EXHIBIT 1

https://www.westernmassnews.com/arraignment-held-for-man-charged-in-connection-with-granby-marijuana-growing-operation/article_a0a058fa-74c2-11ec-bab0-6b3fc096976c.html

Arraignment held for man charged in connection with Granby marijuana growing operation

RYAN TROWBRIDGE, LEON PURVIS
POSTED JAN 13, 2022

BELCHERTOWN, MA (WGGB/WSHM) -- A man charged with growing close to 1,400 pounds of marijuana in a Granby house faced a judge on Thursday and is now being held on $30,000 bail.

When Haolin Yu faced that judge, he became very emotional.

Yu, 30, of Brooklyn, NY was arrested Wednesday in a joint investigation by Granby Police and the FBI. He's charged with operating a marijuana grow house on Amherst Street and trafficking of marijuana.

Western Mass News was outside the property as it was searched for hours yesterday. We've obtained court documents that said investigators found six rooms with grow lights and hundreds of plants in each room - nearly 1,400 plants in all.

Yu's attorney told the judge that he doesn't have a criminal record, has a family, and a baby on the way.

The next court date for Yu is February 7.

Ryan Trowbridge
Digital Content Manager

Leon Purvis

EXHIBIT 2

2 arrested after marijuana grow operation sparks massive fire

Submitted by Cannabis News (/users/cannabis-news) on Fri, 01/14/2022 - 08:34

San Bernardino County Fire crews were able to knock down a major two-alarm commercial fire in Adelanto Wednesday evening.

Authorities said the fire crews responded to the large commercial blaze in the 18000 block of Baldwin Street at around 4:35 p.m. Wednesday and went into defensive mode to protect other nearby homes and a strip mall center.

Officials said they think the fire started at a nursery on Baldwin Street. There were reportedly several explosions, possibly from propane tanks used at the business where the fire raged.

About 50 firefighters were called out to manage the blaze. No injuries were reported, and fire damage did not extend to any homes or the neighboring strip mall.

Two people were arrested and accused of sparking the fire. According to the San Bernardino County Sheriff's Department, Peng Wei and Jing Wei Ping are accused of running an illegal cannabis grow operation which sparked the massive fire. After the fire was knocked down, investigators found evidence of a butane extraction lab, a marijuana extraction system, cash, two unserialized firearms and a large quantity of processed and concentrated marijuana.

EXHIBIT 3

Americans Against Legalizing Marijuana

AALM.info

WATER AND WILDLIFE...OR WEED?

The issues of water availability and the killing of wildlife due to contaminants from marijuana growing are serious issues in states that have legalized marijuana such as California. **The huge number of marijuana grows are having very negative effects on water availability, water quality, aquatic habitats, riparian habitat, wetlands and springs and rivers.** Wildlife may be exposed to dangerous chemicals due to marijuana growing. Animals exposed to these chemicals "drown in their own blood or stumble around until they're eaten themselves, passing the poison up the food chain to predators like owls and fishers." [1]

Pictured: This male fisher was found dead near Yosemite National Park. Tissue samples confirmed the animal was killed by rat poison consumed at a marijuana grow. ELIZABETH SHOGREN / NPR

Executive Summary

1. Marijuana growers are responsible for theft of water during droughts.
2. This water is needed elsewhere to grow food and to fight wild fires, and for human use.
3. Many "legal" and all illegal marijuana grows are not regulated safely.
4. The increase in water theft has exposed the vulnerabilities in the state systems to secure water and the complications of weak marijuana law enforcement.
5. Current marijuana cultivation activities have led to significant environmental impacts, including habitat degradation, loss and fragmentation or burying of streams, diversion of surface waters, and impacts to water quality, including sediment, garbage, pesticides, and petroleum products.

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1 Illegal Pot Farms Are Poisoning California's Forests. Secret growers are taking advantage of the state's remote stretches of public land - and the environmental impact is severe. https://www.theatlantic.com/science/archive/2017/03/backcountry-drug-war/521352/

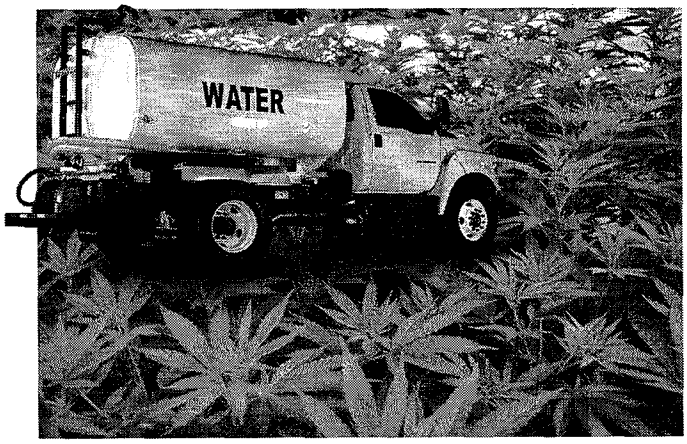
Americans Against Legalizing Marijuana is an all-volunteer IRS approved non-profit 501(c)(3) dedicated to providing information on the harms of marijuana to individuals and our Country based on the premise of No Use of Any Illegal Drug and No Illegal Use of Legal Drugs.

AALM.info PO Box 158 Carmichael CA 95609 Phones: 916-708-4111 619-990-7480

6. Intimidation by marijuana growers is an impediment to more robust reporting and enforcement.
7. Much of the marijuana industry is out of control and has made water more scarce and more polluted.
8. Lack of clean water and pollution is killing wildlife.
9. Although there may be some regulations, there are massive number of illegal grows that are not regulated.[2]

Water Usage

Marijuana legalization has allowed black market growing and selling to continue because marijuana advertising fuels demand. Some states produce more marijuana than is consumed within their state. The excess is shipped illegally across state lines to the east where prices are higher. Local law enforcement agencies are completely overwhelmed with marijuana related criminal activities.[3] Legalization was supposed to reduce demands on law enforcement.



Pictured: Water thieves are using any type of vehicle/ containers to transport stolen water such as large tanker water trucks, water cubed containers in backs of beds, trailers with water tanks.

Theft of Water

Recent press reports document that marijuana growers are stealing scarce water. Water thieves working for illicit marijuana operations are stealing water from wells, aquifers, remote filling stations and tap into fire hydrants and improperly shut off water valves. This leads to a limited water supply for fighting fires and food production.[4]

The majority of California agriculture is subject to heavy water use regulation.

2 Cannabis Cultivation Policy, State Water Resources Control Board, approved April 16, 2019. https://www.waterboards.ca.gov/water_issues/programs/cannabis/

3 Thieves are stealing California's scarce water. Where's it going? Illegal marijuana farms" Julie Cart, July 27, 2021, https://calmatters.org/environment/2021/07/illegal-marijuana-growers-steal-california-water/Illegal cannabis growers are stealing water amid California's drought, officials say," Washington Post, Rachel Pannett, July 28, 2021 https://www.washingtonpost.com/nation/2021/07/28/water-theft-drought-cannabis/?utm_campaign=wp_post_most&utm_medium=email&utm_source=newsletter&wpisrc=nl_most&carta-url=https%

4 Thieves are stealing California's scarce water. Where's it going? Illegal marijuana farms" Julie Cart, July 27, 2021, https://calmatters.org/environment/2021/07/illegal-marijuana-growers-steal-california-water/

5 See: "Cultivating Disaster" page 33 at https://static1.squarespace.com/static/599a426ee45a7ccab72c77d2/t/618dbf053f3402756b4b7659/1636679434662/CULTIVATING.DISASTER+%282%29.pdf Thieves are stealing California's scarce water. Where's it going? Illegal marijuana farms" Julie Cart, July 27, 2021, https://calmatters.org/environment/2021/07/illegal-marijuana-growers-steal-california-water/ "Illegal cannabis growers are stealing water amid California's drought, officials say," Washington Post, Rachel Pannett, July 28, 2021 https://www.washingtonpost.com/nation/2021/07/28/water-theft-drought-cannabis/?utm_campaign=wp_post_most&utm_medium=email&utm_source=newsletter&wpisrc=nl_most&carta-url=https%

Farmers of most irrigated crops help their plants through the dry summer months by filling water tanks in the winter, when streams and springs are full. By contrast, many marijuana growers draw surface water during the plant's summer growing season, when drought conditions are worse. Taking water directly from rivers and streams in the summer not only reduces the water available for agriculture but also threatens wildlife species, especially birds and fish.[5]

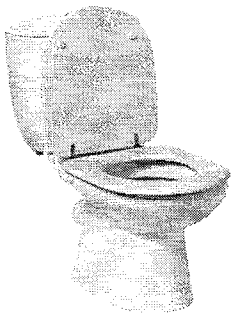
Farmers, ranchers and licensed marijuana growers fight to obtain water through legal channels but illegal pot growers are stealing it or purchasing it from illicit sources. The increase in water theft has exposed the vulnerabilities in the state systems to secure water and the complications of weak marijuana law enforcement.

Intimidation by marijuana growers is an impediment to more robust reporting and enforcement. In addition, the political power of marijuana interests is undermining the ability of citizens to get local jurisdictions to address these problems. [6]

Watersheds have been losing water flow to an "alarming rate" because of illegal marijuana cultivation. It is estimated that there are 40-50,000 illegal grow sites in California using precious water. Each pot plant requires between 6 and 8 gallons of water per day. For example, illegal grows in just three southern California counties use an astounding 5.4 million gallons of water each day. [7]

6 Gallons of Water: Which Do you Choose?

FLUSH 4x EACH DAY



Avg. **1.6 gallons**/flush x 4 flushes = 6 gallons

FEED 1 MARIJUANA PLANT 6 GALLONS EACH DAY

Each marijuana plant requires at least **6 gallons** of water each day

SAVE WATER FOR HUMAN USE - NOT POT PLANTS

6 Thieves are stealing California's scarce water. Where's it going? Illegal marijuana farms" Julie Cart, July 27, 2021, https://calmatters.org/environment/2021/07/illegal-marijuana-growers-steal-california-water/Ilegal cannabis growers are stealing water amid California's drought, officials say," Washington Post, Rachel Pannett, July 28, 2021 https://www.washingtonpost.com/nation/2021/07/28/water-theft-drought-cannabis/?utm_campaign=wp_post_most&utm_medium=email&utm_source=newsletter&wpisrc=nl_most&carta-url=https% Jewel Wicker, "Marijuana farmers blamed for water theft as drought grips American west" https://www.theguardian.com/environment/2021/jul/23/water-theft-marijuana-farmers-california-american-west "California Cracks Down on Illegal Cannabis Growers Stealing Water Amidst Droughts & Wildfires," James Eason, July 30, 2021 https://marijuanapackaging.com/blogs/california-marijuana/california-cracks-down-on-illegal-cannabis-growers-stealing-water-amidst-droughts-wildfires.

7 Thieves are stealing California's scarce water. Where's it going? Illegal marijuana farms" Julie Cart, July 27, 2021, https://calmatters.org/environment/2021/07/illegal-marijuana-growers-steal-california-water/ Illegal cannabis growers are stealing water amid California's drought, officials say," Washington Post, Rachel Pannett, July 28, 2021; https://www.washingtonpost.com/nation/2021/07/28/water-theft-drought-cannabis/?utm_campaign=wp_post_most&utm_medium=email&utm_source=newsletter&wpisrc=nl_most&carta-url=https% "California Cracks Down on Illegal Cannabis Growers Stealing Water Amidst Droughts & Wildfires"; https://marijuanapackaging.com/blogs/california-marijuana/california-cracks-down-on-illegal-cannabis-growers-stealing-water-amidst-droughts-wildfires

8 Cannabis farms in California rely on wells outside of regulated groundwater basins, Christopher Dillis et al 2021 Environ. Res. Commun. 3 075005; https://iopscience.iop.org/article/10.1088/2515-7620/ac1124

The Science

A study suggests that widespread reliance on groundwater wells for marijuana irrigation may result in stream flow depletion. Well use by marijuana farms is in the 11 top marijuana producing counties in California. Some trespass growers leave their irrigation systems running around the clock. In eight of these 11 counties, more than one quarter of farms are using wells that are located outside of groundwater basins subject to state groundwater use regulations.[8] Some grows use 50 percent more water because of inefficient irrigation systems and added stressors like pests, pathogens, and drier weather at higher elevations. Multiply that by hundreds of thousands of plants and there is a serious water problem. A study by the California Department of Fish and Wildlife estimated that trespass marijuana grows used about 300 million gallons of water per square mile, roughly the same as almond orchards.[9] California and other states that have legalized marijuana have droughts that make it very clear that clean water is a precious and critically important natural resource essential to life. Much of the marijuana industry in those states is out of control and is threatening this natural resource. Legalization of marijuana has made water more scarce and more polluted.

Pictured: These barred owls died from anticoagulant rodenticide, which causes rats to bleed out, and inevitably accumulates in apex predators like owls. The poison most likely came from an illegal cannabis operation. Matt Simon / WIRED

Wildlife or Weed?

Marijuana cultivation has caused significant environmental damage, including discharges of pollutants to surface water and ground water, erosion and sedimentation, and illegal diversions of surface water. The federal and state laws that all farmers must follow have been ignored by many marijuana growers. There is improper use of chemicals and fertilizers at marijuana grows. Even many licensed growers do not abide by the rules. [10]

Fertilizers with high nitrates are of particular concern as nitrate loading contributes to cyanobacteria that kill fish and animals. Pesticides used at grows are often not approved for use on crops for human consumption.

9 Illegal Pot Farms Are Poisoning California's Forests Secret growers are taking advantage of the state's remote stretches of public land - and the environmental impact is severe. https://www.theatlantic.com/science/archive/2017/03/backcountry-drug-war/521352/

10 For more documentation see: "Cultivating Disaster" at 18-19 https://static1.squarespace.com/static/599a426ee45a7ccab72c77d2/t/618dbf053f34027 56b4b7659/1636679434662/CULTIVATING.DISASTER+%282%29.pdf

11 For more documentation see the entire document "Cultivating Disaster" Ibid. https://www.oregonlive.com/opinion/index.ssf/2018/01/us_attorney_a_call_for_transpa.html; https://www.marijuana.com/news/2018/05/u-s-attorney-to-crack-down-on-illegally-grown-northern-california-marijuana/

Current marijuana cultivation activities have led to significant environmental impacts, including habitat degradation, loss and fragmentation or burying of streams, diversion of surface waters, and impacts to water quality including sediment, garbage, pesticides and petroleum products. [11]

The illegal growers often use chemical fertilizers and pesticides restricted or banned in the United States, including carbofuran, diazinon and zinc phosphide. "Carbofuran, one of these banned pesticides, can cause headaches, nausea, vomiting, convulsions, and even death to humans or animals that consume it. Diazinon, another chemical found at many illegal grows sites, can cause breathing difficulties, weakness, blue lips, convulsions, and coma." [12]
Carbofuran is turning up at 60 to 70% of illegal grow sites, often mixed in bottles with no labels. One third of a teaspoon can kill a 300 lb bear. [13]

Growers have turned thousands of acres of woodlands into waste dumps so toxic that law enforcement officers who inadvertently touched plants and equipment require hospitalization. Many animals are dying. Many contaminated rivers and creeks flow into the water supply system in our most populous areas. Streams may test positive for chemicals more than a year after illegal grows are cleared. It may take months or years for chemicals to migrate through the soil. [14] The Huffington Post noted that many of the chemicals applied to marijuana plants are intended only for lawns and other non-edible uses. They reported that marijuana pesticide contamination is widespread and in some cases pesticide residue levels are 1,600 times greater than the legal desirable amount. [15]

Impact of Water Pollution

Normal agriculture in California follows strict requirements in the application of chemicals and fertilizers. Products used must be labeled as approved for use on the agricultural product being grown with application rates, methods, time of day, wind speed, containment. In the case of chemicals there must be OSHA compliant safety equipment used and blood testing of workers. Air and water monitoring both upstream and downstream are often required to insure there is no migration of chemicals onto neighboring property via air or into adjacent streams. In some cases, neighbors must be notified. [16]

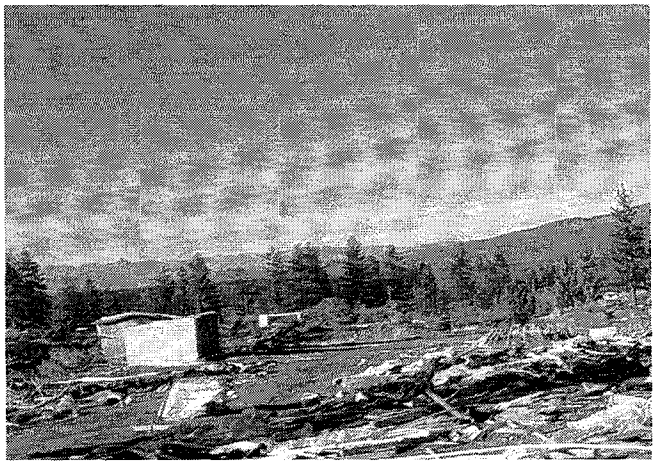
12 https://merryjane.com/health/toxic-pesticides-from-illegal-cannabis-grows-are-seeping-into-california-waterways; https://www.thecannabist.co/2018/01/01/california-marijuana-legalization-environmental-regulations/95680/

13 https://www.cbsnews.com/news/lassen-national-forest-toxic-chemicals-killing-wildlife-illegal-marijuana-grows/https://www.co.siskiyou.ca.us/sites/default/files/SO-20160920_MarijuanaEnforcementUpdate.pdf

14 "Banned Pesticides from Illegal Pot Farms Seep into California Water, 35 No. 16 Westlaw Journal Toxic Torts 5, September 22, 2017

15 http://www.huffingtonpost.com/2013/05/24/marijuana-pesticides-contamination_n_3328122.html

16 See: "Cultivating Disaster" page 12 at https://static1.squarespace.com/static/599a426ee45a7ccab72c77d2/t/618dbf053f3402756b4b7659/1636679434662/CULTIVATING.DISASTER+%282%29.pdf



Pictured: California land & nature trashed with various marijuana grow tools

An article in The Atlantic about marijuana grows in California noted the following problems:

1. **Rodenticides used in marijuana growing causes neurological damage and internal bleeding.**
2. **Animals exposed to these chemicals "drown in their own blood or stumble around until they're eaten themselves, passing the poison up the food chain to predators like owls and fishers."**
3. **The growers bait open tuna cans with pesticides, which are often flavored like meat or peanut butter, or string up poisoned hot dogs on fish hooks. People have found bears, foxes, vultures, and deer with chemicals from grow sites in their bodies.**

One study of owls in the Pacific Northwest found that 80 percent of the birds tested positive for dangerous chemicals. And for every animal found, there are probably dozens more in a similar condition.

4. The poisons could spread far beyond each grow site and contaminate the water supply of towns and cities far downstream. The toxicants can leach into the soil and linger for years.

5. The chemical containers can explode. They can gasify and build up pressure in the heat of the sun. [17]

Indoor Growing

Indoor and hydroponic growing is defined as the process of growing plants in sand, gravel, or liquid, with added nutrients but without soil. The water used contains a specialty mix of chemicals and fertilizers designed for high potency growth. When the water is disposed of into a municipal waste treatment systems or private on-site septic systems that are not designed to handle the effluent, environmental damage results. [18] Pest problems are always worse indoors, which biases farmers toward a chemically intensive regime and chemical run-off into water sources. [19]

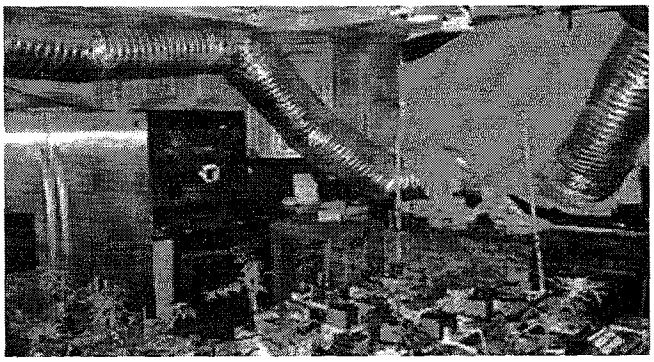
17 See the entire document: "Cultivating Disaster" Ibid. Illegal Pot Farms Are Poisoning California's Forests Secret growers are taking advantage of the state's remote stretches of public land - and the environmental impact is severe. https://www.theatlantic.com/science/archive/2017/03/backcountry-drug-war/521352/

18 See: "Cultivating Disaster" page 22. Ibid

19 See: "Cultivating Disaster" page 35, Ibid

The Science

It has been found that toxicants from marijuana cultivation cause a threat to birds. [20] One environmental side-effect of marijuana growing is the extensive use of anticoagulant rodenticides to prevent damage to marijuana plants caused by wild rodents. The proliferation of grow operations with their use of anticoagulant rodenticides in forested landscapes used by northern spotted owls may pose an additional stressor for this threatened species. In Humboldt County California it is estimated there are 4,000 to 15,000 marijuana grow sites. Many marijuana growers use anticoagulant rodenticides. When rodents exposed to anticoagulant rodenticides are eaten by the birds and animals that feed on them the birds die from uncontrollable bleeding. The anticoagulant rodenticides also run off into rivers and streams and kill fish such as salmon. These deaths "have been directly attributed to rat poison used by cannabis farmers." [21] The increase in cannabis use might increase its levels in freshwaters, enhancing hazards to bivalves and to the whole aquatic community. [22]



Pictured: A Fremont CA couple's rental property damaged by a black market marijuana grow.
DAN NOYES/ABC

Direct Contact with Human Beings

Research finds that the application of dangerous chemicals can make direct contact with human beings. For example, many municipal systems spray their treated water onto local golf courses. Without testing for the discrete chemicals that the US Forest Service found on grow sites, the tainted water could make its way into direct contact with people recreating in contaminated areas and waters. People are not be aware of the potential dangers or the level of risk associated with using these recreational facilities. [23]

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20 "Patterns of Natural and Human-Caused Mortality Factors of a Rare Forest Carnivore, the Fisher (Pekania pennanti) in California," Mourad W. Gabriel, Leslie W. Wood, Greta M. Wengert, Nicole Stephenson, et. al, PLOS ONE/DOI:10.1371/journal.pone.0140640 November 4, 2015

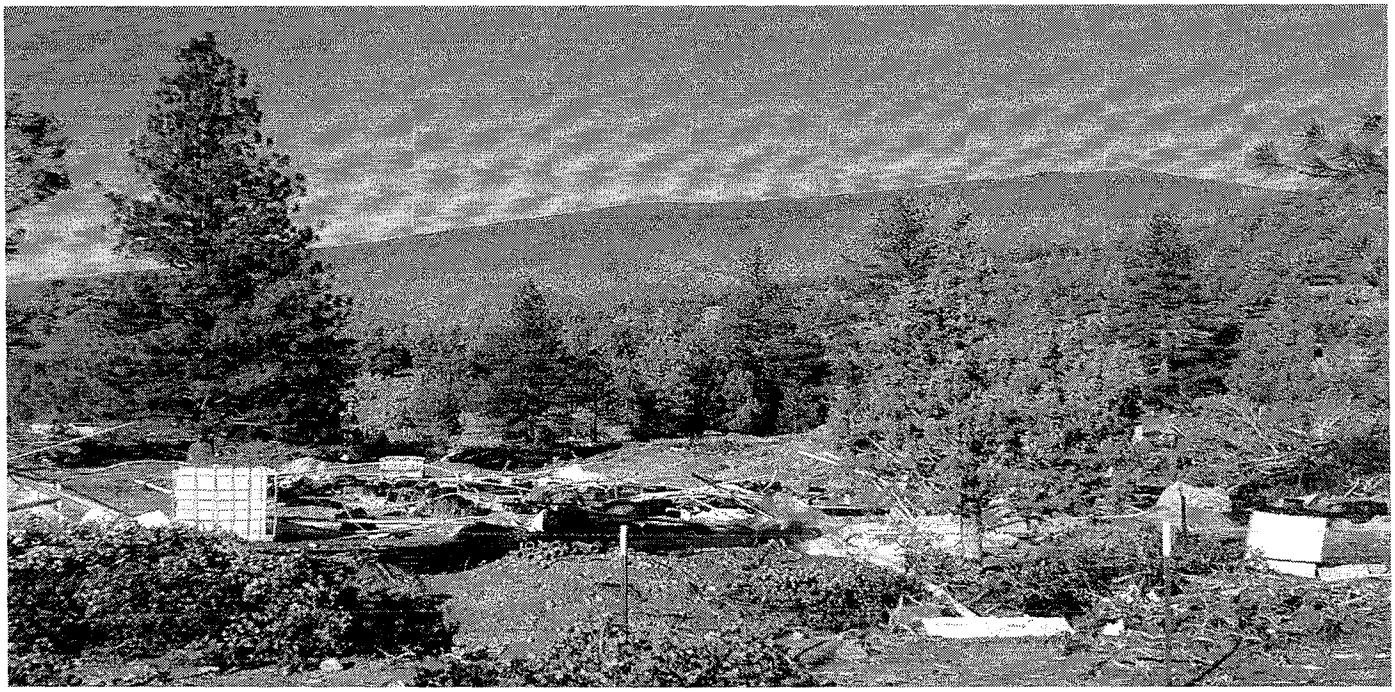
21 "Grass is not always greener: rodenticide exposure of a threatened species near marijuana growing operations," Franklin et al. BMC Res Notes (2018) 11:94; https://doi.org/10 .1186/s l3104-018-3206z. See also, AVIAN CONSERVATION & ECOLOGY VOLUME 13, ISSUE 1, ARTICLE 2 Gabriel, M. W., L. V. Diller, J. P. Dumbacher, G. M. Wengert, I M. Higley, R. H. Poppenga, and S. Mendia. 2018. Exposure to rodenticides in Northern Spotted and Barred Owls on remote forest lands in northwestern California: evidence of food web contamination.

22 Environ Toxicol Chem. 2017 Feb;36(2):472-479. doi: 10.1002/etc.3575. Epub 2016 Oct 5. Increase in cannabis use may indirectly affect the health status of a freshwater species. Parolini M, Castiglioni S, Magni S, Della Torre C, Binelli A1.

23 See: "Cultivating Disaster" page 23 https://static1.squarespace.com/static/599a426ee45a7ccab72c77d2/t/618dbf053f3402756b4b7659/1636679434662/CULTIVATING.DISASTER+%282%29.pdf

Conclusion

The states that have legalized marijuana and do not really regulate marijuana growing must choose. They cannot continue as they are **and** have water **and** wildlife **and** weed.



Pictured: Trashed California land is a direct negative result of marijuana farming & growing.

Acknowledgement

Pictured: Dennis Miller at an illegal grow site

Dennis Mills, the author of Cultivating Disaster that is cited herein has given permission to use his work. It clearly documents the environmental damage caused by marijuana growing and is an excellent scientific resource paper. Our nation owes a great debt to him for his tireless work exposing this threat. Cultivating Disaster was prepared with the Communications Institute. https://communicationsinstitute.org, who have also given their permission.

EXHIBIT 4

Wendy L. Patrick, J.D., Ph.D.
Why Bad Looks Good

DOMESTIC VIOLENCE

Seeing Green? Cannabis Use Associated With Domestic Violence

New research adds marijuana use as a risk factor.

Posted October 8, 2018

Domestic Violence Awareness Month highlights the epidemic of domestic abuse, a crime that often flies under the radar. Having prosecuted countless crimes of domestic abuse in my over 20 years as a prosecutor, my experience is consistent with research findings regarding the fact that physical abuse is often precipitated by observable risk factors.

In an attempt to reduce the likelihood of interpersonal violence, there has traditionally been an emphasis placed on precursors such as anger management, history of violent behavior, and alcohol abuse. But marijuana? Because it is a drug that enjoys a more peaceful reputation than many other illicit substances, the finding that it is linked to interpersonal violence requires us to re-examine the complicated

Rolling Out the Green Carpet

As an increasing number of states continue to legalize marijuana for both medical and recreational use, research continues to focus on potential consequences of using the substance. There is a strong focus on marijuana's potential impact on driving, operating machinery, performing cognitive tasks, caring for children, and other activities that require mental alertness and good judgment.

Physiologically, marijuana can create relaxation, decrease reaction time, stimulate appetite, and promote sedation. But can it make someone violent?

Marijuana Use and Interpersonal Violence

A study by Ryan C. Shorey et al. (2018) linked marijuana use and interpersonal violence (IPV).[i] The authors began by reporting that marijuana use is commonly reported among men arrested for domestic violence, a report that is concerning given the fact that past research has established a link between marijuana use and IPV.

Acknowledging IPV as a serious public health problem, the authors set out to discover whether marijuana was linked to IPV on its own, versus in combination with other factors. Accordingly, their research examined the link between marijuana use and IPV perpetration after controlling for three known risk factors for IPV: alcohol use and related problems, antisocial personality symptoms, and relationship satisfaction.

psychological, and sexual) even after controlling for all three risk factors. They also found that the link between marijuana use and sexual IPV was stronger when combined with high levels of alcohol consumption and related problems, as compared to low levels. The authors note this finding is consistent with past research, which suggests that polysubstance users report more frequent IPV episodes than their non-polysubstance using counterparts.

The association between marijuana and domestic violence may be better understood within the context of how other risk factors lead to domestic abuse.

Other Domestic Violence Risk Factors

Megan J. Brem et al. (2018) found other factors to be linked to IPV in men arrested for domestic violence.[ii] The title of their article, "Antisocial Traits, Distress Tolerance, and Alcohol Problems as Predictors of Intimate Partner Violence in Men Arrested for Domestic Violence," described the scope of their research.

The authors adopt a research-based definition of distress tolerance as "an ability to withstand aversive internal and external states elicited by a stressor." They note that people

strategize long-term solutions. Two such impulsive behaviors are IPV and alcohol use.

In their study, they found that traits of antisocial personality disorder (ASPD) were linked to psychological aggression perpetration both directly and indirectly, through distress tolerance and problematic use of alcohol. They also found that ASPD traits were linked to elevated problems with alcohol, which was linked to psychological aggression perpetration.

DOMESTIC VIOLENCE ESSENTIAL READS

Domestic Violence Affects Pets, Too

Domestic Violence and Divorce: Common Questions and Answers

problems with alcohol explained the relationship between traits related to ASPD traits and physical assault. They opine, "It is plausible that alcohol problems increased participants' susceptibility to involvement in antisocial activities, including IPV perpetration, thereby reducing the likelihood that distress tolerance would account for the relationship."

Future research will no doubt examine whether substances other than alcohol may increase susceptibility to IPV perpetration in the same fashion. Also note that in correlational studies, it's always possible that hidden variables (such as personality traits or psychopathology) could explain the association between the variables under examination.

Targeting All Forms of Domestic Abuse

Ideally, the goal is to prevent all forms of domestic abuse. Some abusers use psychological aggression to control their victims with domination, intimidation, and humiliation. Other toxic relationships include physical abuse, which can progress incrementally over a time—often culminating in significant physical harm.

In all cases, however, a familiarity with risk factors is helpful for both potential victims and abusers, with an eye toward intervention, treatment, and ultimately eradication of this often-deadly societal epidemic.

References

Is Associated With Intimate Partner Violence Perpetration Among Men Arrested for Domestic Violence," Translational Issues in Psychological Science 4, no. 1, 2018, 108–118.

[ii]Megan J. Brem, Autumn Rae Florimbio, JoAnna Elmquist, Ryan C. Shorey, and Gregory L. Stuart, "Antisocial Traits, Distress Tolerance, and Alcohol Problems as Predictors of Intimate Partner Violence in Men Arrested for Domestic Violence," Psychology of Violence 8, no. 1, 2018, 132–139.

About the Author

Wendy L. Patrick, J.D., Ph.D., is a career trial attorney, behavioral analyst, author of *Red Flags*, and co-author of *Reading People.*

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NIHMSID: NIHMS913793
PMID: 30829345

Marijuana use is associated with intimate partner violence perpetration among men arrested for domestic violence

Ryan C. Shorey,[1] Ellen Haynes,[1] Meagan Brem,[2] Autumn Rae Florimbio,[2] Hannah Grigorian,[2] and Gregory L. Stuart[2]

Abstract

Intimate partner violence (IPV) is a serious public health problem. Substance use, particularly alcohol, is a robust risk factor for IPV. There is a small but growing body of research demonstrating that marijuana use is positively associated with IPV perpetration. However, research on marijuana use and IPV has failed to control for other known predictors of IPV that may account for the positive association between marijuana use and IPV perpetration. Therefore, the current study examined whether marijuana use was associated with IPV perpetration after controlling for alcohol use and problems, antisocial personality symptoms, and relationship satisfaction, all known risk factors for IPV. Participants were men arrested for domestic violence and court-referred to batterer intervention programs ($N = 269$). Findings demonstrated that marijuana use was positively and significantly associated with psychological, physical, and sexual IPV perpetration, even after controlling for alcohol use and problems, antisocial personality symptoms, and relationship satisfaction. Moreover, marijuana use and alcohol use and problems interacted to predict sexual IPV, such that marijuana use was associated with sexual IPV at high, but not low, levels of alcohol use and problems. These findings lend additional support to the body of research demonstrating that marijuana use is positively associated with IPV perpetration in a variety of samples. Results suggest that additional, rigorous research is needed to further explore why and under what conditions marijuana is associated with IPV perpetration.

Keywords: Marijuana, intimate partner violence, substance use, domestic violence

Intimate partner violence (IPV) is a difficult to treat and prevalent public health problem. IPV includes psychological, physical, and sexual aggression (Straus, Hamby, Boney-McCoy, & Sugarman, 1996). In the general population, annual prevalence rates of IPV are approximately 80% for psychological IPV, 25% for physical IPV, and 20% for sexual IPV (Archer, 2000; Shorey, Cornelius, & Bell, 2008). Not surprisingly, victims of IPV experience numerous negative consequences, including depression

(Devries et al., 2013), anxiety (Nathanson, Shorey, Tirone, & Rhatigan, 2012), increased substance use (Devries et al., 2014), physical injuries (Archer, 2000; Campbell, 2002), suicidal ideation (Devries et al., 2013), and in the most severe cases, death (Davis, 2010). Unfortunately, psychosocial intervention efforts aimed at reducing IPV perpetration among men arrested for domestic violence have been largely unsuccessful. Meta-analyses on the effectiveness of batterer intervention programs (BIPs), programs individuals who are arrested for domestic violence are court-mandated to attend, demonstrate small effect sizes (Babcock, Green, & Robie, 2004) or no effect at all (Feder & Wilson, 2005). Thus, there is considerable room for improving these programs.

Researchers have argued that interventions for IPV should include a focus on reducing substance use (Stuart, Temple, & Moore, 2007), as substance use, particularly alcohol, is known to be a robust risk factor for IPV perpetration across populations (Foran & O'Leary, 2008; Shorey, Stuart, & Cornelius, 2011). Indeed, preliminary evidence suggested that BIPs have better short-term outcomes (i.e., reduced IPV) when adjunctive alcohol interventions are included; however, the positive effects of this brief alcohol intervention fade over time (Stuart et al., 2013). This may be due, in part, to extensive drug use among men arrested for domestic violence (e.g., Stuart et al., 2004), which may have compromised IPV treatment outcomes. Thus, researchers have recently advocated for additional research on substances other than alcohol to determine their relations to IPV (Shorey, Haynes, Strauss, Temple, & Stuart, 2017; Testa & Brown, 2015) since these substances may impact intervention outcomes. Specifically, researchers have advocated for studies on the association between marijuana and IPV, as well as the effects of combined alcohol and marijuana use on IPV (Shorey et al., 2017; Testa & Brown, 2015).

Marijuana use is prevalent among men arrested for domestic violence and some research suggests it is positively associated with IPV perpetration (Moore et al., 2008; Moore & Stuart, 2004; Moore & Stuart, 2005; Testa & Brown, 2015). This research is particularly important for a number of reasons, especially with the increasing legalization of marijuana for both medical and recreational purposes in many US states, as it is imperative that public health officials and policy makers have a clear understanding of how marijuana use intersects with other important public health problems, such as IPV. Thus, the purpose of the present study was to examine the association between marijuana use and IPV perpetration among men arrested for domestic violence and court-referred to BIPs, controlling for known IPV risk factors of alcohol use and problems, antisocial personality symptoms, and relationship satisfaction.

Marijuana and IPV

The theoretical relationship between marijuana and IPV has received scant attention. Although still underdeveloped, it has been theoretically postulated that, for some individuals, marijuana may lead to increased negative effects (e.g., irritability, anxiety), which may then lead to negative couple-related outcomes, such as IPV (Testa & Brown, 2015). A meta-analysis on the association between marijuana and IPV perpetration demonstrated that, across 14 studies, there was a positive association between marijuana use and physical ($d = .21$) and psychological ($d = .35$), but not sexual, IPV (Moore et al., 2008). Since this meta-analysis, a review of 30 studies concluded that marijuana use distally (e.g., frequency of use in the past year) demonstrated modest, but positive, associations with distal reports of IPV (e.g., frequency of IPV perpetration in past year; Testa & Brown, 2015). In addition, Moore and Stuart (2004) reported that 53% of their sample of men arrested for domestic violence reported past year marijuana use. However, the majority of prior studies examining marijuana and IPV failed to control for known risk factors for IPV that may account for this relationship. Specifically, it has been postulated that the relationship between marijuana and IPV may be due to third variables such as

alcohol use, antisocial personality, and relationship satisfaction (Moore & Stuart, 2005; Moore et al., 2008; Shorey et al., 2017). Thus, it will be important for marijuana and IPV research to account for these well-established IPV risk factors.

In addition to controlling for IPV risk factors, researchers have called for investigations on the interaction between marijuana and alcohol use in predicting IPV perpetration (Shorey et al., 2017). Research on simultaneous marijuana and alcohol use shows that it is associated with a number of negative consequences, including more frequent use of either substance, increased quantity of alcohol use, driving while under the influence, social conflicts (e.g., arguments; conflict with spouse), unprotected sex, arrests, and personal consequences (e.g., health, finances; Metrik, Caswell, Magill, Monti, & Kahler, 2016; Subbaraman & Kerr, 2015; Terry-McElrath, O'Malley, & Johnston, 2013). Not surprisingly, simultaneous use of these substances produces greater impairment, disinhibition, and risk-taking relative to either substance when used alone (Subbaraman & Kerr, 2015). From a theoretical standpoint, the disinhibition caused by using alcohol and marijuana together may increase the risk for IPV, as disinhibition, according to the alcohol myopia model (AMM; Steele & Josephs, 1990) is a proposed mechanism for the relationship between alcohol and IPV (Giancola, 2002). Thus, marijuana may further decrease disinhibition when alcohol is consumed, further increasing the risk for IPV.

We are aware of only one study to date that has examined the impact of concurrent marijuana and alcohol use on IPV. A recent cross-sectional study demonstrated that young adult men who were marijuana and alcohol users were more likely to perpetrate sexual IPV than men who only used alcohol (Low et al., 2017). Thus, continued research is needed to examine whether marijuana and alcohol interact to increase the risk for IPV perpetration. In all, knowledge of whether marijuana use is associated with IPV among men arrested for domestic violence, or whether marijuana and alcohol use interact to predict IPV, may provide important clinical information for the development of more effective BIPs. That is, it is currently unknown whether marijuana use would be an important treatment target in BIPs, and thus research in this area would provide initial information on whether these programs should focus attention on reducing marijuana use.

Based on previous findings and theory regarding the role of marijuana use with IPV, we examined whether marijuana use was associated with psychological, physical, and sexual IPV perpetration in a sample of men arrested for domestic violence and court-referred to BIPs. After controlling for alcohol use and problems, antisocial personality symptoms, and relationship satisfaction, we expected marijuana use to be positively associated with IPV perpetration. Antisocial personality symptoms and relationship satisfaction were chosen as covariates due to prior research demonstrating their consistent associations with IPV perpetration (Brem, Florimbio, Elmquist, Shorey, & Stuart, 2017; Stith, Green, Smith, & Ward, 2008) and speculation that the association between marijuana and IPV may reflect the influence of these confounding variables (e.g., Moore et al., 2008). Based on the combined disinhibiting effects of marijuana and alcohol use, we also expected the strength of the association between marijuana use and IPV perpetration to be stronger for men high in alcohol use and problems, relative to men low in alcohol use and problems.

Method

Participants

Participants included men who were arrested for domestic violence and were court-referred to BIPs (N = 269). These participants are a subsample of men reported on elsewhere (Brem, Florimbio, Elmquist, Shorey, & Stuart, in press), and were chosen for inclusion in the current study based on having completed all measures of interest. Participants reported a mean age of 32.39 years (SD = 11.26). The

majority of the sample identified as White (63.2%). Participants also identified as Hispanic or Latino (12.3%), Black (8.6%), American Indian or Alaska Native (4.1%), or other (6.3%); 5.6% of the sample did not report a race. In regards to relationship status, most participants reported being in a current intimate relationship (68.1%). In the entire sample, 27.9% reported being in a dating relationship, 26.4% of participants reported living with a partner but not being married, and 13.8% reported being married. The average length of relationship reported by participants was 4.63 years ($SD = 7.07$).

Procedure

Participants were recruited for study participation at BIP locations. Study investigators obtained informed consent from individuals interested in participating in the study. Questionnaires were completed in paper and pencil format in a group setting during participants' regularly scheduled BIP sessions. All study participation was voluntary and all information was kept confidential from the BIP group facilitators and courts. No compensation for participating was provided. All procedures were approved by the Institutional Review Board where the study took place. At the time of study participation, the mean number of BIP sessions attended by participants was 11.28 ($SD = 7.61$).

Measures

Marijuana Use Marijuana use was measured using a single marijuana use item from the Drug Use Disorders Identification Test (DUDIT; Stuart et al., 2003a,b; Stuart et al., 2004), a measure that captures a variety of different substances (e.g., marijuana, cocaine, opiates). The marijuana item asked participants "How often do you use cannabis?", with instructions for participants to think of the year prior to entering their BIP. This is the only item on the DUDIT that is specific to marijuana use. Participants were asked to rate their marijuana use on a 7-point scale (0 = Never, 1 = less than monthly, 2 = monthly, 3 = 2–3 times a month, 4 = weekly, 5 = 2–3 times a week, 6 = 4 or more times a week). Higher scores correspond with more frequent marijuana use. The DUDIT has demonstrated good psychometric properties in prior research (Stuart et al., 2003a,b).

IPV Perpetration Psychological, physical, and sexual IPV perpetration were measured using the Revised Conflict Tactics Scales (CTS2; Straus et al., 1996), a 78-item self-report measure that assesses the amount of negotiation, psychological aggression, physical assault, sexual coercion, and injury within an intimate relationship. The psychological aggression, physical assault, and sexual coercion perpetration subscales were included in the present study. Participants are asked to rate the frequency of each item's occurrence in the year prior to entry into the BIP on a 7-point scale (0=Never; 6=more than 20 times). The psychological perpetration subscale includes 8 questions, the physical perpetration subscale includes 12 questions, and the sexual perpetration subscale includes 7 questions. Total scores for each subscale are obtained by summing the midpoints for each item (e.g., 3–5 times is recoded into 4; Straus, Hamby, & Warren, 2003). Higher scores correspond to more frequent IPV perpetration. Past research with the CTS2 has demonstrated good reliability (Straus, 2004) and good construct and discriminant validity (Straus et al., 1996). For the present study, the internal consistency for the physical perpetration subscale was good ($\alpha = .88$), the psychological perpetration subscale was good ($\alpha = .83$), and the sexual subscale was acceptable ($\alpha = .63$).

Alcohol Use and Problems The 10-item Alcohol Use Disorders Identification Test (AUDIT; Saunders, Asaland, Babor, de la Fuente, & Grant, 1993) was used to measure alcohol use and problems in the year prior to entry into the BIP. Participants rated their agreement with the first seven items on a 5-point scale, and the final three items on a 3-point scale. Possible scores range from 0–40 and were

calculated by summing all items. Higher scores correspond to more alcohol use and related problems. In past research the AUDIT demonstrated high internal consistency (average α's = .81–.93; Saunders, et al., 1993). Internal consistency in the current sample was good (α = .87).

Antisocial Personality Symptoms The Antisocial Personality Disorder (ASPD) subscale of the Personality Diagnostic Questionnaire-4 (PDQ4; Hyler et al. 1988) was used to measure antisocial personality symptoms. The PDQ4 is a brief screening instrument used to assess possible personality disorders, and contains a subscale for symptoms of ASPD (e.g., "Lying comes easily to me and I often do it"). Individuals were asked to rate each item as true or false about their personality, and scores can range from 0–11. Higher scores on the ASPD subscale indicate higher endorsement of symptoms associated with ASPD. In past research, the PDQ4 has demonstrated good test re-test reliability (Trull, 1993), high internal consistency (Hyler et al., 1989), and high sensitivity and specificity for detecting ASPD (Hyler et al., 1989). Internal consistency in the present study was excellent (α = .90).

Relationship Satisfaction Relationship satisfaction was measured using the Relationship Assessment Scale (RAS; Hendrick, 1988). Participants indicated their agreement with 7 questions about their current intimate relationship (or most recent intimate relationship if not currently in a relationship) on a 5-point scale (e.g. "How well does your partner meet your needs?"). Possible scores range from 7–35. Higher scores correspond to higher levels of relationship satisfaction. Participants completed the RAS in reference to the same partner they rated on the CTS2. In past research, the RAS has demonstrated good convergent validity with other relationship satisfaction measures and high internal consistency (Hendrick, Dicke, & Hendrick, 1998). In the present study, internal consistency of the RAS was excellent (α = .90).

Data Analytic Strategy

We examined the relationship between marijuana and IPV perpetration utilizing SPSS version 23.0. Prior to analyses, we log-transformed all IPV variables due to positive skew and kurtosis, consistent with prior IPV research (e.g., Mattson, O'Farrell, Lofgreen, Cunningham, & Murphy, 2012; Shorey, Brasfield, Febres, & Stuart, 2011). First, we examined bivariate correlations among study variables. Second, three separate regression analyses, one for each type of IPV, were conducted to determine whether the relationship between marijuana use and IPV was present after controlling for alcohol use and problems, antisocial personality symptoms, and relationship satisfaction. Finally, after main effect analyses, we examined the interactive effects of alcohol use and problems and marijuana use on IPV following recommendations for testing interactions by Aiken and West (1991). That is, we mean centered independent variables to reduce multicollinearity and then formed an interaction term between alcohol use and problems and marijuana use, which was entered into the regression equations. Significant interactions were probed at high (+1 *SD*) and low (−1 *SD*) levels of alcohol use and problems.

Results

Means, standard deviations, and correlations among study variables are presented in Table 1. As displayed, psychological, physical, and sexual IPV perpetration were positively and significantly associated with marijuana use. All three forms of IPV were positively and significantly associated with alcohol use and problems and antisocial personality symptoms. Psychological and physical IPV were negatively and significantly related to relationship satisfaction. Marijuana use and alcohol use and problems positively and significantly related to antisocial personality symptoms. Number of BIP sessions completed negatively related to relationship satisfaction. Regarding marijuana use in the year prior to BIP entry, 40.5% of the sample reported no marijuana use, 11.5% reported less than monthly

use, 3% reported monthly use, 5.6% reported use 2 to 3 times a month, 4.1% reported weekly use, 5.9% reported use 2 to 3 times a week, and 29.4% reported use 4 or more times a week. Thus, 59.5% of the entire sample reported marijuana use in the previous year and 39.4% of the entire sample reported at least weekly marijuana use.

Table 1

Means, standard deviations, and bivariate correlations among study variables

	1	2	3	4	5	6	7	8
1. Psychological IPV Perpetration	-							
2. Physical IPV Perpetration	.55**	-						
3. Sexual IPV Perpetration	.28**	.43**	-					
4. Marijuana Use	.17**	.17**	.28**	-				
5. Alcohol Use and Problems	.27**	.23**	.22**	.06	-			
6. Antisocial Symptoms	.18**	.28**	.28**	.22**	.34**	-		
7. Relationship Satisfaction	−.37**	−.27**	−.11	.07	−.02	−.07	-	
8. Number of BIP Sessions	.08	.09	.16**	.00	.10	−.07	−.17**	-
Mean	37.46	10.81	6.36	2.57	9.11	3.16	22.96	11.28
Standard Deviation	38.10	26.06	15.50	2.63	8.65	2.23	7.49	7.61

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Note. Psychological, physical, and sexual IPV mean scores reflect raw values; log-transformed scores were used for correlation analyses.

** $p < .01$.

Table 2 presents results of the regression analyses for each form of IPV perpetration. Semi-partial (*sr*) correlations between marijuana and IPV perpetration, derived from the regression analyses, are presented below. As displayed in Table 2, marijuana use frequency remained positively associated with the psychological ($sr = .17$, $p < .01$), physical ($sr = ..14$, $p < .05$), and sexual IPV ($sr = .23$, $p < .001$) perpetration frequency after accounting for alcohol use and problems, antisocial personality symptoms, and relationship satisfaction. The main effect of marijuana use on sexual IPV was qualified by a significant interaction between alcohol use and problems and marijuana use. Specifically, marijuana use was positively associated with IPV perpetration at high ($\beta = .36$, $p < .001$), but not low ($\beta = .12$, $p > .05$), levels of alcohol use and problems (see Figure 1).

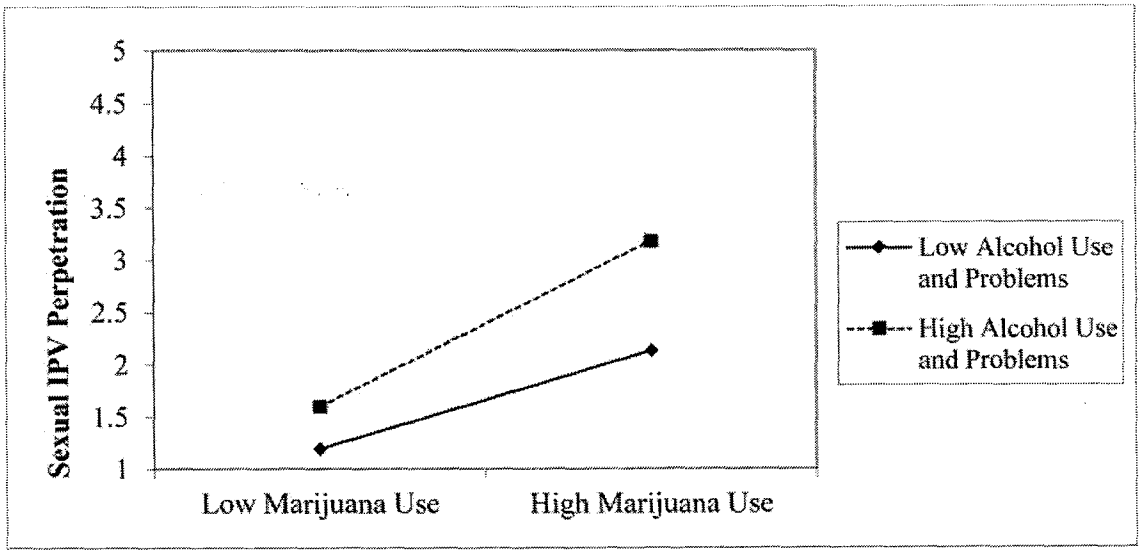

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Figure 1

Interaction between Marijuana Use and Alcohol Use and Problems predicting Sexual IPV Perpetration.

Table 2

Regression analyses predicting IPV perpetration

	Psychological	Physical	Sexual
Model 1	$F = 19.96$; $R^2 = .24$	$F = 14.64$; $R^2 = .18$	$F = 12.81$; $R^2 = .16$
Alcohol Use and Problems	.24 (.01)***	.16 (.01)**	.14 (.01)*
Antisocial Personality	.04 (.04)	.17 (.04)**	.17 (.04)**
Relationship Satisfaction	−.37 (.01)***	−.27 (.01)***	−.13 (.01)*
Marijuana Use	.17 (.03)**	.16 (.03)**	.24 (.03)***
Model 2	$F = 16.34$; $R^2 = .24$	$F = 12.21$; $R^2 = .18$	$F = 11.17$; $R^2 = .17$
Alcohol Use and Problems	.23 (.01)***	.17 (.01)**	.16 (.01)**
Antisocial Personality	.04 (.04)	.17 (.04)**	.17 (.04)**
Relationship Satisfaction	−.37 (.01)***	−.26 (.01)***	−.11 (.01)*
Marijuana Use	.17 (.03)**	.14 (.03)**	.24 (.03)***
Marijuana X Alcohol	−.07 (.00)	.08 (.00)	.11 (.00)*

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Note: Standardized betas are reported. Standard errors are in parentheses.

*$p < .05$,
**$p < .01$,
***$p < .001$

Discussion

Recent research indicated that marijuana use positively associated with IPV perpetration among men arrested for domestic violence, but did not examine this association in the presence of other known risk factors for IPV. Therefore, we examined the association between marijuana use and IPV perpetration while controlling for alcohol use and problems, antisocial personality symptoms, and relationship satisfaction in a sample of men arrested for domestic violence and court-referred to attend BIPs. After accounting for these risk factors, our findings demonstrated marijuana use positively associated with all forms of IPV (psychological, physical, and sexual). Moreover, the main effect of marijuana use on sexual IPV was qualified by an interaction between marijuana use and alcohol use and problems, such that marijuana use was associated with IPV at high, but not low, levels of alcohol use and problems among men arrested for domestic violence.

That marijuana use positively related to all three forms of IPV in the present study is noteworthy given previous meta-analytic findings indicating that marijuana use did not relate to sexual IPV (Moore et al., 2008). However, this meta-analysis only included one study that assessed the association between

marijuana use and sexual IPV. Other studies show that marijuana use is associated with increased odds for problematic sexual behavior, such as condomless sex (Metrik et al., 2016). Our findings provide preliminary evidence that this association may also extend to sexual IPV perpetration. Importantly, the present findings demonstrated that the association between marijuana use and sexual IPV was stronger for individuals with high levels of alcohol use and problems relative to those with low alcohol use and problems. This finding is consistent with prior research which suggests that polysubstance users report more frequent IPV than non-polysubstance users (e.g., Low et al., 2017), suggesting polysubstance use is an indicator for increased IPV risk. Although our study did not assess the acute effects of marijuana and alcohol use, this finding may also suggest that co-ingestion of marijuana and alcohol could create a high-risk situation for sexual IPV, as simultaneous use of these two substances creates greater disinhibition and impairment than either substance alone (Subbaraman & Kerr, 2015). However, until future research examines these relationships utilizing event-level data (e.g., daily diary studies), firm conclusions about co-ingestion of these two substances on risk for IPV is limited to speculation. Moreover, caution should be used when interpreting this interaction finding due to the small percentage of variance accounted for in sexual IPV by the interaction between marijuana use and alcohol.

Our findings provide important information for future research to build upon, since increasing evidence suggests that marijuana use is positively associated with IPV perpetration. However, the reasons for this association (i.e., mechanisms) remain unknown. In order to understand this association, we believe that future research examining marijuana use at the event-level is needed. Indeed, researchers previously advocated for daily diary studies or ecological momentary assessment designs to explore the temporal association between marijuana use and IPV perpetration (Testa & Brown, 2015; Shorey et al., 2017). This design will allow for the examination of the events that immediately precede IPV, such as marijuana use, and potential mechanisms underlying marijuana-related IPV. This design would also allow for the examination of concordance of marijuana use between partners. Theory (e.g., Testa & Brown, 2015) and prior research (e.g., Homish et al., 2009) suggests discordant marijuana use among intimate partners may increase the risk for negative couple outcomes, such as IPV, to a greater degree than concordant marijuana use, as concordant substance use may reflect shared behaviors and closeness among intimate partners.

The alcohol myopia model (AMM; Steele & Josephs, 1990), which provides theoretical support for the relationship between alcohol use and IPV, may offer insight into the association between marijuana use and IPV. According to the AMM, alcohol use causes individuals to focus on the most salient aspects in their environment (Steele & Joseph, 1990). When the most salient environmental cue is negative (e.g., negative affect), alcohol will intensify this myopic effect, which may increase the risk for IPV (Giancola, 2002). A similar process may take place for marijuana-related IPV. Indeed, research suggested that marijuana use may increase allocation of attentional resources to negative stimuli (Metrik et al., 2015). Moreover, negative affect may precede, and be increased by, marijuana use (Shadur, Hussong, & Haroon, 2015; Shrier, Ross, & Blood, 2014; Trull, Wycoff, Lane, Carpenter, & Brown, 2016). Preliminary daily diary research with drinking college women demonstrated that marijuana use was positively associated with psychological IPV perpetration at high, but not low, levels of negative affect (Shorey, Stuart, Moore, & McNulty, 2014). Thus, it is plausible that proximal negative affect may impact risk for marijuana-related IPV among men arrested for domestic violence. Future research incorporating event-level research methods should explore this theoretical supposition.

An additional area for future practitioners and researchers is to consider is whether marijuana use negatively impacts intervention outcomes for IPV. As previously mentioned, alcohol interventions for men in BIPs result in improved short-term outcomes relative to BIPs alone although the positive effects of the alcohol intervention fade over time (Stuart et al., 2013). Given the high prevalence of marijuana

use among men in BIPs identified in the present study, and our preliminary finding that marijuana and alcohol use and problems interact to predict sexual IPV, it is plausible that marijuana use could negatively impact BIP outcomes. Indeed, individuals who are in alcohol treatment have poorer outcomes when they are using marijuana during treatment relative to individuals who do not use marijuana during treatment (Subbaraman, Metrik, Patterson, & Swift, 2017). Therefore, BIPs should consider targeting marijuana use in their programs in order to determine whether marijuana use treatment impacts BIP outcomes.

There are several limitations to consider when interpreting the findings of the present study. First, the sample was comprised of men arrested for domestic violence perpetration, limiting the generalizability of these findings to men who may perpetrate less frequent or less severe forms of IPV. In addition, the measure of marijuana use consisted of a single item and assessed only the frequency of marijuana use. Utilizing an in-depth measure that extends beyond one item and assesses for other characteristics of marijuana use (e.g., quantity, problems associated with marijuana use) would allow for a more comprehensive understanding of the relation between marijuana use and IPV. The cross-sectional nature of the study design precludes making causal inferences about the study variables. Future studies should employ a longitudinal design to further elucidate the relationship between marijuana use and IPV, while also controlling for identified risk factors for IPV perpetration. Event-level data (e.g., daily diary designs) would also provide information on the acute effects of marijuana, and the combined effects of marijuana and alcohol, on IPV, and future research should utilize these types of designs. The generalizability of the findings is limited given the sample was comprised of primarily non-Hispanic White men. Future studies should include a more ethnically diverse sample, as well as include women. We also did not collect information on the number of men who declined to participate in the current study and whether they may have differed from men who agreed to participate. Finally, it should be noted that because the sample consisted of men arrested and court-mandated to BIPs, social desirability may have impacted study findings.

In summary, findings demonstrated marijuana use positively associated with psychological, physical, and sexual IPV perpetration among men arrested for domestic violence and court-referred to BIPs. These findings were present even after accounting for other known risk factors for IPV perpetration. We believe continued investigation into the associations between marijuana use and IPV is important due to the public health, legal policy, and treatment implications that would result from this line of research. Continued research utilizing rigorous methodological designs, such as daily diary designs, is needed to further understand the association between marijuana and IPV perpetration. Finally, pending replication and extension, findings suggest BIPs may want to target reductions in marijuana use, which may have the concurrent benefit of reducing IPV.

Public Significance Statement

Marijuana use is prevalent among men arrested for domestic violence. Our findings demonstrated that marijuana use was positively associated with intimate partner violence perpetration among men arrested for domestic violence. Treatment of men arrested for domestic violence should consider reducing marijuana.

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EXHIBIT 5

SHOOTERS, TERRORISTS AND MASS KILLERS WHO USED MARIJUANA (MONTH/YEAR)

Many people associate a peaceful, "summer of love" mentality with marijuana. Whatever peace comes over people is not long lasting, as many people develop anxiety with much pot use. In the long run, use changes the brains in such a way that people do things they may not have done without the drug's assault on their brains.

These violent offenders who committed or attempted mass murder were allegedly marijuana users. Some of them had psychosis and had deranged, paranoid thinking which may have been triggered by pot use. Others are not so clear, but they appeared to lack a conscience or empathy. Scientific research tells us that people who have schizophrenia and use marijuana, instead of prescribed medicines, they become more violent and vengeful than they otherwise would be.

12/27/21 - Lakewood, Colorado shooter Lyndon McLeod took out his anger at several massage parlor owners and co-workers, killing 6 people and trying to kill more. A writer who divulged his planning in books, he appears to have been a long-time pot user because a couple who bought a house from him said he had a large marijuana grow in the house.
https://denver.cbslocal.com/2021/12/29/lyndon-mcleod-couple-home-denver-shooting-spree/#.Yc01SXrLOxo.twitter

11/26/21 Ethan Crumbley allegedly shot and killed 4 students at a high school Oxford, MI. He had a troubled history with his parents who had purchased the gun for him, but were known to leave him alone for long periods of time when he was young. While no pot links to the shooter have been found, "Eli Crumbley, Ethan's older half-brother who had previously worked at the same diner, was once caught with marijuana at the job and "hinted that his father and stepmother had given it to him, the diner's manager told the Daily Mail.
https://www.dailymail.co.uk/news/article-10281863/Neighbor-Michigan-school-shooter-15-claims-warned-authorities-neglected.html

11/20/21 Darrell Brooks, Jr, 39, drove through a Christmas parade in Waukesha, WI, killing 6, including a child. He had a long arrest record including several arrests for marijuana. Was clearly psychotic at the time.' On his social media pages, Brooks describes himself as a "stoner."
https://www.nationalreview.com/corner/was-the-waukesha-killer-a-stoner/ "... Brooks' attorney, public defender Anna Kees, argued that Brooks was high during the incident, noting that officers who arrested him noticed he smelled of marijuana and his eyes were red and glassy... But District Attorney Susan Opper countered that all Brooks had to do was stop the vehicle, and that even if he was high on marijuana he still committed multiple crimes..."
https://www.dailymail.co.uk/news/article-10404189/Waukesha-parade-killer-Darrell-Brooks-stand-trial-murder-probable-cause-hearing-rules.html?ito=native_share_article-masthead

3/22/21 - Ahmad Al Aliwi Al-Issa shot and killed 10 in a grocery store and injured 2, in Boulder, CO. He had a history of mental illness according to the family. Although they don't mention mariju-ana, 80% of Boulder students allegedly use it, and it may have contributed to his mental illness.

https://www.independent.co.uk/news/world/americas/boulder-shooter-name-colorado-gunman-b1821207.html

12/19 – Grafton Thomas, who recently went after several attendees of a Hannakuh dinner at a rabbi's house in New York. "Law enforcement officials said Thomas was arrested before in New York and New Jersey for alleged crimes like menacing and marijuana possession." He fits the pattern of the many who commit hate crimes and use cannabis.
https://newyork.cbslocal.com/2019/12/29/new-york-monsey-synagogue-stabbing-attack-grafton-thomas-greenwood-lake/

08/19 Connor Betts gunned down 9 people in Dayton, Ohio. He was a heavy drug user and belonged to a band called Menstrual Munchies. His notebooks and diaries were very disturbing, His hallucinations began when he was in high School. Friend Ethan Kollie said they did hard drugs as well as marijuana and acid 4 or 5 times a week for two years.
https://www.yahoo.com/news/2-friend-gunman-ohio-mass-184347593.html

6/19 – Samuel Little the US's most prolific murderer has confessed to killing more than 90 women (and admitted to 5 more in June 2019) over 6 decades has a history of burglary, breaking and entering, assault and battery, assault with the intent to rob, assault with a firearm, armed robbery, assault on a police officer, solicitation of prostitution, DUI, shoplifting, theft, grand theft, possession of marijuana, unlawful flight to avoid prosecution, resisting arrest, battery, false imprisonment, assault with great bodily injury, robbery, rape, and sodomy.
https://www.thecut.com/2018/12/how-serial-killer-samuel-little-was-caught.html

5/31/2019 DeWayne Craddock shot and killed 12 employees in Virginia Beach, all co workers in his municipal office. A neighbor who was interviewed said, "Craddock was in front of his apartment with two other people, smoking what smelled like marijuana," but that was the only reference to drugs we found. He was an engineer who kept to himself.
https://www.cnn.com/2019/06/01/us/virginia-beach-suspect/index.html

5/7/2019 Devon Erickson, one of the two shooters at the STEM High School in Highlands Ranch, Colorado, which killed 1 and injured 8, was a daily or near daily pot user. "Toxicologist Wanda Guidry said Devon Erickson was severely malnourished because he ingested cocaine, marijuana and cough syrup nearly daily, and he suffered from long-term sleep deprivation and insomnia, The Denver Post reported. 'I believe it created psychiatric symptoms...disruption in mood, behavior and thinking,' Guidry said of the drugs found in Erickson's system hours after the shooting."

2/19/19 Gary Martin was a disgruntled work in Aurora, IL. He was terminated and ended up by shooting 5 people. A neighbor described him as a loner, but said they sometimes smoked weed together, as reported in the Daily Beast.
https://www.thedailybeast.com/eyewitness-to-aurora-shooting-gunman-is-a-co-worker-at-henry-pratt-company

2/11/19 Camden Nicholson, age 27, allegedly killed 3, his parents and their housekeeper in a

gated community of Newport Beach. The best description was in LA Times in February 19, 2019:
https://www.stoppot.org/2019/02/23/orange-county-murders-horrify-friends-and-neighbors/

1/26/19 Dakota Theriot, a 21-year-old from Louisiana, allegedly killed 4: his parents, his girlfriend and her father and brother. A sheriff called the Dakota Theriot case an "extremely horrific example of failed mental health system." Five people died, but the violent outbreak follows a pattern of family murders linked to pot use and mental illness. (January 26, 2019)
https://www.theadvocate.com/baton_rouge/news/crime_police/article_bef1127c-25c4-11e9-a111-8b4106437e1b.html

1/19/19 – Gregory Gago, 42, killed 4, used an axe to kill his 9-month old baby, his girlfriend, his mother and stepfather in Oregon. He grew marijuana on the family farm.
https://www.dailymail.co.uk/news/article-6613055/Man-kills-parents-girlfriend-nine-month-old-daughter-rural-Oregon-home.html. The toxicology report showed he had methamphetamine, alcohol and marijuana in his system.
https://www.oregonlive.com/clackamascounty/2019/05/there-is-someone-else-alive-in-this-house-deputies-describe-saving-girl-from-killer-who-wiped-out-family.html/ (January 19, 2019)

12/12/18: Strasbourg, France shooting leaving 3 dead and at least 12 wounded: Suspect, Cherif Chekatt, who was on terror watch list was described by neighbors as smoking too much pot, having "lost his marbles" and had a criminal activity.
https://www.telegraph.co.uk/news/2018/12/12/strasbourg-shooting-christmas-market-terror-suspect-run-killing/

11/7/18 - Ian David Long,28, was a decorated veteran with PTSD. He killed 13 people at the Borderline Bar and night Club in Thousand Oaks, CA. For a long time we suspected he was a pot user, because his unraveling sounds somewhat similar to others with PTSD who used pot and became crazed. The DA report was recently made public and it showed that marijuana was in his toxicology report.
https://www.vcdistrictattorney.com/wp-content/uploads/2020/12/Borderline-Bar-Grill-OIS-Report-12-17-2020.pdf?fbclid=IwAR1BTkfN8PU1SCF2HWNHoQZEfdfZ5I4yuaiOhhtYslGTd_uQOcK4D1tjydY

7/18 Faisel Hassan, Canada: Hussain's family said he suffered from "severe mental health challenges" and struggled with psychosis and depression. Relatives said they tried their best "to seek help for him throughout his life of struggle and pain," but never imagined the "destructive" path he would choose at the end of his life. Canadian press is quiet about his marijuana use, but we suspect it. His brother died of a drug overdose and a sister died in a car crash. He killed two girls, ages 10, 18, and wounded 13 others.
https://www.thestar.com/news/canada/2018/07/24/danforth-gunman-not-on-the-radar-of-national-security-agencies-safety-minister-says.html?utm_source=Twitter&utm_medium=SocialMedia&utm_campaign=930am&utm_campaign_id=Crime&utm_content=DanforthShooterReshare2018

7/18--20-year-old Emanuel Lopes shot and killed two: a policeman and a woman in Weymouth,

Massachusetts. A heavy drug user, he posted photos marijuana and a concentrate on his social media pages. The changes in his personality seem to have come over him at age 15, around the time he began using drugs.
https://www.masslive.com/news/erry-2018/07/1402e009c49628/who-is-emmanuel-lopes-social-m.html

6/18 Jeremy Webster shot 4 people in Westminster, Colorado, with road rage believed to be the motive. He went after a woman, her two sons and a bystander. He killed the 13 year old. He was licensed to work at medical marijuana dispensary but we don't know much more.
https://heavy.com/news/2018/06/jeremy-john-webster/

4/22/18 3 a.m. (two days after 4-20 celebrations) Travis Reinking, the man who shot and killed 4 people in a Tennessee Wafflehouse, had mental illness and allegedly suffered from schizophrenia. (It is not clear which came first the pot use or the schizophrenia, but we know that marijuana worsens schizophrenia and compromises the treatment of the disease.) Shortly before the incident, "Reinking wrote in a journal about plans to drive to Colorado, describing a life in which he would hang out with friends, smoke marijuana, hike in the mountains and "repossess" cars and houses so that he would not have to work, a prosecutor said."
https://apnews.com/article/nashville-travis-reinking-6839ec09d4c4a743bc5c31c54b918290

2/14/18 Nikolas Cruz, the Parkland shooter, had a troubled life and developmental disabilities. Yet he took tons of marijuana and tons of Xanax to quiet the voices in his head. While this doesn't show cause and effect, marijuana didn't help his troubles and most likely exacerbated them. He killed 17 students, injured 17, at Marjory Stoneham Douglas High School Parkland, FL At his trial, he said: "I hate drugs, and I believe this country would do better if everyone would stop smoking marijuana and doing all these drugs and causing racism and violence out in the streets."
https://www.cnn.com/2021/10/20/us/nikolas-cruz-parkland-shooting-guilty/index.html

11/17 Veteran Shane Kirk who suffered from PTSD, was using marijuana to wean himself from depression medication. Efforts to get him help from the VA failed. He shot and killed 2: his stepfather and wife in front of the three children. He had just returned from Colorado.

11/17 Kevin Neal a pot farmer in Northern Cal shot his wife, neighbors then went on a rampage in Red Bluff, CA shooting and killing 4, hitting a total of 14 people including children at a school. (Had history of psychosis and mental illness. The toxicology reports that only THC was in his blood.

11/17: Devin Patrick Kelley shot 36 people – killing 26 at the First Baptist Church in Sutherland Springs, TX. The toxicology report showed presence of marijuana. He may have had a criminal arrest for marijuana possession in 2013, although the source is not clear. He was court-martialed from Air Force in 2012, following assaulting his spouse and child.
https://www.nbcnews.com/storyline/texas-church-shooting/autopsy-confirms-sutherland-springs-church-gunman-died-suicide-n888051
10/17 Malik Murphy, aged 20, murdered 2: his brother, Noah, 7 and his sister, Sophia, 5, as the

family was sleeping, in Colorado Springs. Murphy and his father Vinnie then got into a fight. As Malik tried to stab his father, another brother called 911. One of the first reports of his erratic behavior: "The parents pinpoint a specific day at school when Malik was 16. Melissa (the mom) says he found a cell phone and instead of returning it to the lost and found, he destroyed it. https://www.kktv.com/content/news/Parents-of-son-who-murdered-his-two-younger-siblings-speak-out-461188133.html

7/17 Cosmo DiNardo, a 20-year-old man lured four other young men to his farm where he grew pot in Pennsylvania, for the purpose of selling marijuana to them. He killed all 4 of the men, ages 19-22 and buried them on the property. A year earlier he had been in mental health treatment for schizophrenia.
https://www.nytimes.com/2017/07/17/us/bucks-county-pennsylvania-murders-cosmo-dinardo-.html

6/17 James Hodgkinson went from Illinois to Alexandria, Virginia, to protest. He shot at a baseball practice with Republicans, severely wounding Congressman Steve Scalise and four others. A Bernie Sanders supporter with domestic violence/anger issues, he advocated for the legalization of marijuana (suggests but doesn't prove he was a user) in the Press.
https://heavy.com/news/2017/06/james-hodgkinson-alexandria-gop-baseball-shooter-shooting-gunman-identified-illinois/

5/17: Salman Abedi the Manchester England bomber had calls about his erratic behavior made around five years before the bombing to Police after Abedi left school, where he was known to have been a marijuana user mixed with gangs in south Manchester. He killed 22 people.
https://www.telegraph.co.uk/news/2017/05/26/everything-know-manchester-suicide-bomber-salman-abedi/

5/17 Jeremy Christian knifed and killed 2 men who were defending the Muslim women he was attacking on public transportation in Portland, Oregon. He had declared his love for cannabis and comic books on Facebook. Christian's behavior was consistent with marijuana-induced psychosis. His psych evaluation showed no consistent ideology but his only goal was to be a cannabis farmer in Brazil.
https://drive.google.com/file/d/1PfNc0guWsPzGIHYErvUUSXQen7A1Iy4c/view

5/17: Richard Rojas was a troubled man, veteran, with a history of drunken driving bolted from his maroon Honda Accord after his deadly midday rampage in Times Square that left one person dead and 20 others injured. He later told another officer, "I smoked marijuana. I laced the marijuana with PCP," according to the complaint.
https://www.dailymail.co.uk/news/article-4522752/Troubled-history-Times-Square-driver-Richard-Rojas.html

10/16 Steven Bourgoin, 36-year-old victim of PTSD. He felt he needed marijuana to be calm, but had a psychotic break. One day he sought but couldn't get psychiatric help in Vermont. He was speeding on a highway, going wrong way. He killed 5, and the toxicology report showed large amount of THC in his system.

https://vtdigger.org/2017/11/28/driver-crash-killed-5-teens-elevated-thc-toxicology-report-shows

9/16: WA Cascades Mall Shooter Arcan Cetin opened fire on random people and killed 5. He blamed cannabis for his behavior. He was only 20, used marijuana and drugs in HS and suffered from PTSD.
https://komonews.com/news/local/accused-mall-shooter-faces-murder-charges-bail-set-at-2-million

9/16 Nathan Desai opened fire at a Texas mall. He shot and injured 9. He had fallen apart after the collapse of his law firm and neighbors noticed heavy smell of marijuana from his apartment. Fortunately none of his victims died.
https://ninjapundit.blogspot.com/2016/09/nathan-desai-disgruntled-lawyer-houston.html

7/16 Mohammed Bouhlel, murdered 86 people on July 14, 2016. He plowed into the crowd with a truck on Bastille Day in Nice, France, on the Promenade des Anglais while people celebrated the national holiday. He used very strong cannabis while in high school and had his first psychotic break at age 19.
https://www.mirror.co.uk/news/world-news/nice-massacre-monster-mohamed-bouhlel-8436103

7/16 A Japanese man stabbed and killed 19 disabled people at facility in Japan; His name was Satoshi Uematsu
https://www.japantimes.co.jp/news/2016/08/08/national/crime-legal/sagamihara-massacre-suspect-tests-positive-marijuana-sources/#.Wy_WEyAnaUk
He had been alternately diagnosed with bipolar disorder and marijuana-induced psychosis.

6/16: Omar Mateen Orlando night club shooter admitted to using marijuana and steroids. Clearly his anger and behavior problems went beyond pot use and went back to a very young age, including an incident in second grade when he sang "marijuana, marijuana" in school, instead of "mariposa, mariposa." He killed 49 people and injured 53. (The two ABC News reports we used for this information is no longer available online.)

11/15: Brahim Abdeslam, leader of the bombings at the Bataclan Night Club in Paris was known marijuana user whose wife said it made him lazy. He and his brother used drugs in his café in Molenbeek Brussels, which was overrun by the smell of marijuana. The attackers killed 130 people, including 90 at the Bataclan theatre. Another 416 people were injured, almost 100 critically.
https://www.nzherald.co.nz/world/paris-terror-attacks-ex-wife-of-suicide-bomber-calls-him-a-lazy-pothead/E3HO7P7OV5TJEBN7E35JK5EK4E/?c_id=2&objectid=11547260

11/15: Robert Dear, Planned Parenthood gunman in Colorado moved to CO from North Carolina for marijuana. He shot and killed three people. Forensic psychiatrists declared him unable to stand trial.
https://www.nytimes.com/2015/12/02/us/robert-dear-planned-parenthood-shooting.html

10/15 Only 3 weeks earlier, another Colorado Springs shooter named Noah Harpham suddenly

went psychotic and killed 3. Family was trying to get him into treatment. Marijuana was the only drug in his toxicology report. He suffered from both marijuana and alcohol addiction, and marijuana put him into psychosis
http://www.westword.com/news/noah-harpham-killings-police-explain-10-minute-response-delay-after-first-911-call-7306531

8/15: Jody Herring, lost custody of her child because she was erratic and tested positive for THC. She said she took THC pills for pain. She shot and killed a Vermont Social worker and 3 others who were her relatives.

7/15: Chattanooga TN shooter Mohammad Abdulazeez killed 4 Marines and a sailor, was a heavy user of marijuana. He had been diagnosed as bipolar.
https://www.washingtonpost.com/politics/chattanooga-shooter-an-aimless-young-man-who-smoked-dope-and-shot-guns/2015/07/18/c213f6a6-2d7d-11e5-a5ea-cf74396e59ec_story.html?utm_term=.9081f0e035fb

6/15 Tunisian beach shooter Seiffeddine Rezgui, 23, killed 39 tourists on the beach, many of them British. In addition, he injured 36. According to British journalist Peter Hitchens, he was a cannabis user.
https://hitchensblog.mailonsunday.co.uk/2016/07/is-the-latest-mass-murder-really-incomprehensible-.html

6/15: Dylann Roof who shot and killed 9 members of a church in Charleston, South Carolina, was an early marijuana user at age 12, and did other drugs. He was diagnosed with schizophrenia.
https://www.wlox.com/story/35435134/new-dylann-roof-documents-unsealed-im-just-a-sociopath/

3/15 - Robert Durst arrested – killed 3 or 4 people, including his wife and Susan Berman, a confidant who knew his history. The incidents happened over several years and he always used marijuana. He is a wealthy guy who always evaded police and a true psychopath.
https://nypost.com/2015/03/17/robert-durst-had-pot-38-caliber-revolver-when-he-was-arrested/

1/15 Charlie Hebdo murderers, the Kouachi, particular Cherif, sat around and smoked pot all the time, according to one of the ex-wives. They killed 12 people and injured 13.
http://www.nydailynews.com/news/world/charlie-hebdo-massacre-suspect-pot-smoking-loser-lawy-article-1.2070082

1/15 – In South Africa, 20-year-old Henri Van Breda murdered his wealthy parents and brother with an axe. His 16-year-old sister survived an attack with brutal head and neck injuries. Initially, Henri, the guilty son, claimed to have been attacked, and that he was not the attacker. Investigations led to the fact that the so[J1]n was high at the time. He's now in prison.
https://www.dailymail.co.uk/news/article-2954720/South-African-student-survived-triple-axe-murder-family-high-drugs-time.html

10/14 Jaylen Fryberg shot four friends in high school cafeteria and turned on himself. His Twitter account exposed that his girlfriend broke up with him because of his marijuana use which she thought pot made him stupid. He admitted that he would need to smoke a whole lot of weed to get over her breaking up with him.
https://www.nbcnews.com/storyline/marysville-school-shooting/washington-school-shooter-jaylen-fryberg-happy-popular-students-n233506

10/14 Ottawa terrorist Michael Zehaf-Bibeau shot and killed one security officer before he was killed. He had extensive drug history which included much marijuana, as well as PCP:
http://nationalpost.com/news/canada/alleged-ottawa-shooter-apparently-had-criminal-past-in-quebec-was-repeatedly-brought-in-on-drug-charges

4/14: Richard Kirk, Colorado father of 3, shot his wife in the head while she is talking to the 911 operator She explained on the phone that he had eaten a marijuana-laced candy and wanted her to kill him. The defendant was clearly influenced by marijuana-induced psychosis.
https://www.theguardian.com/society/2016/may/11/family-sues-marijuana-dispensary-murder-colorado

2/14 Ashton Sachs drove from Seattle to southern California to murder his parents. He tried to murder his brother but left him badly injured. A heavy marijuana user, he had made previous suicide attempts, but blamed his parents for messing up his life. He was supposed to be attending community college in Seattle. Instead of going to class, he smoked pot and played video games.
https://www.dailymail.co.uk/news/article-3842272/Orange-County-man-murdered-wealthy-parents-paralyzed-eight-year-old-brother-shooting-attack-luxury-family-home-sentenced-life-prison.html

2014, 2013, 2003 -- Charles Severance, a man who murdered 3 people in Alexandria, Virginia, by showing up at the doors in daylight, was a frequent political candidate and advocate for legalizing marijuana since the 1990s.
http://alexandria.wusa9.com/news/news/1199171-who-charles-severance The murders took place between 2003 and 2014. He clearly suffered from mental health issues and psychosis consistent with years of marijuana use.
https://www.nbcwashington.com/news/local/accused-serial-killer-charles-severance/63218/

1/14: Mall in Columbia (MD) shooter marijuana user Darion Aguilar killed 2 and then himself.
https://www.washingtonpost.com/local/crime/2014/01/29/a936f5ca-8932-11e3-a5bd-844629433ba3_story.html?_=ddid-6-1641336960

4/13: Boston Marathon bombing, both Tsarnaev brothers were heavy marijuana users. They killed 3 people and injured ~ 264. After the incident, it was discovered that Tamerlan Tsarnaev was probably connected to the murders of two men, former friends who bodies were covered in marijuana.
https://www3.bostonglobe.com//Page/Boston/2011-2020/WebGraphics/Metro/BostonGlobe.com/2013/12/15tsarnaev/tsarnaev.html?arc404=true

12/12: Jacob T Roberts in Clackamas Town Center OR killed 2 seriously injured 1 and then killed himself a chronic marijuana since age 16.
https://www.oregonlive.com/forest-grove/2013/05/clackamas_town_center_shooting.html

7/12: Aurora, Colorado theater shooter, James Holmes, was a heavy marijuana user. As the New York Post reported, a neighbor said that he would see him smoking pot by the garbage bins of apartment complex.
https://nypost.com/2012/07/21/massacre-suspect-trolled-web-for-sex/#ixzz21GIfphdV It happened the summer before the vote to legalize, but Coloradans still voted to legalize and didn't seem to notice the connection. He killed 12 and injured 70.

1/11: Tucson Massacre convict Jared Loughner was a habitual pot user. He failed a recruitment in the military because of excessive pot use. He killed 6 people and injured 9, including Rep Gabby Giffords. http://content.time.com/time/nation/article/0,8599,2041634,00.html

3/10: Pentagon shooter John Bedell's history of mental illness and marijuana abuse. He was given a medical marijuana card when it was bad advice.
http://voices.washingtonpost.com/postpartisan/2010/03/the_pentagon_shooter_and_medic.html

5/06 Michael Kennedy, 18, ambushed a police station in Chantilly, Virginia, shooting several rounds and killing two police officers. His father, was a marijuana user and gun collector who gave his son marijuana. A heavy pot user, the son Michael was very erratic and crazy.
https://www.washingtonpost.com/wp-dyn/content/article/2007/08/07/AR2007080700885.html

7/96 Eric Rudolph, the first abortion clinic terrorist was discharged from army for marijuana use. He killed 2 and injured 120 others.
https://www.nytimes.com/2003/06/01/us/suspect-in-96-olympic-bombing-and-3-other-attacks-is-caught.html

4/96 Timothy McVeigh, the Oklahoma City bomber, killed 168. He was known to be a marijuana user, a vet and man with strong anti-government ideology.

1/93 The Brown's Chicken murders in Palatine, IL killed 8 people. Juan Luna and Jim Degorski smoked marijuana afterwards. "A woman reported that they drove to her Elgin townhouse where she said the trio smoked marijuana and split the money the men said they had taken from Brown's." Another article says they "smoked a couple of bowls" after the murders.
https://www.chicagotribune.com/news/ct-xpm-2002-06-09-0206090449-story.html
10/91 George Hennard who drove a pickup into Luby's cafeteria in Killeen, Texas, and then shot people, killing 23 and himself. He had a previous marijuana arrest in 1989 and underwent substance abuse treatment. https://en.wikipedia.org/wiki/Luby%27s_shooting

1984-1985 Richard Ramirez was convicted of murderting 13 in California. He began smoking marijuana at age 10 with an older cousin who filled his mind lurid stories idealizing violence.
https://en.wikipedia.org/wiki/Richard_Ramirez
1984 - Suzan and Michael Bear Carson were convicted of 3 bizarre murders on "Murder

Mountain" in California. https://www.thedailybeast.com/witch-killers-family-keep-them-in-jail Michael was a stay-at-home marijuana dealer in suburban Phoenix with a degree in Chinese philosophy. His daughter said: "No one could have foreseen this—especially how weird it got. Typically your Jewish father doesn't convert to Islam, then to radical Islam, and change it to some weird religion where they grow pot and kill gays.

1983 – Bruce Blackman, a Canadian, killed 6 family members in 1983 while high on marijuana, and having psychotic break. He was a heavy user for several years possibly triggering his paranoid schizophrenia. According to court testimony Blackman was on an intense stone from eating and smoking marijuana. Bruce Blackman, British Columbia, killed 6 in his family, on an intense marijuana psychosis, 1983
https://www.reddit.com/r/TrueCrime/comments/5ggm3c/bruce_blackman_familicide/

1978 – Stephan, the son of Jim Jones, who led 400 to suicide at Jonestown in Guyana, confirmed that Jones used LSD and marijuana. . https://simple.wikipedia.org/wiki/Jim_Jones

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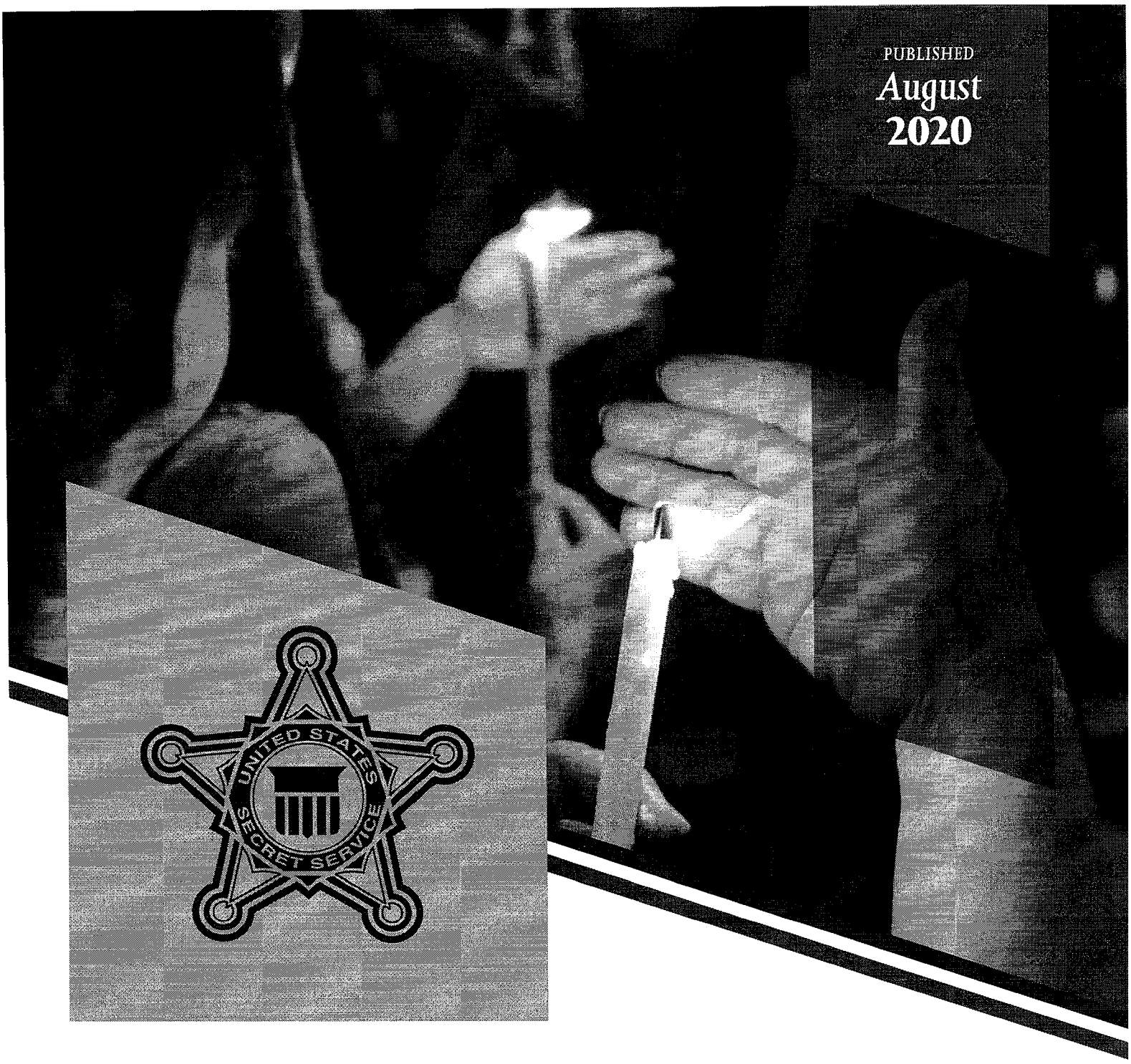
EXHIBIT 6



PUBLISHED
August
2020

United States Secret Service
NATIONAL THREAT ASSESSMENT CENTER

MASS ATTACKS IN PUBLIC SPACES - 2019

U.S. Department of Homeland Security

EMPLOYMENT HISTORY

Nearly one-third of the attackers (n = 11, 30%) were known to be employed at the time of the attack, while approximately the same percentage (n = 11, 30%) were unemployed. Those employed held a variety of positions, including two military personnel, two fast food employees, a city engineer, a vocal instructor and delivery driver, a chiropractor, a tech support representative, a defense auditor, a handyman, and a manufacturing assemblyman. The employment status of the remaining 13 (35%) attackers could not be determined because of limited publicly available information.

Recent Job Loss

Seven attackers experienced, or were about to experience, a job loss prior to their attacks. Four of the unemployed attackers experienced a job loss in the year prior to the attack. This included two attackers who quit, one attacker whose contract ended, and one attacker who left active duty military service. Two more attackers were fired minutes or hours prior to initiating their attacks. This included one attacker who opened fire immediately after being terminated, and another who drove through two towns fatally shooting seven and injuring approximately 25 others two hours after his termination. Another attacker submitted his two-week notice hours before opening fire at the city municipal building where he worked.

SUBSTANCE USE

Nearly half of the attackers (n = 17, 46%) had a history of using illicit drugs (e.g., cocaine, methamphetamine, LSD, Ecstasy) or misusing prescription medications (e.g., Xanax, Adderall, Vyvanse). For two-fifths of the attackers (n = 15, 41%), the use of these substances and/or alcohol and marijuana may have reached the level of abuse causing negative consequences in their lives, including criminal charges, academic failures, court-ordered treatment, and eviction. One of the attackers later claimed to have no memory of his attack, alleging he had been drinking heavily at the time and had blacked out. In this sample of attackers, a significant relationship was observed between substance abuse and domestic violence.[12] Ten attackers (27%) had histories of both domestic violence and substance abuse.

> *On August 4, 2019, a 24-year-old male fatally shot 9 and injured 20 in a popular bar district before being killed by responding law enforcement. Friends reported the attacker regularly used amphetamines, marijuana, cocaine, and LSD for at least five years leading up to the attack. The attacker was found to have had Xanax and cocaine in his system at the time of the shooting. He also had a history of assaulting women he dated.*

EXHIBIT 7

INTERNATIONAL HIGHLIFE

+16

THC Crystals: The Purest THC on the Planet

By International Highlife | September 18, 2020

KNOWLEDGE PURE THC THC

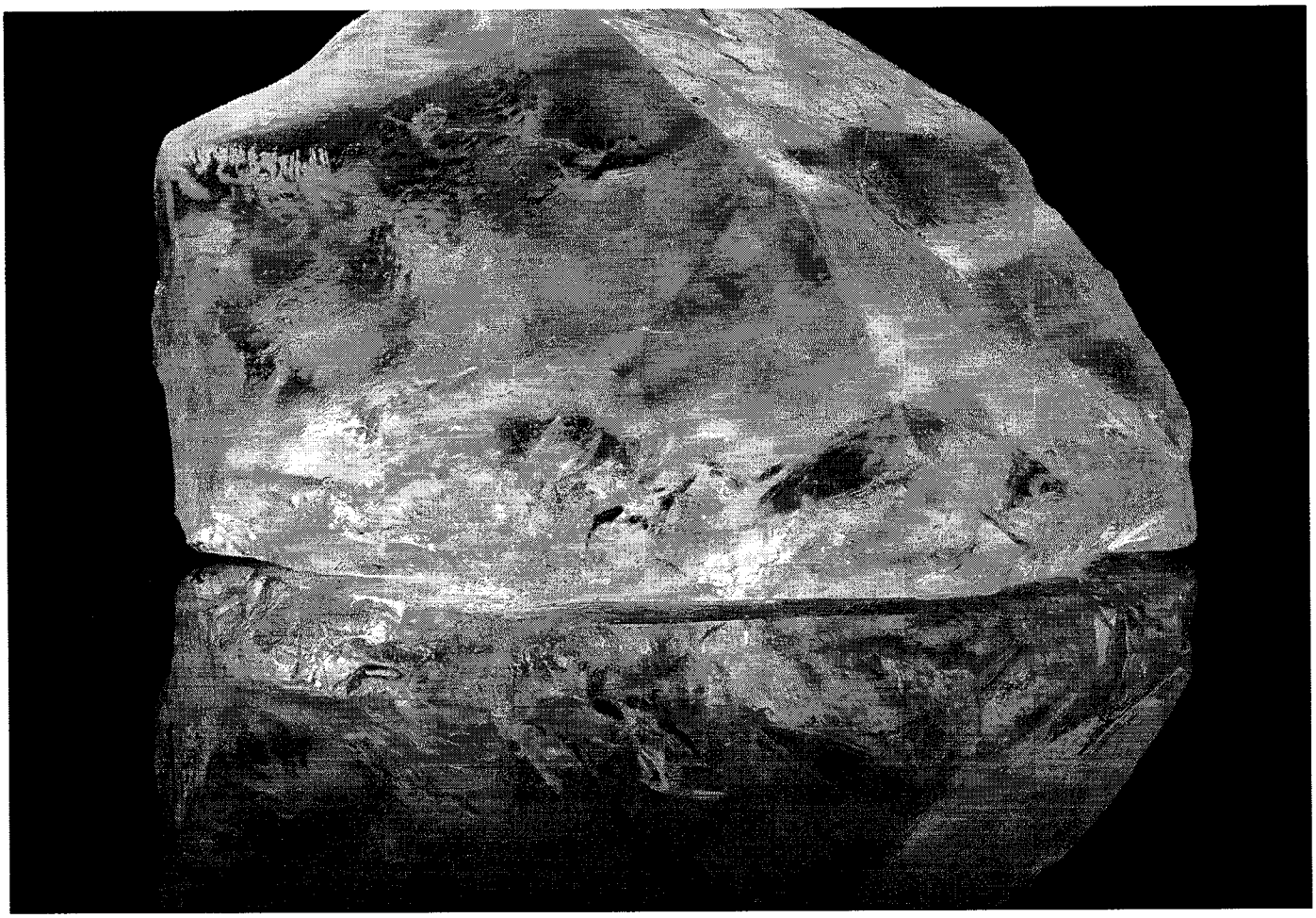
Welcome to the future of cannabis in a pure, potent, and crystallized format. Over the last decade or so, cannabis producers have pushed concentrates far beyond potencies we ever thought possible. From sticky shatters to beautiful butter to the jaw drawing Dragon Ball Z creations. The sky's the limit when it comes to concentrates. Pure THC crystals are one of the newest and most exciting trends in extraction technology. With potencies pushing 99.9 percent – it's not hard to see why.

Online Smoke Shop

out.

But, if getting baked out of your tree is exactly what you are into, then let's dig into the details about what pure THC crystals are, how they are made, and what the high is like. Hold on tight folks; it's about to get potent.

What Are THC Crystals?



Before a grower harvests and cures their cannabis crop, the plants contain a slightly different set of cannabinoids than what you might expect. Consumers like us are used to THC and CBD, but fresh weed contains the acid-ended cannabinoids. These are the precursors to CBD and THC. Instead of THC, fresh bud has tetrahydrocannabinolic acid (THCA), and instead of CBD, it has cannabidiolic acid (CBDA). Both of these cannabinoids also have many beneficial medical benefits, but the properties are less understood than THC and CBD.

Through an advanced extraction process, producers today can pull out the THCA, which then crystallizes. Hence the name crystalline, or THC crystal. But we can already hear you muttering in confusion. "You just said THCA is different than THC, but you are talking about THC crystals?" It is confusing, but hear me out.

trust me, this is the purest cannabinoid product you can get.

The THCA crystalline remains in its unstable THCA form until the user subjects it to high heat. Incineration, induction, or convention of THCA transforms the molecule and removes the "A." It's the same process that occurs to a fresh nug in a pipe, called decarboxylation. When the flower meets flame, the THCA turns to THC. This transformation is why some companies brand their products as THC Crystal. When you smoke it, you are actually consumer THC, not THCA.

Interestingly, before you light up and heat the pure THCA crystals, they are nonpsychoactive. Although there are over a hundred known cannabinoids to date, only THC triggers a psychoactive experience.

- Sure Jell / Certo Drug Test Detox – Does it Really Work?
- What's Kief and How Can You Use It?
- THC Vape Cart Prices – How Much Should You Pay for Liquid THC

What Are The Medical Uses Of THC Crystals?

Because of the sometimes extreme potency – THC crystals are medically useful in many ways. It's like a supercharged hit of THC. Some companies have achieved as high as 99.9 percent THCA, although most on the market hovers somewhere around 80 percent potency. The extraction process removes most, if not all, of the other cannabinoids and terpenes. The product is typically flavorless and has no aroma.

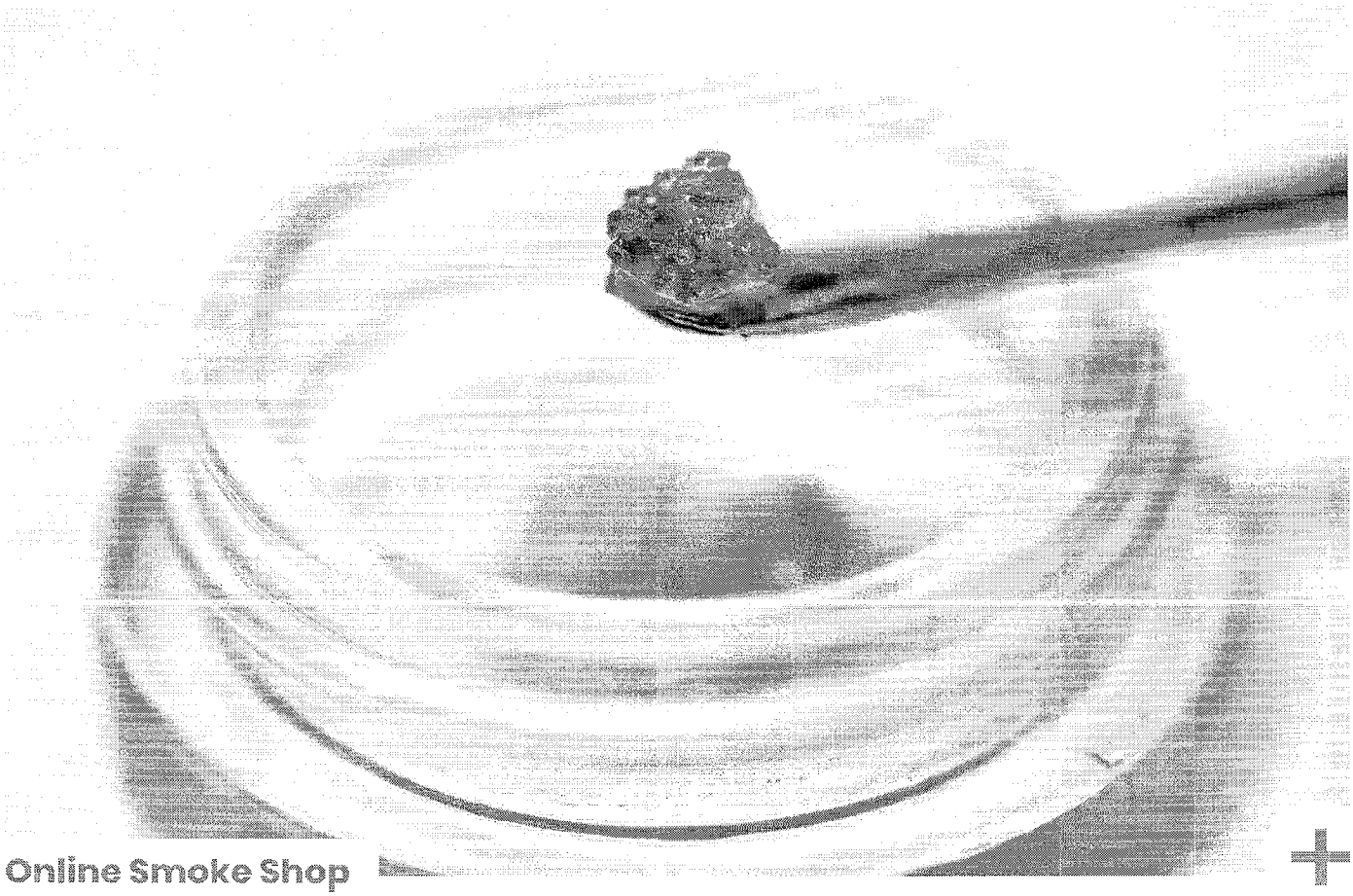
When you smoke THCA crystalline, the high comes almost immediately. Unlike edibles, you won't have to wait around for hours to feel the effects. This immediacy is perfect for treating acute issues, like sudden pain, inflammation, and headache. Pure THC is an excellent tool for use with difficult to treat pain, chronic illness, and some mood disorders.

What is perhaps more exciting than the smoked, dabbed, or vaped version of THC crystal is the benefits of oral ingestion. Because THCA crystalline is a crystal, it dissolves easily in food. You can take it in a tincture or capsule form. There are so far, very few studies specifically on the benefits of THCA. However, preliminary research suggests the following possibilities:

- Spasticity
- Neuroprotection

With more research, there may well be massive potential for THCA as a therapeutic agent. Considering it's hard to find (and use) in other types of products, the pure concentration found in THC crystals may make it a desirable medicinal compound.

How Is Crystalline THC Extracted?



caveat said, we do know a few things about how it's made, even if we don't know the more delicate details.

The first step is the initial extractions. This is done using what we can assume are standard extraction procedures that protect the sensitive THCA molecule. Most producers will use low heat technology, perhaps CO2, to do so.

Once the first extract is obtained, it still contains any number of other compounds like fats, cannabinoids, terpenes, and the like. These are removed through a series of different washes, using specific solutions depending on the compound. For example, the process may include an acetate wash and a hexane wash.

A second stage called "preparative chromatography" is then performed. Which essentially passes the clarified extract through various mediums and filters to remove further compounds. The details are fuzzy here, but the preparative chromatography process flushes the extract at variable speeds, through variable mediums until the desired concentration is achieved.

After so much processing, the solution still contains a few lingering contaminants. This final stage of processing is needed to 'clean' the solution. This takes out any chemicals not fit for human consumption. Once complete, you've got almost 100 percent pure THC crystal on your hands.

How Does The High Feel?

Pure THC crystal, when smoked, dabbed, vaped or otherwise heated, can make for an intense experience. If you aren't well versed in potent strains or dabbing, you might want to take it easy.

Take your time dosing THC crystal. Less is more until you know how much you can handle. The high is going to be an experience. It's going to hit fast, and hard. Its an extremely powerful high, one like you've never had.

terpenes. No flavor or aroma. Pure bliss and a truly spectacular experience. Provided you don't overdo it.

Of course, if you don't smoke it, but instead ingest it orally with no heat, there will be no high at all. Remember THCA compared to THC is a much different experience. THCA as a nonpsychoactive substance, won't have any effects unless of course, you count the potential medicinal benefits.

Have you Tried Pure THC Crystals?

If you are a cannabis enthusiast but haven't tried pure THC crystals yet, it's worth a special trip to your dispensary. Considering the advanced technology requirements needed to produce it, it does come with a higher price point. But, arguably well worth the investment. Keep a look for lab-tested brands to avoid any lingering contamination. In most places today, though, the rigorous testing requirements will weed out any problem products. Let us know in the comments below about your experience with THCA Crystalline; good, bad, or maybe even magical?

EXHIBIT 8

White Paper
Driving Under the Influence of Drugs (DUID)

Revised December 30, 2021

"Essentially what we surmised is that in the state of Missouri you can smoke marijuana, drive a motor vehicle, fail to yield and kill someone, just don't have the marijuana on you at the time of the crash."

Trish Bottfield, whose nephew was killed in a crash involving a driver with marijuana in his system and was not charged.

The Problem

Drugged driving affects each of us at any given time of the day, unlike drunk driving which mostly occurs on the weekends and late at night. In fact, 31% of fatal drunk driving crashes, happen on weekends. The hours between midnight and 3 am can be equally deadly when the highest number of drunk drivers are on the road.

Drugged drivers, on the other hand are a real threat to the safety of road users at all hours especially since the legalization of marijuana in most states.

The National Traffic Highway Safety Administration's (NHTSA) last 2014 Roadside Survey[1] concluded that the number of drivers with alcohol in their system has declined by nearly one-third since 2007, and by more than three-quarters since the first Roadside Survey in 1973. *But that same survey* found a large increase in the number of drivers using marijuana or other impairing drugs.

Current laws, tools and training cannot cope with this growing problem:

- Drugged drivers frequently escape prosecution which means -
- No conviction which means -
- No punishment or accountability which means -
- No rehabilitation which means -
- No justice for the victim/survivor and
- No protection for society

This problem is not unique to America. Other countries, including New Zealand, Australia, Germany, France have implemented national drugged driving legislation, technologies and

[1] "Results of the 2013-2014 National Roadside Survey of Alcohol and Drug Use by Drivers," NHTSA Traffic Safety Facts Research Note, DOT 812 118, February 2015

training. The latest country to act aggressively against drugged driving is Britain, that implemented drugged driving limits for sixteen drugs on March 2, 2015, after realizing that prosecution of DUID was only 2% of the rate of DUI alcohol, whereas its prevalence was 33% that of DUI alcohol[2]. ***A British distinction is that they have the data to show the need for legislation. With rare exceptions, the United States doesn't.***

The United States has studied the problem for decades but has yet to take meaningful action. The National Highways Traffic Safety Administration (NHTSA) and The Government Accountability Office (GAO) report that the prevalence of driving under the influence of alcohol is gradually declining at the same time that the prevalence of drugged driving is increasing. We rapidly and recklessly accept legalization and commercialization of psychoactive drugs with no strategy to develop the legal means to effectively provide for public safety or common sense. Former Colorado Governor Hickenlooper commented on Colorado's legalization of marijuana, ***"If I could've waved a wand the day after the election, I would've reversed the election. This was a bad idea.[3]"*** The results of these bad and costly decisions from our policy makers fall upon us, the innocent public, who suffer the devastating consequences on our roadways. Those of us who become victims and survivors of drugged driving experience an ongoing victimization, first by the drugged driver, then it continues with an ill-equipped and ineffective legal system unresponsive to our pleas.

Drugged driving is a safety problem regardless of a drug's legal status. But drug legalization and commercialization does make the problem more common as reported by the early marijuana legalization states of Colorado[4] and Washington[5]. More perversely, drug legalization advocates have consistently downplayd the seriousness of the situation[6] [7] [8] and made it more difficult for states to implement sound drugged driving legislation. For example, during New York's 2021 marijuana legalization effort, safety advocates were able to turn back a legislative effort to reduce driving while impaired by marijuana from a misdemeanor to a petty offense.

DUID is not simply a problem of marijuana-impaired drivers. In The 2019 National Survey on Drug Use and Health, 12,865 drivers admitted to driving under the influence of marijuana, a significant 8.7% increase over the previous year, and an additional 2,272 drivers admitted to driving under the influence of selected other illicit drugs.

In 2016, 44 percent of drug tested drivers in fatal car crashes were positive for drugs, according to a report entitled "Drug-Impaired Driving: Marijuana and Opioids Raise Critical Issues for

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[2] https://www.youtube.com/watch?v=0zjsV8onl6c

[3] http://www.breitbart.com/big-government/2015/01/23/colorado-gov-legalizing-pot-was-a-bad-idea/

[4] Migoya D. Traffic fatalities linked to marijuana are up sharply in Colorado Is Legalization to blame? Denver Post August 25, 2017

[5] Tefft BC, Arnold LS, Grabowski JG. Prevalence of Marijuana Involvement in Fatal Crashes: Washington 2010-2014 May 2016 AAA Foundation for Traffic Safety

[6] https://norml.org/marijuana/library/cannabis-and-driving-a-scientific-and-rational-review/

[7] https://drugpolicy.org/does-marijuana-impair-driving-way-alcohol-does

[8] http://3hl3hg1lvfpa2qxgq62uw69x-wpengine.netdna-ssl.com/wp-content/uploads/2018/05/NCIA-State-Cannabis-Progress-2018-Report-FNL-booklet.pdf

States" by the Governors Highway Safety Association. (GHSA) This is up from 28 percent in 2006.

Colorado was the first state to legalize and commercialize marijuana for recreational and tax revenue purposes. New studies are now generating data to understand the horrific consequences of that decision in that state:

1. **Percent of drivers who admit driving after marijuana use**:
   Over half of our marijuana-using youth drive after using marijuana.
   - 18.6% of past 30-day adult marijuana users in 2019[9]
   - 54.4% of past 30-day high school student marijuana users in 2019[10]

2. **Toxicology tests of those arrested for DUI:**[11]
   There are more positive blood tests for DUI-marijuana than for DUI-alcohol.

Drug category		Number
Cannabinoids	Positive screens	4,205
	THC positive	4,069
Alcohol		3,956
Benzodiazepines		1,774
Amphetamines		1,090
Cocaine		838
Opioids/opiates		699
Sleeping Zs		115

Note: Colorado Bureau of Investigation (CBI) data from July 2019 to June 2020 when all DUI blood samples were tested for both alcohol and a full drug panel.

3. **DUI charges– percent caused by alcohol, THC and polydrug use – 3-year trend:**[12]
   DUI-alcohol charges are decreasing while DUI-drug charges are increasing.

	2016	2018	% change
Alcohol	75.8%	75.3%	- 4.4%
THC	5.4%	6.4%	+18.5%
Polydrug	12.7%	14.5%	+14.2%

4. **Traffic deaths per Billion Vehicle Miles Traveled (BVMT)**:
   Traffic deaths increased over 1.5/BVMT since marijuana commercialization.
   - Increased from 9.91 in the five years before marijuana commercialization to 11.26 in the five years after marijuana commercialization[13].

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[9] https://marijuanahealthinfo.colorado.gov/health-data/behavioral-risk-factor-surveillance-system-brfss-data

[10] https://marijuanahealthinfo.colorado.gov/health-data/behavioral-risk-factor-surveillance-system-brfss-data 11.2% of students divided by 20.6% of past 30-day users

[11] https://us17.campaign-archive.com/?u=8c19b56d089ffb41f61475b71&id=7e46389639

[12] Rosenthal A, Reed J. Driving Under the Influence of Drugs and Alcohol. Colorado Department of Public Safety, Division of Criminal Justice, Office of Research and Statistics, Nov 2020

[13] Federal Highway Administration, https://www.fhwa.dot.gov/resources/pubstats/

- Increase of 1.46 deaths/BVMT per year adjusted after marijuana commercialization, compared with a synthetic control[14].
- Increase of 1.9 deaths/BVMT per year adjusted after marijuana commercialization, compared with states with stable legalization policies[15].
- Increase of 1.7 deaths/BVMT per year non-adjusted after marijuana commercialization compared with states without legal recreational or medical marijuana[16].

Note: the above reports measured the effect of marijuana commercialization in 2014, not marijuana legalization in 2012.

5. **Traffic fatalities implicating THC:**

Deaths implicating THC are increasing.

	Traffic fatalities	THC-positive	THC≥5 ng/ml
2018[17]	632	83	36
2019[18]	596	113	73

6. **Crash involvement by drug group convictions:[19]**

Impaired drivers' crash risk is at least double that of sober drivers.

Impaired category	**Crash rate**	**Crash risk**
Non-impaired controls	2.87%	1.0
THC *only*	7.1%	2.5
Alcohol *only*	24.8%	8.6
Single other drug *only*	28.7%	10.0
Alcohol + THC	28.5%	9.9
Other polydrug	30.7%	10.7

Note: Impaired drivers were all convicted of DUI in 2018, categorized by drug assay. Controls were all non-impaired Colorado drivers in 2018.

7. **Vehicular homicide convictions by drug group in 2016:[20]**

Drugged driving causes vehicular homicide and convictions.

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[14] Santaella-Tenorio J, Wheeler-Martin K, DiMaggio CJ et al. Association of Recreational Cannabis Laws in Colorado and Washington State With Changes in Traffic Fatalities, 2005-2017. JAMA Intern Med. Published Online June 22 (2020)

[15] Aydelotte JD, Mardock AL, Mancheski CA et al. Fatal crashes in the 5 years after recreational marijuana legalization in Colorado and Washington. Accident Analysis and Prevention 132 (2019) 105284

[16] Kamer RS, Warshafsky S, Kamaer GC. Change in Traffic Fatality Rates in the First 4 States to Legalize Recreational Marijuana. JAMA Intern Med. Published Online June 22 (2020)

[17] Gorman T. The Legalization of Marijuana in Colorado: The Impact. Vol 6 Sept 2019. Rocky Mountain High Intensity Drug Trafficking Area

[18] Clarke C. The Legalization of Marijuana in Colorado: The Impact. Vol 7 Sept 2020. Rocky Mountain High Intensity Drug Trafficking Area

[19] Drugged driver data:Rosenthal A, Reed J. Driving Under the Influence of Drugs and Alcohol. Colorado Department of Public Safety, Division of Criminal Justice, Office of Research and Statistics, Nov 2020. Control data: Colorado Department of Transportation https://www.codot.gov/safety/safetydata/colorado-problem-identification-id-reports/2020_statewideperspective_final.pdf. And Colorado Department of Revenue data, personal communication, Christine Demont, Epidemiologist for Colorado Department of Public Health and Environment, Dec 31, 2020

[20] Bui B, Reed J. Driving Under the Influence of Alcohol and Drugs. A Report Pursuant to HB 17-1315. July 2018. Colorado Division of Criminal Justice

Drugs detected	Number
Alcohol *only*	10
THC *only*	2
Single other drug *only*	1
Alcohol + THC	2
Alcohol + other drug	1
Alcohol + THC + other drug	2

The White House's Office of National Drug Control Policy identified drugged driving as a policy priority and established a goal in the agency's 2011 National Drug Control Strategy to reduce drugged driving 10 percent by 2015. That goal was not met. **Concrete actions** are needed to stop the cultural acceptance of Driving Under the Influence of Drugs (DUID). Concrete actions like national alcohol *per se* laws, administrative license revocation and incentives for ignition interlock devices address the DUI-alcohol epidemic. *No similar actions or incentives have been implemented with DUID.*

We Need Action to Save Lives!

The 23 U.S Code 405[21] National priority safety programs addresses impaired driving, *but all listed programs are specific to alcohol impairment.* This can be remedied by revising 23 U.S Code §405 to provide incentives to States who implement the following technologies, practices and laws specifically directed at the measurement and deterrence of drugged driving. There are specific grants to States to reduce alcohol impairment (such as grants to adopt and enforce mandatory alcohol-ignition interlocks) but *none* for drugged driving impairment.

Multiple highway safety organizations including AAA (American Automobile Association), Resposibility.org, National Safety Council, and GHSA (Governors Highway Safety Association) have all added drugged driving to their agenda. The Senate's Drug Caucus recommended cannabis policy initiatives[22] and California's Highway Patrol published recommended best practices to deal with drugged driving[23]. *The Department of Transportation needs to do the same. But we need more than agenda items; we need the Federal Government to financially incentivize states to adopt practices that will reduce DUID.*

Congress should support the following initiatives to reduce DUID:

1. **Each state should maintain a comprehensive drugged driving data base**

   Each state should be tasked with the responsibility of ensuring that *all* data related to DUID is collected, analyzed, and published so we can better understand the prevalence,

[21] www.law.cornell.edu/uscode/text/23/405

[22] Cannabis Policy: Public Health and Safety Issues and Recommendations. A Report by the US Senate Caucus n International Narcotics Control. March 2021

[23] California Highway Patrol Impaired Driving Task Force Best Practice Protocol Meeting Minutes Octo 14, 2019

causes and consequences of drugged driving. This information comes from the law enforcement agencies, toxicology laboratories and the courts. They should also report the number of DUID citations and causes, and convictions compared to DUI-alcohol. (*Also recommended by NHTSA and GHSA.)*

2. **Adopt best practices to ensure each state's DUID conviction rate is no lower that 90% of the DUI-alcohol conviction rate.**

   Adoption of recommendation #1 will inform the state of the conviction rates for all forms of DUI. If the conviction rate for DUID drops below 90% of the conviction rate for DUI due to alcohol, the state should compare its practices with those of other states having higher DUID conviction rates and adopt those practices that can increase conviction rates. Practices studied should include training, staffing, law enforcement, prosecution, technology, and laws.

3. **Implement oral fluid testing (both roadside preliminary devices and evidentiary assays):**

- Roadside non-quantitative oral fluid testing devices can be used by officers prior to arrest if the officer has *reasonable* grounds to believe that the driver may be impaired by drugs.
  - Roadside non-quantitative oral fluid testing devices shall guide officers in evidence collection.
  - The roadside non-quantitative oral fluid test results may not be considered evidentiary.
  - Available devices test for drugs including opiates, cocaine, amphetamines and cannabis.
- Evidentiary laboratory oral fluid testing has been scientifically validated for use in lieu of blood evidentiary testing to prove presence of an impairing substance[24]. Roadside preliminary oral fluid testing is now being used routinely in three states[25].

4. **Provide more Drug Recognition Experts (DREs) and Advanced Roadside Impaired Driving Enforcement (ARIDE)trained officers:**

   Provide additional training for and use of (DREs) and ARIDE trained officers. According to the International Association of Chiefs of Police, there were *only* 9,878 DREs in the United States through December 31, 2019. For example Virginia is now seeking legislative support to legalize marijuana yet they only have 25 trained DREs, the lowest number in the country.

   "*Why the need? Quite simply the cultural changes of liberalized drug policy and reduced perception of harm from drugs parallel an increase in drug use, an increase in drugged*

[24] Desrosiers NA, Huestis MA. Oral Fluid Drug Testing: Analytical Approaches, Issues and Interpretation of Results. J Anal Tox (2019) 43:415-443
[25] Moore C, Lindsey B, Harper CE, Knudsen JR. Use of Oral Fluid to Detect Drugged Drivers. Between the Lines, National Traffic Law Center Oct 2020 Vol 28, Issue 10

driving, and an increased difficulty convicting drugged drivers in front of jurors subject to the same social climate. There isn't a lot we can do about the first of those, but improving detection and deterrence followed up with more effective and convincing testimony are squarely in the realm of priorities that can be aided by DRE's." Matt Myers, DRE and Assistant Chief of Police, Peachtree City Police Department

5. Implement mandatory drug testing in the following cases:

- Preliminary breath alcohol tests and preliminary oral fluid drug tests for all drivers who are arrested for driving recklessly or impaired.

  Even though officers are authorized to collect and test specimens for drugs on all DUI/DUID arrestees (with probable cause and a warrant for a blood test), they do not routinely perform drug testing especially when the BAC is .08 or higher. Colorado began testing all blood samples from drivers arrested for DUI for both alcohol and a full drug panel in July 2019.

- Evidentiary alcohol and drug tests of all (surviving and deceased) drivers involved in crashes that result in death or serious injuries. Ongoing lack of testing ensures that DUID remains under-reported.

  The Governors Highway Safety Association reported that in 2015 55.4% of deceased drivers in fatal collisions were tested for drugs and 19.0% of surviving drivers were tested for drugs. Test protocols and reporting are so poorly standardized that the National Highway Traffic Safety Administration issued a caution that researchers not use its data to infer drugged driving trends[26].

6. Implement eWarrants for blood draws:

Reduce delays in collecting blood samples through the use of electronic warrants. Traditional warrants can add 1 hour to the normal two hours required to collect a blood sample in cases of death or serious bodily injury. An average of 73% of marijuana's THC is cleared from the blood within 25 minutes after beginning to smoke, making blood THC levels irrelevant after such a delay.

7. Enhance penalties for polydrug impairment:

Enhance penalties for driving under the influence of combinations of drugs including alcohol. Combinations of drugs can be more impairing than individual drugs. *Enhanced penalties can incentivize and financially support additional drug testing.*

8. Adopt responsible DUID legislative options:

1. Zero tolerance for impairing drugs for drivers under the age of 21.

[26] Berning A, Smither DD. Understanding the limitations of drug test information, reporting and testing practices in fatal crashes. NHTSA Traffic Safety Facts Research Note DOT HS 812 072 November 2014

2. Tandem DUI *per se* where a driver is guilty of Tandem DUI *per se* if the following sequence of events occurs:
   - An officer had probable cause, based on the driver's demeanor, behavior and observable impairment to believe that the driver was impaired; and
   - Proof that the driver had any amount of an impairing substance in blood, oral fluid or breath other than alcohol.
3. Permissible inference that a driver is guilty of DUI if the driver had any amount of an impairing substance in blood, oral fluid or breath other than alcohol.

Sixteen states have zero drug tolerance for drivers, following the Department of Transportation's zero drug tolerance policy for commercial drivers and other select employees. These zero tolerance laws vary widely from state-to-state, but all are suitable substitutes for Tandem DUI *per se*. *Per se* drug concentration limits for drugs other than alcohol are not advised. The impossibility of determining scientifically valid *per se* levels for all drugs becomes readily apparent when one considers the multiple thousand combinations of drugs that must also be considered.

> *A 5 ng/ml THC per se law or a non-zero permissible inference level is NOT a responsible DUID option; most THC-impaired drivers test below 5 ng/ml THC in whole blood.*

9. Implement 24/7 sobriety programs for chronic alcohol and drug offenders:

24/7 sobriety programs are being used in 8 states. The RAND Corporation evaluated North Dakota's program, finding a 13.7 percentage point lower rearrest or probation revocation compared with subjects not in a 27/7 program. Washington and North Dakota have successfully included drugged drivers in their 24/7 programs[27].

10. Impose Administrative License Revocation for drugged driving:

Drivers' licenses should be revoked administratively for all drivers who either fail preliminary alcohol or drug tests or who refuse to provide biological samples for alcohol or drug testing.

- At a minimum, the administrative penalty (license suspension) for a refusal to provide a specimen for drug testing should be at least as severe as for a first DUID offense. (IACP)

11. Comprehensive drugged driving plans must be made mandatory by states prior to legalizing psychoactive drugs like marijuana.

[27]Midgette G, Kilmer B, Nicosia N, Heaton P. A Natural Experiment to Test the Effect of Sanction Certainty and Celerity on Substance-Impaired Driving: North Dakota's 24/7 Sobriety Program. J of Quantitative Criminology (2020)

Comprehensive drugged driving plans should include creation of a drugged driving database for at least five years prior to legalizing psychoactive drugs to enable measuring the impact of drug legalization on traffic crashes and deaths.

12. Implied consent laws should cover both alcohol and drugs

Implied consent laws should: (a) extend to drugs and support the collection of blood and/or oral fluid for drug testing; (b) include the collection of a specimen or specimens for multiple tests; and (c) should not permit suspects to choose the type of test(s). (IACP)

The combination of all the above practices will act as a deterrent to drugged-driving and will demonstrate that DUID will not be tolerated. Most importantly, they will provide the means to collect reliable and critical data that will enable States to measure the impact of their initiatives and develop effective long-term strategies to deal with this growing threat on our highways.

Conclusion

The drug-impaired driving problem is out of control in part due to a common belief that drug-impaired driving is not a problem. Opinions are shaped by self-serving publicity from the marijuana industry and from the media. A defectively designed study by NHTSA[28] has been misrepresented to support claims that psychoactive drugs like marijuana THC cause no impairment. Even the CDC published misleading information regarding the safety of THC-impaired driving[29]. The CDC has since changed its analysis[30] but not before Colorado's Department of Motor Vehicles included a misquote of the incorrect CDC analysis in the state's 2020 Driver Handbook[31].

These common erroneous beliefs were documents by the 2017 GHSA report[32]:

> In surveys and focus groups with regular marijuana users in Colorado and Washington, almost all believed that marijuana doesn't impair their driving, and some believed that marijuana improves their driving (CDOT, 2014; PIRE, 2014; Hartman and Huestis, 2013). Most regular marijuana users surveyed in Colorado and Washington drove "high" on a regular basis. They believed it is safer to drive after using marijuana than after drinking alcohol. They believed that they have developed a tolerance for marijuana effects and can compensate for any effects, for instance by driving more slowly or by allowing greater headways. However, Ramaekers et al. (2016) found that marijuana

[28] Compton RP, Berning A. Drug and Alcohol Crash Risk. NHTSA Traffic Safety Facts Research Note DOT HS 812 117 (2015)
[29] https://www.cdc.gov/marijuana/pdf/marijuana-driving-508.pdf
[30] https://www.cdc.gov/transportationsafety/pdf/Drug-Impaired-Driving-Summary-Sheet-LD-508.pdf
[31] https://www.codot.gov/safety/traffic-safety-pulse/2020/november-2020/the-colorado-driver-handbook
[32] Hedlund J. Drug-impaired driving: A guide for what states can do. GHSA and Foundation for Advancing Alcohol Responsibility.

effects on cognitive performance were similar for both frequent and infrequent marijuana users[33].

We now have the facts proving that drug-impaired driving is a very real threat to highway safety. Handwringing and passing toothless resolutions won't solve this problem. Congress must take a lead by changing the narrative that accommodates drug-impaired driving and by requiring states to implement meaningful reform.

[33] Drug Impaired Driving: A Guide for States. Governors Highway Safety Association