Institute for Traffic Safety Management & Research

KEY FINDINGS

OVERVIEW

- According to NSDUH 2018-2019, driving under the influence of cannabis was three times more prevalent than driving under the influence of alcohol without the presence of drugs in New York.
- Only a small proportion of arrested impaired drivers in New York were charged with drug-impaired driving.

DRIVERS EVALUATED AND TESTED

- The number of DRE evaluations dropped in 2022, despite an increase in DRE numbers.
- Refusal of chemical testing doubled from 11% to 22% of drivers evaluated, 2018-2022.
- Of the drivers tested, 79% had a blood test only in 2022, up from 68% in 2018.

DRUGS FOUND

- Regarding drug categories, cannabis prevalence remained unchanged, while narcotic analgesics and CNS stimulants showed substantial increases in the post-legalization period.
- In terms of individual drugs, Delta-9-THC consistently emerged as the most frequently detected drug; nevertheless, fentanyl and cocaine showed notable increases in prevalence in the post-legalization period.
- In the post-legalization period, one out of four cannabis-positive drivers had three or more drug categories in their system.

CANNABIS-POSITIVE DRIVERS

- 46% of the cannabis-positive drivers were under age 30 post-legalization, a decrease from 57% pre-legalization.
- Cannabis-positive drivers tended to be younger than non-cannabis drug-positive drivers.

CANNABIS-POSITIVE DRIVING EVENTS

- Of the drivers positive for a single drug category, cannabis-only drivers had the lowest crash involvement.
- Of the cannabis-only drivers ticketed for impaired driving, the most common companion violations charged were lane-related violations, followed by speeding and failure to signal for turning movements.

CANNABIS AND DRIVING BEFORE AND AFTER NEW YORK'S LEGALIZATION OF CANNABIS

INTRODUCTION

According to the National Survey on Drug Use and Health (NSDUH) 2018-2019, approximately 600,000 New York residents each year self-reported driving under the influence of cannabis (DUIC) in the past year. This figure is approaching the number of New Yorkers who self-reported driving under the influence of alcohol and is three times higher than the number of New Yorkers who self-reported driving under the influence of alcohol without the presence of drugs.

Effective March 31, 2021, New York State enacted legislation legalizing adult-use recreational cannabis. DUIC remains illegal and penalties include the loss of driving privileges, fines, and potential incarceration. However, enforcing DUIC faces unique challenges such as the lack of real-time drug testing, and the weak correlation between cannabis levels in bodily fluids and the degree of impairment.

To gain insights into cannabis and driving before and after the legislation, the Governor's Traffic Safety Committee funded the Institute for Traffic Safety Management & Research (ITSMR) to conduct a comprehensive study examining pre-law and post-law data on drivers evaluated by Drug Recognition Experts (DREs) for impaired driving and who tested positive for drugs in their blood. Focusing on the period of 2018-2022, this research note aims to present key findings on cannabis use and driving on New York's roadways before and after the legalization:

- Overview
- Drivers Evaluated and Tested
- Drugs Found in Drug-Positive Drivers
- Characteristics of Cannabis-Positive Drivers
- Characteristics of Cannabis-Positive Driving Events

The primary data sources for the study are the New York State DRE database maintained by ITSMR and the New York State Department of Motor Vehicles' Traffic Safety Law Enforcement and Disposition (TSLED) system.

OVERVIEW

Cannabis and Driving

Cannabis is the most common drug used by drivers in the United States (NTSB, 2022). The National Roadside Survey of Alcohol and Drug Use by Drivers provides one of the best datasets on cannabis use by drivers nationwide (Kelley-Baker et al., 2017). This nationally representative survey directly collects biological specimens from drivers on the road and tests for alcohol and a large number of drugs and drug metabolites. According to the most recent survey in 2013-2014, 13% of weekend nighttime drivers tested positive for THC, the main psychoactive substance in cannabis. In comparison, 7% of weekend nighttime drivers tested positive for any potentially impairing medication, and 5% tested positive for any illicit drug other than cannabis.

The presence of cannabis in a driver's system, however, does not necessarily indicate that the person was driving under the influence of cannabis. THC and its metabolites can persist in bodily fluids long after any impairment (Berning & Smither, 2014; Odell et al., 2015). Adding to the challenge of measuring impairment, the degree of impairment is not well associated with THC concentration in bodily fluids, whereas a blood alcohol level of 0.08 percent is the widely accepted threshold for impairment (Compton, 2017).

Drawing on individuals' self-reported behavior, the National Survey on Drug Use and Health (NSDUH) offers crucial insights into the prevalence of DUIC among cannabis users. The survey is conducted annually with a nationally representative sample of approximately 70,000 respondents. Based on the 2016-2020 data, 28% of cannabis users nationwide reported DUIC over the past year (Myers et al., 2023). In comparison, only 12% of alcohol users reported driving under the influence of alcohol, and 9% of non-cannabis drug users reported driving under the influence of non-cannabis drugs over the past year. The high prevalence of self-reported DUIC among cannabis users is a great concern to traffic safety and highlights the need for more research, education, and enforcement on cannabis and driving.

Impaired Driving and Arrests in New York

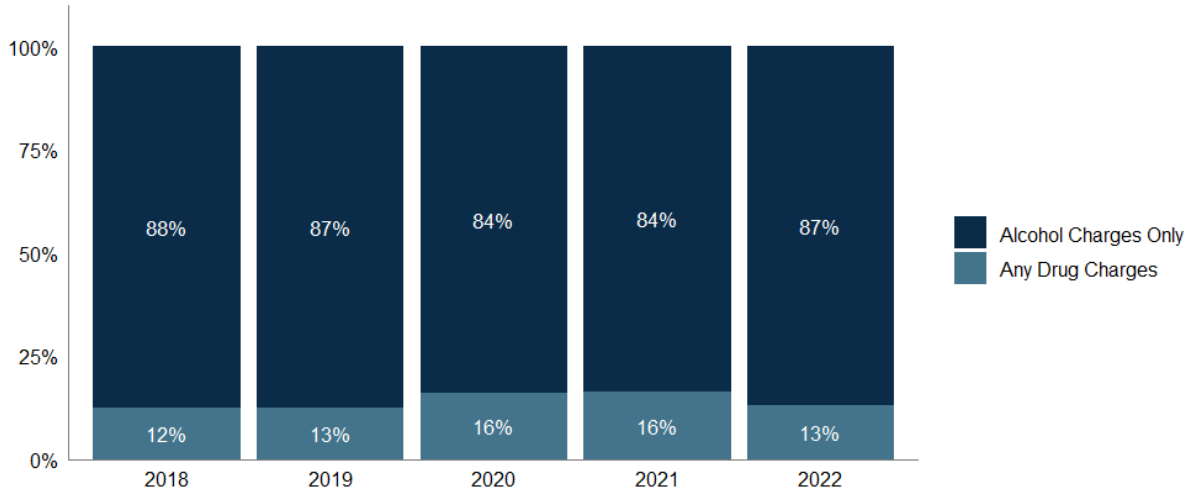
According to the latest NSDUH estimates (2018-2019), approximately 600,000 New York residents annually reported driving under the influence of cannabis within the past 12 months. In comparison, 700,000 New York residents reported driving under the influence of alcohol and 200,000 reported driving under the influence of alcohol without the presence of drugs.

These statistics provide three crucial insights into impaired driving in New York before the state's legalization of recreational cannabis. Firstly, the prevalence of DUIC was not far from that of driving under the influence of alcohol. Secondly, DUIC was much more prevalent than driving under the influence of alcohol without the presence of drugs. Thirdly, driving under the combined influence of alcohol and drugs exceeded the prevalence of driving under the influence of alcohol without the presence of drugs.

However, New York's impaired-driving arrest data paints a starkly different picture. The state's Traffic Safety Law Enforcement and Disposition (TSLED) system tracks traffic tickets issued statewide, with the exception of New York City. Based on TSLED data, an average of 28,868 drivers were arrested annually for impaired driving (VTL 1192.1-4) from 2018 to 2022. As shown in Figure 1, 84%-88% of these impaired drivers were

charged with alcohol-impaired driving only (VTL 1192.1-3), while 12%-16% were charged with drug-impaired driving (VTL 1192.4 or VLT 1192.4a), with or without concurrent alcohol charges.

FIGURE 1. Drivers Arrested for Impaired Driving by Charges*



** TSLED data only; impaired driving arrest data by charges were not available from the NYPD.*

Compared to alcohol-impaired driving, law enforcement officers face significantly greater challenges in detecting and collecting evidence for drug-impaired driving (Berning et al., 2022; Gourdet et al., 2020). Police officers have varying degrees of training and experience in detecting drug-impaired driving in the field. At the basic level, many officers are trained in Standardized Field Sobriety Tests (SFSTs) during basic academy training. While SFSTs have been validated for identifying alcohol impairment, they are likely not sufficient to screen for all potentially impairing drugs (NTSB, 2022). Advanced Roadside Impaired Driving Enforcement (ARIDE) training further enhances an officer's ability to observe, identify, and document signs of drug impairment. A selective group of officers complete the most advanced training through the Drug Evaluation and Classification (DEC) program and become Drug Recognition Experts (DRE). While New York has been actively working to increase the number of officers with ARIDE and DRE training, the availability of such officers, DREs in particular, remains limited in many jurisdictions.

Moreover, in contrast to alcohol testing, drug testing in impaired driving cases often requires the collection of blood. Obtaining blood samples can be challenging and often requires medical personnel. The time between the initial roadside stop and the blood draw can take several hours of valuable time for an officer. Furthermore, while the blood alcohol level of 0.08 percent is widely accepted as the threshold for alcohol impairment, there is no consistent relationship between drug concentration in blood and impairment (Gourdet et al., 2020). For instance, it is possible for a person with only one nanogram of THC per milliliter of blood to be impaired, while another person with over five nanograms of THC per milliliter of blood to not show any impairment. Therefore, drug impairment cannot be determined based on drug test results alone.

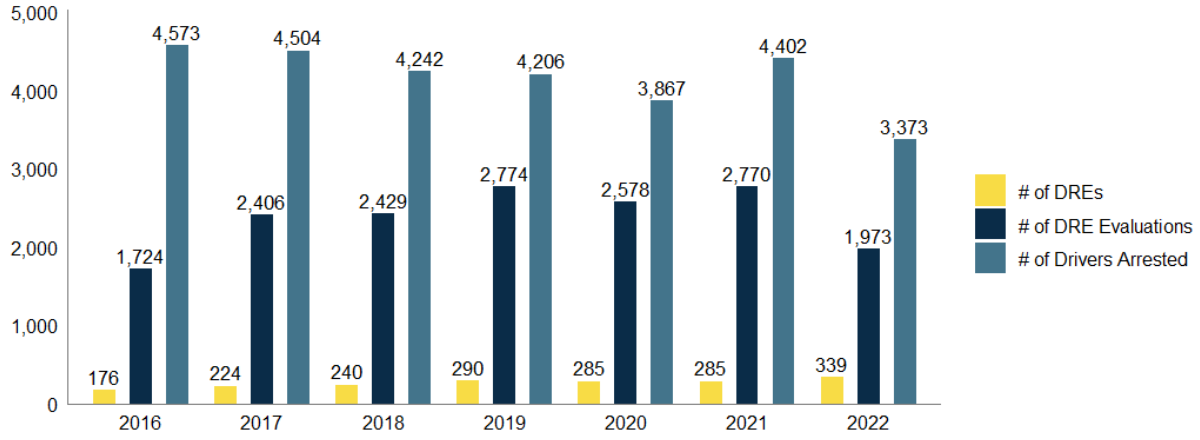
Given these challenges, individuals under the influence of drugs alone may escape impaired driving charges altogether, while those under the combined influence of alcohol and drugs may only face charges related to alcohol impairment. In 2016, a year that saw 45,160 impaired-driving arrests statewide, only 4,903 cases were submitted for drug testing in New York laboratories (TOX-TWG, 2017), and a mere 1,724 drivers underwent evaluation by a DRE officer. The lack of sufficient drug impairment investigations not only hinders accurate assessments of impaired driving cases but also leads to the systematic undercounting of crashes involving drugged drivers.

New York State DRE Program

The DRE program, formally known as the International Drug Evaluation & Classification Program, is the highest-level training for law enforcement officers to assess drug impairment in drivers. Since 1987, New York has participated in the DRE program, now recognized by all fifty states in the US, the District of Columbia, Canada, Hong Kong, and the United Kingdom. The DRE program operates under the guidance and direction of the International Association of Chiefs of Police (IACP) and is supported by the National Highway Traffic Safety Administration (NHTSA). It trains police officers to use a standardized and systematic method to determine whether a driver is impaired by drugs; if so, what category or combination of categories of drugs are the likely cause of the impairment. After successfully completing the training, DRE officers are certified for two years and must meet certain requirements for re-certification.

During the evaluation of suspected drug-impaired drivers, a DRE follows a 12-step protocol and captures a variety of data on a standard data collection form developed by the IACP. Because of the intense nature of the evaluation protocol, the GTSC contracted with ITSMR in 2013 to develop an application that would allow the state's DRE officers to capture the data on a mobile device for transmission directly into a database maintained by ITSMR. This change has enabled New York to develop a database containing a wealth of information pertaining to the drivers evaluated by DREs for suspected drug-impaired driving.

FIGURE 2. Number of DREs*, DRE Evaluations & Drivers Arrested for Drug-Impaired Driving**



*The number of DREs reflects those who submitted any enforcement evaluations in that year. **TSLED data only; impaired driving arrest data by charges were not available from the NYPD; a drug-impaired driving arrest is defined as one in which the driver is charged with a violation of VTL Section 1192.4 (DWAI Drugs) or 1192.4a (DWAI Drugs & Alcohol).

The DRE program in New York has expanded considerably over the past decade. As shown in Figure 2, the number of DREs who submitted any enforcement evaluations nearly doubled from 176 in 2016 to 339 in 2022. The total number of DRE evaluations submitted increased from 1,724 in 2016 to a peak of 2,774 in 2019. The total number of DRE evaluations dropped slightly in 2020 but recovered in 2021. 2022 saw a decrease in the total number of evaluations conducted despite an increase in the number of DREs. Overall, the expansion of the DRE program has considerably narrowed the gap between the number of drivers arrested for drug-impaired driving and the number of drivers evaluated by a DRE.

It is important to note that drivers evaluated by DREs remain a small subset of over 27,000 impaired driving arrests statewide each year. Moreover, DREs are often requested when the driver is suspected of impairment by drugs rather than alcohol. Therefore, drivers evaluated by DREs are not representative of all arrested impaired drivers, who can be impaired by alcohol, drugs or a combination of alcohol and drugs. Findings from this research note should be interpreted with these limitations in mind.

Drivers Evaluated and Tested Before and After the Cannabis Legalization

Each driver evaluated by a DRE is asked to submit a biological specimen (blood/urine/saliva) for chemical testing by a toxicology laboratory. The DRE officers then obtain the toxicology results from the lab or the arresting agency and enter the data into the DRE database. For the drivers evaluated each year (2018-2022), Table 1 shows the number and proportion of drivers who submitted to a chemical test, and the type of chemical test conducted. During the five-year period, the proportion of drivers who submitted to a chemical test declined consecutively from 83% to 72%, while drivers' refusal rate doubled from 11% to 22%. Among drivers who underwent chemical tests, the percentage with a urine test alone decreased from 29% in 2018 to 18% in 2022. Conversely, the percentage with a blood test alone increased from 68% in 2018 to 79% in 2022. While not shown in the table, very few drivers had a saliva test and only a small percentage of drivers had multiple test types.

TABLE 1
Drivers Evaluated and Tested

Drivers Evaluated	**2018 (N=2,429)**		**2019 (N=2,774)**		**2020 (N=2,578)**		**2021 (N=2,770)**		**2022 (N=1,973)**	
Chem Tests Conducted	2,027	83%	2,227	80%	1,993	77%	2,073	75%	1,415	72%
Chem Tests Refused	271	11%	359	13%	431	17%	544	20%	436	22%
Chem Tests Not taken	131	5%	188	7%	154	6%	153	6%	122	6%
Chem Tests Conducted	**2,027**		**2,227**		**1,993**		**2,073**		**1,415**	
Urine Test Only	580	29%	553	25%	475	24%	490	24%	258	18%
Blood Test Only	1,381	68%	1,571	71%	1,445	73%	1,532	74%	1,124	79%
Blood Results Available	*1,027*	*74%*	*1,258*	*80%*	*1,177*	*81%*	*1,168*	*76%*	*831*	*74%*
Other/Unknown	66	3%	103	5%	73	4%	51	2%	33	2%

To capture recent, relevant drug use, the current study focused on drugs detected through blood testing only. Blood is considered the "gold standard" for testing for the presence of drugs in impaired driving cases and is most useful for detecting substance use that occurred within 2 to 12 hours of the test (Compton, 2017; Hadland & Levy, 2016). Among drivers with a blood test only, 2018-2022, 74%-81% had available results for inclusion in this study (Table 1). Individuals who submitted more than one specimen type were excluded because drugs results were not reported by specimen type.

In the pre-legalization period (1/2018 – 3/2021), the blood results were available for 3,815 drivers; 92% of those drivers had at least one drug compound detected (Table 2). In the post-legalization period (3/2021 – 12/2022), the blood results were available for 1,644 drivers; 94% of those drivers had at least one drug compound detected.

TABLE 2
Detection Rate of Drugs in Blood Before and After the Legalization

	Pre-Legalization (1/2018 – 3/2021)		Post-Legalization (3/2021 – 12/2022)	
Drivers with Available Blood Results	**3,815**		**1,644**	
Any drug compound found	3,498	92%	1,549	94%
Any impairing parent drug or active metabolite found*	3,438	90%	1,513	92%

*Non-impairing drugs and drug compounds likely administered post-crash were excluded from this analysis; one inactive metabolite, BENZOYLECGONINE, was included in the analysis because the parent drug cocaine remains for a very short time in blood and is rarely observed.

It is important to note that toxicology results can include non-impairing substances such as caffeine, non-impairing medications, drugs administered as part of treatment following a crash, and metabolites of the parent drug that was ingested, insufflated, or injected. Some metabolites remain active and can potentially affect cognitive or motor functions until further metabolism is complete; other metabolites are inactive (i.e., do not impact cognitive or motor functions) (Thomas et al., 2020).

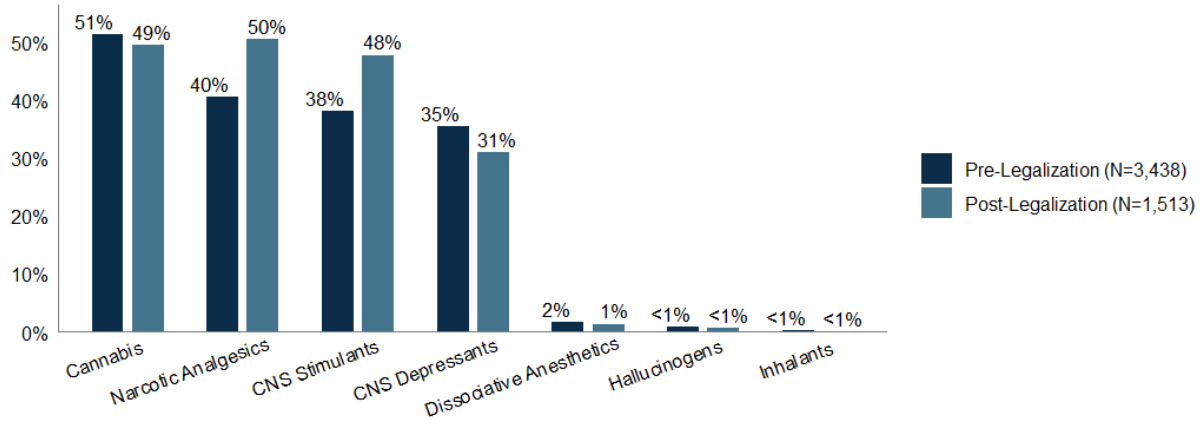
The following analyses were based on impairing parent drugs and active metabolites in the blood, excluding inactive metabolites, non-impairing drugs and drugs likely administered in post-crash settings. The presence of any parent drug or active metabolite indicates that an active form of a drug was in the blood of the driver at the time of arrest (Thomas et al., 2020). Of drivers with available blood results, 90%-92% tested positive for at least one impairing parent drug or active metabolite before and after the legalization (Table 2). Therefore, a total of 3,438 drug-positive drivers in the pre-legalization period and 1,513 drug-positive drivers in the post-legalization period were included in the following analyses.

Drugs Found Before and After the Cannabis Legalization

Figure 3 shows the prevalence of drug categories detected among drug-positive drivers from 2018 to 2022. Before and after the legalization, one out of two drug-positive drivers tested positive for the cannabis category, which includes cannabinoids and synthetic cannabinoids like Dronabinol. The proportion of drug-positive drivers found with narcotic analgesics and CNS stimulants had substantial increases in post-legalization period. 50% of the drug-positive drivers tested positive for narcotic analgesics in the post-

legalization period, up from 40% in the pre-legalization period. 48% of the drug-positive drivers tested positive for CNS stimulants in the post-legalization period, up from 38% in the pre-legalization period. The prevalence of CNS depressants declined from 35% in the pre-legalization period to 31% in the post-legalization period. Dissociative anesthetics, hallucinogens, and inhalants were rarely detected in drug-positive drivers.

FIGURE 3. Drug Categories Found in Drug-Positive Drivers (Blood Test Only), 2018 - 2022



To determine the individual drugs used by drug-positive drivers, metabolites of any parent drug were coded up to the parent drug, following the metabolite coding rules developed by NTSB (NTSB, 2022). First, the detection of a parent drug's metabolite(s) was coded as testing positive for use of the parent drug, even if the parent drug was not detected. Second, metabolites that can also be used as a parent drug were generally coded as the highest detected parent drug. For example, amphetamine is the primary metabolite of methamphetamine and can also be taken as a parent drug. If amphetamine was detected with methamphetamine, it was coded as methamphetamine. If amphetamine was detected without methamphetamine, it was coded as amphetamine.

Consistent with self-report data on DUIC, Delta-9-THC, the main psychoactive substance in cannabis, was the most commonly used individual drug (Table 3). 49%-51% of the drug-positive drivers tested positive for Delta 9 THC before and after the legalization. Fentanyl and cocaine were the next most common drugs used by drug-positive drivers. Their prevalence increased from 21%-22% in the pre-legalization period to 30% in the post-legalization period. Other drugs with a sizable increase in prevalence were methamphetamine (13% to 18%) and buprenorphine (8% to 14%). Drugs with a notable decrease in prevalence were alprazolam (19% to 14%) and morphine (7% to 2%).

TABLE 3 Top Ten Individual Drugs Found in Drug-Positive Drivers (Blood Test Only)					
Pre-Legalization (N=3,438) (1/2018 – 3/2021)			Post-Legalization (N=1,513) (3/2021 – 12/2022)		
Parent Drug	**Category**	**%**	**Parent Drug**	**Category**	**%**
DELTA 9 THC	Cannabis	51%	DELTA 9 THC	Cannabis	49%
COCAINE	CNS Stimulants	22%	FENTANYL	Narcotic Analgesics	30%
FENTANYL	Narcotic Analgesics	21%	COCAINE	CNS Stimulants	30%
ALPRAZOLAM	CNS Depressants	19%	METHAMPHETAMINE	CNS Stimulants	18%
METHAMPHETAMINE	CNS Stimulants	13%	ALPRAZOLAM	CNS Depressants	14%
CLONAZEPAM	CNS Depressants	10%	BUPRENORPHINE	Narcotic Analgesics	14%
BUPRENORPHINE	Narcotic Analgesics	8%	CLONAZEPAM	CNS Depressants	9%
MORPHINE	Narcotic Analgesics	7%	METHADONE	Narcotic Analgesics	7%
AMPHETAMINE	CNS Stimulants	6%	AMPHETAMINE	CNS Stimulants	5%
OXYCODONE	Narcotic Analgesics	5%	OXYCODONE	Narcotic Analgesics	3%

Table 4 shows the drug categories found in cannabis-positive drivers. In both periods before and after the legalization, over half of the cannabis-positive drivers tested positive for at least one non-cannabis drug category. The proportion of those who had cannabis only in the blood dropped from 47% in the pre-legalization period to 41% in the post-legalization period. When only cannabis and another drug category were found, cannabis and CNS stimulants was the most common combination, followed by cannabis and narcotic analgesics in the post-legalization period.

It is noteworthy that, post-legalization, 25% of the cannabis-positive drivers had two or more non-cannabis drug categories found in their blood, up from 21% pre-legalization. Research indicates that wide-ranging polysubstance use among cannabis-users is associated with elevated risk of severe substance dependence; polysubstance use is especially prevalent in treatment seeking substance abusers (Connor et al., 2013; Connor et al., 2014). The prevalence of polycategory substance use among cannabis-positive drivers suggests that many DUIC suspects may be dependent on substances and would require intensive service resources to prevent future impaired driving.

TABLE 4 Drug Categories Found in Cannabis-Positive Drivers (Blood Test Only)				
	Pre-legalization (1/2018 – 3/2021)		Post-legalization (3/2021 – 12/2022)	
Cannabis - Positive	**1,763**	**100%**	**748**	**100%**
Cannabis Only	832	47%	310	41%
Cannabis + Any Other Drug Category	931	53%	438	59%
Cannabis and CNS Stimulants	213	12%	107	14%
Cannabis and Narcotic Analgesics	165	9%	90	12%
Cannabis and CNS Depressants	170	10%	47	6%
Cannabis and Dissociative Anesthetics/ Hallucinogens/Inhalants	21	1%	5	<1%
Cannabis and two or more drug categories	362	21%	189	25%

CANNABIS-POSITIVE DRIVERS BEFORE AND AFTER LEGALIZATION

The following analyses were conducted to examine the gender and age of cannabis-positive drivers before and after the legalization. To determine the extent to which cannabis-positive drivers may be different from other drug-positive drivers, the same analyses were conducted on non-cannabis drivers (i.e., those who tested positive for non-cannabis drug categories only).

Driver Gender

Men comprised the majority of cannabis-positive drivers (Figure 4a). In the post-legalization period, 77% of the cannabis-positive drivers were male and 23% were female. Compared to other drug-positive drivers (Figure 4b), cannabis-positive drivers were more likely to be male. Compared to the pre-legalization period, men's proportion increased slightly among both cannabis-positive drivers and other drug-positive drivers.

FIGURE 4a. Gender Composition of Cannabis-Positive Drivers (Blood Test Only), 2018 – 2022

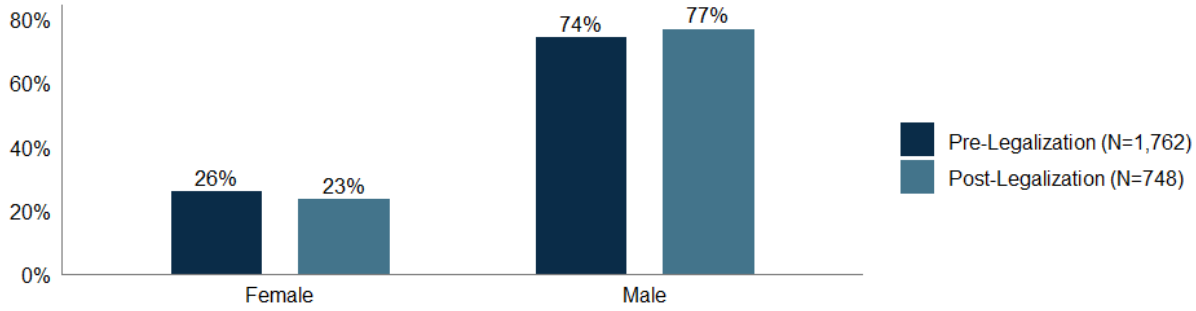
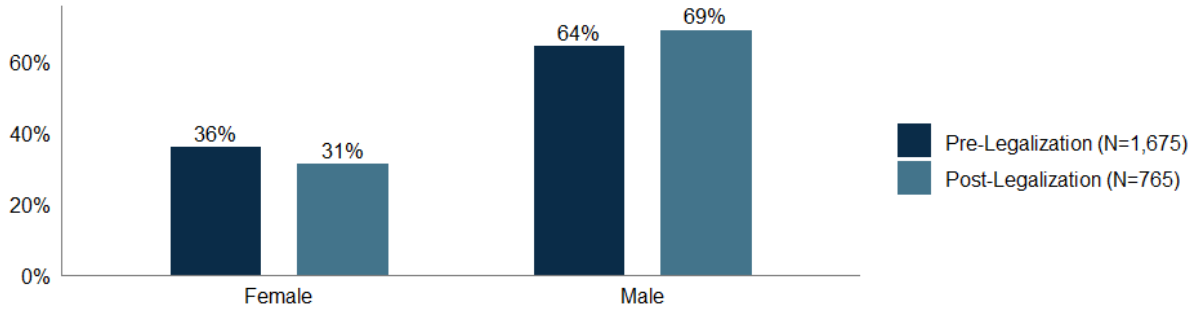


FIGURE 4b. Gender Composition of Non-Cannabis Drivers (Blood Test Only), 2018 – 2022



Driver Age

The proportion of cannabis-positive drivers who were young declined post-legalization (Figure 5a), with 46% under age 30 compared to 57% pre-legalization. For non-cannabis drug-positive drivers, the 40-59 age groups saw an increase in proportion, while the 21-29 age group decreased post-legalization (Figure 5b). It's important to note that the aging drug-positive drivers predated cannabis legalization; therefore, the age differences between the two periods were not likely due to legalization.

Compared to non-cannabis drivers, cannabis-positive drivers were substantially younger. In the post-legalization period, 11% of cannabis-positive drivers were under age 21 and 46% were under age 30; in contrast, only 2% of non-cannabis drivers were under age 21 and only 16% where under age 30.

FIGURE 5a. Age Composition of Cannabis-Positive Drivers (Blood Test Only), 2018 – 2022

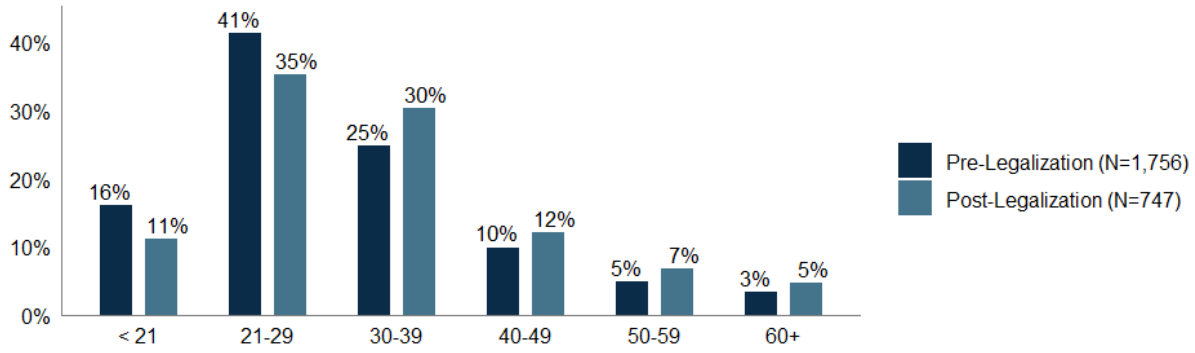
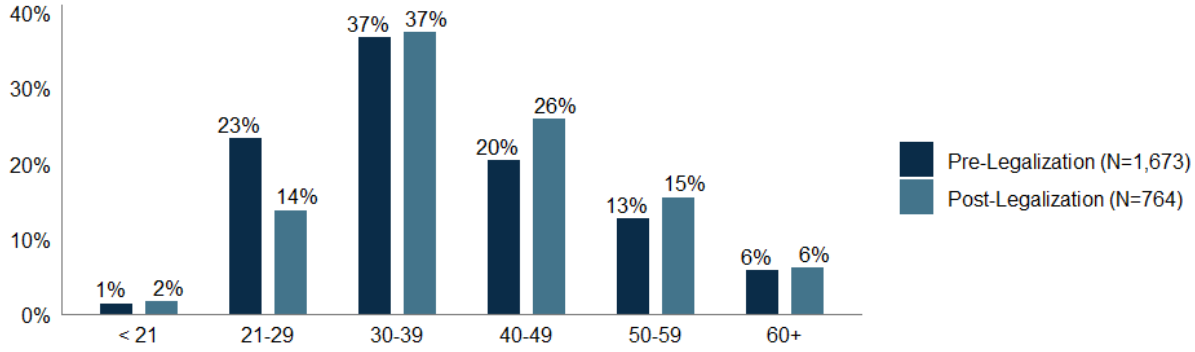


FIGURE 5b. Age Composition of Non-Cannabis Drivers (Blood Test Only), 2018 – 2022



CHARACTERISTICS OF CANNABIS-POSITIVE DRIVING EVENTS

Analyses were also conducted to examine the characteristics of the cannabis-positive driving events that resulted in a DRE evaluation, before and after the legalization. Those characteristics included the day of week and time of day when the driver was arrested, whether there was a crash, and the type of companion traffic violations issued to the driver. In addition, comparisons were made to assess how cannabis-positive driving events differed from other drug-positive driving events.

Day of Week

Cannabis-positive arrests showed a relatively even distribution across days of the week (Figure 6a). Before legalization, Friday and Saturday exhibited slightly larger proportions than the rest of the week. However, after legalization, there were no meaningful distinctions between weekends and weekdays. This pattern sharply contrasted with alcohol impairment arrests, which were more likely to occur on weekends (see ITSMR fact sheet on Alcohol & Drugged Driving Arrests). Non-cannabis drug-positive drivers also displayed no meaningful differences between weekends and weekdays (Figure 6b).

FIGURE 6a. Arrests by Day of Week Among Cannabis-Positive Drivers (Blood Test Only), 2018 – 2022

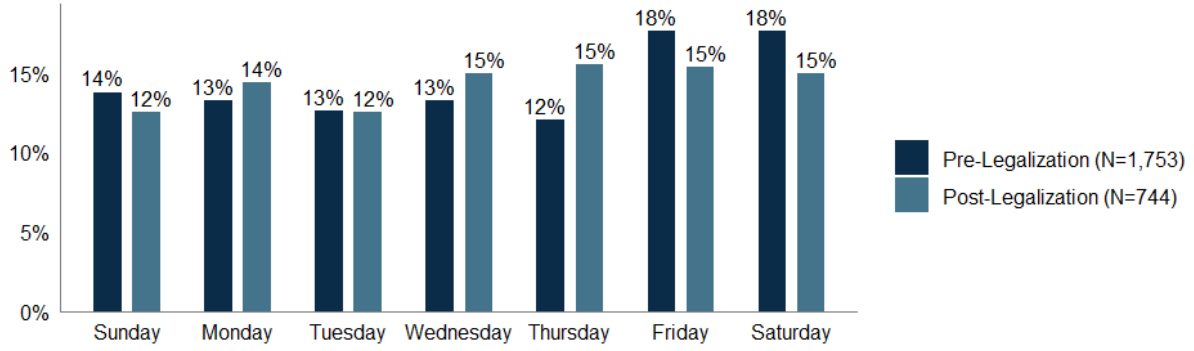
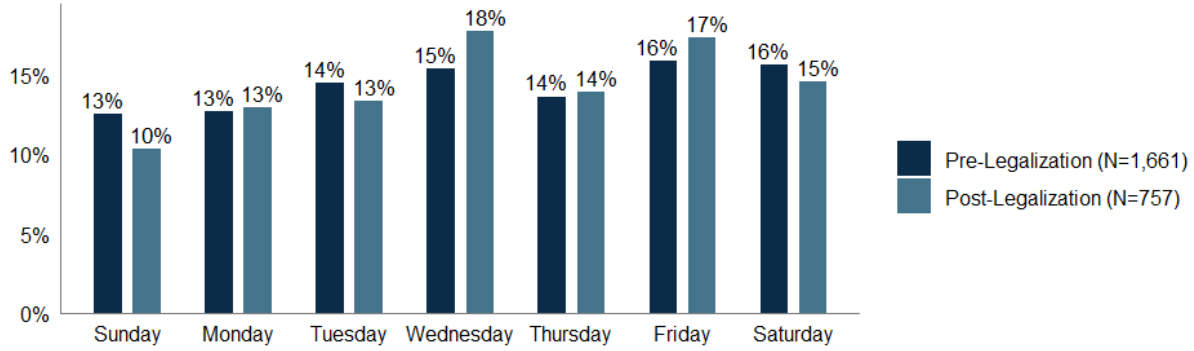


FIGURE 6b. Arrests by Day of Week Among Non-Cannabis Drivers (Blood Test Only), 2018 – 2022



Time of Day

The time-of-day pattern of arrests among cannabis-positive drivers remained relatively the same between the two periods (Figure 7a). The largest proportion of cannabis-positive drivers were arrested between 9 PM and midnight, with the arrests increasing consecutively from morning to midnight.

For non-cannabis drug-positive drivers, the time-of-day pattern also remained similar between the two periods (Figure 7b). Unlike cannabis-positive drivers, non-cannabis arrests increased consecutively from morning to 3 PM and remained elevated until midnight.

FIGURE 7a. Arrests by Time of Day Among Cannabis-Positive Drivers (Blood Test Only), 2018 – 2022

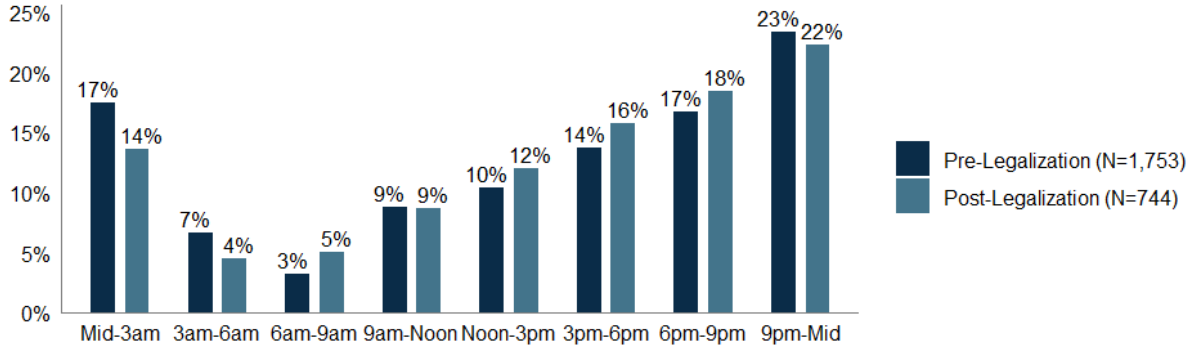
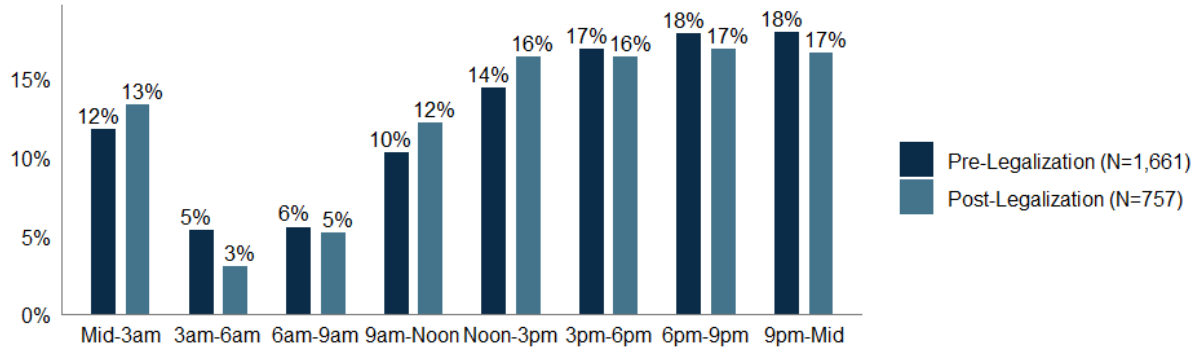


FIGURE 7b. Arrests by Time of Day Among Non-Cannabis Drivers (Blood Test Only), 2018 – 2022

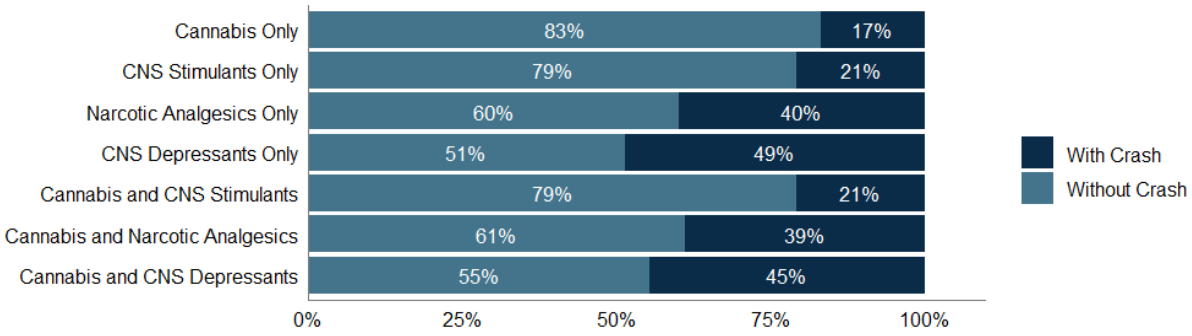


Crash Involvement

Figure 8 examines the relationship between the presence of cannabis or a combination of cannabis and another drug category in a driver's blood and their involvement in crashes. To eliminate the potential confounding effect of alcohol, the analysis excluded drivers with unknown BAC or a positive BAC from the evidential breath test. When focusing on individuals who tested positive for a single drug category, those with narcotic analgesics and CNS depressants in their system were more than twice as likely to be involved in a crash compared to the cannabis-only drivers (40%-49% vs. 17%); those with CNS stimulants were

slightly more likely to be involved in a crash than the cannabis-only drivers (21% vs. 17%). In instances where individuals tested positive for both cannabis and another drug category, those with cannabis and CNS depressants exhibited the highest crash involvement at 45%, followed by those with cannabis and analgesics at 39%, and those with cannabis and CNS stimulants at 21%. It is noteworthy that cannabis-only drivers had the lowest crash involvement among the selected groups of drug-positive drivers. Furthermore, the crash involvement among drivers testing positive for both cannabis and another drug category was similar to that among drivers testing positive for the respective non-cannabis drug category alone.

FIGURE 8. Crash Involvement Among Drivers with Select Drug Categories* (Blood Test Only), 2018-2022



**Drivers positive for dissociative analgesics/hallucinogens/inhalants were not presented due to low counts. Drivers with unknown BAC or a positive BAC from the evidential breath test were excluded from the analysis.*

Companion Traffic Violations

Experimental studies examining the impact of cannabis on driving performance have revealed that THC negatively influences a driver's ability to maintain the correct lane position, handle multiple driving subtasks simultaneously, and react promptly to unexpected events. Additionally, drivers impaired by cannabis tend to compensate for their impairment by driving more slowly, maintaining greater distances from other cars, and taking fewer risks (Compton, 2017; Hartman & Huestis, 2013). However, experiments conducted in controlled, artificial environments might not generalize well to the complexities of everyday driving situations.

The integration of NYS TSLED ticket data with the DRE data presented a unique opportunity to investigate companion traffic violations that might be associated with the effects of cannabis on driving in real-life scenarios. To identify all tickets issued to drivers evaluated by a DRE, DRE evaluations conducted between 2018 and 2022 were first linked to impairment tickets in the TSLED data. In this step, 79% of drug-positive drivers in the DRE database had corresponding impairment tickets for the same driving event, based on subject name/license number and a close time proximity between the ticket issue time and the start time of the DRE evaluation. This matching rate exhibited minimal variation over time and among drivers with various drug categories in the blood. 21% of drug-positive drivers in the DRE database had no matches, poor matches, or occasionally conflicting matches, and were consequently excluded from the following analysis. Finally, non-impairment traffic violations, such as speeding tickets, for the same driving event were linked to drug-positive drivers with matching impairment tickets. Individual violations were grouped into larger violation categories for easier interpretation.

Table 5a presents the prevalence of select categories of companion traffic violations that could be related to the impairment effect of a single drug category. To eliminate the potential confounding effect of alcohol, drivers with unknown BAC or a positive BAC from the evidential breath test were excluded from the analysis. Over the five-year period, 2018-2022, 759 cannabis-only drivers, 314 drivers positive for CNS stimulants only, 256 drivers positive for narcotic analgesics only and 222 drivers positive for CNS depressants only had matching impairment tickets for the same driving event in the TSLED database.

Among all four groups of drivers, the most common category of companion tickets issued were lane-related violations. 30% of the cannabis-only drivers were ticketed for lane-related violations. In comparison, 34% of the CNS-stimulants-only drivers, 54% of the narcotic-analgesics-only drivers and 54% of the CNS-depressants-only drivers were ticketed for lane-related violations. In contrast to the common perception that cannabis-impaired drivers drive more slowly, speeding violations were most prevalent among the cannabis-only drivers (20%). Other common companion violations of cannabis-only drivers were failure to signal for turning movements (12%) and violations related to traffic device and stops (8%). These analyses help shed light on the impairing effect of cannabis independent from other drug categories and alcohol.

TABLE 5a
Drivers Positive for a Single Drug Category* in Blood 2018 - 2022
Select Traffic Violations

Violation Category	Cannabis Only (N = 759)		CNS Stimulants Only (N = 314)		Narcotic Analgesics Only (N = 256)		CNS Depressants Only (N = 222)	
Lane-Related Violations (V&T 1120-1128, 1130-1131, 1160, 1166, 1225A)	228	30%	108	34%	138	54%	119	54%
Speeding (V&T 1180)	157	20%	50	16%	26	10%	13	6%
Turn Signal (V&T 1163-1164)	84	12%	35	12%	24	10%	21	10%
Traffic Device and Stops (V&T 1110-1116, 1172, 1173, 1174A)	64	8%	27	8%	16	6%	14	6%
Following Too Closely (V&T 1129)	17	2%	9	2%	12	4%	19	8%
Reckless Driving (V&T 1212)	17	2%	14	4%	7	2%	7	4%
Failed to Yield Right-of-Way (V&T 1140-1146)	20	2%	5	2%	4	2%	3	2%
Backing Unsafely (V&T 1211)	7	<1%	3	<1%	4	2%	4	2%
Driving too Slowly (V&T 1181)	1	<1%	1	<1%	1	<1%	5	2%

** Drivers positive for dissociative analgesics/hallucinogens/inhalants were not presented due to low counts. Drivers with unknown BAC or a positive BAC from the evidential breath test were excluded from the analysis.*

Table 5b presents the prevalence of select categories of companion traffic violations that could be related to the impairment effect of cannabis combined with another drug category. Over the five-year period, 2018-2022, 209 drivers positive for cannabis plus CNS stimulants, 182 drivers positive for cannabis plus narcotic analgesics and 144 drivers positive for cannabis plus CNS depressants had matching impairment tickets for the same driving event in the TSLED database.

For all three groups of drivers, the top three companion traffic violations are lane-related violations, followed by speeding violations and failure to signal for turning movements. Compared to cannabis-only drivers, drivers positive for cannabis plus narcotic analgesics/CNS depressants were considerably more likely to have a lane-related violation (30% vs. 52%-58%). Notably, compared to drivers positive for narcotic analgesics/CNS depressants only, drivers positive for cannabis plus narcotic analgesics/CNS depressants were more likely to have a speeding violation.

TABLE 5b
Cannabis-Positive Drivers with Two Drug Categories* in Blood 2018 - 2022
Select Traffic Violations

Violation Category	Cannabis + CNS Stimulants (N = 209)		Cannabis + Narcotic Analgesics (N = 182)		Cannabis + CNS Depressants (N = 144)	
Lane-Related Violations (V&T 1120-1128, 1130-1131, 1160, 1166, 1225A)	62	30%	93	52%	84	58%
Speeding (V&T 1180)	28	14%	31	18%	28	20%
Turn Signal (V&T 1163-1164)	24	12%	6	4%	17	12%
Traffic Device and Stops (V&T 1110-1116, 1172, 1173, 1174A)	12	6%	4	2%	14	10%
Following Too Closely (V&T 1129)	5	2%	5	2%	14	10%
Reckless Driving (V&T 1212)	8	4%	3	2%	4	2%
Failed to Yield Right-of-Way (V&T 1140-1146)	3	2%	3	2%	2	2%
Backing Unsafely (V&T 1211)	0	0%	0	0%	1	<1%
Driving too Slowly (V&T 1181)	2	<1%	0	0%	2	2%

** Drivers positive for dissociative analgesics/hallucinogens/inhalants were not presented due to low counts. Drivers with unknown BAC or a positive BAC from the evidential breath test were excluded from the analysis.*

Summary and Conclusion

The issue of driving under the influence of drugs has become increasingly serious on New York roadways. Based on data from New York State Department of Motor Vehicles Accident Information System, a decade ago, there were considerably more fatalities involving a drinking driver than those involving a drug-related driver. However, in 2020 and 2022, fatalities involving a drug-related driver surpassed those involving a drinking driver, comprising 23% to 25% of total motor vehicle fatalities in the state.

Understanding DUIC is of paramount importance for New York as it endeavors to revamp its strategies in tackling drugged driving. According to the National Survey on Drug Use and Health (NSDUH) 2018-2019, approximately 600,000 New York residents annually reported driving under the influence of cannabis in the past year. This figure was three times higher than the number of individuals self-reporting driving under the influence of alcohol without the presence of drugs. However, low levels of drug-impairment

arrests and limited drug testing present a significant hurdle in our quest for a thorough understanding of drugged driving and its true impact on the safety of our roadways.

To gain insights into cannabis and driving before and after the legislation, the study comprehensively examined the pre-law and post-law data on drivers who were evaluated by a DRE and tested positive for at least one active impairing drug in the blood. Among the drug-positive drivers, the prevalence of cannabis as a drug category and its main psychoactive substance (Delta-9 THC) remained the same before and after the legalization. However, notable increases were identified in the prevalence of narcotic analgesics (specifically fentanyl and buprenorphine) as well as CNS stimulants (specifically cocaine and methamphetamine) during the post-legalization period. These findings suggest that factors beyond cannabis legalization have been influencing the landscape of drugged driving in New York.

When looking at characteristics of drug-positive drivers and driving events, more substantial distinctions were identified among drivers with distinct drug categories than in the comparison between the periods before and after legalization. Compared to non-cannabis drug positive drivers, cannabis drivers were more likely to be male, under age 30, and arrested between 9 PM and midnight. Cannabis-only drivers were less likely to be involved in a crash than drivers testing positive for a single non-cannabis drug category and drivers testing positive for cannabis plus another drug category.

Last but not least, the NYS TSLED ticket data were integrated with the DRE data to examine companion traffic violations that might be associated with the effects of cannabis on driving in real-life scenarios. Of the drivers positive for cannabis, with or without another drug category, the most common companion violations charged were lane-related violations, followed by speeding and failure to signal turning movements. Compared to drivers positive for narcotic analgesics only or CNS depressants only, cannabis-only drivers were much less likely to be ticketed for lane-related violations, but more likely to be ticketed for speeding.

It's important to note that this study does not establish a causal relationship between cannabis legalization and drugged driving. The observed changes from pre-law to post-law periods are descriptive and may not be directly attributed to cannabis legalization itself. Additionally, this research note examined data on drivers evaluated by Drug Recognition Experts (DREs) for suspected drug-impaired driving; findings from this study may not generalize to all drivers under the influence of cannabis and/or other drugs on NY roadways. Lastly, it's important to recognize that testing positive for a drug doesn't necessarily indicate driving under the influence of that drug. Conversely, not testing positive for a drug doesn't guarantee that the drug didn't contribute to impairment; variations in blood collection timing and drug stability can result in undetectable levels at testing despite their presence at the time of arrest. Despite these limitations, this report provided New York’s traffic safety community much needed information on cannabis and driving before the cannabis legalization and during its early phase. As the landscape evolves with the rollout of legal recreational marijuana dispensaries across the state, further research should assess the long-term impact of the cannabis legalization on traffic safety.

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