Geographic Differences in Cannabis Use and Cannabis Use Disorder in the US Veteran Population

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Abstract

Objective: To examine regional differences in cannabis use and probable cannabis use disorder (CUD) in US veterans.

Methods: Participants (N = 2,441) were drawn from a nationally representative sample of US veterans who participated in the 2022 National Health and Resilience in Veterans Study, conducted from August 11 to September 12, 2022. Weighted estimates indicated that 85.5% reported no cannabis use, 11.6% reported cannabis use, and 2.9% screened positive for probable CUD. Chi-square tests were conducted to assess differences in cannabis use and probable CUD across 9 US Census Bureau–defined regions: New England, Middle Atlantic, East and West North Central, South Atlantic, East and West South Central, Mountain, and Pacific.

Results: Significant regional differences were observed in cannabis use and CUD across the 9 regions ($\chi^2_{16} = 73.33$, $P < .001$). Veterans in the Pacific region exhibited the highest rates of cannabis use (18.6%) compared to all other regions except New England (8.2%–13.4%, $Ps < .05$). The Pacific region also had significantly higher rates of probable CUD (8.8%) relative to all other regions (0.7%–3.5%, $Ps < .05$).

Conclusion: These findings demonstrate substantial regional differences in cannabis use and probable CUD among US veterans and underscore the importance of routine screening for cannabis-related problems in health care settings serving veterans, particularly in higher-prevalence regions of the United States.

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Veterans often use cannabis to manage a range of health conditions, including chronic pain, posttraumatic stress disorder (PTSD), anxiety, and insomnia.[1,2] In a recent study, we found that 11.9% of a national sample of US veterans reported cannabis use and 2.7% screened positive for probable cannabis use disorder (CUD).[3] Both cannabis use and CUD were also associated with significantly elevated rates of psychiatric conditions (eg, PTSD, mood, anxiety, and substance use disorders) and suicide-related outcomes.[2] Given the significant mental and physical health problems associated with CUD and cannabis use, understanding related ecological factors such as geographic variation is critical to improving care for veterans and their overall health. The present study analyzes cannabis use and CUD by geographic region—a potential proxy for the impact of public policy, health care access, and individual sociodemographic characteristics.

Rates of cannabis use and CUD have increased in the general population following the legalization of medical and recreational cannabis in multiple states.[4] Similarly, rates of clinician-diagnosed CUD among veterans receiving care in the Veterans Health Administration (VHA) increased modestly after legalization, particularly among older veterans.[5] However, these effects were relatively small at the state level, suggesting that the impact of cannabis legalization may be more widespread across the country rather than confined to individual states.

To date, no study has examined regional differences in cannabis use and disorder in a nationally representative sample of US veterans. Because VHA policies often span across states within Veteran Integrated Service Networks, understanding regional geographic variations in cannabis use and disorder patterns may help inform health care practices, guide resource allocation, and support the development of targeted prevention and treatment strategies. This study examines the prevalence of cannabis use and CUD among US veterans to identify potential risk patterns across 9 US Census Bureau–defined geographic regions.

Clinical Points

- National data on cannabis use in US veterans are limited, with little attention to geographic variation. This study fills an important gap by demonstrating marked regional differences in cannabis use and probable cannabis use disorder (CUD), highlighting how regional policy, access, and norms may shape risk patterns among veterans.
- Veterans living in higher-prevalence regions—particularly the Pacific—may benefit from routine screening for cannabis use and CUD. Incorporating brief tools like the CUDIT-SF can help identify veterans who may need referral to evidence-based treatment for CUD.

METHODS

Sample

Data were drawn from the 2022 National Health and Resilience in Veterans Study (NHRVS), a web-based survey administered from August 11 to September 12, 2022. Of the 2,951 veterans invited to participate, 2,441 (82.7%) completed the survey. Participants were recruited from Ipsos' KnowledgePanel, a probability-based panel designed to mirror the demographic composition of US veterans. Poststratification weights were applied to align the sample with national sociodemographic benchmarks of US veterans—including age, sex, race, and ethnicity, 9 US Census Bureau–defined geographic regions, education, household income, military branch, and years of military service—which were derived from the most contemporaneous 2021 US Census Bureau Current Population Survey Veterans Supplement. As a result, the weighted sample is nationally representative of US veterans, although not necessarily representative at the state level. The study protocol was approved by the VA Connecticut Healthcare System Human Subjects Committee, and all participants provided electronic informed consent.

Measures

Geographic region. Participants were classified into one of 9 US Census Bureau–defined regions: New England, Middle Atlantic, East and West North Central, South Atlantic, East and West South Central, Mountain, and Pacific. States included in each of these regions are shown in Figure 1.

Cannabis use and disorder. Cannabis use was assessed with the question, "Have you used any cannabis (ie, marijuana, hashish, THC, pot, grass, weed, reefer) over the past six months?" (yes/no). Probable CUD was assessed using the 3-item Cannabis Use Disorders Identification Test—Short Form (CUDIT-SF),[6] a validated *DSM-5*–aligned screening tool composed of the following 3 questions: (1) "How often during the past 6 months did you find that you were not able to stop using cannabis once you had started?" (2) "How often in the past 6 months have you devoted a great deal of your time to getting, using, or recovering from cannabis?" and (3) "How often in the past 6 months have you had a problem with your memory or concentration after using cannabis?" All items were rated on a 0–4 scale ranging from "Never" to "Daily or almost daily." A score ≥2 is indicative of probable CUD.[6] Veterans who reported cannabis use but did not screen positive were classified as cannabis users.

Sociodemographic and military characteristics. Participants completed a standardized demographic questionnaire assessing age, sex, race, and ethnicity (categorized as non-Hispanic White, non-Hispanic Black, Hispanic, or other/multiracial), marital/partnered status, educational attainment (college degree or higher vs less), and annual household income (>$60,000 vs ≤$60,000). Military service variables included years of service (≤3, 4–9, or ≥10 years). Combat veteran status was assessed with the item, "Did you ever serve in a combat or war zone?" Veterans also reported whether the VHA was their primary source of health care using the question, "Is the VA your main source of health care?"

Disability in activities of daily living and instrumental activities of daily living. Activities of daily living (ADL) disability was measured using a brief self-report measure that asked whether participants required assistance from another person to complete any of 4 basic self-care activities: (1) bathing, (2) dressing, (3) getting in and out of a chair, and (4) ambulating. Instrumental activities of daily living (IADL) disability was assessed with 7 items evaluating whether participants required help with more complex, independent-living activities: (1) shopping, (2) attending health care appointments, (3) traveling locally, (4) paying bills or managing money, (5) meal preparation, (6) household chores, and (7) taking medication. For analysis, a composite indicator representing the presence of any ADL or IADL disability was derived.

Data Analysis

Analysis of variance and χ^2 tests compared sample characteristics by cannabis use and probable CUD status. Regional differences were assessed using omnibus χ^2 tests, followed by pairwise χ^2 comparisons to identify specific regional differences ($P < .05$). Analyses were conducted using IBM SPSS version 30.

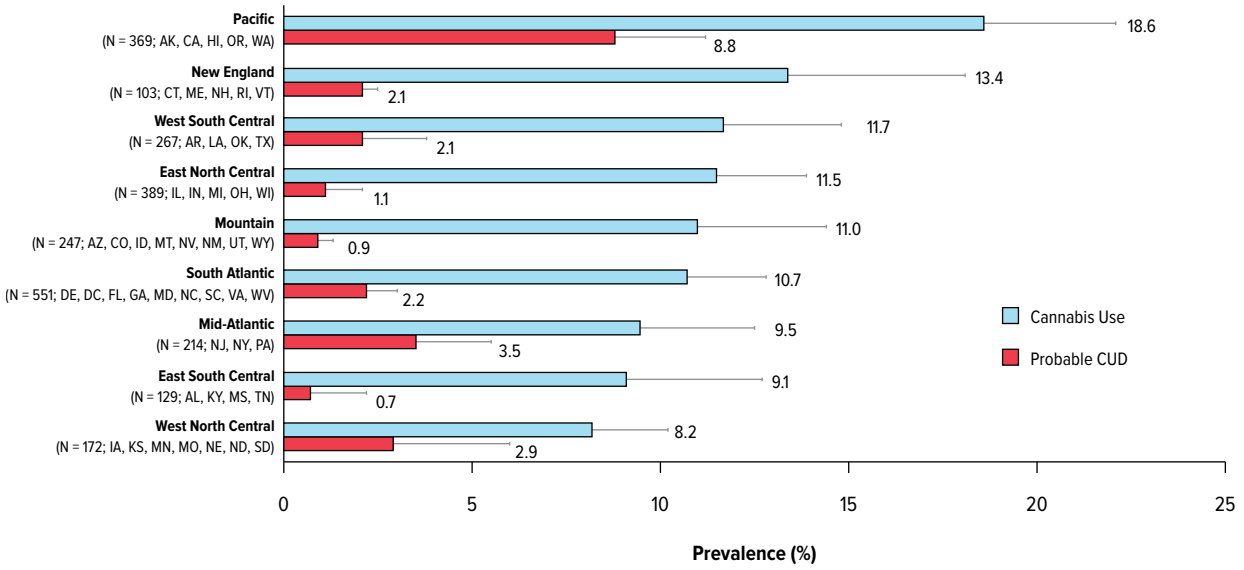
RESULTS

Sociodemographic characteristics by group are shown in Table 1. Of the 2,441 Veterans who completed the survey, a total of 2,087 veterans (weighted 85.5%) reported no cannabis use, 284 (weighted 11.6%) reported cannabis use, and 70 (weighted 2.9%) had probable CUD.

Statistically significant differences were observed across groups with respect to age, socioeconomic

Figure 1.

Regional Variation in the Prevalence of Cannabis Use and Probable Cannabis Use Disorder Among US Veterans[a]



[a]Error bars represent standard error estimates.

indicators, disability status, and main source of health care. Specifically, veterans with probable CUD were younger than veterans who used cannabis, who were younger than veterans who denied cannabis use. Racial and ethnic composition varied significantly, with the no-use group being predominantly White non-Hispanic. Veterans who endorsed cannabis use were more likely to be Hispanic than those who denied cannabis use, and veterans with probable CUD were more likely than those who did and did not endorse cannabis use to be other/multiracial. Relative to nonusers, veterans who endorsed cannabis use and those with probable CUD were less likely to be married/partnered and to have an ADL or IADL disability. Veterans with CUD were less likely to have completed college or higher education. Those with CUD were less likely than the other groups to have served 10 or more years in the military. Finally, veterans with probable CUD were more likely to use the VA as their primary source of health care, followed by veterans who endorsed and denied cannabis use.

Significant geographic variation in the prevalence of cannabis use and probable CUD was observed across the 9 US Census Bureau–defined regions ($\chi^2_{16} = 73.33$, $P < .001$). The Pacific region had the highest prevalence of both cannabis use (18.6%) and probable CUD (8.8%). Specifically, the Pacific region's rate of probable CUD was significantly higher than all other regions (all uncorrected Ps < .05), including New England (3.5%). However, for cannabis use, the prevalence was significantly higher in the Pacific region relative to all regions except for New England (13.4%; $P = .24$), and the prevalence of cannabis use in New England did not significantly differ from any other region (all Ps > .17).

Among states with at least 30 respondents, the highest prevalence of cannabis use was observed in Oregon (26.7%), California (22.4%), Oklahoma (20.5%), Massachusetts (16.7%), New York (15.7%), Alabama (15.0%), Illinois (14.9%), Arizona (14.3%), Ohio (14.1%), and Virginia (13.7%). States with the highest prevalence of CUD were Oregon (13.3%), Washington (9.6%), North Carolina (9.0%), California (6.7%), Indiana (4.9%), New York (4.5%), Pennsylvania (3.7%), Texas (3.2%), Wisconsin (3.1%), and Kentucky (3.1%).

DISCUSSION

This study identified meaningful regional differences in cannabis use and probable CUD among US Veterans. Veterans residing in the Pacific region exhibited the highest prevalence of both outcomes, with probable CUD rates exceeding contemporary estimates for the general adult US population (7%).[8] These findings highlight the importance of geographic context in understanding cannabis-related behaviors among veterans and suggest that regional factors may shape patterns of cannabis use and disorder in this population.

Regional variability in medical and recreational cannabis legalization likely contributed to the observed geographic differences. States in the Pacific region—such as Oregon, California, and Washington—were among the

Table 1.

Sociodemographic Characteristics by Cannabis Use and Probable Cannabis Use Disorder in US Veterans

	No cannabis use[a] (1)	Cannabis use[a] (2)	Probable CUD[a] (3)	Test of difference (F or χ^2)	P value	Pairwise contrast
N (weighted %)	2,088 (85.5%)	284 (11.6%)	N = 70 (2.9%)			
Age, mean (SD), y	64.0 (14.0)	58.8 (12.2)	52.9 (14.7)	32.34	<.001	1 > 2 > 3
Male sex	1,876 (89.9%)	251 (88.4%)	60 (87.0%)	1.16	.56	—
Race and ethnicity				44.91	<.001	
White, non-Hispanic	1678 (80.3%)	201 (70.8%)	47 (68.1%)			1 > 2,3
Black, non-Hispanic	227 (10.9%)	42 (14.8%)	12 (17.4%)			—
Hispanic	113 (5.4%)	35 (12.3%)	2 (2.9%)			2 > 1
Other/multiracial	70 (3.4%)	6 (2.1%)	8 (11.6%)			3 > 1,2
Married/partnered	1593 (76.3%)	155 (54.8%)	42 (60.9%)	64.74	<.001	1 > 2,3
College graduate or higher education	715 (34.2%)	77 (27.1%)	14 (20.0%)	11.26	.004	1 > 3
Annual household income >$60,000	1264 (60.5%)	165 (58.1%)	38 (55.1%)	1.37	.50	—
Years of military service				12.40	.015	
3 or less	734 (35.2%)	108 (38.0%)	32 (45.7%)			—
4–9	884 (42.3%)	119 (41.9%)	34 (48.6%)			—
10+	470 (22.5%)	57 (20.1%)	4 (5.7%)			1,2 > 3
Combat veteran	772 (37.0%)	91 (32.2%)	32 (45.7%)	5.04	.080	—
Any ADL or IADL disability[7]	195 (9.3%)	50 (17.6%)	17 (24.3%)	31.58	<.001	2,3 > 1
VHA is primary source of health care	415 (19.9%)	76 (26.8%)	30 (42.9%)	26.95	<.001	3 > 2 > 1

[a]Values are expressed as n (%) unless otherwise noted.
Abbreviations: ADL = activities of daily living, CUD = cannabis use disorder, IADL = instrumental activities of daily living, SD = standard deviation, VHA = Veterans Health Administration.

first to decriminalize and subsequently legalize medical and recreational cannabis use, and they consistently show high rates of use and CUD.[9] Similar patterns have been observed in the general population, where legalization has been associated with increases in CUD and cannabis-related adverse events.[10] However, elevated cannabis use or probable CUD was also observed in states without legalized recreational cannabis at the time of data collection. For example, Oklahoma had the third-highest prevalence of cannabis use, and North Carolina and Indiana were among the top 5 for probable CUD. These patterns suggest that, while regional and state-specific factors are influential, cannabis use and CUD have increased nationwide and are likely to remain pressing clinical and policy concerns as legalization expands and societal norms continue to shift. Other regionally variable contributors, such as the distribution of mental health conditions, substance use comorbidity, and access to behavioral health services, may further account for these differences. Future work should assess psychological, medical, and health system correlates of cannabis use and CUD across regions, including variation in access to mental health services and perceptions of care.

Prior research has consistently found higher rates of cannabis use and CUD among younger adults in both the general population[11] and veteran samples.[3] Although cannabis use and CUD were more prevalent among younger veterans in the current study, the mean ages of these groups were 59 and 53 years, respectively. Considered together with evidence of increasing cannabis use and CUD among older veterans receiving VHA care,[5] this finding underscores the importance of continued research and clinical monitoring of cannabis-related problems in aging veteran populations.

These findings have implications for policy and health care planning within the VHA and other veteran-serving health care systems. Veterans who reported relying on the VHA as their primary source of health care were significantly more likely to report cannabis use and to screen positive for probable CUD, consistent with prior work demonstrating that VA users have higher burdens of physical and mental health conditions than non-VA users.[12] Systematic CUD screening within VHA primary care and mental health services may be particularly important in high-prevalence regions. In addition, expanding behavioral health capacity, increasing access to evidence-based treatments for CUD, and enhancing telehealth-delivered interventions may help address regional disparities. Providers may also benefit from training tailored to region-specific cannabis laws and policies, which continue to vary considerably across states.[13,14]

This study has several limitations. First, its cross-sectional design precludes causal inference. Second, smaller sample sizes in some regions and states may have reduced the precision of prevalence estimates. Third, reliance on a self-reported cannabis use and disorder screening measure may result in underreporting or overreporting. Future longitudinal

studies with larger, nationally representative samples and diagnostic interview–based assessments are needed to better characterize trends in cannabis use and CUD as legalization continues to evolve. Item-level or domain-specific analyses of cannabis use and CUD symptoms may also clarify whether particular symptom patterns vary across regions. Finally, research examining clinical, psychosocial, and contextual correlates of cannabis use and CUD may help identify factors that contribute to the onset, progression, and persistence of cannabis-related problems among veterans.

CONCLUSION

Cannabis use and probable CUD were most prevalent among veterans residing in the Pacific region, with New England showing comparably high cannabis use but not probable CUD. These findings underscore the need for targeted screening and intervention efforts in high-prevalence regions and highlight the importance of preparing primary care, general mental health, and specialty clinics—within and outside the VHA—to systematically assess cannabis use and deliver evidence-based treatments to address this emerging public health concern.

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