the NSDUH. State-level data tables data are published online approximately two years following each annual data collection cycle; these data tables were used for this report.

Behavioral Health Risk Factor Surveillance System (BRFSS)

The Behavioral Risk Factor Surveillance System (BRFSS) is an ongoing telephone survey of adults aged 18 and older sponsored by the U.S. Centers for Disease Control and Prevention (CDC). This population-based survey collects data from U.S. residents regarding key health-related behaviors, chronic health

conditions, and safety practices. The Maryland Department of Health manages and administers the BRFSS in Maryland. Since 2018, the Maryland BRFSS has asked questions on current cannabis use, methods of consumption, and reasons for use (e.g., medical, non-medical). MMCC has requested the addition of questions to future survey cycles to assess cannabis and driving behaviors, perceived risks, and problem cannabis use.

Youth Risk Behavior Survey/Youth Tobacco Survey (YRBS/YTS)

The Maryland YRBS/YTS is an on-site survey of students in Maryland public middle and high schools, focusing on behaviors that contribute to the leading causes of death and disability, including but not limited to, alcohol and other drug use, tobacco use, sexual behaviors, unintentional injuries and violence, and poor physical activity and dietary behaviors. Cannabis-related questions include current use, frequency of use, and methods of administration. The Maryland YRBS/YTS is a combination of CDC's Youth Risk Behavior Survey (YRBS) and Youth Tobacco Survey (YTS) and is administered every two years by the Maryland Department of Health in partnership with the Maryland State Department of Education.

Monitoring the Future (MTF)

Monitoring the Future (MTF) is an annual nationwide survey of approximately 50,000 8^{th}, 10^{th}, and 12^{th} grade students that measures drug and alcohol use and related attitudes among adolescent students. The MTF survey is funded by research grants from the National Institute on Drug Abuse and is conducted at the Survey Research Center in the Institute for Social Research at the University of Michigan.

Pregnancy Risk Assessment Monitoring System (PRAMS)

The Pregnancy Risk Assessment Monitoring System (PRAMS) is a survey delivered by mail and phone to persons who recently gave birth. PRAMS is sponsored by the CDC and is administered in the State by the Maryland Department of Health. PRAMS collects population-based data on experiences and behaviors among persons before, during, and after pregnancy. In 2019, the Maryland PRAMS began collecting information on any cannabis use during pregnancy. MMCC has requested an expansion of its cannabis-related data collection, including additional questions on frequency of use and methods of consumption in future survey cycles.

Maryland Medical Cannabis Patient Survey 2022 (MMCPS-22)

MMCC conducted an online patient survey to measure patterns of use and perceptions of cannabis among medical patients prior to legalization of adult use cannabis. The survey, which was administered in September 2022 by Cannabis Public Policy Consulting, was anonymous and collected data on demographics, product use, methods of use, perceptions of medical use, driving behaviors, problem cannabis use, priorities related to adult use in the State, cannabis education gaps and needs. More than 13,000 completed surveys were collected, far exceeding the recruitment goal of 7,500 participants. A follow up survey cycle (post-referendum and legalization) is planned for Fall 2023.

Maryland Young Adult Survey on Alcohol (MYSA)

The Maryland Young Adult Survey on Alcohol (MYSA) is an online, biennial survey that collects information about alcohol and other substance use in young adults across the State. MYSA is supported by the Maryland Department of Health and conducted by the University of Maryland School of Pharmacy, Behavioral Health Research and Technical Assistance Center (BHRT). Maryland residents

ages 18 to 25 are eligible to participate via a publicly accessible survey link (on the school's website).[6] Due to this "open" recruitment process, it is possible that some ineligible respondents (i.e., those under age 18 or over age 25), intentionally or unintentionally, may complete the survey. Launched in 2016, the MYSA added a cannabis section for the first time in 2020, collecting responses from more than 6,500 young adults. Data from the 2022 MYSA was not available at the time this report was prepared.

Maryland Poison Center (MPC)

The Maryland Poison Center (MPC) serves as the State's poison center and is used by the general public and medical professionals seeking advice on exposures or to report adverse events. MPC produces a cannabis exposure report that documents the number of cannabis exposures by product type (e.g., dried flower, edible, pill/capsule) outcome (major effect, moderate effect, minor, or no effect), victim age, reason (e.g., intentional abuse, unintentional), caller site, management site, and jurisdiction.

Fatality Analysis Reporting System (FARS)

The Maryland Department of Transportation (MDOT) recommended use of the Fatality Analysis Reporting System (FARS) to study substance-involved traffic fatalities. The FARS is a nationwide census that provides yearly data regarding fatal injuries suffered in motor vehicle traffic crashes. There is an online FARS dashboard to query factors, including roadway type, time of day, and weather conditions at the time of fatal crashes. The FARS analyst located in the Maryland State Police provided a dataset of drug and alcohol impaired fatalities for this study. Note: MMCC requested data on impaired driving due to traffic accidents, in addition to fatalities; however, FARS was unable to provide traffic accident data.

District Court of Maryland Arrest Report: Traffic Arrests for Drug/Controlled Substances

MMCC obtained traffic-related arrest data from the District Court of Maryland via public information request. The District Court of Maryland's traffic-related arrest data does not differentiate cannabis from other drugs or controlled substances, due to limitations in verifying whether impairment was due to cannabis. MMCC also obtained the "Discretionary-Based Traffic Stop" dataset from GOCPYVS. However, because this dataset is based on "discretionary" traffic stops versus all traffic stops and does not differentiate cannabis from other drugs or controlled substances, this dataset was not included.

Drug Recognition Expert (DRE) Evaluations

MMCC obtained data on DRE evaluations from the 2021 Annual Report of the International Association of Chiefs of Police (IACP) Drug Evaluation & Classification Program. When a driver being investigated for impaired driving shows a breathalyzer result with blood alcohol concentration (BAC) that is less than .08 (the legal limit for alcohol-impaired driving), and the officer believes that the driver is impaired to a degree that is inconsistent with their measured BAC, a trained drug recognition expert (DRE) will conduct a formal evaluation of impairment. Evaluations are based on both questioning and physical tests (such as pupil dilation in the presence of changing light), and the DRE delivers a formal opinion on whether the driver is impaired, and by what type of drug category. Note: If a person is investigated for impaired driving and breathalyzer test results indicate an alcohol DUI (e.g., blood alcohol concentration [BAC] is 0.08 or greater), then further investigation of drug impairment is rarely conducted. This procedure means that a person driving while impaired by both alcohol and cannabis is likely to be categorized as only an alcohol-impaired DUI case, resulting in an under-count of actual cannabis-impaired or other drug-impaired driving.

[6] MYSA survey information is available at Maryland Young Adult Survey on Alcohol (MYSA) (umaryland.edu).

Health Services Cost Review Commission (HSCRC) Case Mix Data

The Maryland Healthcare Association (MHA) recommended using HSCRC data for measuring cannabis-related hospitalizations. The Maryland Health Services Cost Review Commission (HSCRC) collects various data sets from acute care hospitals and licensed specialty hospitals in the State. This data includes financial and confidential patient-level administrative data (referred to as 'case mix data') on all inpatient and outpatient hospital visits. Upon request, HSCRC provides aggregate, statistical datasets for public use. For this study, HSCRC provided a statistical dataset with the number of cannabis-related inpatient and outpatient hospital visits, using International Classification of Diseases codes (ICD-10 codes). ICD-10 codes are assigned based on the documentation by the patient's provider.[7] For each hospitalization and ED visit, there is a "primary diagnosis" (i.e., the chief complaint) as well as "other" diagnoses that provide additional details about the hospital encounter.

Public Behavioral Health Services (PBHS) Reporting System

The Maryland Department of Health's Behavioral Health Administration (BHA) provided Public Behavioral Health Services (PBHS) data on cannabis-related substance use treatment admissions to help measure cannabis use disorder. For consistency, the same ICD-10 codes for cannabis-related admissions were used for the BHA and HSCRC datasets. Maryland's PBHS dataset includes authorizations and claims for behavioral health services for individuals who are Medicaid participants, uninsured, and/or supported with state services. Maryland's PBHS data is collected and managed by an Administrative Services Organization (ASO).

State Designated Health Information Exchange

MMCC consulted with Maryland's designated Health Information Exchange, Chesapeake Regional Information Systems for our Patients (CRISP) for this study. CRISP Reporting Services maintains data including Hospital Admit, Transfer, Discharge, clinical notes, clinical care documentation, and primary care. This data may inform the prevalence of cannabis use disorder (CUD) in the state. However, the data have not been previously analyzed, and additional resources would be required to support this work. Additionally, HIPAA requires CRISP to have a valid reason or exception to provide data to non-clinical entities, including public health authorities, such as MMCC. MMCC utilized other data sources to assess problem cannabis use, including the MMCPS-22 and PBHS.

[7] Centers for Medicare and Medicaid Services (CMS). ICD-10-CM Official Guidelines for Coding and Reporting. Retrieved February 16, 2023 from https://www.cms.gov/files/document/fy-2022-icd-10-cm-coding-guidelines-updated-02012022.pdf.

Data Matrix

Section 1 Subtitle 44 of Chapter 26 of the Acts of 2022 requires the Commission to repeat the cannabis use survey biennially, using the same methodology as the baseline study. To support future studies, a matrix of the baseline data sources and measures is provided below.

Data Set	Years	Formal Data Request	Patterns of Use	Attitudes and Perceptions	Public Health and Safety	Health Care Services	Measures
BRFSS	2018, 2019, 2020, 2021	X (DUA)	X				Frequency of current (past 30-day) cannabis use; methods of consumption; current use of other various substances; mental health and general health status.
FARS	2018, 2019, 2020, 2021	X			X		Number of alcohol and drug-impaired fatal traffic crashes; proportion of fatal crashes that involve drugs and alcohol; drug test results from drug-impaired fatal traffic crashes.
HSCRC Case Mix	2018, 2019, 2020, 2021	X (DUA)				X	Number of cannabis-related hospitalizations and ED visits by demographic; number of other various substance-related hospitalizations and ED visits.
MD Court Traffic Arrests	2018, 2019, 2020, 2021	X			X		Number of drug or controlled substance-related traffic arrests.
DREs	2017, 2018 2019, 2020, 2021				X		Number and percent of cannabis-impaired drug assessments among drivers evaluated by DREs.
MMCPS	2022		X	X	X	X	Qualifying conditions; frequency of cannabis use; changes in use during COVID; method and dose of consumption; education priorities; frequency of driving after cannabis use; safe storage and cannabis use in the home; adverse reactions to cannabis consumption; cannabis use and method of

Data Set	Years	Formal Data Request	Patterns of Use	Attitudes and Perceptions	Public Health and Safety	Health Care Services	Measures
							consumption during pregnancy and breastfeeding; ED/urgent care visits.
MPC	2018, 2019, 2020, 2021	X			X		Number of cannabis-related calls by age, product, and whether exposure was intentional or unintentional.
MTF	2021			X			Percent of students that report substances are fairly easy or very easy to obtain.
MYSA	2020	X	X	X			Reason for consumption and source of cannabis; perception of risk of drinking alcohol in combination with cannabis; driving behaviors after cannabis use.
NSDUH	2012-2020		X	X			MD and U.S. trends in perception of risk from smoking cannabis versus other substances.
PBHS	2018, 2019, 2020, 2021*****	X				X	Number of cannabis-related SUD treatment admissions.
PRAMS	2019-2020	X			X		Percent of pregnant persons who used cannabis during their pregnancy.
YRBS/YTS	2005-2021	X (DUA)	X				Youth current (past 30-day) and ever use of cannabis and other various substances; consumption before age 13; frequency of youth cannabis use, percent of students who felt sad or hopeless in the past 12 months; method of cannabis use.

***Fiscal year**

Acronyms

Abbreviation	Definition
BHA/PBHS	Behavioral Health Administration/Public Behavioral Health System
BRFSS	Behavioral Risk Factor Surveillance System
CDC	Centers for Disease Control and Prevention
CRISP	Chesapeake Regional Information Systems for our Patients
CUDIT	Cannabis Use Disorder Identification Test
DHS	Department of Human Services
DRE	Drug Recognition Expert
DSM	Diagnostic and Statistical Manual
DUA	Data Use Agreement
ED	Emergency Department
FARS	Fatality Analysis Reporting System
HIPAA	Health Insurance Portability and Accountability Act
HSCRC	Health Services Cost Review Commission
ICD	International Classification of Diseases
MHA	Maryland Healthcare Association
MMCC	Maryland Medical Cannabis Commission
MMCPS	Maryland Medical Cannabis Patient Survey
MPC	Maryland Poison Control
MYSA	Maryland Young Adult Survey on Alcohol
NSDUH	National Survey on Drug Use and Health
PRAMS	Pregnancy Risk Assessment Monitoring System
SAMHSA	Substance Abuse and Mental Health Services Administration
THC	Tetrahydrocannabinol
YRBS/YTS	Youth Risk Behavior Survey/Youth Tobacco Survey

Chapter I: Patterns of Use

Introduction

This chapter addresses patterns of use, including frequency of use and methods of consumption among youth (under 18 years), young adults (18 to 20 years), adults (21 to 55 years), and adults (over 55 years). Dose is measured for medical cannabis patients. Patterns of use among pregnant and breastfeeding persons are found in Chapter III, Public Health and Safety.

Youth Use

Youth are at special risk for harms from cannabis use. Brain development is not complete until young adulthood (the mid-20s). As a result, memory, learning, and attention may be impacted, especially with regular or heavy use, and effects may be long-lasting.[8],[9],[10]. Youth use has also been linked with an increased risk for developing adverse mental health symptoms, which can include depression and social anxiety.[11]

Frequency of Use

Youth measures include "current use," "ever use," and "age of initiation" of cannabis use. Current cannabis use refers to any cannabis use in the past 30 days and is a cross-sectional representation of cannabis use at a given point in time. Ever use means that cannabis has been used at least one time and suggests (1) youth have access to cannabis and (2) have a willingness to try cannabis. Jurisdiction-level data on current use and ever use is available in Appendix A. Age of initiation of cannabis is an important measure, since early use of cannabis is associated with adverse outcomes, including the development of problem cannabis use and addiction, as well as misuse of other substances such as tobacco and alcohol.[12]

---

[8] National Academies of Sciences, Engineering, and Medicine, et al. *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research*. National Academies Press (US), 12 January 2017. https://doi.org/10.17226/24625.

[9] A Batalla et al. *Structural and functional imaging studies in chronic cannabis users: a systematic review of adolescent and adult findings.* PLoS One. 2013;8(2): e55821. https://doi.org/10.1371/journal.pone.0055821.

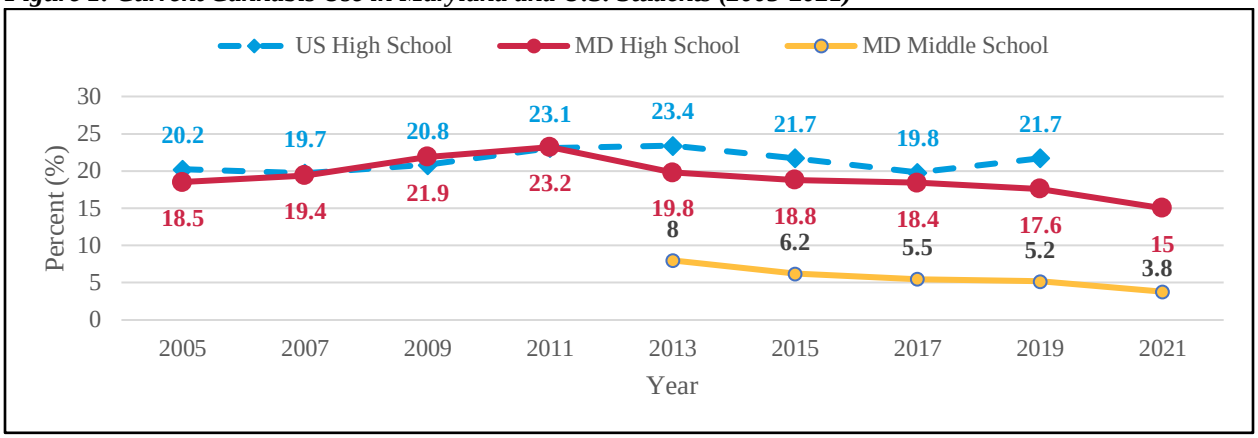
[10] R.M. Schuster et al, Early onset marijuana use is associated with learning inefficiencies. Neuropsychology, (2016) 30(4): 405–415. https://doi.org/10.1037/neu0000281.

[11] National Academies of Sciences, Engineering, and Medicine, et al. *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research*. National Academies Press (US), 12 January 2017. https://doi.org/10.17226/24625.

[12] LD Hawke et al., *Early cannabis initiation: Substance use and mental health profiles of service-seeking youth* Journal of Adolescence (2020) 83:112-121, ISSN 0140-1971, https://doi.org/10.1016/j.adolescence.2020.06.004.

Data in this section comes from the national and Maryland Youth Risk Behavior Survey/Youth Tobacco Surveys (YRBS/YTS). The national YRBS is only administered for high school students and does not include the tobacco survey (i.e., YTS). Maryland administers a jurisdiction-level high school and middle school YRBS/YTS, although the middle school survey is shorter and includes fewer cannabis-related questions. For example, the middle school survey does not include "usual method" of cannabis consumption, which was added to the 2021-2022 Maryland High School YRBS/YTS.
Note: Some students who participated in the Maryland High School YRBS/YTS may be over 18 years of age.

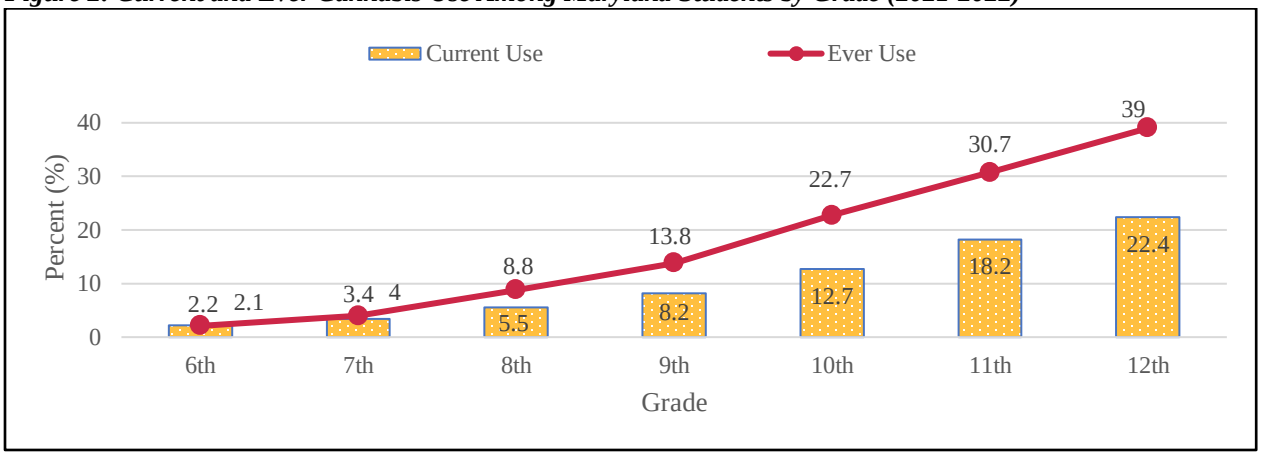
Figure 1: Current Cannabis Use in Maryland and U.S. Students (2005-2021)



Source: National HS and Maryland HS, MS YRBS/YTS 2005-2021
National 2021-2022 YRBS/YTS HS data was not available at the time of report preparation.
"Current use" refers to use in the past 30 days.

- In 2021, 15 percent of high school and nearly four (4) percent of middle school students in Maryland reported current cannabis use.
- Current use among Maryland high school and middle school students has trended down since 2013.
- Current use in Maryland high school students has been lower than national levels since 2013.

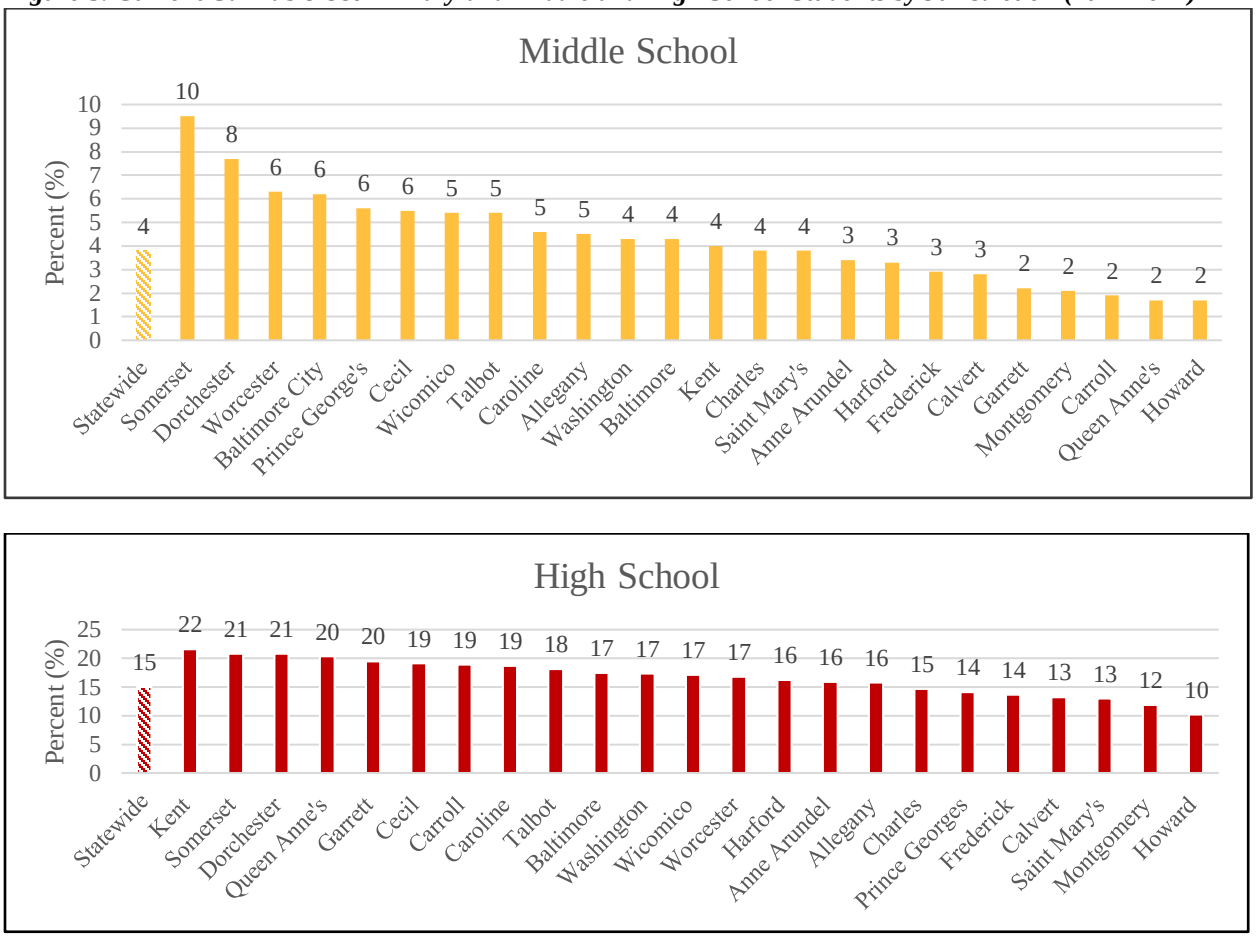
Figure 2: Current and Ever Cannabis Use Among Maryland Students by Grade (2021-2022)



Source: Maryland YRBS/YTS 2021-2022
Ever-use is defined as at least once in their lifetime.

- Ever use and current use of cannabis increased with each grade level.
- Ever use was higher than current use at each grade level. By 12th grade, ever use was nearly double that of current use.
- About 14 percent of 9th graders and 40 percent of 12th graders tried cannabis at least one time.
- The percent of students who have used cannabis at least once nearly triples from 9th grade to 12th grade. Current use also nearly tripled from 9th to 12th grade.

Figure 3: Current Cannabis Use in Maryland Middle and High School Students by Jurisdiction (2021-2022)



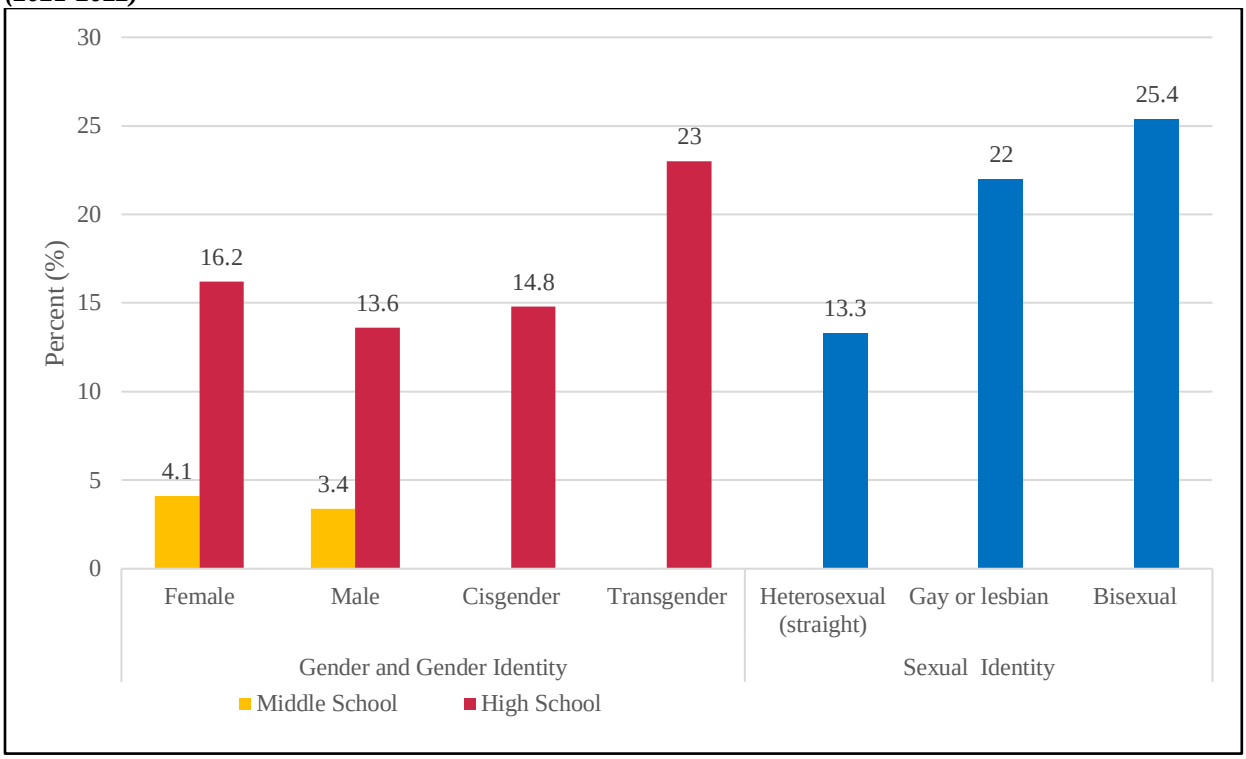
Source: Maryland YRBS/YTS 2021-2022

Notes: Data are rounded for visual clarity. Complete data are available in Appendix A.

Baltimore City is not reported as 2021-2022 YRBS/YTS high school participation did not reach the CDC-required threshold to ensure data are representative of the jurisdiction.

- In 2021-2022, Somerset and Dorchester Counties had the highest percent of middle school students reporting current cannabis use. Kent County had the highest percent of current use in high school students, followed by Somerset and Dorchester.
- Howard County had the lowest percent of both middle and high school students reporting current cannabis use (2 and 10 percent, respectively).
- Five (5) jurisdictions had current high school cannabis use rates above 20 percent.

Figure 4: Current Cannabis Use in Maryland Middle and High School Students by Gender and Sexual Identity (2021-2022)



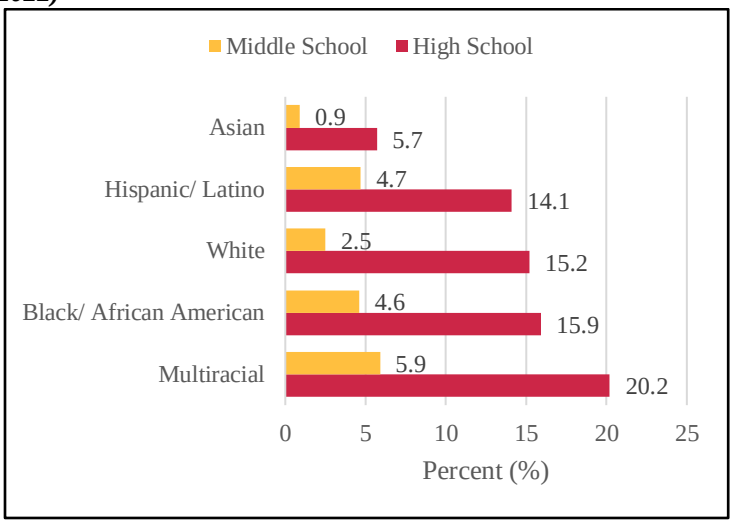
Source: Maryland YRBS/YTS 2021-2022
Note: Gender and sexual identity is not collected for middle school students.

- In middle and high school, slightly more females than males reported current cannabis use. (This changes in adults, with slightly more males than females reporting current use.)
- Current use was nearly 50 percent higher among students who identify as transgender, lesbian, gay, or bisexual compared to students who identify as cisgender or heterosexual.[13]
- Higher substance use has been reported in adolescents who identify as LGBTQ; these findings in Maryland students warrant close monitoring.[14]

[13] Cisgender is a person whose gender identity corresponds with the sex registered for them at birth.

[14] T.L. Caputi et al, *Substance Use Among Lesbian, Gay, Bisexual, and Questioning Adolescents in the United States*, American Journal of Public Health (2015) 108, no. 8 :1031-1034. https://doi.org/10.2105/AJPH.2018.304446.

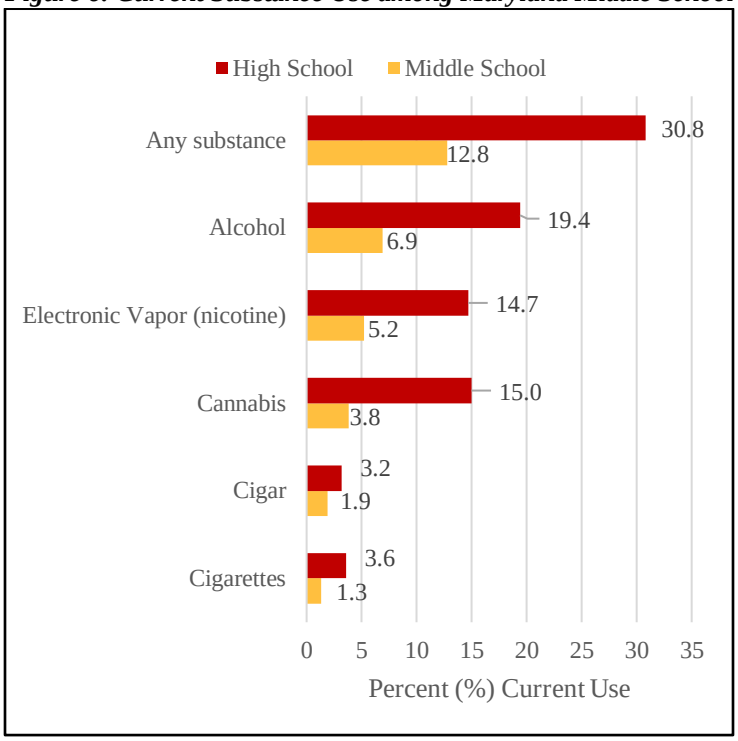
Figure 5: Current Cannabis Use in Maryland Middle and High School Students by Race and Ethnicity (2021-2022)



- Current use was highest among middle and high school students who are Multiracial.
- Current use was lowest in middle and high school students who are Asian.
- Current use was similar among high school students who are Black/African American, White, and Hispanic/Latino.

*Source: Maryland YRBS/YTS 2021-2022 *Additional detail on race/ethnicity is available in Appendix A.*

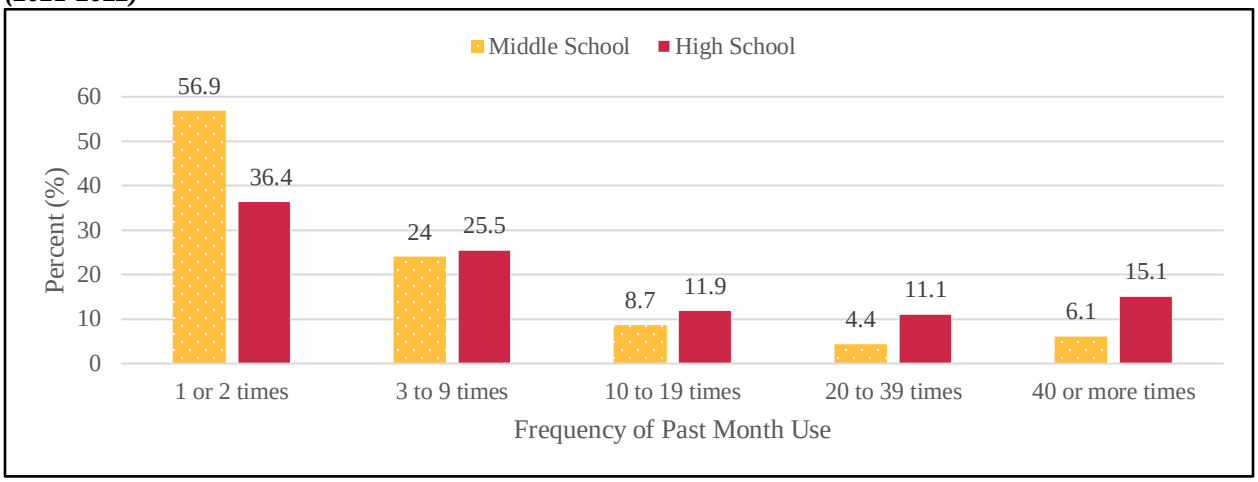
Figure 6: Current Substance Use among Maryland Middle School and High School Students (2021-2022)



- Use of any substance was about three (3) times greater in high school students compared to middle school students.
- The most frequent substance used among middle and high school students was alcohol.
- Current use of electronic vapor (nicotine) and cannabis was similar in high school students (15 percent).
- Current tobacco use (cigarettes, cigars) was lower than other substances in middle and high school students.

Source: Maryland YRBS/YTS 2021-2022
Any substance refers to if student has used any substances listed.
Electronic vapor includes e-cigarettes, vapes, mods, e-cigs, e-hookahs, or vape pens.

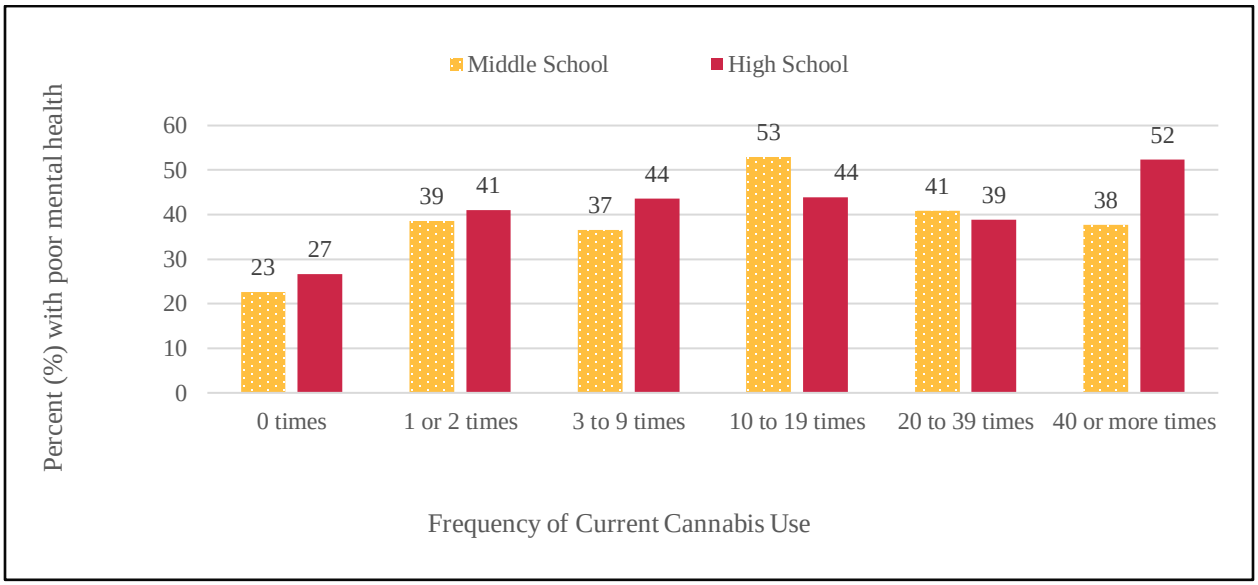
Figure 7: Frequency of Current Cannabis Use among Maryland Middle School and High School Students (2021-2022)



Source: Maryland 2021-2022 YRBS/YTS

- Among middle school students who used cannabis in the past month, most used cannabis just 1-2 times per month.
- Among high school students who used cannabis in the past month, most used cannabis less than 10 times per month.
- About a third of high school students who used cannabis did so at a high frequency (i.e., more than 10 times a month).

Figure 8: Frequency of Current Cannabis Use among Maryland Middle and High School Students With Poor Mental Health

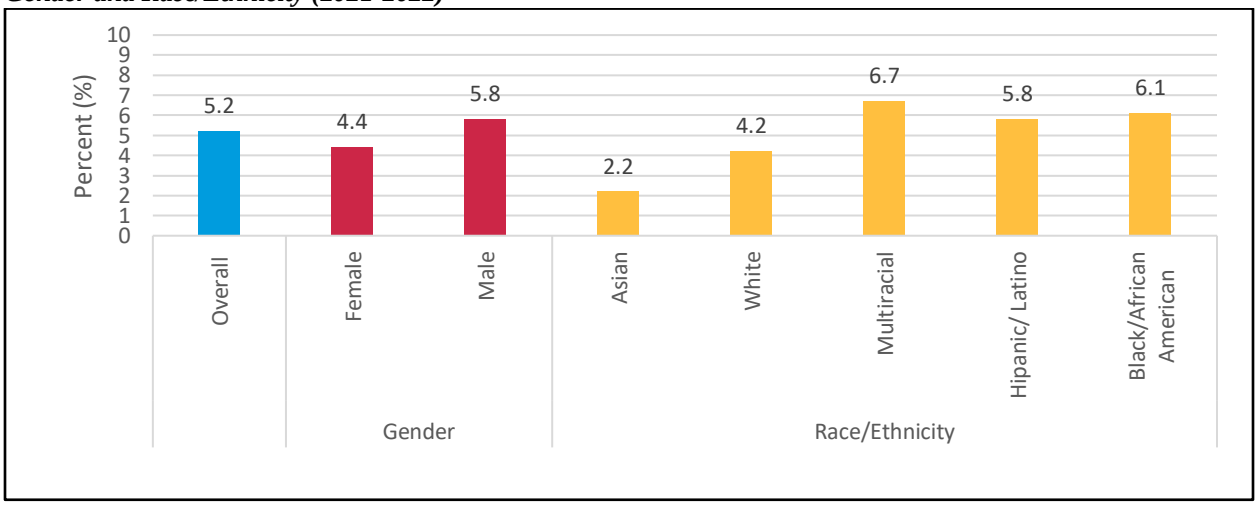


Source: Maryland YRBS/YTS 2021-2022
Poor mental health was defined as a response of "most of the time" or "always" in the past 30 days.

<u>Question</u>: During the past 30 days, how often was your mental health not good? (Poor mental health includes stress, anxiety, and depression.) Response options: Never, Rarely, Sometime, Most of the time, or Always.

- Students who used any cannabis were nearly 50 percent more likely to report poor mental health compared to students who did not consume any cannabis. This finding was observed for middle and high school students and at each frequency level (i.e., 1 or 2 times, 3 to 9 times, etc.).
- There may be an association between cannabis use and mental health among adolescents and continued monitoring is warranted.

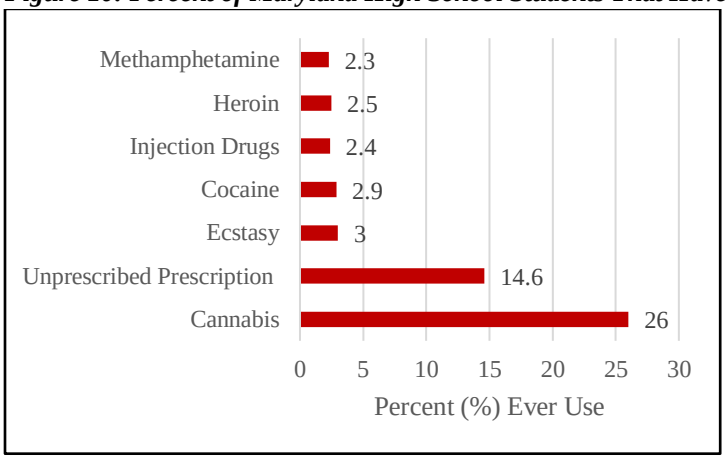
Figure 9: Percent of Maryland High School Students Who Tried Cannabis for the First Time Before Age 13 by Gender and Race/Ethnicity (2021-2022)



Source: Maryland YRBS/YTS 2021-2022

- Overall, about five (5) percent of high school students tried cannabis for the first time before age 13.
- Slightly more males than females tried cannabis for the first time before age 13.
- Students who are Multiracial had the highest percent of early cannabis use.
- Asian students were least likely to have tried cannabis before age 13.

Figure 10: Percent of Maryland High School Students That Have Ever Used Illicit Substances (2021-2022)



- More high school students have ever used cannabis than any other illicit substance.
- High school students are about twice as likely to ever used cannabis than the next closest substance, unprescribed prescription pain medicine.
- High school students are about 10 times more likely to have ever used cannabis than ecstasy, cocaine, injection drugs, heroin, or methamphetamine.

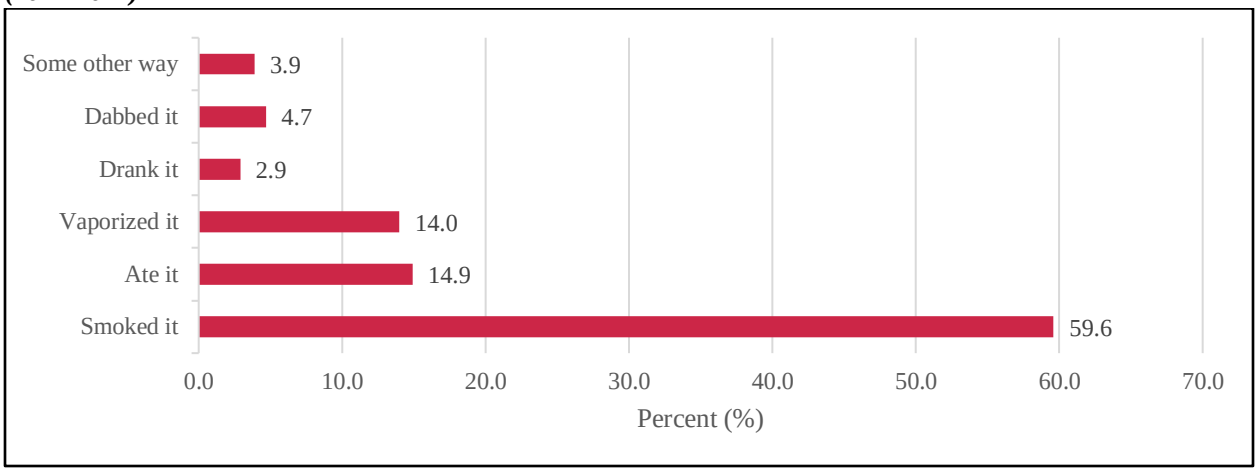
Source: Maryland YRBS/YTS 2021-2022
Unprescribed prescription refers to unprescribed prescription pain medication.

Methods of Cannabis Use

There are numerous methods to consume cannabis. Common methods include smoking dried flower, vaping cannabis cartridges, consuming edibles (e.g., gummies, baked goods) and using concentrate products (i.e., dabbing).

The usual method of cannabis consumption was measured for the first time in the 2021-2022 High School Maryland YRBS/YTS. Method is not available for middle school students.

Figure 11: Usual Method of Cannabis Consumption Among High School Students Who Currently Use Cannabis (2021-2022)

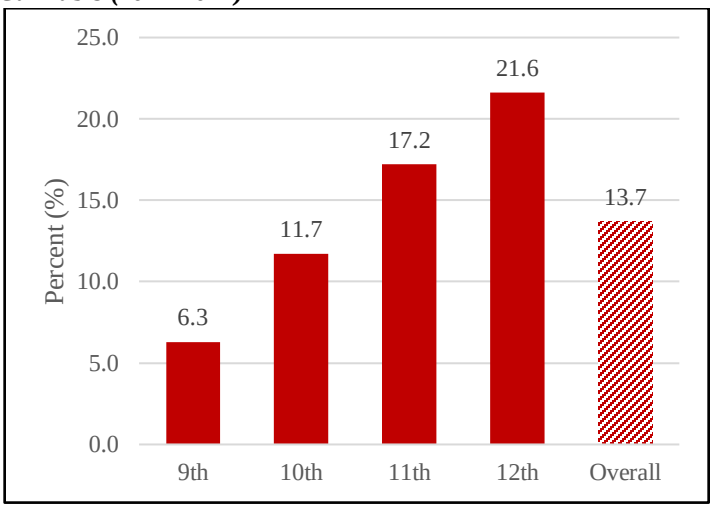


Source: Maryland YRBS/YTS 2021-2022

Question: During the past 30 days, how did you usually use marijuana? Only one (1) response option was allowed.

- Among high school students who currently used cannabis, smoking was the most common method.
- Edibles and vaping were used similarly (14.9 and 14 percent, respectively).

Figure 12: Percent of High School Students Who Have Ever Used an Electronic Vapor Product to Inhale Cannabis (2021-2022)



Source: Maryland YRBS/YTS 2021-2022

- More than one in five 12th graders have used an electronic vapor product to inhale cannabis.
- The percent of high school students who have ever used an electronic vapor product to consume cannabis increased nearly fourfold from 9th to 12th grade.

Adult Use

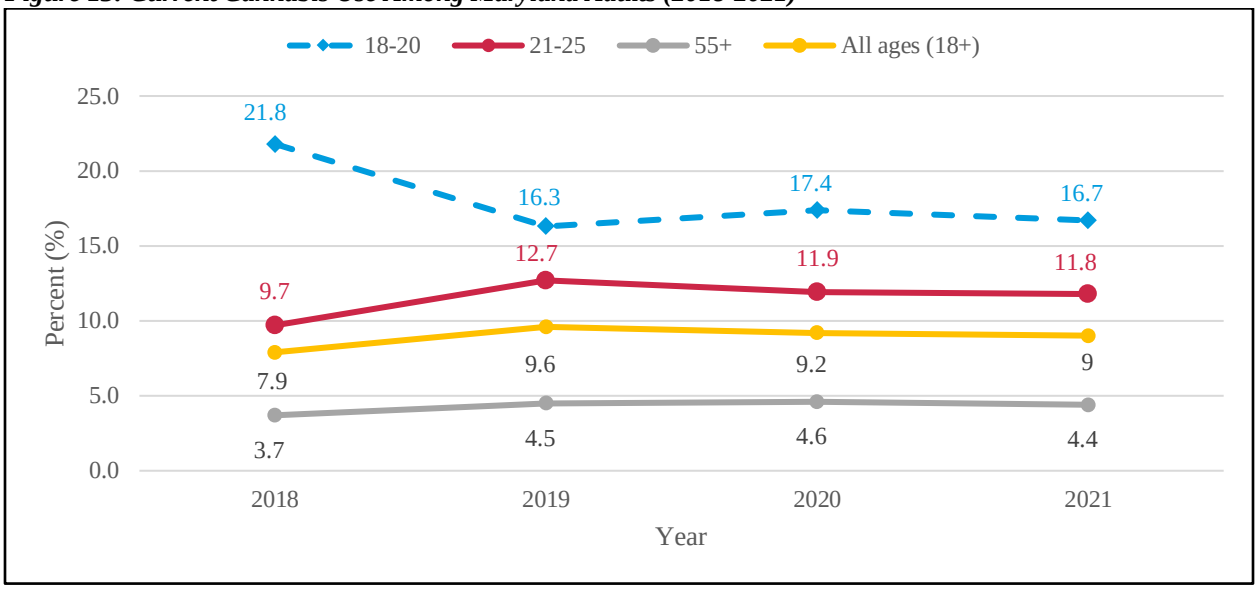
In the 2022 General Election, Marylanders voted to legalize cannabis for use by adults ages 21 and older, beginning on or after July 1, 2023. This section provides insight into adult use, including frequency of use and usual method of consumption, prior to the start of legal sales. Where possible, the data were analyzed by age category (18 to 20, 21 to 25, and over 55 years) and demographic variables.

Frequency of Use

Data sources:

- Maryland Behavioral Risk Factor Surveillance Survey (BRFSS) is conducted annually among adults 18+ and collects data on a wide variety of health risk behaviors. Cannabis use was added for the first time in 2018.
- Maryland Young Adult Survey on Alcohol (MYSA) is conducted biannually and examines patterns of alcohol and other drug use among young adults ages 18 to 25. Cannabis use was added in 2020.

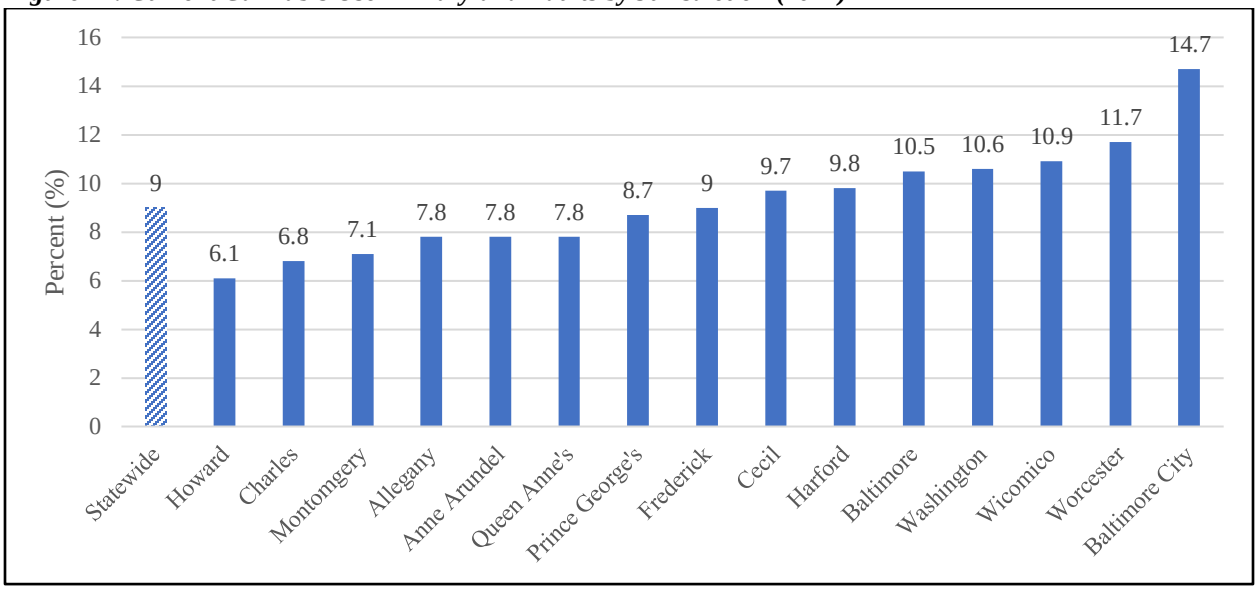
Figure 13: Current Cannabis Use Among Maryland Adults (2018-2021)



Source: Maryland BRFSS 2018-2021
"Current use" is defined as past month or past 30-day.
National BRFSS prevalence estimates for current cannabis use are not available for comparison since cannabis is an optional module and not part of the core survey.

- In 2021, nine (9) percent of Maryland adults, overall, reported current cannabis use. Use was lowest among adults 55+ and highest among young adults (18 to 20 years).
- In each year, 2018 to 2021, current cannabis use was about four (4) times greater in young adults (18 to 20 years) compared to older adults (55+).
- Since 2019, current cannabis use has been consistent within each age group.

Figure 14: Current Cannabis Use in Maryland Adults by Jurisdiction (2021)

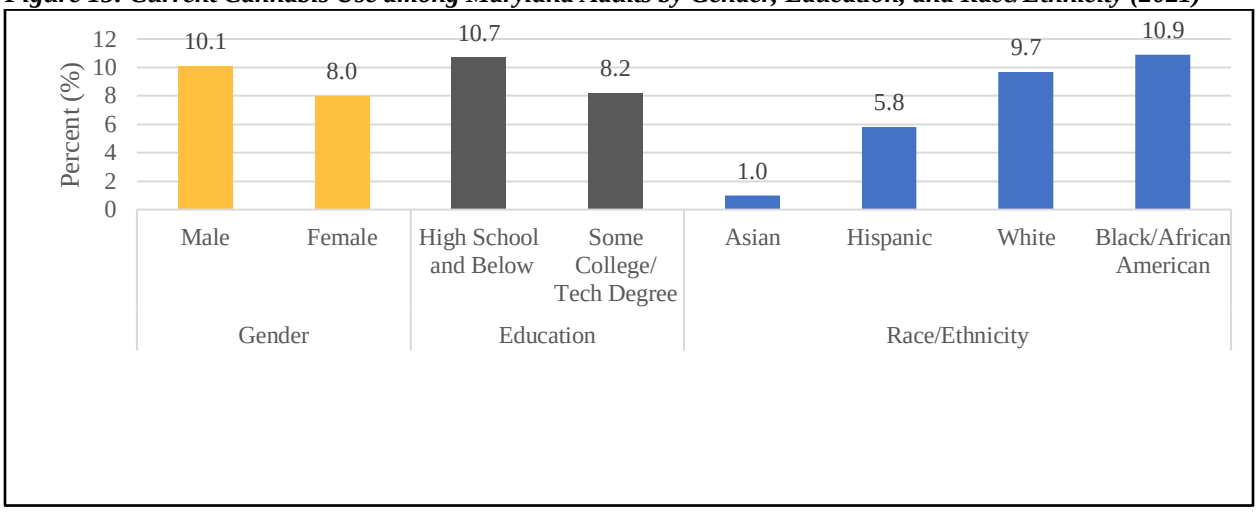


Source: Maryland BRFSS 2021

** Data were suppressed due to small sample sizes for Calvert, Caroline, Carroll, Dorchester, Garrett, Kent, Saint Mary's, Sommerset, and Talbot Counties.*

- In 2021, Baltimore City and Worcester County had the highest prevalence of current adult cannabis use in the state (14.7 and 11.7 percent, respectively).
- Howard and Charles Counties had the lowest prevalence of current cannabis use (under 7 percent).

Figure 15: Current Cannabis Use among Maryland Adults by Gender, Education, and Race/Ethnicity (2021)



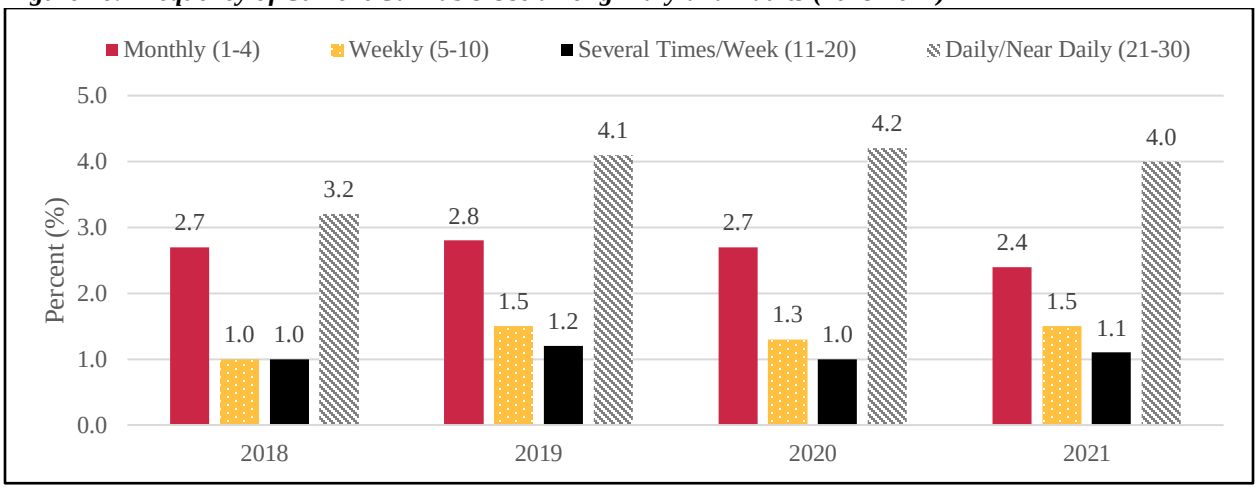
Sources: Maryland BRFSS 2021

See Appendix A for additional demographics.

- In 2021, slightly more adult men used cannabis than women. Data on gender and sexual identity is not reported in the Maryland BRFSS.
- Current cannabis use was higher among adults with a high school education or below, compared to those with some college or a technical degree.

- Black/African American adults had the highest prevalence of current cannabis use followed closely by White adults.
- Asian adults had the lowest prevalence of current cannabis use.

Figure 16: Frequency of Current Cannabis Use among Maryland Adults (2018-2021)

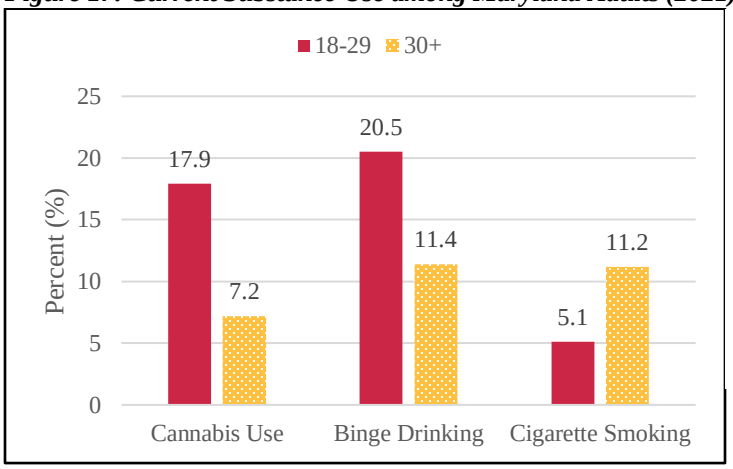


Source: Maryland BRFSS 2018-2021
Counts were too small to represent the data by age categories (18-20, 21-25, and 55+).

<u>Survey question</u> (for all participants): During the past 30 days, on how many days did you use marijuana or cannabis? Exclude hemp/CBD products.

- The frequency of current cannabis use among adults remained stable from 2018 to 2021.
- In each year, 2018 to 2021, the most common frequency was daily/near daily use.
- Overall, in 2021, four (4) percent of adults reported daily/near daily use. Of those adults who reported current use (9 percent, see
- Figure 18), nearly half (4 percent) used cannabis daily or near daily.

Figure 17: Current Substance Use among Maryland Adults (2021)



Source: Maryland BRFSS 2021

- Younger adults (18 to 29 years) reported more past month binge drinking and cannabis use but less cigarette smoking than older adults (30+).
- Current cannabis use and binge drinking was double among younger adults (18 to 29 years) compared to older adults (30+).

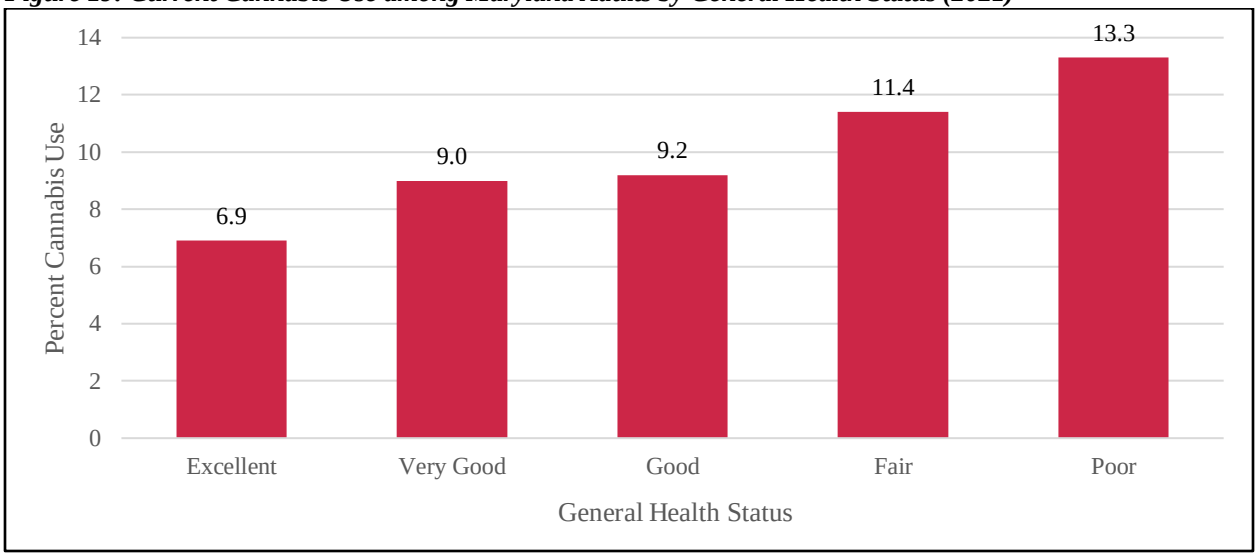
Figure 18: Current Cannabis Use among Maryland Adults by Mental Health Status (2021)

Source: Maryland BRFSS 2021

<u>Question</u>: Thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

- The percent of adults who reported current cannabis use increased as the number of days of poor mental health increased.
- Current cannabis use was nearly five (5) times greater in people with 21 to 30 days of poor mental health compared to adults with no reported days of poor mental health.

Figure 19: Current Cannabis Use among Maryland Adults by General Health Status (2021)



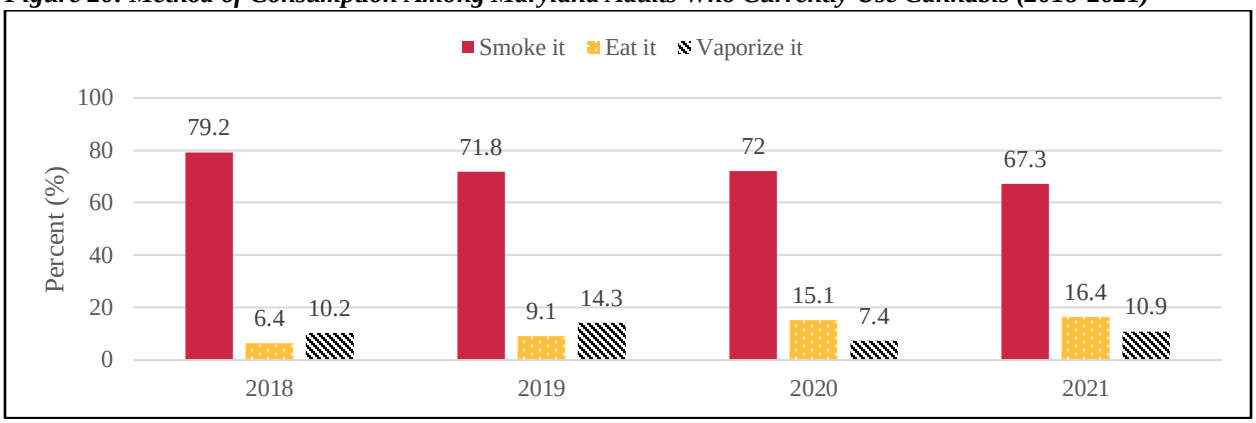
Source: Maryland BRFSS 2021

<u>Question</u>: Would you say that, in general, your health is: Excellent, Very good, Good, Fair, or Poor?

- The percent of adults who reported current cannabis use increased as general health status worsened.
- Adults who reported "poor health" had nearly double the cannabis use as compared to those who reported "excellent health".

Method of Consumption, Reason for Use, and Usual Source

Figure 20: Method of Consumption Among Maryland Adults Who Currently Use Cannabis (2018-2021)

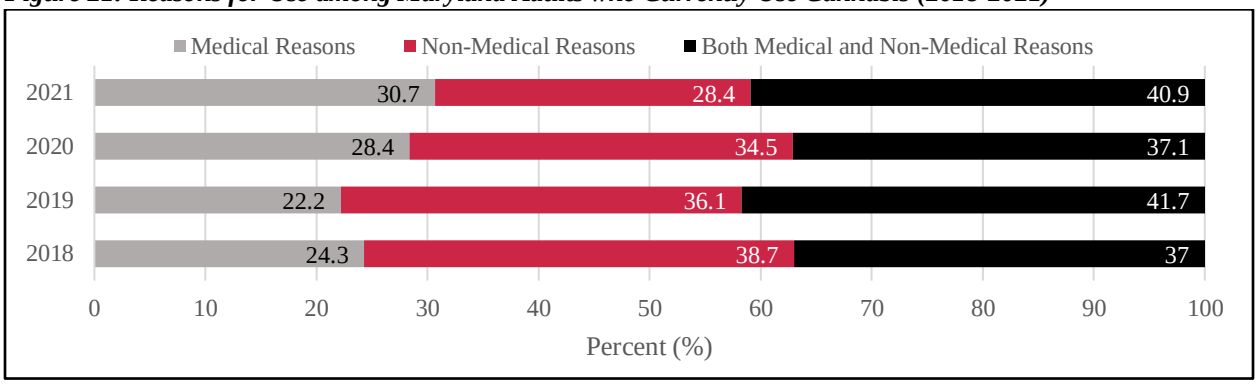


Source: Maryland BRFSS 2018-2021

<u>Question</u>: [This question was only asked if respondents reported use of cannabis in the past month]. During the past 30 days, which one of the following ways did you use marijuana the most often? (Select one).

- In each year, 2018 to 2021, smoking was the most common method of cannabis consumption; however, smoking prevalence overall has decreased since 2018.
- Edible consumption nearly tripled from 2018 to 2021.
- In 2020, edibles surpassed vaping as the second most frequent method of cannabis consumption.

Figure 21: Reasons for Use among Maryland Adults who Currently Use Cannabis (2018-2021)

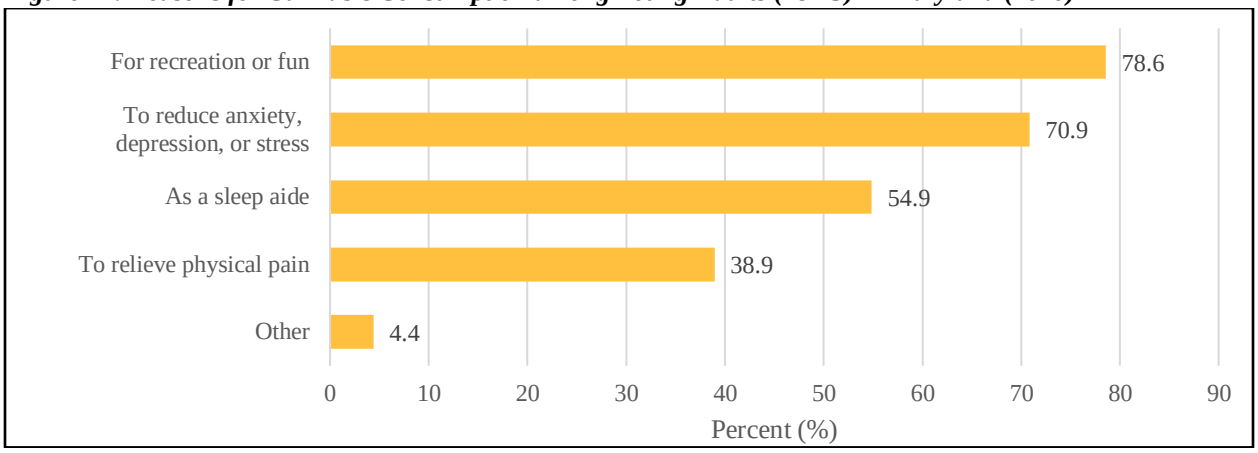


Source: Maryland BRFSS 2018-2021

<u>Question</u>: When you used marijuana or cannabis during the past 30 days, was it usually: for medical reasons, for non-medical reasons, or for both medical and non-medical reasons?

- In 2021, about 30 percent of adults who used cannabis reported using cannabis exclusively for medical reasons.
- From 2018 to 2021, the percent of adults who used cannabis for medical reasons increased (aligning with growth in the Maryland medical cannabis patient program) and use for non-medical reasons decreased.

Figure 22: Reasons for Cannabis Consumption among Young Adults (18-25) in Maryland (2020)

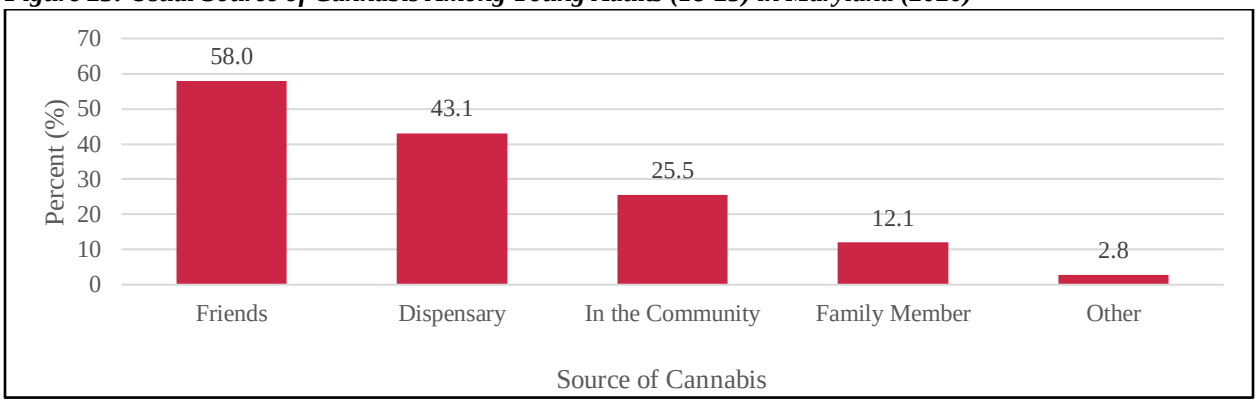


Source: MYSA 2020
Responses do not add to 100 percent due to multiple response options.

Question: [Among those who used cannabis] Why did you use Cannabis? (Select all)

- Among young adults (18 to 25 years) who used cannabis, almost 80 percent used cannabis for recreation or for fun.
- More than 70 percent reported using cannabis to help manage their mental health (e.g., to reduce anxiety, depression, or stress).
- Use of cannabis as a sleep aide and to relieve physical pain were also commonly reported reasons for use.

Figure 23: Usual Source of Cannabis Among Young Adults (18-25) in Maryland (2020)



Source: MYSA 2020
Note: Data does not equal 100 percent, because respondents could select all applicable answers.

Question: [Among those who use cannabis] Where did you get your marijuana from? (Select all)

- Most young adults (18 to 25 years) who used cannabis report obtaining it from friends.
- Many young adults obtained cannabis from a dispensary; however, the survey question does not specify if the purchase was through a licensed medical dispensary in Maryland or through another type of dispensary, including out of state.

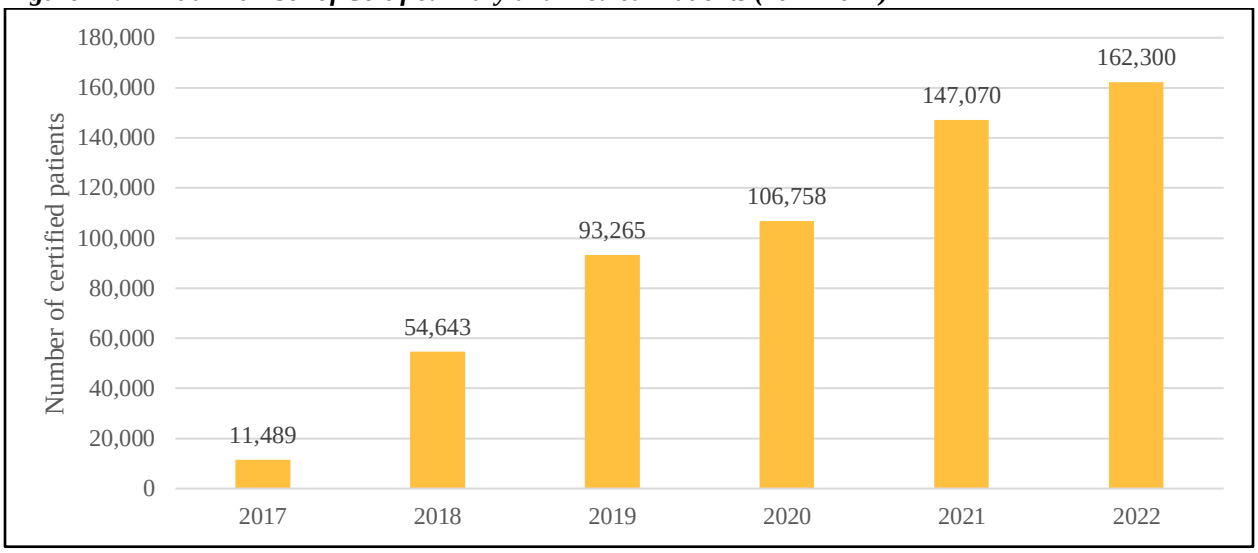
Medical Patient Use

The Maryland Medical Cannabis Program became operational on December 1, 2017. Over the past five years, Maryland's medical cannabis industry has grown substantially. Nearly 200 medical cannabis growers, processors, dispensaries, testing laboratories, and ancillary businesses serve a patient population of more than 162,000 patients (as of December 31, 2022).

Frequency of Use

Data on medical cannabis patients was collected through the 2022 Maryland Medical Cannabis Patient Survey (MMCPS-22). More than 13,000 certified medical patients participated in the survey, including patients from all 24 jurisdictions. The surveyed population was a 93 percent match with the actual medical patient population demographics, which strongly supports the representativeness of the findings.

Figure 24: Annual Number of Certified Maryland Medical Patients (2017-2022)

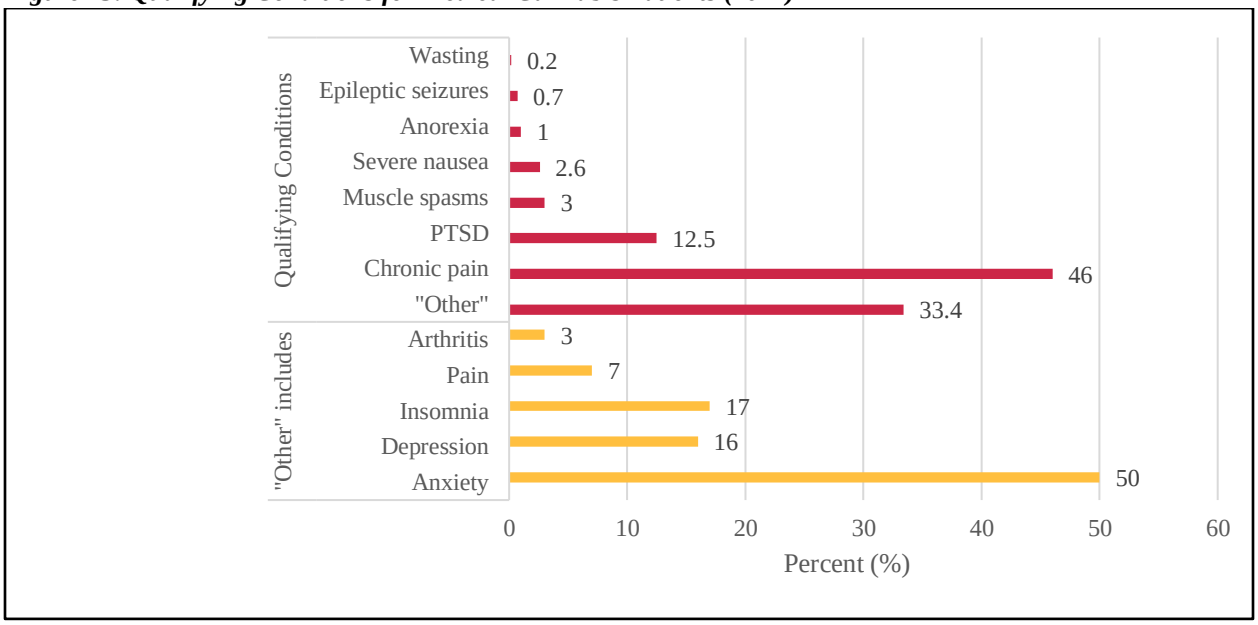


Source: Maryland Medical Cannabis Commission (MMCC)

- "Certified patients" refer to those patients who have registered with MMCC, have completed a visit with a certifying provider, and have a qualifying medical condition.[15]
- The program has grown with the number of certified patients increasing each year.

[15] Qualifying medical conditions include cachexia, anorexia, wasting syndrome, severe or chronic pain, severe nausea, seizures, severe or persistent muscle spasms, glaucoma, post-traumatic stress disorder (PTSD), or another chronic medical condition which is severe and for which other treatments were ineffective.

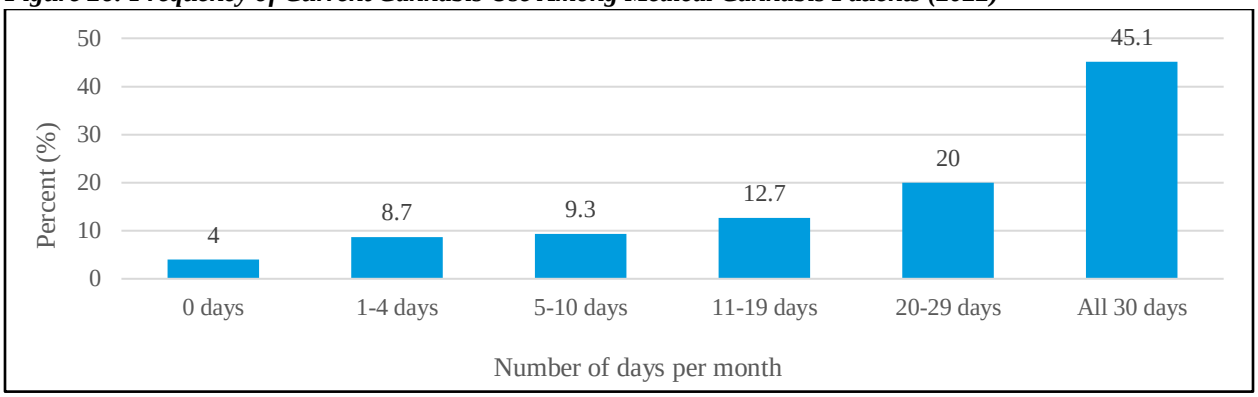
Figure 25: Qualifying Conditions for Medical Cannabis Patients (2022)



Source: MMCPS-22

- Nearly half of medical patients obtained their medical cannabis certification due to chronic pain.
- One-third of medical patients obtained their certification for an "Other" reason. "Other" is an allowed category in the medical program.
- Of those who identified "Other," two-thirds identified anxiety or depression as the reason for obtaining their medical cannabis certification.

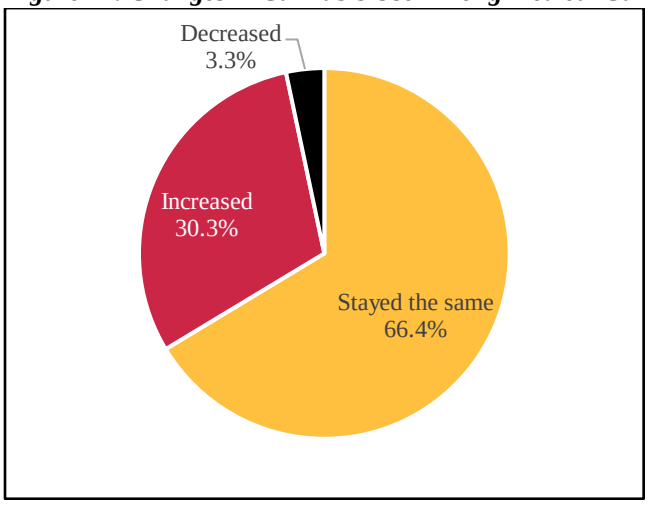
Figure 26: Frequency of Current Cannabis Use Among Medical Cannabis Patients (2022)



Source: MMCPS-22

- Most medical cannabis patients used cannabis one (1) or more days in the past month (96 percent).
- Two-thirds of medical cannabis patients used cannabis daily or almost daily (20+ days per month).

Figure 27: Changes in Cannabis Use Among Medical Cannabis Patients During COVID-19 (2022)

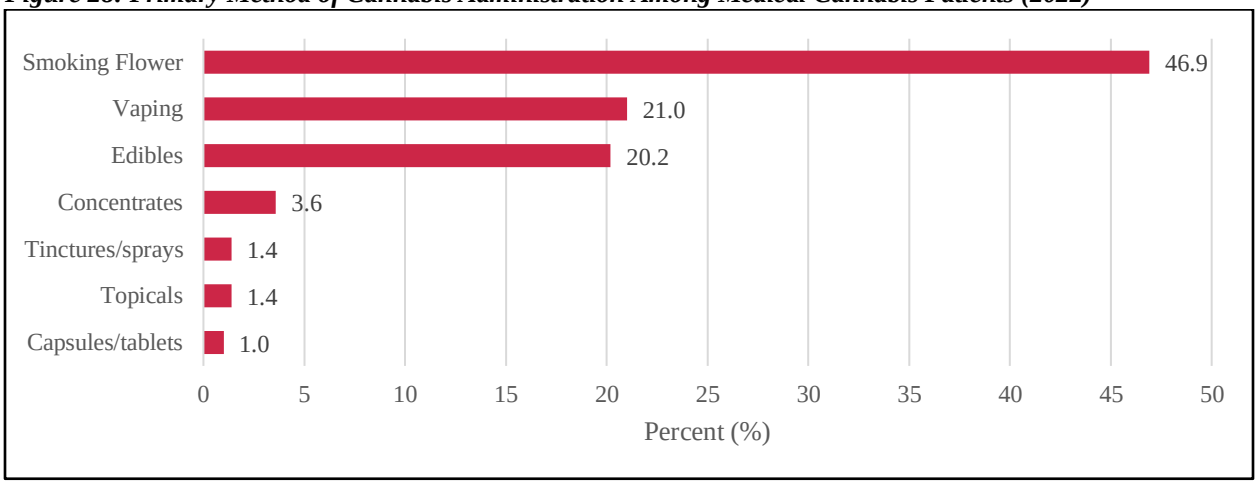


<u>Question:</u> How has the COVID-19 pandemic affected your cannabis consumption?

- Most patients said that their cannabis consumption stayed the same during the COVID pandemic.
- Close to a third said that their cannabis consumption increased.

Usual Method of Consumption

Figure 28: Primary Method of Cannabis Administration Among Medical Cannabis Patients (2022)



Source: MMCPS-22

Note: Transdermal patches and suppositories were not included, as use was 0.0 and 0.1 percent. The total is 96 percent since four (4) percent of patients did not consume cannabis in the prior month.

Question: Which method did you use most commonly to consume cannabis in the past month? (Select one)

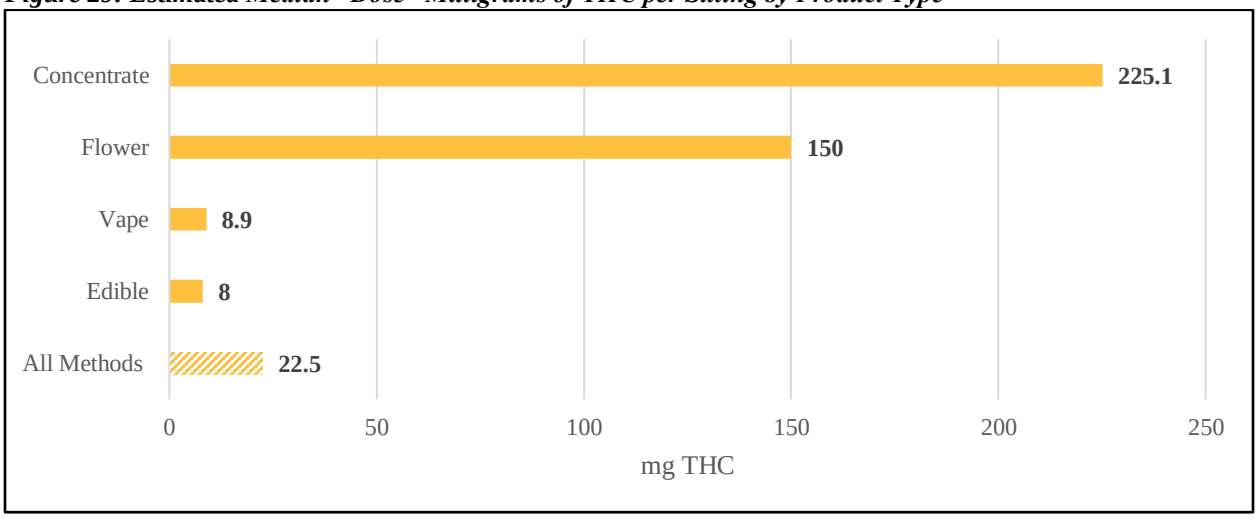
- Smoking, vaping, and edibles were the three most commonly used methods among medical patients.
- Flower was the most common method; flower was used by almost half of medical cannabis patients.
- Use of multiple methods was common; half of medical patients used more than one method in the prior month (data not shown).

Dose

There is growing recognition of the importance of a standard "dose" of THC to help consumers monitor their use. However, dose is still a burgeoning area of scientific research, in part because cannabis remains a Schedule I substance and is not regulated by the FDA. There is not yet a best practice for measuring dose.

The Commission collected data on cannabis dose in Maryland for the first time in the 2022 Maryland Medical Cannabis Patient Survey (MMCPS-22). To MMCC's knowledge, no other state-related programs have rigorously measured cannabis dose. The MMCPS-22 used an emerging approach, deriving dose from a combination of the potency and quantity of a consumed cannabis product. Survey respondents were asked to (1) think about past month cannabis consumption from their primary method (i.e., flower) and (2) report the THC potency and the quantity of cannabis that they typically consumed per sitting. These two (2) data points were then used to compute the typical dose of THC (mg/THC) per sitting. The MMCPS-22 measured typical dose (mg/THC per sitting) for survey participants whose primary method of cannabis consumption was flower, edible, vape or concentrate, which accounted for 92 percent of the survey sample.

Figure 29: Estimated Median "Dose" Milligrams of THC per Sitting by Product Type

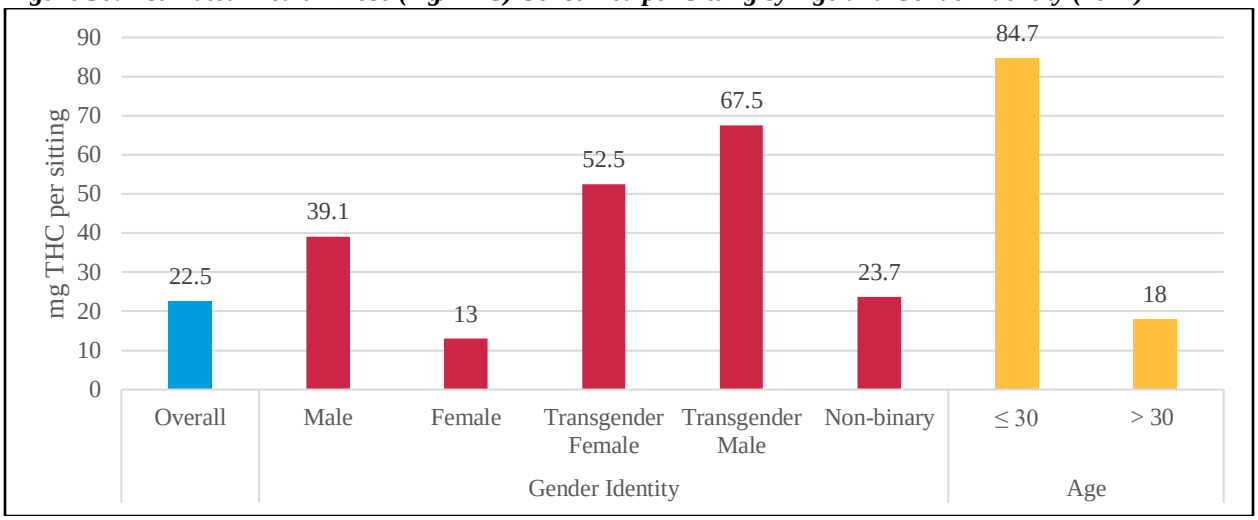


Source: MMCPS-22

.

- The median dose per session was highest for concentrate and flower and lowest for edibles and vapes.
- Concentrates were associated with more than 25 times the mg per THC compared to edibles or vapes. Flower was associated with more than 16 times the mg per THC of edibles and vapes.
- It is possible that survey participants had a harder time quantifying the typical THC potency and amount of concentrate and flower products, as compared to vape and edible products. Furthermore, to better understand the large difference in dose amounts, additional research is needed into how the effects of THC vary by methods of administration.
- Across all methods, the estimated median dose of THC consumed per sitting was 22.5 mg THC. As noted above, caution should be exercised in interpreting this estimate and 22.5 mg is not a recommended dose. Definitive dose recommendations have not been established for medical or nonmedical purposes.

Figure 30: Estimated Median Dose (mg/THC) Consumed per Sitting by Age and Gender Identity (2022)



Source: MMCPS-22

Note: People who identify as Transgender Female, Transgender Male and Non-Binary make up less than 2 percent of the sample, so caution should be used when interpreting this data, as the confidence interval may be wide.

- The estimated dose per sitting was three (3) times higher in males than females and four (4) times higher in younger people (ages 30 and under) than people over age 30.
- People who identify as transgender (both male and female) reported a higher dose per sitting.

Chapter Summary

- Approximately four (4) percent of middle school and 15 percent of high school students in Maryland used cannabis in the past month ("current use"). Current use among middle and high school students has trended down since 2013.

- Most middle school students who used cannabis did so 1-2 times per month. Most high school students who used cannabis did so less than ten times per month; however, about a third reported a high frequency of use (10 or more times a month).

- Approximately nine (9) percent of adults in Maryland used cannabis in the past month. Current use in adults has been consistent since 2019. Of adults who reported current use, nearly half reported daily or near daily use. Overall, four (4) percent of adults used cannabis daily or almost daily.

- The number of certified medical cannabis patients has increased each year, with over 162,000 in 2022.

- Most medical cannabis patients reported using cannabis on a daily or near daily basis.

- Over 30 percent of medical patients increased their cannabis use during the COVID-19 pandemic.

- Current cannabis use was higher among youth and adults with who self-reported poor mental health status. Medical patients reported anxiety, depression, and PTSD as reasons for obtaining medical cannabis certification. Further study on mental health and cannabis use is warranted.

- Youth who identify as lesbian, gay, bisexual, and transgender reported more current cannabis use than heterosexual and cisgender youth. Higher use of substances (e.g., tobacco, alcohol) has been reported in LGBTQ youth.[16] This data is not available among adults, as the 2021 Maryland BRFSS did not assess gender and sexual identity.

- Smoking was the most common method of consumption for high school students, adults, and medical cannabis patients. Edible consumption appears to have increased since 2018, in both medical and non-medical cannabis consumers.

- A standard measure does not exist for cannabis dosage, largely because it remains a Schedule I drug and is not regulated by the FDA. Therefore, information on "dose" is not available for youth or adults in Maryland. Data from the MMPCS-22 found that the estimated median dose for medical patients per sitting was 22.5 mg THC. This is not a recommended dose, as definitive dose recommendations have not been established for medical or nonmedical purposes.

---

[16] Gonzales G, Przedworski J, Henning-Smith C. Comparison of Health and Health Risk Factors Between Lesbian, Gay, and Bisexual Adults and Heterosexual Adults in the United States: Results from the National Health Interview Survey. JAMA Intern Med. 2016 Sep 1;176(9):1344-51. https://doi.org/10.1001/jamainternmed.2016.3432.

Chapter II: Perceptions and Attitudes

Introduction

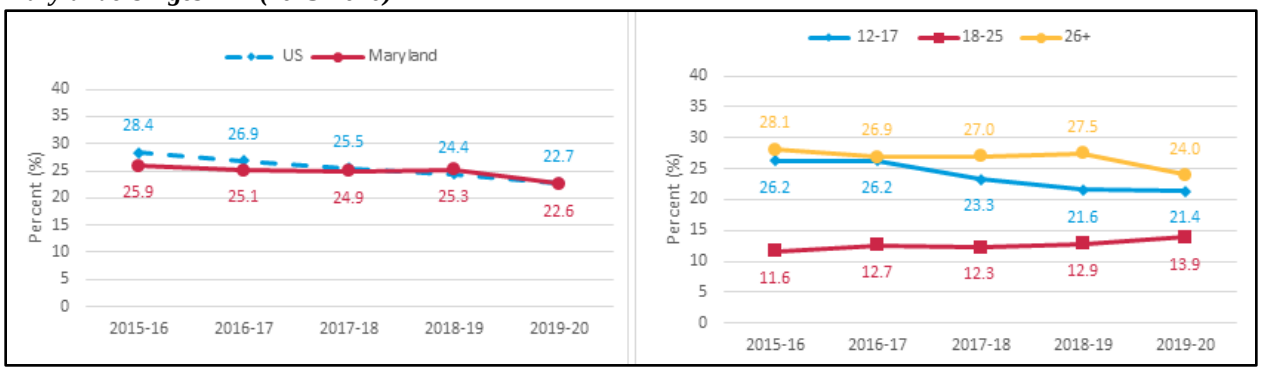
This chapter addresses perceptions related to cannabis use among youth (under 18 years) and adults (18 to 20, 21 to 55, and over 55 years). In addition, this chapter examines reported access to cannabis among youth, as well as educational needs and priorities related to adult cannabis use.

Perceptions of Risk

Risk perception strongly influences an individual's decision to use drugs, as well as to seek help.[17] Research has also shown that the level of perceived risk can help predict future consumption of cannabis.[18]

Data on risk perception comes from the 2020 National Survey of Drug Use and Health (NSDUH) and the 2020 Maryland Young Adult Survey on Alcohol (MYSA) surveys. At the time this report was prepared, state-level data (i.e., Maryland data) from 2021 NSDUH dataset was not yet available.

Figure 31: Perceptions of "Great Risk" from Smoking Cannabis Monthly Among U.S. Residents and Marylanders Ages 12+ (2015-2020)



Source: NSDUH 2015-2020

The figure on the right with age bands (12-17, 18-25, 26+) refers to Maryland residents only.

- In 2020, the perception of 'great risk' from smoking cannabis once a month among Marylanders was approximately the same as the nationwide perception of risk (roughly 23 percent).
- The perception of 'great risk' has decreased in Maryland and the U.S. from 2015 to 2020 but has decreased faster nationwide.

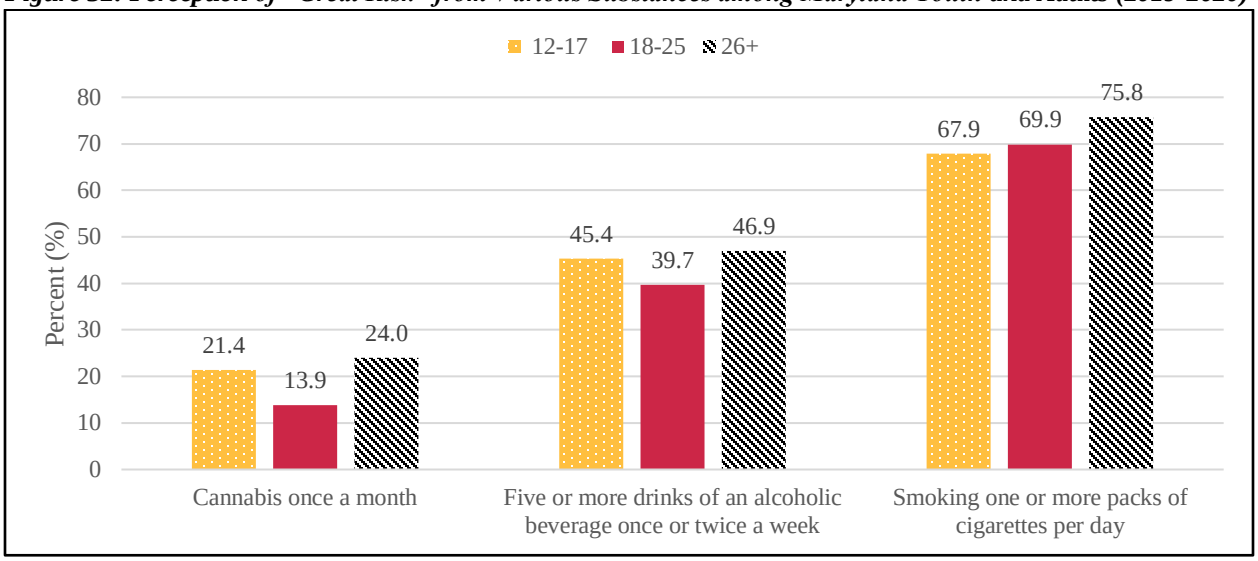
---

[17] L. Montanari L et al. *Cannabis Use among People Entering Drug Treatment in Europe: A Growing Phenomenon?* Eur. Addict. Res. (2017) 23:113–121. https://doi.org/10.1159/000475810.

[18] M. Parker M et al., *Population-level predictions from cannabis risk perceptions to active cannabis use prevalence in the United States, 1991–2014*. Addict. Behav. (2018) 82:101–104. https://doi.org/10.1016/j.addbeh.2018.02.030.

- The perception of 'great risk' of smoking cannabis once a month was lowest among 18 to 25-year-olds.
- The perception of 'great risk' of smoking cannabis once a month is decreasing among 12 to 17-year-olds.
- These findings are concerning given research on cannabis and brain health.[19] THC acts directly on the brain, which continues to develop until about age 25. Regular cannabis use during teen years and early adulthood may harm memory, learning, and attention – and effects may be long term.[20],[21], [22].

Figure 32: Perception of "Great Risk" from Various Substances among Maryland Youth and Adults (2019-2020)



Source: NSDUH 2019-2020

- All age groups perceived a lower risk of monthly cannabis use compared to use of other substances.
- Monthly cannabis use was perceived to be half as risky as regular alcohol use and a third as risky as regular smoking.
- 18 to 25-year-olds had the lowest perceived risk of cannabis use.

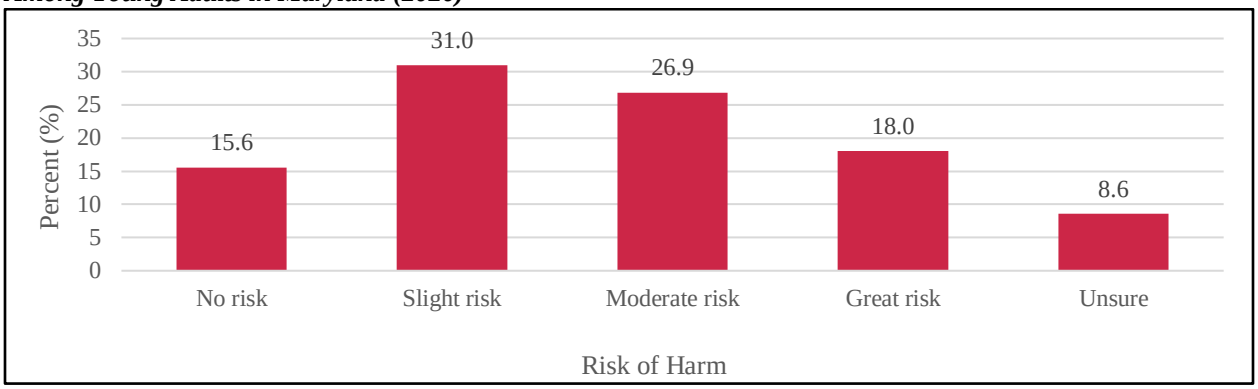
[19] Centers for Disease Control and Prevention (CDC). Brain Health, Retrieved February 16, 2023, from https://www.cdc.gov/marijuana/health-effects/brain-health.html

[20] National Academies of Sciences, Engineering, and Medicine, et al. *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research*. National Academies Press (US), 12 January 2017. https://doi.org/10.17226/24625.

[21] A Batalla et al. *Structural and functional imaging studies in chronic cannabis users: a systematic review of adolescent and adult findings.* PLoS One. 2013;8(2): e55821. https://doi.org/10.1371/journal.pone.0055821.

[22] R.M. Schuster et al, *Early onset marijuana use is associated with learning inefficiencies.* Neuropsychology, (2016) 30(4): 405–415. https://doi.org/10.1037/neu0000281.

Figure 33: Perception of Risk of Physical or Other Harm When Drinking Alcohol in Combination with Cannabis Among Young Adults in Maryland (2020)



Source: MYSA, 2020

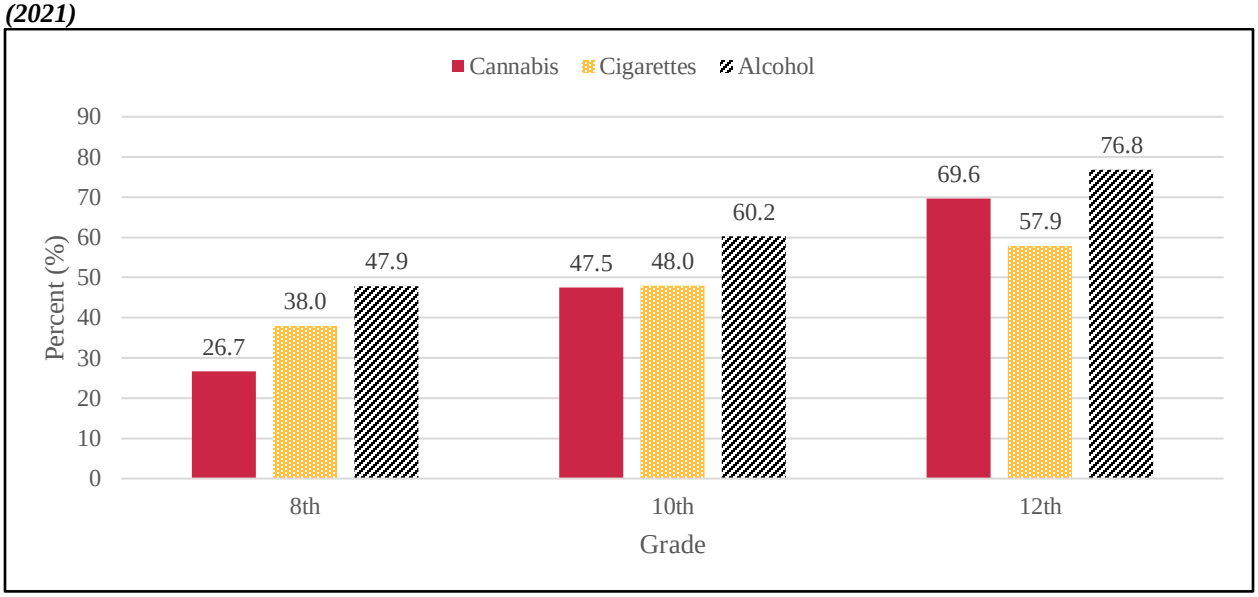
<u>Question</u>: How much do people risk harming themselves physically and in other ways when they drink alcohol in combination with marijuana?

- Close to half of young adults (18 to 25 years) felt that there is no risk or only a slight risk of physical or other harm when drinking alcohol in combination with cannabis.
- Nearly ten percent of young adults (18 to 25 years) were unsure of the risk of physical or other harm when drinking alcohol in combination with cannabis.

Availability of Cannabis

Access to cannabis was captured nationally in 8th, 10th, and 12th grade adolescents from the 2021 Monitoring the Future (MTF) survey. MTF does not report this data at the state level.

Figure 34: Percent of U.S. Students that Report Substances are "Fairly Easy" or "Very Easy" to Get by Grade (2021)



Source: MTF-2021

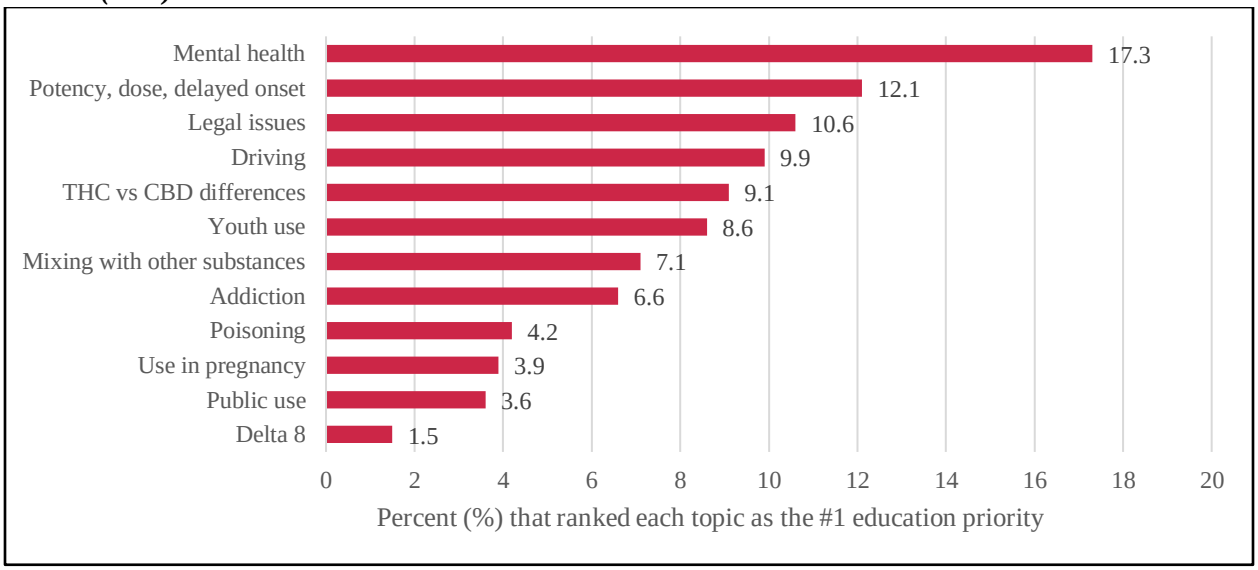
Question: How difficult do you think it would be for you to get each of the following types of drugs, if you wanted some?

- All substances were easier to access with increasing grade level.
- About 50 percent of 10th graders and 70 percent of 12th graders said obtaining cannabis is "very easy" or "fairly easy".
- At every grade level, students reported the most access to alcohol.

Education Priorities

Education priorities were assessed in the 2022 Maryland Medical Cannabis Patient Survey (MMCPS-22). Survey participants were asked to think about adult (recreational) cannabis and important topics on which to educate the public. Survey participants ranked a list of 12 educational topics.

Figure 35: Top Public Education Priorities Related to Recreational Cannabis Use, Ranked by Medical Cannabis Patients (2022)



Source: MMCPS-22

Question: Participants were asked, in thinking about adult use (recreational) cannabis in Maryland, what do you find are the most important topics on which to educate the public? Please rank the topics in order of importance where the most important topic is #1.

- Survey respondents ranked mental health as the most important public education topic regarding cannabis consumption.
- Given the large number of topics to rank (12 in total), the percent that selected mental health is meaningful. However, the survey did not request further detail on cannabis and mental health. This topic area will be explored further in future patient surveys.
- Potency, dose, and delayed onset of cannabis products were also top public education priorities.

Chapter Summary

- The perception of "great risk" from smoking cannabis once a month was lowest among young adults (18 to 25 years) and has trended down since 2015 among adolescents (12 to 17 years) and adults (26 years and older).

- At all ages, Marylanders perceived a lower risk with monthly cannabis use compared to regular alcohol consumption or cigarette smoking.

- About half of young adults felt that there is "no risk" or only a "slight risk" of harm when drinking alcohol in combination with cannabis.

- Nationally, about 50 percent of 10th graders and 70 percent of 12th graders said obtaining cannabis is "very easy" or "fairly easy". More information is needed about access to cannabis at the state level, especially since over one in five 12th graders in Maryland report current use (within the past 30 days).

- State-level data on risk perceptions, knowledge, and attitudes about cannabis is limited. Future opportunities exist to expand data collection through state-level surveys, including the Maryland YRBS/YTS and Maryland BRFSS.[23]

[23] MMCC requested the following question be added to 2023 Maryland BRFSS: *How much do you think daily or near daily use of marijuana or cannabis risks harming the average adult's health? Response options: No risk, Slight risk, Moderate risk, Great risk.* If approved, it is expected that this question will be fielded starting in early 2023.

Chapter III: Public Health and Safety

Introduction

This chapter covers public health-related impacts of cannabis use, including impaired driving behaviors, substance-related traffic fatalities and arrests, accidental poisonings, adverse events, and cannabis consumption while pregnant and breastfeeding.

Driving Behaviors

Cannabis consumption can impair driving, negatively impacting reaction time, motor coordination, and attention. Unlike alcohol, which has a nationwide standard for impairment (0.8 g/ml blood alcohol concentration (BAC)), a standard does not exist for cannabis. THC, the main psychoactive component of cannabis, can stay in the body for weeks, potentially appearing in roadside tests while no longer causing impairment. Additionally, tracking cannabis-impaired driving is difficult because drivers who may be under the influence of cannabis and alcohol are often cited for high BAC and rarely tested for additional substances.

Given measurement limitations, multiple datasets were utilized to study incidents of impaired driving related to cannabis:

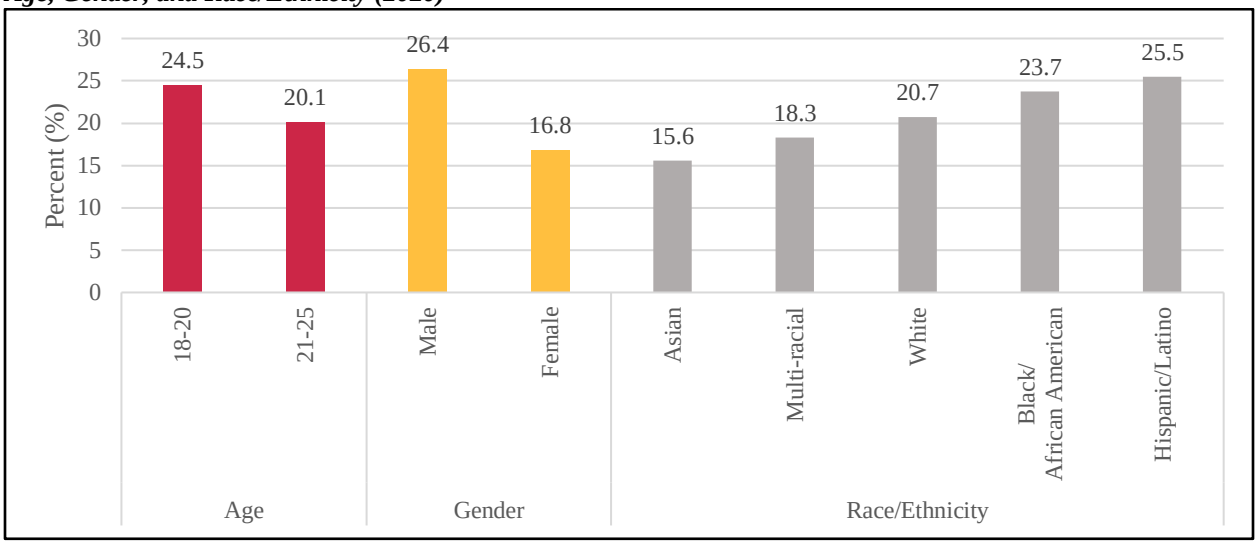
- Self-reported driving behaviors were collected for young adults and medical cannabis patients from the Maryland Young Adult Survey on Alcohol (MYSA) and Maryland Medical Cannabis Patient (MMCPS) surveys, respectively.
- Data on fatal traffic accidents and traffic related arrests were obtained from the Fatality Analysis Reporting System (FARS) and District Court of Maryland Arrest Report, respectively. FARS provides data on the presence of cannabis in fatal accidents, where available (i.e., when testing for THC was conducted); however, Maryland Court data does not differentiate cannabis from other intoxicating drugs.
- Data from Drug Recognition Experts (DRE) was collected to assess trends in cannabis-positive driver evaluations.

Driving after Cannabis Use

Recent guidance suggests waiting at least six (6) hours after consuming cannabis to drive.[24] It may not be easy for consumers to recognize impairment, the effects of cannabis consumption can be delayed, and intoxication levels can vary during each usage, even if the amount used remains constant.

[24] Fischer, Benedikt et al. *Lower-Risk Cannabis Use Guidelines: A Comprehensive Update of Evidence and Recommendations.* American journal of public health (2017) 107(8): e1-e12. https://doi.org/10.2105/AJPH.2017.303818 .

Figure 36: Percent of Young Adults Who Drove within Three Hours of Using Cannabis in the Past Month by Age, Gender, and Race/Ethnicity (2020)

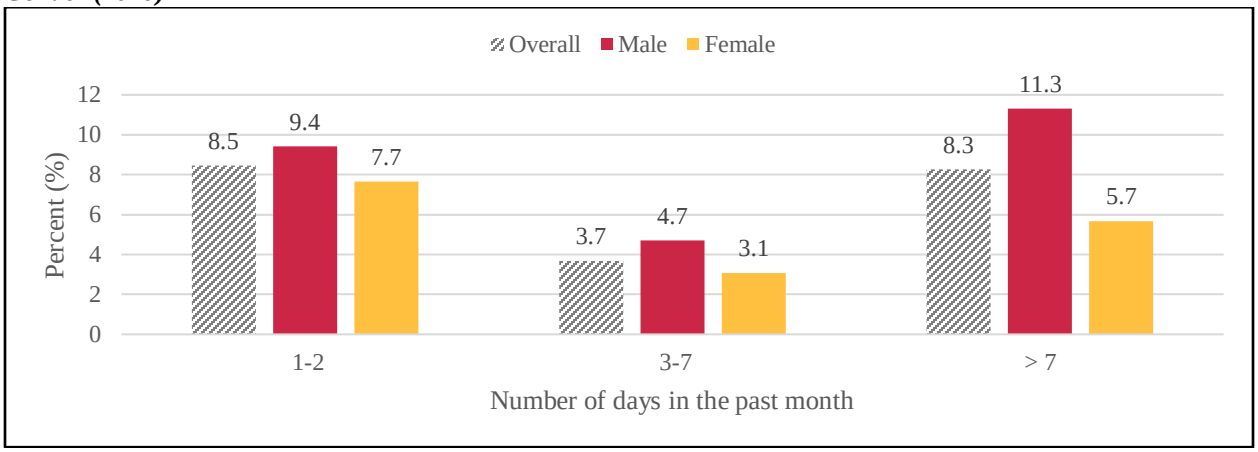


Source: MYSA 2020
Note: Data for "other race" were suppressed and excluded from this graph.

<u>Question</u>: Out of the past 30 days, on about how many days did you drive a motor vehicle within three hours after using marijuana? Questions on cannabis were added to the MYSA survey in 2020, so trend data are not yet available from this source.

- More than twenty percent of all young adults (ages 18 to 25) reported driving a vehicle within three hours after using cannabis.
- The youngest adults (18 to 20) reported driving after using cannabis more frequently than those just a few years older (21 to 25).
- More males reported driving a vehicle within three hours of using cannabis than females.
- The highest race/ethnicity of young adults reporting driving after using cannabis was among Hispanic/Latino adults.

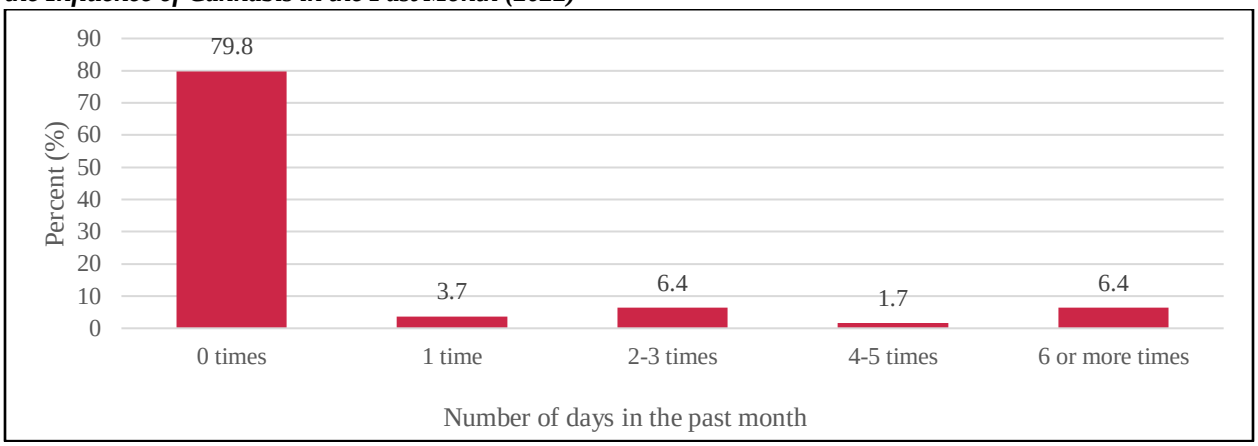
Figure 37: Frequency of Young Adults Driving Within Three Hours of Using Cannabis in the Past Month by Gender (2020)



Source: MYSA, 2020
Not pictured: less than one percent of respondents did not remember their past month driving behavior.

- About eight (8) percent of young adults (ages 18 to 25) drove within three hours of using cannabis more than seven (7) days in the last month.
- Males were twice as likely to frequently drive (i.e., more than 7 times a month) within three hours of cannabis use compared to females.

Figure 38: Frequency of Medical Cannabis Patients Driving within Three Hours of Consuming or While Under the Influence of Cannabis in the Past Month (2022)

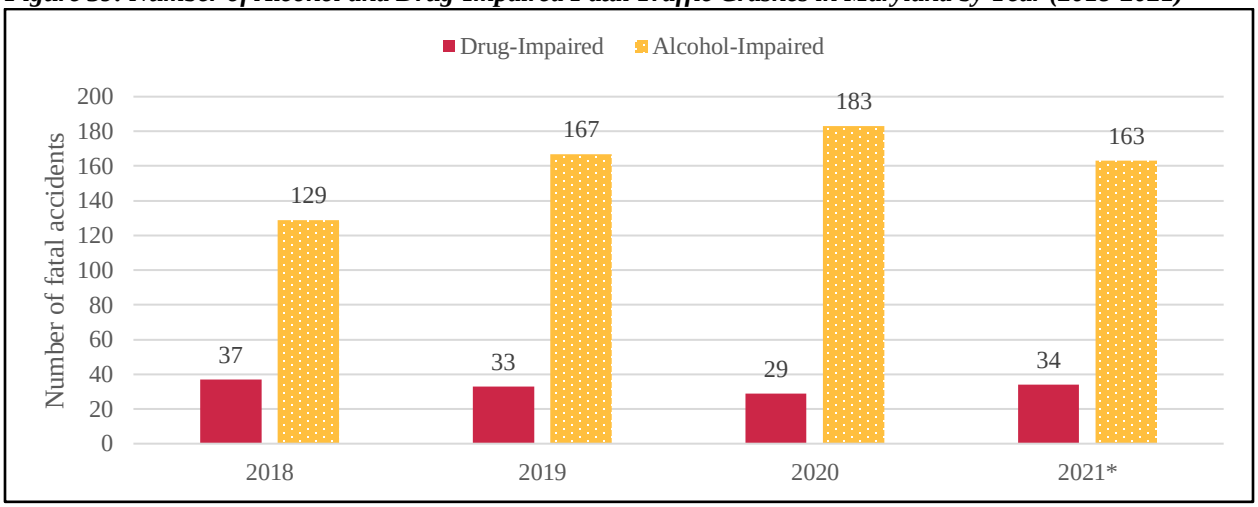


Source: MMCPS-22
Note: 1.2 percent of patients reported that they did not use cannabis in the past 30 days

- Most medical patients reported not driving within three hours of consuming cannabis or while under the influence of cannabis.
- About 20 percent of medical patients reported driving within three hours of using or under the influence of cannabis. Of them, one-third drove six or more times.

Fatal Traffic Crashes

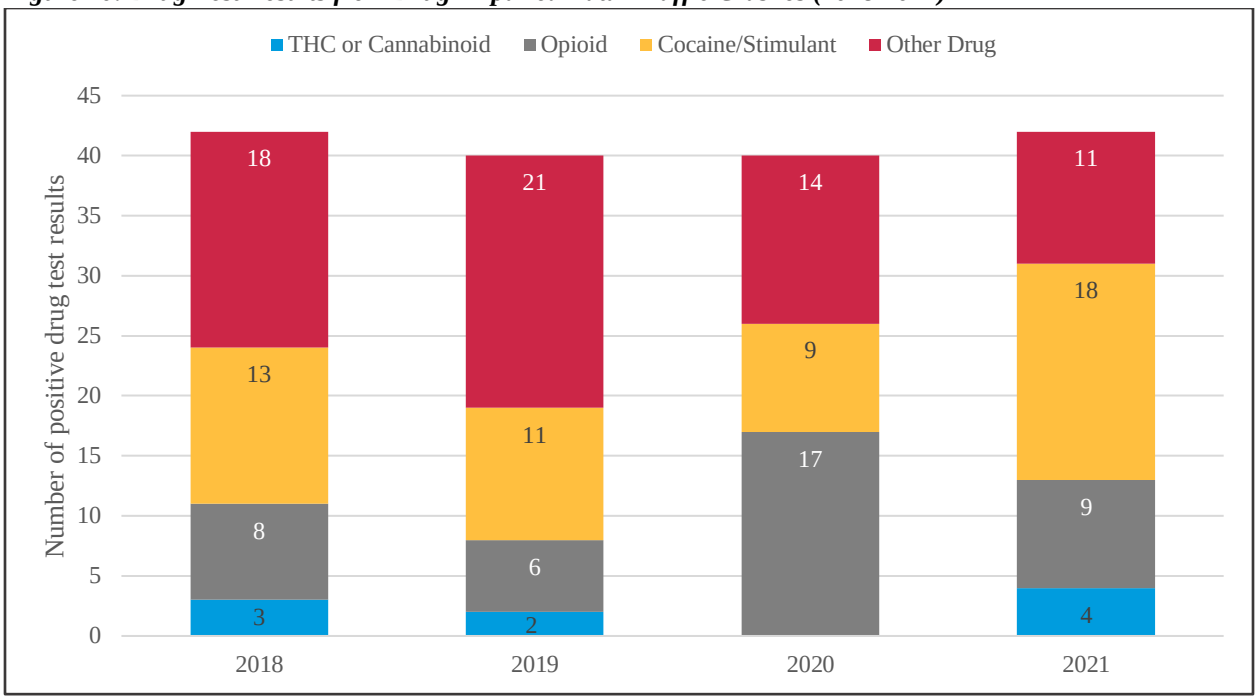
Figure 39: Number of Alcohol and Drug-Impaired Fatal Traffic Crashes in Maryland by Year (2018-2021)



Source: FARS 2018-2021
**The data for 2021 is preliminary and is subject to change.*

- Each year, from 2018 to 2021, there were more traffic fatalities attributed to alcohol-impairment than drug impairment.
- Drug-impaired traffic fatalities remained consistent from 2018 to 2021.

Figure 40: Drug Test Results from Drug-Impaired Fatal Traffic Crashes (2018-2021)



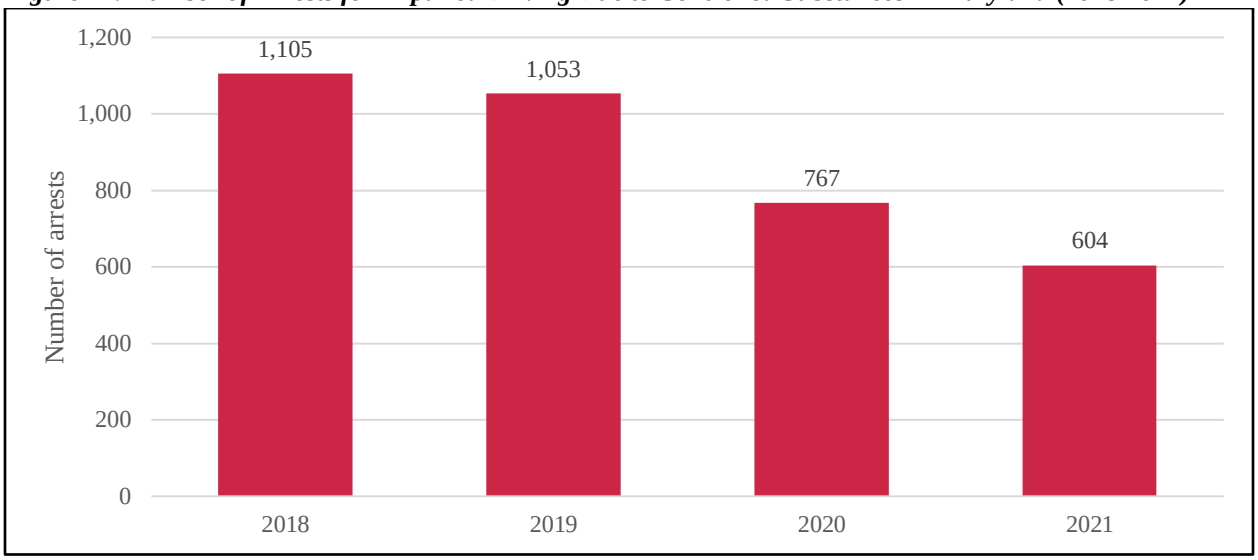
Source: FARS 2018-2021; Note: Drug test results are for at-fault drivers
Drivers may test positive for multiple substances.

- Positive tests for cannabinoids or THC among at-fault drivers were lower than other tested substances from 2018 to 2021.
- In 2020, there were no fatal crashes where the at-fault driver tested positive for cannabis.
- The number of fatal traffic crashes where cannabis was involved should be interpreted with caution. All persons killed in traffic crashes are examined by the Office of the Chief Medical Examiner; however, standard toxicology testing does not include cannabis.

Impaired Driving Traffic Arrests

Data on drug-involved traffic arrests includes impairment by any controlled substance. Cannabis is not differentiated in this data source due to difficulty verifying whether impairment was due to cannabis. Drug or controlled substance arrests include all arrests with code TA-21-902-C and TA-21-902-D, as defined by Maryland Transportation Section 21-902.

Figure 41: Number of Arrests for Impaired Driving Due to Controlled Substances in Maryland (2018-2021)



Source: District Court of Maryland Arrest Report. Note: Code TA- 21-902 C includes impaired driving due to drugs or drugs and alcohol.

- Drug/controlled substance-related traffic arrests decreased each year from 2018 to 2021.
- The reason for the decrease in 2020 and 2021 is not clear. The COVID-19 pandemic may be an important factor.

Cannabis-Impaired Driving Assessments

Drug recognition experts (DREs) evaluate drivers for impairment due to drugs other than alcohol. If the DRE evaluation is positive for drugs, the DRE will identify the category(s) of drug(s), based on shared patterns of effects, causing the impairment. The DRE evaluation typically occurs following an impaired driving arrest by a non-DRE officer who suspects drug impairment. Drug impairment is usually suspected when the impairment is not consistent with the driver's alcohol level as determined by a chemical test. A DRE evaluation may not be conducted if there is no DRE-certified officer available in that location or at the time. Since changes over time in the number of DRE officers statewide could influence the numbers of completed DRE evaluations, percentages of assessments are reported here to help make data comparable over time.

Table 1: Number and percent of cannabis-impaired driving assessments by DREs in Maryland (2017-2021)

	2017	2018	2019	2020	2021	Trend
Number of DRE assessments	695	863	1192	1124	1035	↑
Number of cannabis-positive assessments	134	186	244	231	201	↑
Percent of cannabis-positive assessments	19	22	20	21	19	↔

- The number of DRE assessments in which a formal opinion was issued of cannabis impairment has increased since 2017. However, the percentage of cannabis-positive assessments remained steady during this time – between 19 and 22 percent.
- Monitoring the percentage of cannabis-positive assessments helps account for changes in the number of DRE officers and number of completed assessments each year. In 2017, there were 695 DRE assessments (the lowest number of assessments during this period). The highest number of assessments took place in 2019 with 1192 DRE assessments.
- In 2021, cannabis was the fourth most common drug category identified by DREs. The most identified drug categories were: (1) "polysubstance" (n=439, 42 percent), (2) narcotic analgesic (n=405, 39 percent), and (3) depressants (n=295, 29 percent), cannabis (n=201, 19 percent), stimulants (n=181, 17 percent). Data not shown.[25]

Accidental Poisonings

Children, adults, and pets can mistake cannabis products, particularly edibles, for regular food or candy. Accidental consumption of cannabis can result in serious illness, particularly for children. Symptoms of cannabis-related poisoning in children can include problems walking and sitting up as well as difficulty breathing.[26] Since cannabis has been legalized in numerous states, accidental poisonings in children have increased, sometimes requiring visits to the emergency room or hospitalization.[27],[28]

The Maryland Poison Center (MPC) categorizes cannabis-related calls by product type, reason for exposure, age of exposed person, and outcome. Health-General Article, Title 13, Subtitle 44 requests data on calls to MPC in individuals under age 21. However, data in this report are presented for individuals under age 20 due to the existing age bands established by the National Poison Center (i.e., 0-5 years, 6-12 years, 13-19 years, 20-29 years, etc.).

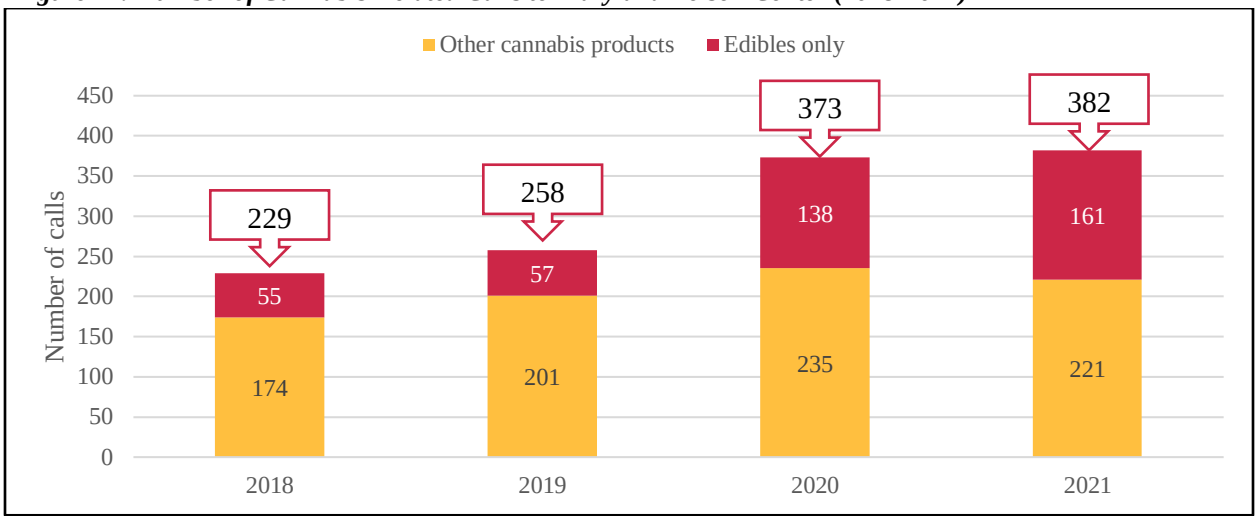
[25] 2021 Annual Report of International Association of Chiefs of Police Drug Evaluation and Classification Program. State of Maryland pg. 28.

[26] Centers for Disease Control and Prevention (CDC) Marijuana Poisoning, Retrieved February 16, 2023, https://www.cdc.gov/marijuana/health-effects/poisoning.html

[27] Calls to MPC may not represent the full scope of accidental cannabis-related poisonings in the state. Residents need to be (1) aware of the service and (2) willing to use it – i.e., not fear punitive action. Other states that have legalized adult use have reported increased call volumes after legalization, which may result in part from reduced concern with contacting poison centers for an adverse event or poisoning in a minor.

[28] JR Richards et al., *Unintentional cannabis ingestion in children: a systematic review*. The Journal of Pediatrics (2017) 190:142-152. https://doi.org/10.1016/j.jpeds.2017.07.005

Figure 42: Number of Cannabis-Related Calls to Maryland Poison Center (2018-2021)

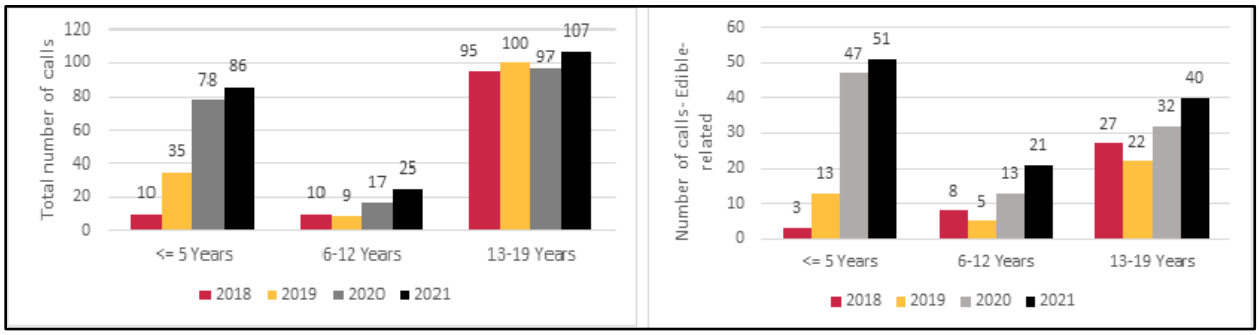


Source: Maryland Poison Control (MPC) 2018-2021

- The number of cannabis-related calls to Maryland Poison Center have increased from 2018 to 2021.
- Between 2019 to 2020, there was a 31 percent increase in cannabis-related calls, from 258 to 373, respectively.
- The number of cannabis-related calls due to edibles has increased since 2018.
- Beginning in 2020, there was a shift with an increase in calls related to edibles. In 2020 and 2021, edibles accounted for about 40 percent of all cannabis-related calls.

Figure 43: Number of Cannabis-Related Calls to Maryland Poison Center for Youth Under Age 20 (2018-2021)

Total Calls *Edible-related Calls*

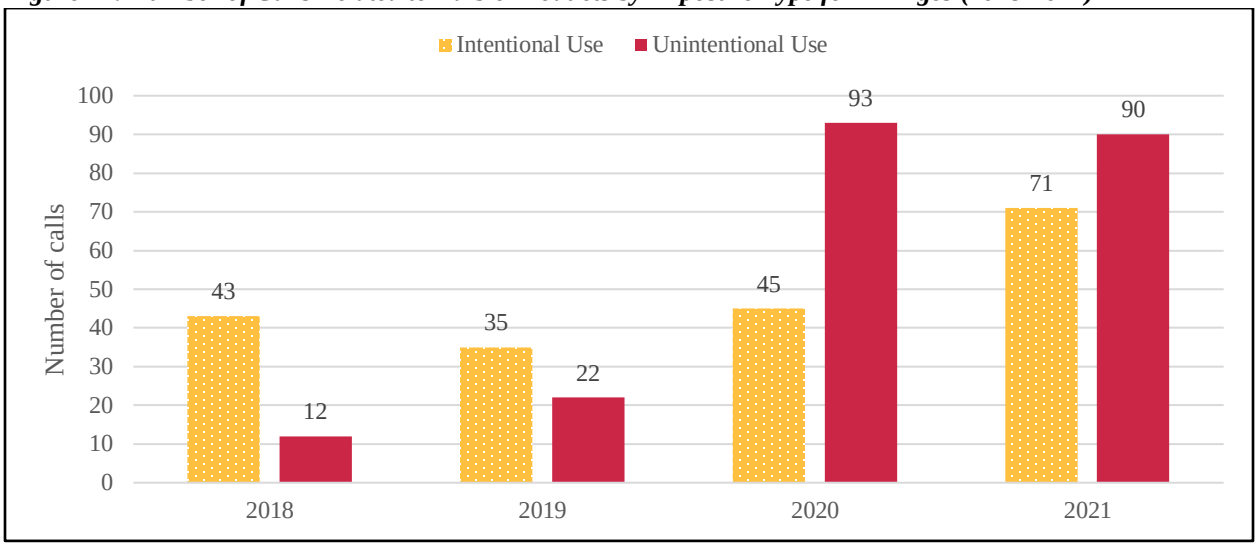


Source: Maryland Poison Control (MPC) 2018-2021

Note: Maryland Poison Center follows national data collection standards, which specify categories including age bands. Age 20 is included in the 20-29-year age band. Youth data reported here is for youth 19 and under.

- From 2018 to 2021, cannabis-related calls to MPC increased in all youth age groups (<5, 6 to 12, 13 to 19 years), with a steep increase among children under age five (5).
- Similarly, from 2018 to 2021, calls related to edibles increased for each age group, with the most pronounced increase in children under age five (5).
- The increase in edible-related calls to MPC was observed prior to the start of edible product sales through the medical cannabis program in April 2021.

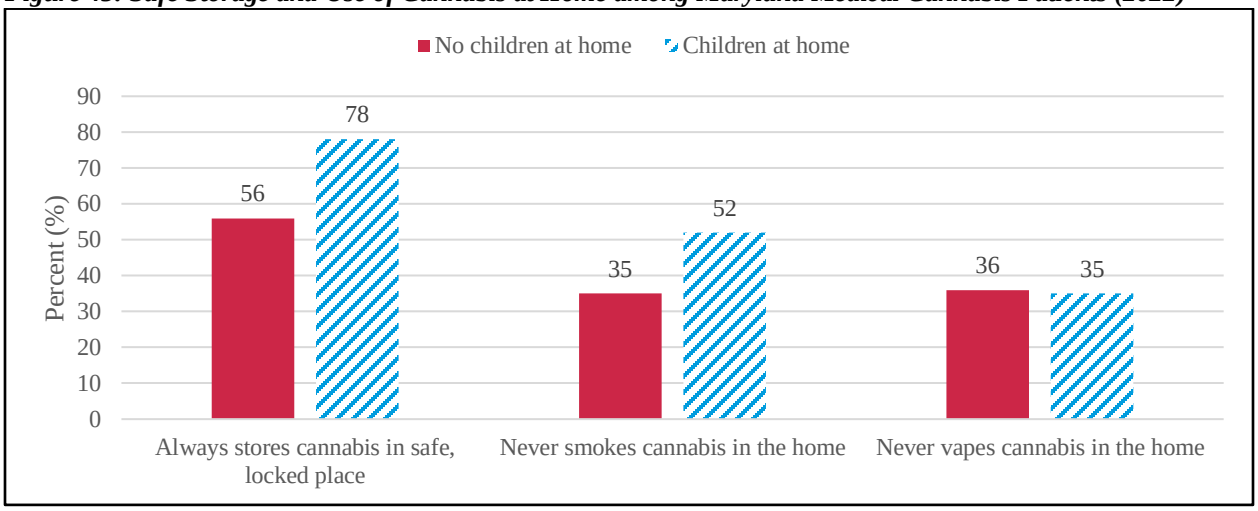
Figure 44: Number of Calls Related to Edible Products by Exposure Type for All Ages (2018-2021)



Source: Maryland Poison Control (MPC) 2018-2021
Note: The exposure categories were created by combining all "intentional" and "unintentional" sub-categories within the MPC dataset.

- Calls resulting from intentional and unintentional edible ingestion increased from 2018 to 2021.
- Unintentional exposures increased to a greater extent.

Figure 45: Safe Storage and Use of Cannabis at Home among Maryland Medical Cannabis Patients (2022)



Source: MMCPS-22

<u>Question</u>: Survey respondents were asked, in the past year, how often did you engage in each of the following? (1) I smoked cannabis inside my house, (2) I vaped cannabis inside my house, (3) I stored cannabis in a locked, safe location.

- More medical cannabis patients with children under age 18 always safely store cannabis than those without children in the home.
- More medical cannabis patients with children at home avoided smoking in the home than patients without children.

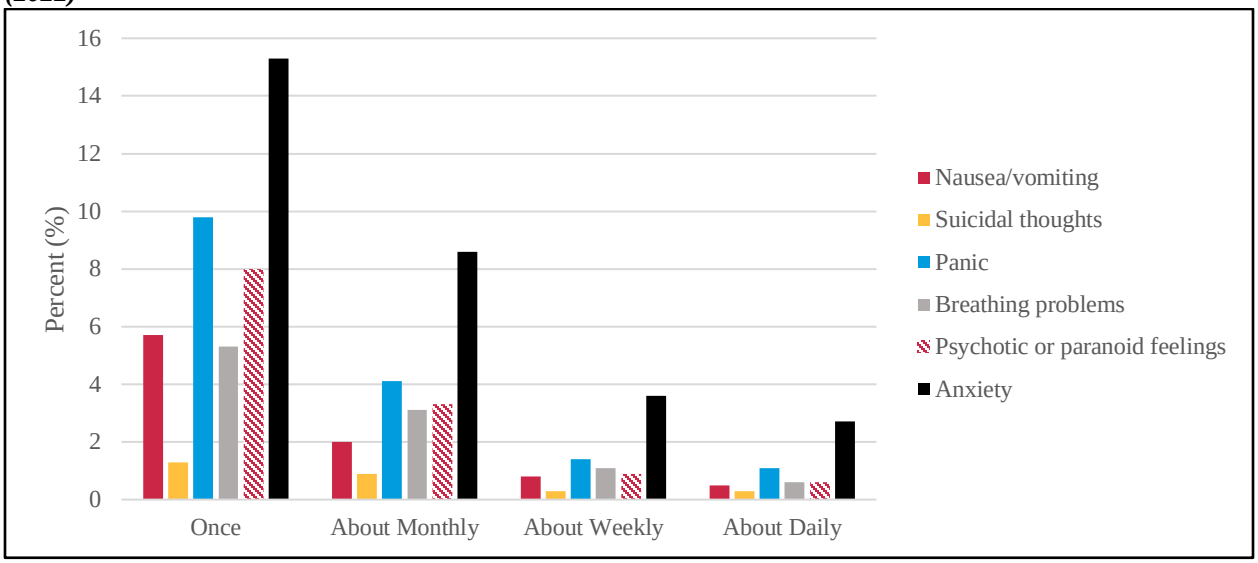
- The percentage of medical cannabis patients that vaped in the home was approximately the same in patients with and without children in the home.
- As only half of patients with children reported never smoking at home and just over one-third reported never vaping at home, there is room for improvement (i.e., public education/awareness) to increase the percentages of adults who never smoke or vape cannabis indoors around children.

Adverse Reactions

There are several potential adverse reactions associated with cannabis consumption, including anxiety, panic, paranoia, nausea/vomiting, and breathing problems.

Adverse reactions were collected from medical cannabis patients in the 2022 Maryland Medical Cannabis Patient Survey (MMCPS-22).

Figure 46: Adverse Reactions to Cannabis Consumption in the Past Year among Medical Cannabis Patients (2022)



Source: MMCPS-22

<u>Question</u>: Survey respondents were asked if they experienced the following conditions when consuming cannabis, and if so, how often?

- Adverse reactions from cannabis consumption were generally uncommon in this sample of medical cannabis patients.
- Of those with adverse events, most occurred just one time in the past year.
- Anxiety was the most reported adverse reaction, followed by panic and psychotic or paranoid feelings.

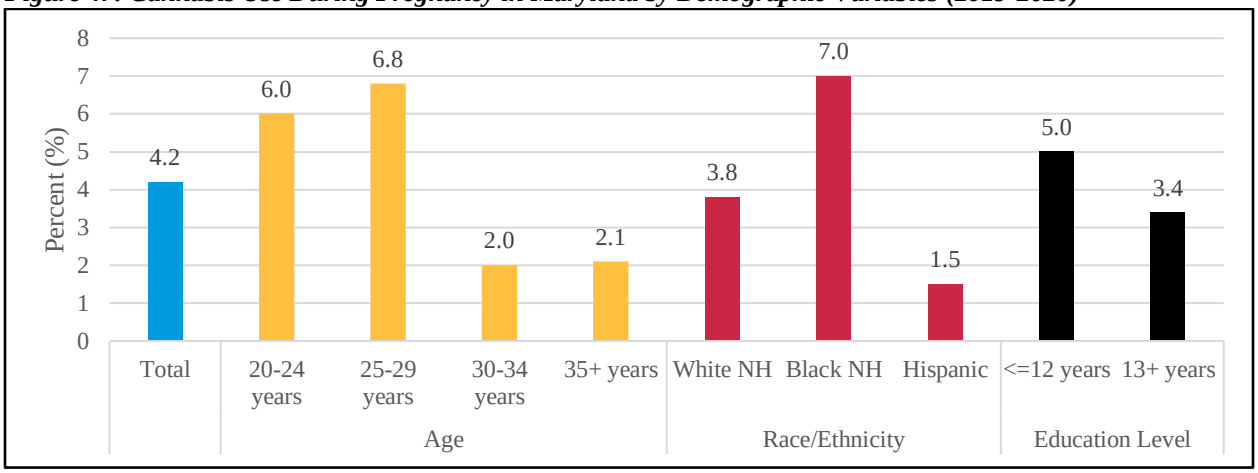
Cannabis Use in Pregnancy

Cannabis is one of the most widely used substances during pregnancy in the United States. Data from the 2020 National Survey on Drug Use and Health (NSDUH) showed that 8 percent of pregnant persons ages 15 through 44 years of age reported use of cannabis in the past month – an increase from 5.4 percent in 2019.[29] Cannabis crosses the placenta, as well as passes into breast milk, resulting in fetal and neonatal exposure.[30] The American College of Obstetrics and Gynecologists and the American Academy of Pediatrics recommend refraining from cannabis use during pregnancy and lactation.[31],[32]

Data sources:

- The Maryland Pregnancy Risk Assessment Monitoring System (PRAMS) collects population-based data on experiences and behaviors among persons before, during, and after pregnancy. Cannabis use during pregnancy was collected for the first time in 2019. Experts note that self-report survey data, even when anonymous, may underestimate the true prevalence of cannabis use among pregnant persons, due to fear of legal consequences as well as stigma.
- The 2022 Maryland Medical Cannabis Patient Survey included 106 pregnant or breastfeeding persons (<1 percent of the survey sample). Given the small sample size of pregnant persons, caution is needed in interpreting the data. Additionally, due to small numbers, cannabis dose could not be measured.

Figure 47: Cannabis Use During Pregnancy in Maryland by Demographic Variables (2019-2020)



Source: Maryland Pregnancy Risk Assessment Monitoring System (PRAMS 2019-2020)
Other race categories were not included due to small counts. NH refers to non-Hispanic.

[29] Substance Abuse and Mental Health Services Administration (SAMHSA). Center for Behavioral Health Statistics and Quality. 2019 and 2020 National Survey on Drug Use and Health Releases: Women. Retrieved February 16, 2023, https://www.samhsa.gov/data/nsduh/national-releases

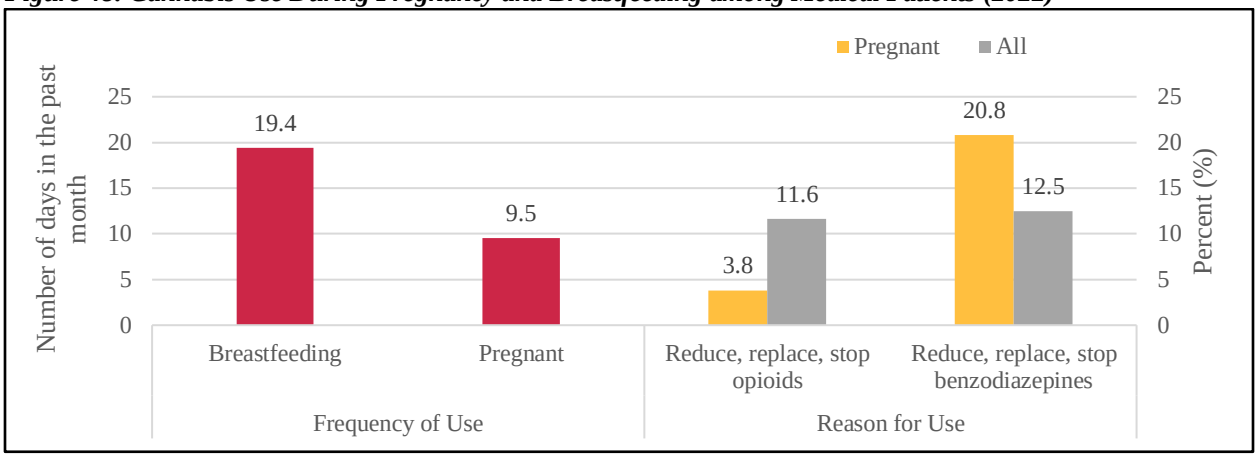
[30] TD Metz et al, *Marijuana Use in Pregnancy and While Breastfeeding*. Obstet Gynecol. (2018) 132(5):1198-1210. https://doi.org/10.1097/AOG.0000000000002878.

[31] American College of Obstetricians and Gynecologists Committee on Obstetric Practice. Committee opinion no. 722: *Marijuana use during pregnancy and lactation.* Obstet Gynecol (2017)130: e205–9.

[32] SA Ryan et al., *Committee on Substance Use and Prevention; Section on Breastfeeding. Marijuana use during pregnancy and breastfeeding: implications for neonatal and childhood outcomes.* Pediatrics (2018) 142: e20181889A https://doi.org/10.1542/peds.2018-1889.

- Overall, about four (4) percent of individuals reported using cannabis during their most recent pregnancy.
- Cannabis use during pregnancy was higher in individuals under age 30, Black, non-Hispanic residents, and people with less than 12 years of education (i.e., did not complete high school).

Figure 48: Cannabis Use During Pregnancy and Breastfeeding among Medical Patients (2022)



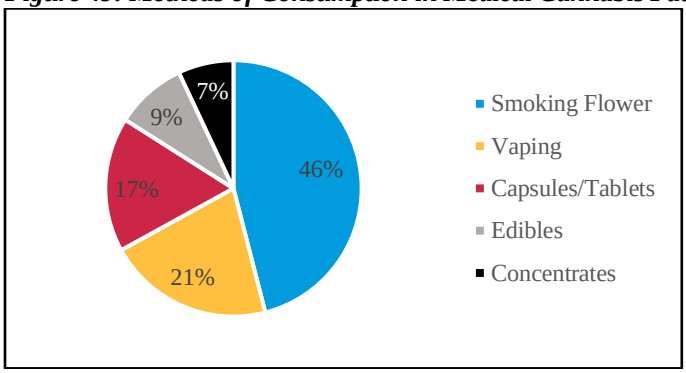
Source: MMCPS-22

Responses are calculated from 106 survey participants (0.9 percent) who reported being currently pregnant or breastfeeding and consuming cannabis.

<u>Question</u>: Survey participants were asked (1) how many days in the past month they used cannabis and (2) whether they used cannabis in the past year to reduce, replace, or stop use of opioids or benzodiazepines.

- Medical patients who were breastfeeding reported use of cannabis twice as many days compared to those who were pregnant (19.4 versus 9.5 days per month).
- More medical patients who were pregnant or breastfeeding reported using cannabis to reduce, replace, or stop use of benzodiazepines compared to the entire sample population of medical patients. The reverse was true for opioids; more patients who were not pregnant or breastfeeding reported using cannabis to reduce, replace, or stop use of opioids compared to those who were pregnant or breastfeeding.
- In the comments field of the MMCPS-22, several participants reported use of cannabis to reduce, replace, or stop use of alcohol. This behavior will be assessed in future patient surveys.

Figure 49: Methods of Consumption in Medical Cannabis Patients who are Pregnant or Breastfeeding (2022)



Source: MMCPS-22

- Among medical cannabis patients who were pregnant or breastfeeding, smoking was the most common method of consumption. Increased risks are associated with combustible products.
- Concentrates were the least commonly reported method of consumption.

Chapter Summary

Driving Behaviors

- About 20 percent of young adults (18 to 25 years) report driving within three hours of cannabis consumption in the past month. Younger adults (18 to 20 years) and males were more likely to drive within three hours of cannabis use, and males were more likely to frequently drive after cannabis use (7 or more times in the past month).

- About 20 percent of medical cannabis patients report driving within three hours of cannabis consumption. Data on cannabis and driving behaviors is expected to be collected for all Maryland adults beginning with the 2023 Maryland BRFSS.

- Between 2017 and 2021, the percent of cannabis-positive DRE assessments among drivers has been consistent, at approximately 20 percent of evaluations.

Poisonings

- Cannabis-related calls to poison control have increased since 2018.

- Among youth, total calls and calls related to edibles have increased since 2018, with the steepest increase among children under age five (5).

- Beginning in 2020, an increasing proportion of cannabis-related calls were attributed to edibles, and more edible calls were due to unintentional (i.e., accidental) exposures versus intentional ingestion.

- Though more medical cannabis patients with children at home safely store cannabis (i.e., always locking cannabis) compared to those without children (78 vs. 56 percent, respectively), a significant number of medical patients with children in the home smoke/vape cannabis indoors and do not lock up their cannabis.

Pregnancy/Breastfeeding

- In 2019-2020, about four percent of women reported using cannabis during their most recent pregnancy. Cannabis use was higher in women under age 30, Black, non-Hispanic women and women with less than 12 years of education (i.e., less than high school).

- Among medical cannabis patients who were also pregnant or breastfeeding at the time of the survey, smoking was the most common method of consumption and the frequency of use was higher in breastfeeding compared to pregnant persons.

Chapter IV: Health Services Utilization

Introduction

This chapter covers health-care services utilization (e.g., hospitalizations, ED visits) and problematic cannabis use. These data help inform the short and long-term risks associated with cannabis use.

Hospitalizations and Emergency Department (ED) Visits

Adverse reactions to cannabis and/or cannabis intoxication can be serious enough to warrant hospitalization and/or emergency care. Reactions can include paranoia,[33] memory problems, altered sense of perception time,[9,34] and vomiting.[35]

In this report, diagnosis codes assigned by providers were used to measure the number of cannabis-related hospitalizations and ED visits. For each hospitalization and ED visit, there is a "primary diagnosis", as well as "other" diagnoses (noted here as, "any cannabis" diagnoses) that provide details about the hospital encounter. The diagnosis codes are defined in Appendix C.

Table 2: Comparison of Primary Cannabis Diagnosis Versus Any Cannabis Diagnosis Codes (2018-2021)

	Hospitalizations				ED Visits			
	2018	2019	2020	2021	2018	2019	2020	2021
Primary Cannabis Diagnosis Code	218	246	191	129	1,880	2,203	2,213	2,140
Any Cannabis Diagnosis Code	19,760	18,437	17,815	17,797	31,817	32,520	26,861	23,894

Source: HSCRC 2018-2021

- From 2018 to 2021, fewer than 250 residents were hospitalized each year due to cannabis (i.e., cannabis was the primary diagnosis for that hospital encounter).
- From 2019 to 2021, hospitalizations due to cannabis (i.e., primary cannabis diagnosis) decreased, while ED visits with a primary cannabis diagnosis have remained relatively constant.
- In 2021, cannabis was the primary reason for less than one (1) percent of hospitalizations and less than nine (9) percent of ED visits where any cannabis code was used.
- Since 2019, ED visits and hospitalizations with any cannabis diagnosis have decreased, with ED visits falling more sharply.
- COVID-19 may have impacted hospitalizations and ED visits in 2020 and 2021.

[33] Arendt, M., et al. *Testing the self-medication hypothesis of depression and aggression in cannabis-dependent subjects*. Psychological Medicine (2007): 37(7), 935-945. https://doi.org/10.1017/S0033291706009688 .
[34] M. Sexton et al. *A Survey of Cannabis Acute Effects and Withdrawal Symptoms: Differential Responses Across User Types and Age*. The Journal of Alternative and Complementary Medicine. (2019) 326-335.http://doi.org/10.1089/acm.2018.0319.
[35] N. Khattar et al., *Emergency Department Treatment of Cannabinoid Hyperemesis Syndrome: A Review*. American Journal of Therapeutics (2018) 25(3): e357-e361. https://doi.org/10.1097/MJT.0000000000000655 .

Table 3: Number of Hospitalizations and ED Visits with Any Cannabis Diagnosis Code by Age Group (2018-2021)

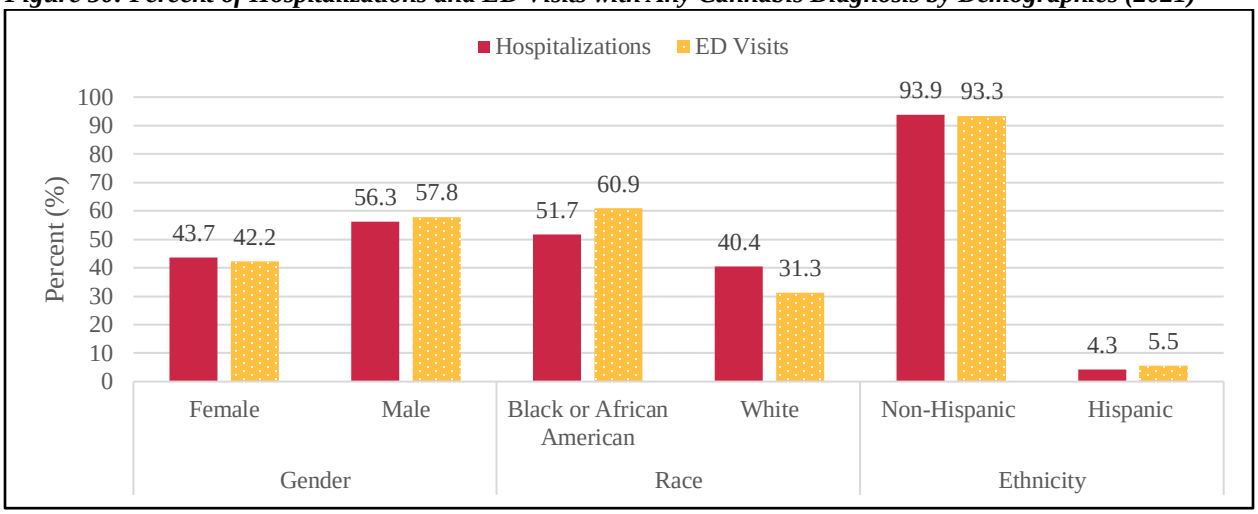
	Hospitalizations					ED Visits				
Age	2018	2019	2020	2021	Trend	2018	2019	2020	2021	Trend
0-12	163	644	787	960	↑	42	62	68	95	↑
13-20	1,893	1,719	1,640	1,557	↓	4,847	4,659	3,674	3,402	↓
21-55	14,614	13,151	12,651	12,500	↓	24,272	24,995	20,723	18,143	↓
56+	3,090	2,923	2,737	2,780	↓	2,656	2,804	2,396	2,254	↓
All Ages	19,760	18,437	17,815	17,797	↓	31,817	32,520	26,861	23,894	↓

Source: HSCRC 2018-2021

Trend captures direction of change in total Hospitalizations or ED visits from 2018-2021.

- In all age groups except for 0 to 12 years, the number of hospitalizations with any cannabis diagnosis have decreased from 2018 to 2021.
- Hospitalizations with any cannabis diagnosis have increased almost 600 percent from 2018 to 2021 in children ages 0 to 12 years.
- Each year, there were less than 100 ED visits with any cannabis diagnosis in 0 to 12-year-olds; however, from 2018 to 2021, ED visits doubled in this age group.

Figure 50: Percent of Hospitalizations and ED Visits with Any Cannabis Diagnosis by Demographics (2021)

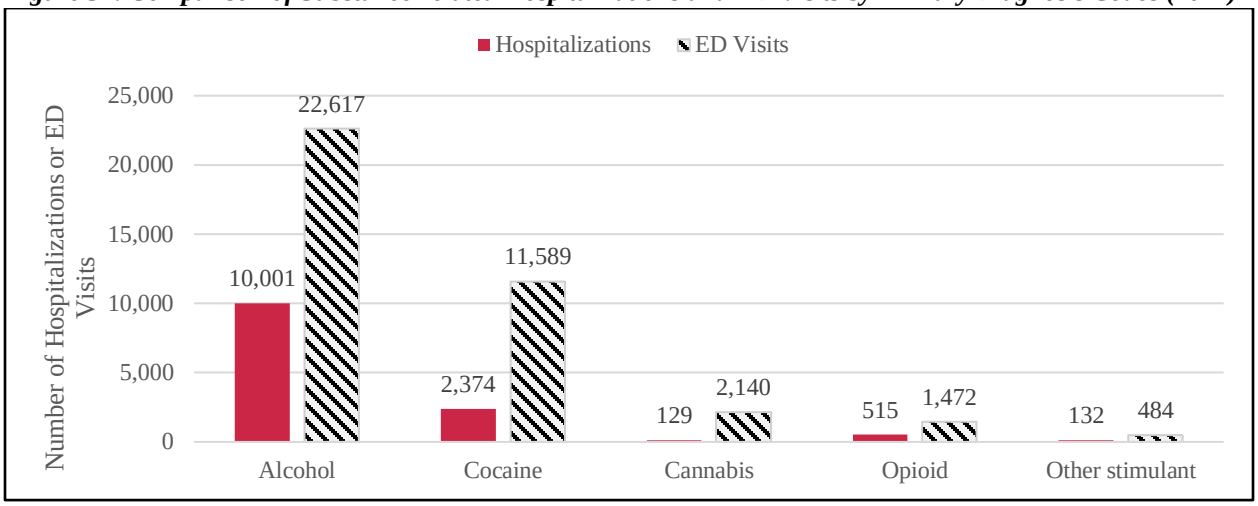


Source: HSCRC 2021

Note: This figure highlights key demographics and will not add to 100 percent due to space and content. The full representation of demographics is available in the Appendix C.

- Males accounted for more hospitalizations and ED visits with any cannabis diagnosis than females.
- More than half of hospitalizations and over 60 percent of ED visits with any cannabis diagnosis were among Black or African Americans.
- Non-Hispanic persons accounted for most hospitalizations and ED visits with any cannabis diagnosis.

Figure 51: Comparison of Substance-related Hospitalizations and ED Visits by Primary Diagnosis Codes (2021)



Source: HSCRC 2021

- In 2021, hospitalizations and ED visits due to alcohol outnumbered hospitalizations due to cocaine, cannabis, opioids, or other stimulants.
- In 2021, there were approximately 20 times more hospitalizations and 10 times more ED visits with a primary alcohol diagnosis compared to a primary cannabis diagnosis.

Table 4: Emergency Department/Urgent Care Visits in the Past Year among Medical Cannabis Patients (2022)

	Cannabis-related (%)	Any reason (%)
Zero times	98.3	84.6
Once	0.7	11
Twice	0.2	2.5
Three times	0.1	0.6
More than three times	0.1	0.6

Source: MMCPS-22

Question: Participants were asked, During the past year, how many times were you treated in an emergency room or urgent care facility for any reason related to cannabis consumption? Were you admitted to the hospital in the past year for any reason?

- Overall, about one (1) percent of medical cannabis patients reported any ED visits related to cannabis in the prior year.
- Close to 15 percent of medical patients were hospitalized for another reason.

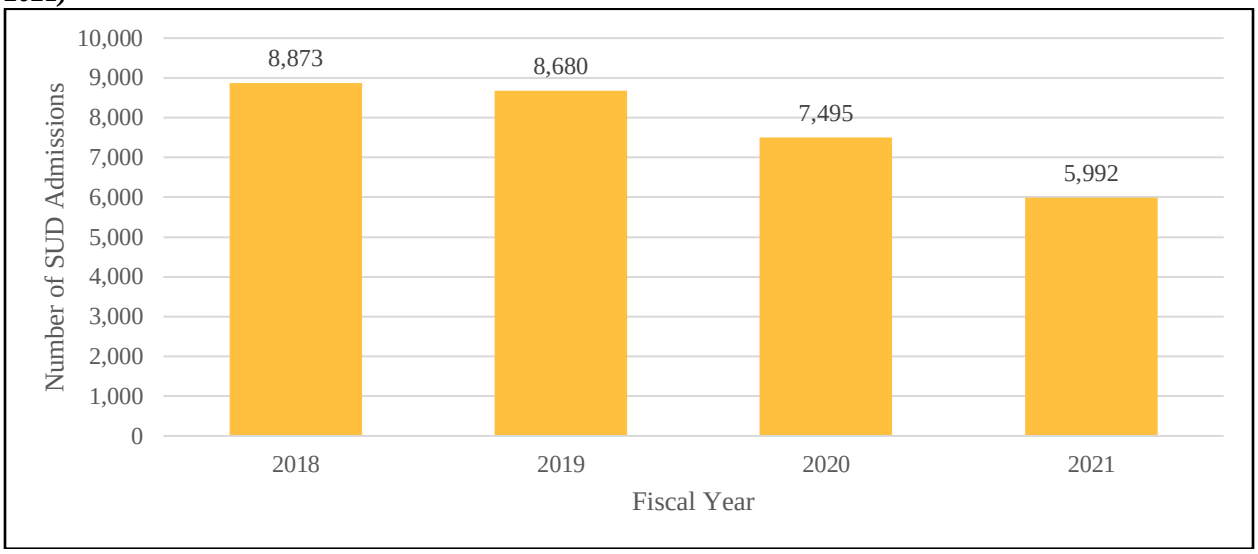
Problem Cannabis Use

Cannabis use disorder (CUD) is a problematic pattern of cannabis use that may include memory and attention impairments, which may affect work or school, preoccupation with obtaining, using, and getting over the drug's effects, as well as cravings and symptoms of withdrawal. In its most severe form, CUD can lead to addiction. Behavioral therapies (i.e., cognitive behavioral therapy) can help treat cannabis addiction.

Diagnosis of CUD involves meeting several criteria established by the Diagnostic and Statistical Manual (DSM) in a 12-month span. In recent years, a short form tool, Cannabis Use Disorder Identification Tests (CUDIT) has been developed for clinical applications to assess for CUD.[36] Questions adapted from the CUDIT were incorporated into the 2022 Maryland Medical Cannabis Patient Survey and are presented in this section. Data on substance use disorder (SUD) treatment admissions for cannabis use disorder are also presented.

Note: SUD treatment admissions data are limited to individuals who participate in public behavioral health services (PBHS) and do not represent all possible SUD treatment admissions in the state.

Figure 52: Number of SUD Treatment Admissions with Primary Diagnosis of Cannabis-Related Disorder (2018-2021)

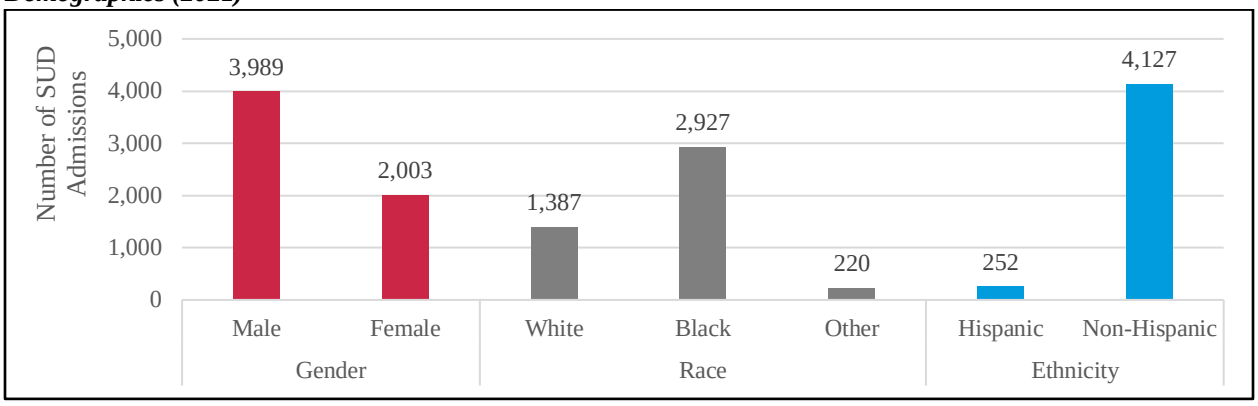


Source: BHA/PBHS 2018-2021

[36] M.O. Bonn-Miller et al. *Preliminary Development of a Brief Cannabis Use Disorder Screening Tool: The Cannabis Use Disorder Identification Test Short-Form.* Cannabis and Cannabinoid Research. (2016) 252-261. https://doi.org/10.1089/can.2016.0022.

- SUD treatment admissions with a primary diagnosis of cannabis related disorder have decreased from 2018-2021.
- It is unclear to what extent COVID-19 impacted the decline in SUD treatment admissions in 2020 and 2021.

Figure 53: Number of SUD Treatment Admissions with a Primary Diagnosis of Cannabis-Related Disorder by Demographics (2021)

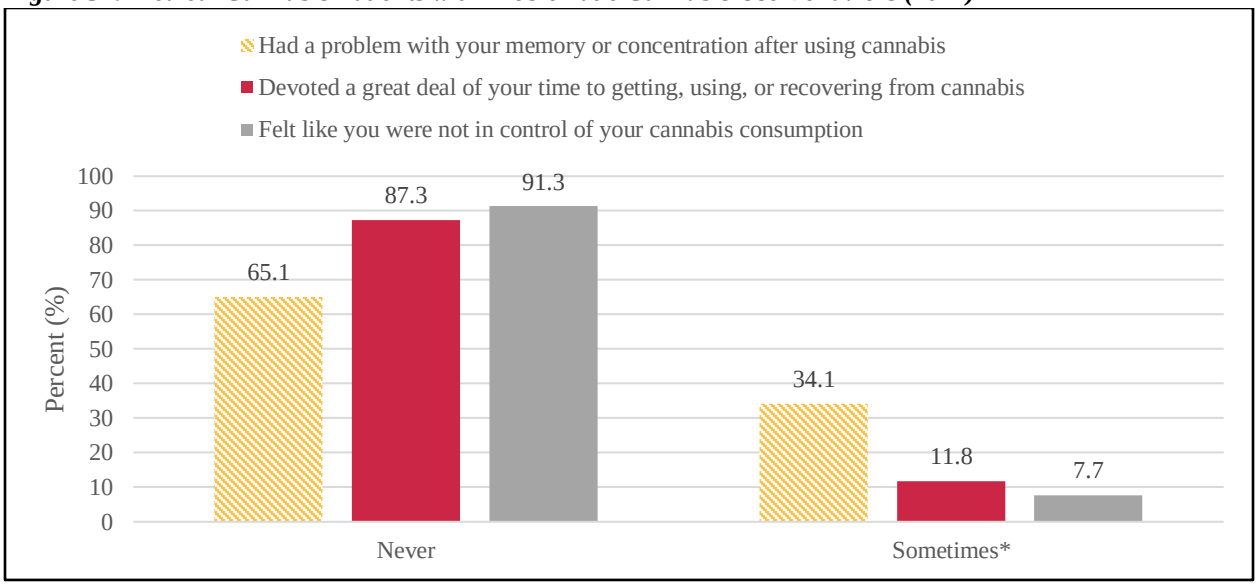


Source: BHA/PBHS 2021

Note: Over 1,400 people listed race and over 1,600 listed Ethnicity as "unknown" or "unspecified" (See Appendix E).

- In 2021, more male, Black/African American, and non-Hispanic residents received treatment for a cannabis-related disorder.
- Almost twice as many males than females received treatment for a cannabis-related disorder in 2021.

Figure 54: Medical Cannabis Patients with Problematic Cannabis Use Behaviors (2022)



Source: MMCPS-22

**Most participants responded with "never" or "sometimes." Other response options (about half the time, most of the time, always) were included in "sometimes."*

Question: Survey respondents were asked, how often in the past 6 months did you experience each of the following? 1) had a problem with your memory or concentration after using cannabis; 2) devoted a great deal of your time getting, using, or recovering from cannabis; 3) felt like you were not in control of your cannabis consumption.

- Most participants indicated "never" on all three of the problematic use questions.
- About one third of participants reported difficulty with memory or concentration after using cannabis.
- About 12 percent of participants reported spending a great deal of time getting, using, or recovering from cannabis and eight percent reported feeling they were not in control of their cannabis consumption.
- Because this survey measured only three potential indicators of problematic use, definitive conclusions about the prevalence of cannabis use disorders among this sample cannot be made.

Chapter Summary

- From 2018 to 2021, fewer than 250 Marylanders were hospitalized each year due to cannabis use (i.e., cannabis was the primary cannabis diagnosis code for that hospital encounter).
- From 2018 to 2021, the number of ED visits due to cannabis use (i.e., with a primary cannabis diagnosis) remained relatively constant at about 2,000 visits each year.
- From 2018 to 2021, hospitalizations and ED visits with any cannabis diagnosis increased in those ages 0 to 12 years.
- Substance use disorder (SUD) treatment admissions with a primary diagnosis of cannabis use disorder (CUD) have decreased since 2018. (Note: Data on SUD treatment admissions only include participants in Maryland Public Health Behavioral Services program).
- It is unknown what impact, if any, COVID-19 had on recent health services utilization for CUD.
- Eight (8) percent of medical cannabis patients reported feeling that they were not in control of their cannabis consumption and 12 percent devoted a great deal of time to getting, using, or recovering from cannabis. However, the prevalence of CUD in medical patients is not known. The MMCPS-22 measured only a subset of indicators of problematic use; therefore, specific conclusions about the scope of problematic use among medical patients cannot be made.

Appendices

Appendices A through E provide key indicators specified in Health-General Article, Title 13, Subtitle 44.

Appendix A: Patterns of Use (Frequency, Dosing, Methods, Perceptions)

Patterns of use are reported for individuals in specified age groups (under 18, 18 to 20, 21 to 55, 55+), as well as among pregnant and breastfeeding persons, where data is available.

Percent of Current (Past 30 Day) and Ever Use of Cannabis by Maryland Youth (Middle and High School); Maryland YRBS/YTS (2021-2022)

	Current Use		Ever Use	
	MS	HS	MS	HS
Jurisdiction				
Maryland	3.8	15	5.1	26
Allegany County	4.5	15.8	5.9	28.9
Anne Arundel County	3.4	15.9	4.3	26.2
Baltimore County	4.3	17.4	6.1	29.7
Calvert County	2.8	13.2	3.9	23.2
Caroline County	4.6	18.7	7	29.4
Carroll County	1.9	18.9	3	28.3
Cecil County	5.5	19.1	6.9	31.4
Charles County	3.8	14.7	5.8	25.5
Dorchester County	7.7	20.8	10.4	30.9
Frederick County	2.9	13.6	3.5	23
Garrett County	2.2	19.5	3	28.8
Harford County	3.3	16.2	4.4	25.8
Howard County	1.7	10.2	2	19.6
Kent County	4	21.6	7.1	34.8
Montgomery County	2.1	11.9	3	22.7
Prince Georges County	5.6	14.1	7.2	25
Queen Anne's County	1.7	20.3	3.3	29.5
Saint Mary's County	3.8	13	5.8	22.7
Somerset County	9.5	20.8	11	32.8
Talbot County	5.4	18.1	4.2	29.1
Washington County	4.3	17.3	5.9	27.1
Wicomico County	5.4	17.1	8.1	30.4
Worcester County	6.3	16.8	7.4	27.9
Baltimore City	6.2	*	8.6	*
Gender				
Female	4.1	16.2	6.1	28.5
Male	3.4	13.6	4.2	23.2
Sexual Identity				

	Current Use		Ever Use	
	MS	HS	MS	HS
Heterosexual	*	13.3	*	23.8
Gay or Lesbian	*	22	*	35.2
Bisexual	*	25.4	*	40.4
Race/Ethnicity				
Black/African American	4.6	15.9	6.7	27.5
Asian	0.9	5.7	0.9	9.8
White	2.5	15.2	3.7	26.3
Hispanic/Latino	4.7	14.1	5.9	25.8
Multiracial	5.9	20.2	8.5	32.9
Native American/Alaska Native, Native Hawaiian/Other Pacific Islander	2.7	20.3	2.6	30.8
Grade				
6	2.2	*	2.1	*
7	3.4	*	4	*
8	5.5	*	8.8	*
9	*	8.2	*	13.8
10	*	12.7	*	22.7
11	*	18.2	*	30.7
12	*	22.4	*	39

*Data not collected or suppressed
Baltimore City data was not available at time of report preparation.
MS refers to Middle School; HS refers to High School

Percent of Current (Past 30 Day) Cannabis Use Among Maryland Adults; Maryland BRFSS 2018-2021

	2018	2019	2020	2021
Maryland	7.9	9.6	9.2	9
Allegany County	7.8	7.1	*	7.8
Anne Arundel County	8.2	8.6	9.6	7.8
Baltimore County	8.9	11.3	11.9	10.5
Calvert County	*	9.3	*	*
Caroline County	*	*	*	*
Carroll County	*	8.2	9.0	*
Cecil County	9.8	6.9	5.9	9.7
Charles County	6.7	10.6	5.9	6.8
Dorchester County	*	*	*	*
Frederick County	9.8	9.6	8.7	9
Garrett County	*	*	10.9	*
Harford County	8.7	9.8	6.9	9.8
Howard County	3.7	8.4	4.2	6.1
Kent County	*	*	*	*
Montgomery County	6.2	6.4	6.5	7.1
Prince Georges County	7.8	7.7	8.1	8.7

	2018	2019	2020	2021
Queen Anne's County	5.4	12.1	8.7	7.8
Saint Mary's County	5.3	9.7	6.2	*
Somerset County	*	*	*	*
Talbot County	7.8	*	7.6	*
Washington County	5.7	7.4	10.1	10.6
Wicomico County	8.2	17.9	14.6	10.9
Worcester County	*	*	14.1	11.7
Baltimore City	11.8	18.2	17.0	14.7
Age				
18-20	21.8	16.3	17.4	16.7
21-55	9.7	12.7	11.9	11.8
55+	3.7	4.5	4.6	4.4
Gender				
Female	9.7	11.6	12	10.1
Male	6.3	7.8	6.8	8
Race/Ethnicity				
White	7.7	9.2	8.4	9.7
Black	10.1	12.5	11.7	10.9
Asian	3.5	4.3	4.7	1
Hispanic	4.7	5.9	7.7	5.8
Other	9.9	13.3	7.4	13
Education				
High School or Less	9.9	11.3	11.4	10.7
At least some college/technical	6.8	8.8	8.1	8.2

*Data suppressed due to sample size.

Percent of Cannabis Use During Most Recent Pregnancy; Maryland PRAMS 2019-2020

	2019-2020
Age	
<20 years	*
20-24 years	6
25-29 years	6.8
30-34 years	2
35+ years	2.1
Race and Ethnicity	
White NH	3.8
Black NH	7
Hispanic	1.5
Asian	0
Other	*

	2019-2020
Education	
<=12 years	5
13+ years	3.4
Total	4.2

Estimated Dose (mg/THC) per Sitting Among Medical Cannabis Patients by Product Type; MMCPS-22

Product Type	Dose (mg/THC)
All Methods	22.5
Edible	8
Vape	8.9
Flower	150
Concentrate	225.1

Usual Method of Cannabis Consumption Among High School Students Who Currently Use Cannabis (percent); Maryland YRBS/YTS 2021-2022

	2021-2022
Smoked it	60
Ate it	15
Vaporized it	14
Drank it	3
Dabbed it	5
Some other way	4

Usual Method of Current Cannabis Consumption among Maryland Adults (percent); Maryland BRFSS 2018-2021

	2018	2019	2020	2021
Smoke it	79.2	71.8	72	67.3
Eat it	6.4	9.1	15.1	16.4
Vaporize it	10.2	14.3	7.4	10.9
Some Other Way	*	2.6	*	*

*Data not reported.

Perceptions of “Great Risk” from Smoking Cannabis Monthly Among Marylanders Ages 12+; (percent) Maryland NSDUH 2015-2020

	2015-16	2016-17	2017-18	2018-19	2019-20
Youth (under 18)	26.2	26.2	23.3	21.6	21.4

	2015-16	2016-17	2017-18	2018-19	2019-20
Young adult (18-25)	11.6	12.7	12.3	12.9	13.9
Adult (26+)	28.11	26.9	27.0	27.5	24.0

Appendix B: Impaired Driving

Number of Drug and Alcohol-Impaired Fatal Traffic Crashes in Maryland by Year; FARS (2018-2021)

	2018	2019	2020	2021
Drug-impaired	37	33	29	34
Alcohol-impaired	129	167	183	163

Number of Arrests for Impaired Driving Due to Drugs/Controlled Dangerous Substances in Maryland; District Court of Maryland Arrest Report (2018-2021)

	2018	2019	2020	2021
Arrests	1,105	1,053	767	604

Number and Percent of Cannabis-Impaired Driving Assessments by DREs in Maryland; Annual Report of International Association of Chiefs of Police Drug Evaluation and Classification Program (2017-2021)

	2017	2018	2019	2020	2021
Number of DRE assessments	695	863	1,192	1,124	1,035
Number of cannabis-positive assessments	134	186	244	231	201
Percent of cannabis-positive assessments	19	22	20	21	19

Appendix C: Hospitalizations Related to Cannabis Use

Number of Cannabis-Related Hospitalizations by Demographics; HSCRC 2018-2021

	2018	2019	2020	2021
Maryland	19,760	18,437	17,815	17,797
Allegany	544	491	478	397
Anne Arundel	1,196	884	844	927
Baltimore	2,579	2,674	2,650	2,680
Baltimore City	5,363	4,944	4,730	4,327
Calvert	249	224	234	191
Caroline	80	41	41	59
Carroll	341	319	361	368
Cecil	310	300	285	293
Charles	209	248	208	222
Dorchester	109	93	69	86
Frederick	686	623	620	441

	2018	2019	2020	2021
Garrett	70	49	55	67
Harford	713	714	646	749
Howard	437	439	461	440
Kent	45	52	28	42
Montgomery	1,314	1,431	1,488	1,537
Prince George's	2,355	1,872	1,793	2,012
Queen Annes	88	58	56	55
Saint Mary's	160	169	189	228
Somerset	71	91	64	86
Talbot	84	40	40	51
Washington	728	802	783	770
Wicomico	469	432	335	366
Worcester	165	131	107	136
Gender				
Female	8,208	7,821	7,650	7,774
Male	11,552	10,615	10,161	10,021
Unknown	*	*	*	*
Age				
0-12	163	644	787	960
13-20	1,893	1,719	1,640	1,557
21-55	14,614	13,151	12,651	12,500
56+	3,090	2,923	2,737	2,780
Payer				
Charity/Self-Pay	542	591	538	437
Commercial	4,129	4,069	3,881	4,175
Medicaid	11,175	9,952	9,688	9,586
Medicare	3,195	2,947	2,819	2,748
Other	719	878	889	851
Race				
American Indian or Alaska Native	41	36	24	36
Asian	128	131	104	108
Black or African American	10,341	9,342	9,061	9,197
Declined to Answer	110	124	237	237
Other	647	675	722	773
Two or More	165	163	168	162
Unknown	132	146	118	91
White	8,196	7,820	7,381	7,193
Ethnicity				
Declined to Answer	42	87	237	249
Non-Hispanic Origin	18,643	17,388	16,750	16,709
Spanish/Hispanic Origin	613	665	683	759
Unknown	462	297	145	80

** Cell size =< 10 is suppressed*

Note: Data reflect any/all cannabis diagnoses rather than primary cannabis diagnosis.

Number of Cannabis-Related ED Visits by Demographics; HSCRC 2018-2021

	2018	2019	2020	2021
Maryland	31,817	32,520	26,861	23,894
Allegany	243	314	414	295
Anne Arundel	1,815	1,130	1,015	945
Baltimore	2,769	2,774	2,619	2,349
Baltimore City	10,809	10,422	7,615	6,038
Calvert	413	645	533	825
Caroline	52	77	85	103
Carroll	231	407	294	245
Cecil	372	350	254	244
Charles	317	633	255	388
Dorchester	125	215	182	173
Frederick	337	328	309	299
Garrett	27	19	29	77
Harford	855	715	519	543
Howard	893	1,529	664	416
Kent	45	58	399	120
Montgomery	2,563	2,740	2,597	2,352
Prince George's	4,904	4,935	4,508	3,406
Queen Annes	103	133	152	147
Saint Mary's	448	440	300	310
Somerset	131	139	81	186
Talbot	88	97	92	84
Washington	658	610	774	697
Wicomico	738	628	455	952
Worcester	179	174	124	276
Gender				
Female	12,365	12,677	10,586	10,091
Male	19,451	19,843	16,274	13,800
Unknown	*	*	*	*
Age				
0-12	42	62	68	95
13-20	4,847	4,659	3,674	3,402
21-55	24,272	24,995	20,723	18,143
56+	2,656	2,804	2,396	2,254
Payer				
Charity/Self-Pay	3,464	3,570	3,195	1,995
Commercial	6,245	6,545	5,527	5,392
Medicaid	18,174	17,905	14,173	13,030
Medicare	2,992	3,048	2,354	2,078
Other	942	1,452	1,612	1,399

	2018	2019	2020	2021
Maryland	31,817	32,520	26,861	23,894
Race				
American Indian or Alaska Native	61	58	73	45
Asian	162	225	172	162
Black or African American	20,590	20,856	16,932	14,545
Declined to Answer	71	55	133	145
Other	1,502	1,557	1,377	1,232
Two or More	220	301	267	209
Unknown	101	138	106	80
White	9,110	9,330	7,801	7,476
Ethnicity				
Declined to Answer	96	58	151	141
Non-Hispanic Origin	30,053	30,657	25,155	22,295
Spanish/Hispanic Origin	1,350	1,570	1,443	1,305
Unknown	318	235	112	153

*Source: HSCRC; * Cell size =< 10 is suppressed*

Substance-Related ICD-10 Diagnostic Codes

Substance	Codes
Cannabis-related diagnostic codes	F12: Cannabis-related disorder* T40.7: Poisoning by, adverse effect of and underdosing of cannabis (derivatives) P04.81: Newborn affected by maternal use of cannabis
Alcohol-related diagnostic codes	E24.4: Alcohol-induced pseudo-Cushing's syndrome F10: Alcohol-related disorders G31.2: Degeneration of nervous system due to alcohol G62.1: Alcoholic polyneuropathy G72.1: Code for alcoholic myopathy I42.6: Alcoholic cardiomyopathy K29.2: Alcoholic gastritis K70: Alcoholic liver disease K85.2: Alcohol induced acute pancreatitis K86.0: Alcohol-induced chronic pancreatitis O35.4: Maternal care for (suspected) damage to fetus from alcohol O99.31: Alcohol use complicating pregnancy, childbirth, and the puerperium P04.3: Newborn affected by maternal use of alcohol Q86.0: Fetal alcohol syndrome T51.0: Toxic effect of alcohol Y90. [4-8]: Evidence of alcohol involvement determined by blood alcohol level
Cocaine-related diagnostic codes	F14: Cocaine related disorders T40.5: Poisoning by, adverse effect of and underdosing of cocaine R78.2: Finding cocaine in blood

Substance	Codes
Opioid-related diagnostic codes	F11-Opioid related disorders T40. [0-4]: Poisoning by, adverse effect of and underdosing of opium, heroin, other opioids, methadone, synthetic narcotics T40.6: Poisoning by, adverse effect of and underdosing of other and unspecified narcotics Z79.891 Long term (current) use of opiate analgesic
Other Stimulant-related diagnostic codes	F15: Other stimulant related disorders T43.6: Poisoning by, adverse effect of and underdosing of psychostimulants

*All F12 codes

The same codes were used for hospitalization, ED (HSCRC), and SUD treatment admissions (BHA) data requests.

Appendix D: Calls to Poison Control

Number of calls to Maryland Poison Center; MPC 2018-2021

	2018	2019	2020	2021
All	229	258	373	382
Edibles	55	57	138	161
Other cannabis products	174	201	235	221

Number of calls to Maryland Poison Center for Youth Under Age 20; MPC 2018-2021

	2018	2019	2020	2021
<5 years	10	35	78	86
6-12 years	10	9	17	25
13-19 years	95	100	97	107

Appendix E: Diagnoses of Problem Cannabis Use

Counts of SUD Treatment Admissions with Primary Diagnosis of Cannabis-Related Disorder (ICD-10 codes) by Demographics; PBHS 2018-2021

	FY 2018	FY 2019	FY 2020	FY 2021
Maryland	8,873	8,680	7,495	5,992
Allegany	192	147	115	100
Anne Arundel	691	732	560	440
Baltimore County	736	756	569	481
Calvert	190	215	150	101
Caroline	55	87	64	58
Carroll	103	129	80	56
Cecil	230	214	155	153

	FY 2018	FY 2019	FY 2020	FY 2021
Charles	272	216	156	130
Dorchester	180	232	238	144
Frederick	366	370	291	214
Garrett	51	53	43	42
Harford	332	422	355	267
Howard	200	162	156	128
Kent	37	41	54	45
Montgomery	619	543	445	378
Prince George's	873	788	618	510
Queen Anne's	48	47	39	32
Somerset	91	143	105	82
St. Mary's	210	197	172	127
Talbot	73	93	73	32
Washington	306	309	269	204
Wicomico	420	491	490	340
Worcester	195	186	165	139
Baltimore City	2,540	2,242	2,253	1,821
Gender				
Female	2,990	2,838	2,481	2,003
Male	5,883	5,842	5,014	3,989
Unknown	<11		0	0
Race				
Asian	115	135	172	155
Black	4,551	4,269	3,778	2,927
Hispanic	27	20	35	35
Multi-racial	0	0	<11	<11
Native American	62	51	37	23
Native Hawaiian/ Pacific Islander	<11	<11	<11	<11
White	2,182	2,267	1,770	1,387
Unknown	1,929	1,929	1,692	1,458
Ethnicity				
Not Hispanic	2,985	3,420	4,133	4,127
Hispanic	138	184	209	252
Unknown	5,750	5,076	3,153	1,613

Note: County totals are not equal to statewide totals as individuals may have resided in multiple counties across the period. State totals are unduplicated.

Appendix F: 2022 Maryland Medical Cannabis Patient Survey (MMCPS-22)

To view the survey report, visit: MMCPS-22 (mmcc.maryland.gov)