

CANNABIS-ASSOCIATED HOSPITALIZATIONS IN MISSISSIPPI, 2016-2019



Research Report, 10/28/2020

KEY FINDINGS: Between 2016 and 2019, there were 42,508 hospitalizations with a primary or secondary cannabis diagnosis in Mississippi. Almost one quarter of these cannabis-associated hospitalizations were among patients younger than 25 years of age during the four-year period. During 2019, there were 255 infants affected by maternal cannabis use in Mississippi. Multiple drug use was common among patients hospitalized with a cannabis-related diagnosis: over one third of all cannabis-associated hospitalizations had a coexisting substance use disorder, over half had nicotine dependence and nearly one quarter had an alcohol-related disorder. Mental health diagnoses were highly prevalent among patients suffering from cannabis use disorder: more than half of all cannabis-associated hospitalizations had at least one coexisting mental health condition.

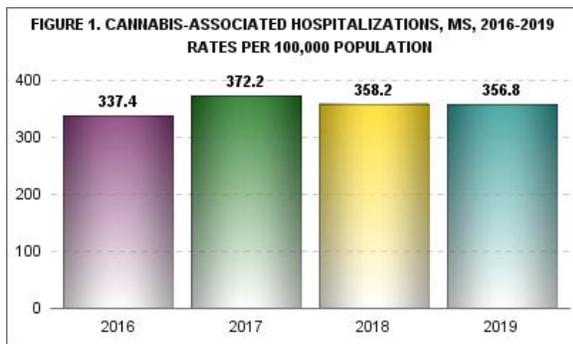
Background: During 2014–2017, 234,000 or 9.6% of all Mississippians aged 12 and older reported past-year cannabis use.¹ Although widespread and often depicted as harmless, the recreational use of this substance has harmful effects that would increase rates of addiction, mental illness, and premature death. Research suggests, for instance, that one out of ten cannabis users will become dependent on this substance.² In addition, recent studies have shown that the use of cannabis could aggravate existing mental health disorders.³ More recently, the outbreak of severe and potentially fatal pulmonary illness related to THC vaping has revitalized the debate about the safety of cannabis use. Due to all of these reasons, this rapidly evolving public health crisis calls for vigilance and data-driven responses aimed at reducing cannabis-related harms.

Objectives and Data: Our goal was to provide an overview of cannabis-associated hospitalizations in Mississippi. Analyzing 2016-2019 hospital discharge data (HDD),

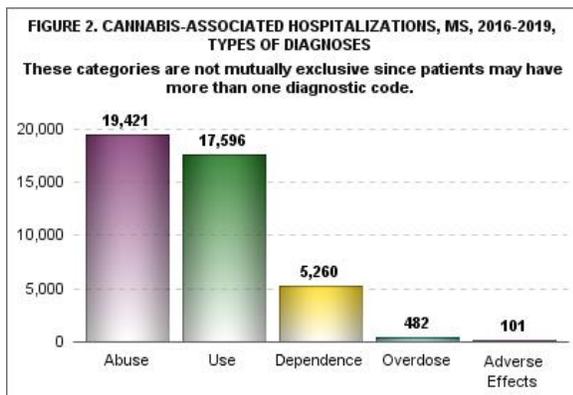
we obtained the prevalence of cannabis-associated hospitalizations in Mississippi and evaluated the demographic characteristics, co-occurring drug-related disorders, and coexisting mental health disorders of such hospital stays. Compiled from medical claims, HDD contain information on patient’s demographics, residence, length of stays, total charges, clinical diagnoses, and procedures performed. All non-federal general hospitals in the state are required to report their data. We included hospitalizations from acute and long-term care hospitals.

Methods: We selected hospitalizations with primary and secondary cannabis-related diagnoses among Mississippi and non-Mississippi residents. Because the cause for hospitalizations may not be directly related to cannabis use, we categorized these hospital stays as cannabis-associated hospitalizations. We performed descriptive and inferential statistical analyses, including Student’s t-tests and chi-square tests.

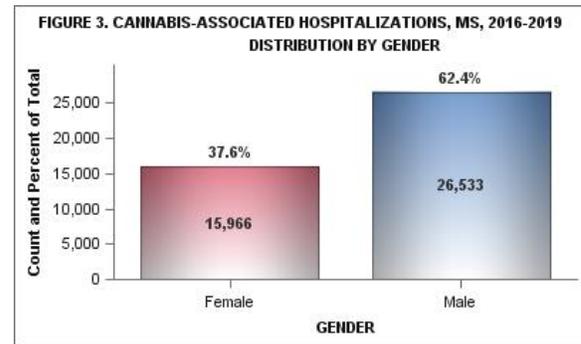
Overview: Between 2016 and 2019, there were 42,508 hospitalizations with a primary or secondary cannabis diagnosis. The number of stays with a primary cannabis-related diagnosis was 1,160 (2.7%). The percentage of cannabis-associated hospitalizations among all hospital stays was 2.7% (10,083) in 2016; 2.9% (11,107) in 2017; 2.8% (10,699) in 2018, and 2.8% (10,619) in 2019. The rates of cannabis-associated stays per 100,000 population remained stable between 2016 and 2019 (Figure 1).



Most of the cannabis-associated hospitalizations were in acute care hospitals (90.6%) and 23.9% were admissions to an intensive care unit (ICU). Cannabis abuse was recorded in 45.7% (19,421); cannabis use in 41.4% (17,596); cannabis dependence in 12.4% (5,260); overdoses in 1.1% (482), and adverse effects in 101 (0.2%) of all cannabis-associated hospital stays (Figure 2). There were 255 infants affected by maternal cannabis use in 2019.



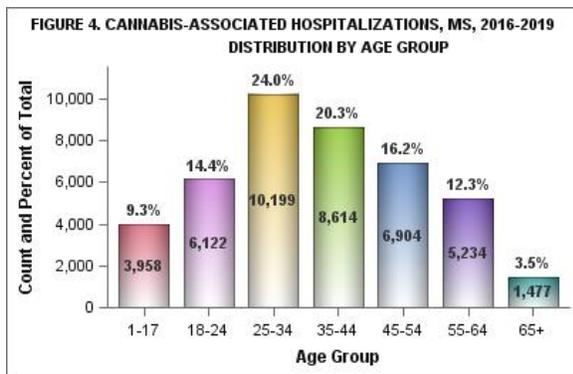
Demographics: Most of the cannabis-associated hospitalizations (40,088 or 94.3%) were among Mississippi residents. The majority (62.4%) of patients hospitalized with a cannabis-associated diagnosis were males and 53.8% were African Americans (Figure 3 and Table 1).



Over one-third (35.5%) of all cannabis-associated hospitalizations were among self-paying patients. Homelessness was recorded among 5.4% of patients hospitalized with a cannabis-associated diagnosis. In fact, 28.1% of all patients with documented homelessness had a cannabis-related diagnosis.

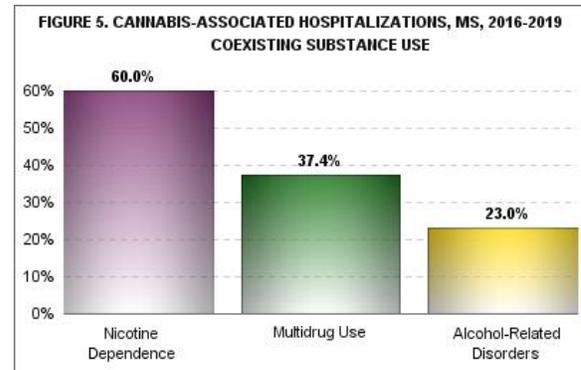
	Number of hospitalizations	Percent
Age Group		
1-17 years	3,958	9.3
18-24 years	6,122	14.4
25-34 years	10,199	24.0
35-44 years	8,614	20.3
45-54 years	6,904	16.2
55-64 years	5,234	12.3
65+ years	1,477	3.5
Gender		
Female	15,966	37.6
Male	26,533	62.4
Unknown	9	0.0
Race		
African Americans	22,851	53.8
Caucasians	18,903	44.5
Other	754	1.7
Payer		
Self-pay	15,109	35.5
Medicaid	10,827	25.5
Private	8,435	19.8
Medicare	6,817	16.0
Other	1,320	3.2
Homelessness	2,276	5.4

Cannabis-associated hospitalizations were most prevalent among the younger patients. On average, patients with a cannabis-associated diagnosis were 13.3 years younger than patients without such a diagnosis (mean age 37.1 years vs. 50.4 years, $p < .001$). Almost one out of every ten cannabis-associated stays (9.3%) was among the pediatric age group (1-17). Nearly one quarter were among the 25-34 age group and almost one quarter were among patients younger than 25 years of age (Figure 4).



Overdoses Associated with Cannabis: More than half of the 482 (264 or 54.8%) cannabis-associated overdoses involved multidrug use (opioids, cocaine, amphetamines/methamphetamines). Among the patients hospitalized with a cannabis-associated overdose, 320 (66.4%) were treated in an ICU and eight patients died in the hospital. One fifth (20.3%) of these overdoses were among patients younger than 25 years of age.

Multidrug Use: Compared to all other hospitalizations, cannabis-associated stays were more likely to have coexisting nicotine dependence (60.0% vs. 16.2%, $p < .001$), multiple drug use (opioids, cocaine, amphetamines/methamphetamines) (37.4% vs. 3.9% $p < .001$), and alcohol-related disorders (23.0% vs. 3.9%, $p < .001$) (Table 2).



Mental Health Disorders: Mental health disorders were highly prevalent among the studied population. Compared to all other stays, cannabis-associated stays were more likely to have coexisting schizophrenia, schizotypal, and delusional disorders (15.2% vs. 2.9%, $p < .001$); coexisting mood disorders, depression, or bipolar disorder (40.2% vs. 15.1%, $p < .001$); and coexisting neurotic, anxiety, stress-related, or somatoform disorders (22.1% vs. 11.5%, $p < .001$). The majority (58.5%) of all cannabis-associated hospitalizations had one or more of the above-mentioned codes (Table 2).

Comorbid Conditions	All Hospital Stays		Cannabis-Associated Hospital Stays		All Other Hospital Stays		P Value
	No	%	No	%	No	%	
Nicotine dependence	265,368	17.4	25,519	60.0	239,849	16.2	<.001
Multidrug use	60,208	3.9	15,888	37.4	44,320	3.0	<.001
Alcohol-related disorders	67,597	4.4	9,757	23.0	57,840	3.9	<.001
Schizophrenia, schizotypal, and delusional disorders	49,310	3.2	6,464	15.2	42,846	2.9	<.001
Mood disorders, depression, or bipolar disorders	240,608	15.8	17,090	40.2	223,518	15.1	<.001
Neurotic, anxiety, stress-related, or somatoform disorders	179,563	11.8	9,382	22.1	170,181	11.5	<.001

International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) codes: cannabis abuse (F12.1), cannabis dependence (F12.2), unspecified cannabis use (F12.9), cannabis-poisoning (T40.7X1-T40.7X2, T40.7X3, T40.7X4), cannabis adverse effects (T40.7X5), infants affected by maternal use of cannabis (P04.81); nicotine dependence (F17); opioid-related codes: F11; T400X1-T400X5; T401X1-T401X4; T402X1-T402X5; T403X1-T403X5; T404X1-T404X5; T40601-T40605; T40691-T40695; amphetamine-related codes: F15; T43601-T43605; T43621-T43625; T43631-T43635; T43691-T43695; cocaine-related codes: F14; T405X1-T405X5; alcohol-related disorders (F10); schizophrenia, schizotypal, and delusional disorders (F20-F29); mood disorders, depression, or bipolar disorders (F30-F39); neurotic, anxiety, stress-related, or somatoform disorders (F40-49).

Discussion: Our study revealed that cannabis-associated hospitalizations were more prevalent among males, African Americans, and younger patients in Mississippi. In fact, one quarter of all cannabis-associated hospitalizations were among patients younger than 25 years of age during the four-year period. Specifically, one out of every ten cannabis-associated hospitalizations were among the pediatric age group (< 18 years). This finding is concerning because the use of cannabis early in life has been strongly associated with other illicit drug use.⁴

Cannabis as a gateway substance has been the subject of numerous studies. According to a longitudinal national study, lifelong cannabis users have a 44.7% probability to use another illicit drug.⁵ While the causal relationship cannot be established, we identified a high rate of multidrug use in our studied group. For example, over one third of all cannabis-associated hospitalizations had a coexisting substance use disorder. In addition, over half of all cannabis-associated hospitalizations had nicotine dependence and nearly one quarter had an alcohol-related disorder.

Our findings also revealed a high prevalence of mental health comorbidities among patients hospitalized with cannabis disorders. Nearly half of all cannabis-associated hospitalizations had a least one co-existing mental health condition. Fifteen percent of all cannabis-associated hospitalizations had schizophrenia; one fifth had anxiety or stress related disorders, and over one third had mood disorders or depression. The causality between cannabis use disorder and schizophrenia has been studied; yet, it is still controversial and highly divisive. While the effect of cannabis as a trigger of schizophrenia is not well-proven, some

research has identified an enhanced risk for cannabis use among patients suffering from schizophrenia.⁶ The direction of causality between cannabis use and anxiety is unclear as well; however, evidence suggests that cannabis use among young adults increases the risk for depression and suicide, especially among younger individuals.⁷

Given the young age of patients hospitalized with a cannabis-related diagnosis in Mississippi and the high rate of coexisting drug use and comorbid mental health conditions, it is important that the state establishes a surveillance system monitoring cannabis use and the complications associated with it. Measures to reduce the negative impact of cannabis use should include education on the harms associated with this substance, as well as social support and medical treatment for patients suffering from addiction and mental health disorders.

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