

'A tale of two substances': An observational study of opioid use among cannabis-related emergency room visits in Colorado

WHAT WE LEARNED

Concurrent opioid use among marijuana users has a high correlation with increased hospital admission rates and higher ED utilization.

BACKGROUND

- Despite legalization of medical and recreational cannabis in Colorado over the past decade, the exact effects on public health remain unknown.
- Visits to the University of Colorado Hospital Emergency Department that are at least partially attributable to cannabis use have been on the rise in the past several years, nearly quadrupling from 4.4 to 15.9 per 1,000 visits from 2012 to 2016.

OBJECTIVES

- This study aims to look at differences in emergency room visits (specifically with marijuana-related ICD-9/10-CM codes) between those that are also associated with opioid use and those that are not.

METHODS

- This retrospective observational study was done by performing chart review of all visits to the University of Colorado Hospital Emergency Department (UCH ED) that took place between 2012 and 2016 that had at least one cannabis ICD-9/10-CM code, using the same methodology and dataset as described in Shelton et al.¹
- If urine toxicology, patient narrative, or ICD-9/10-CM code indicated opioid use, the visit was considered to have been an opioid-use positive (OU+) visit.
- Demographic data, various visit metrics, and substance exposures, including opioid use per urine toxicology or patient narrative, were abstracted and analyzed using Exploratory.io.

Table 1. Patient Demographics

Characteristic	All Records (n = 6741)	MJ related visits (n = 2574)	Non-MJ related (n = 4167)
Median age (IQR)	34 (25-47)	30 (24-41)	37 (27-51)
Gender			
Male	4318 (64.02)	1678 (65.19)	2460 (63.35)
Female	2423 (35.92)	896 (34.81)	1527 (36.65)
Unknown	4 (0.06)	unknown	unknown
Race			
American Indian/Alaska Native	48 (0.71)	9 (0.3)	39 (0.9)
Asian	51 (0.76)	31 (1.2)	20 (0.5)
Black	2483 (36.81)	943 (36.6)	1540 (37.0)
Multiple	8 (0.12)	0 (0)	8 (0.2)
Native Hawaiian/other Pacific Islander	8 (0.12)	4 (0.2)	4 (0.1)
Other	996 (14.77)	457 (17.8)	539 (12.9)
White	3112 (46.14)	1116 (43.4)	1996 (47.9)
Unknown/not reported	39 (0.58)	14 (0.5)	21 (0.5)
Ethnicity			
Hispanic	1012 (15.0)	460 (17.9)	552 (13.2)
Non-Hispanic	5713 (84.7)	2105 (81.8)	3608 (86.6)
Missing	20 (0.3)	9 (0.3)	7 (0.2)
State of residence			
Colorado	6302 (93.4)	2322 (90.2)	3980 (95.5)
Other	438 (6.5)	251 (9.8)	187 (4.5)
Unknown	5 (0.1)	1 (0.04)	0 (0)

RESULTS

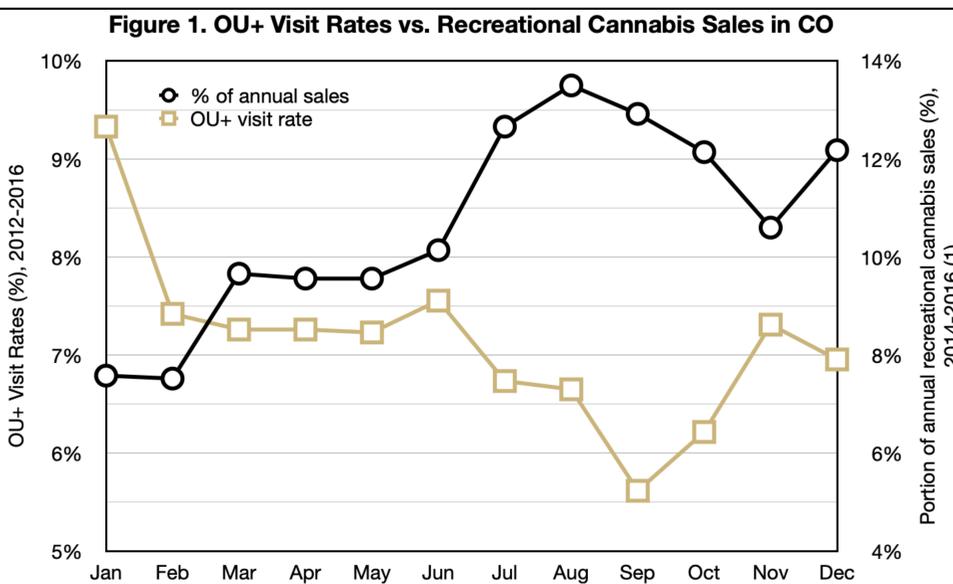
- Of the study population, 9.6% of visits were also associated with opioid use (OU+). These patients were more likely to be white men than all-comers to the ED ($p < 0.0001$), and were significantly more likely to be admitted (71.4%) than all-comers (15.1%) or the study population (47.6%, $p < 0.0001$).
- The overall frequency of THC positivity on urine toxicology in the C-ICD group was 68.9%; this rate was significantly higher among OU+ visits (89.8% vs. 67.0%, $p < 0.0001$). Cocaine co-use was also more frequent in the OU+ group (22.2% vs. 12.9%, $p < 0.0001$), as well as benzodiazepine co-use (26.4% vs. 5.7%, $p < 0.0001$) and amphetamine co-use (21.3% vs. 9.8%, $p < 0.0001$).

LIMITATIONS

- The analysis of opioid use was limited to a specific sub-group: those that have had a marijuana-related visit (attributable or not) to the ED. These findings may not have high external validity, but do inform us about an important sub-group.

CONCLUSIONS

- Among patients with cannabis-related emergency department visits, concurrent opioid use has a high correlation with increased hospital admission rates, additional substance use, and is associated with a higher frequency visits to the emergency department.
- The negative correlation between recreational marijuana sales and seasonal opioid use rates among marijuana users may suggest that marijuana may occasionally act as a replacement or deterrent to opioid use in this population.



1. Shelton SK, Mills E, Saben DL, Devivo M, Hall KE, Monte AA et al. Why do patients come to the emergency department after using cannabis? *Clinical Toxicology*. 2020;58(6):453-459. doi: 10.1080/1556365

2. Colorado Department of Revenue. Marijuana Sales Reports. Denver: Colorado Department of Revenue; 2018. Accessed at colorado.gov/pacific/revenue/colorado-marijuana-sales-reports on Aug 29 2020.