



Let's Be Blunt: Marijuana and Impaired Driving

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LEGALIZATION OF MARIJUANA: Implications on Traffic Safety/ Study in California

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Agenda

- What is Marijuana (THC)?
- Legalization in the US.
- Effects on Driving.
- Prevalence and Crash Risk.
- Implications on Traffic Safety.
- Reducing Marijuana Impaired Driving.
- Minimum Legal Marijuana Use Age 21.
- Study in California.
- Black Market in California
- Summary



What is Marijuana?

- Marijuana is the term for the dried flowers and leaves of the ***Cannabis sativa*** plant
- ***Cannabinoids*** in marijuana are mind-altering chemicals
- ***Marijuana*** – herbal cannabis
- ***Hashish*** – cannabis resin
- ***Cannabis*** is a ***psychoactive drug***, not a CNS stimulant nor a depressive
- Psychoactive ingredient in marijuana is:
delta-9-tetrahydrocannabinol (***THC***)



How is Marijuana Consumed?

- Smoked (joint, pipe, bong)
- Eaten (brownies, cookies, cakes)
- Drank (Green Dragon: alcohol infused with THC; tea)
- Patch (in mouth above gum line)
- Pills (THC)
- Inhaled



How is Testing for Marijuana Use Accomplished?

- **Blood** - THC stays in blood for a few hours; measured in nanograms per milliliter [ng/ml]
- **Urine** – THC metabolites stay in urine for days
- **Saliva** – detects most immediate smoking of marijuana
- **Hair** – can detect marijuana use 3-4 months after
- **Breath?** – Working on it

Marijuana Laws in the US: 2021

Medical and Recreational THC Legal

- Colorado (2012)
- Washington (2012)
- Oregon (2014)
- Alaska (2014)
- District of Columbia (2014)
- California (2016)
- Maine (2016)
- Massachusetts (2016)
- Nevada (2016)
- Michigan (2018)
- Vermont (2018)
- Illinois (2019)
- Arizona (2020)
- Montana (2021)
- New Jersey (2021)
- South Dakota (2021)

- **15 States + DC**

Medical THC Legal and Recreational THC Decriminalized

- Connecticut
- Delaware
- Maryland
- Minnesota
- Missouri
- New Hampshire
- New Mexico
- New York
- North Carolina
- North Dakota
- Ohio
- Rhode Island

- **12 States**

Medical THC Only

- Alabama
- Arkansas
- Florida
- Georgia
- Hawaii
- Indiana
- Iowa
- Kansas
- Kentucky
- Louisiana
- Mississippi
- Oklahoma
- Pennsylvania
- South Carolina
- Tennessee
- Texas
- Utah
- Virginia
- West Virginia
- Wisconsin
- Wyoming

- **21 States**

Recreational THC Decriminalized

- Nebraska
- **1 State**

THC Illegal

- Idaho
- **1 State**



Background in U.S.

- Marijuana is most widely used illegal/legal drug in the U.S. (current estimated **18-22 million users**) second to alcohol (**60% of adults**)
- **9%-13%** of nighttime drivers on U.S. roads have marijuana (THC) in their systems



Signs of Marijuana Use

- Bloodshot eyes
- Increased heart rate
- Sleepiness
- Poor coordination
- Delayed reaction time
- Increased appetite



What Are the Effects of Marijuana on Driving?

- Some driving skills impaired (e.g., **tracking, lane maintenance**)
- Heavy marijuana use may **increase the risk** of being in a serious crash

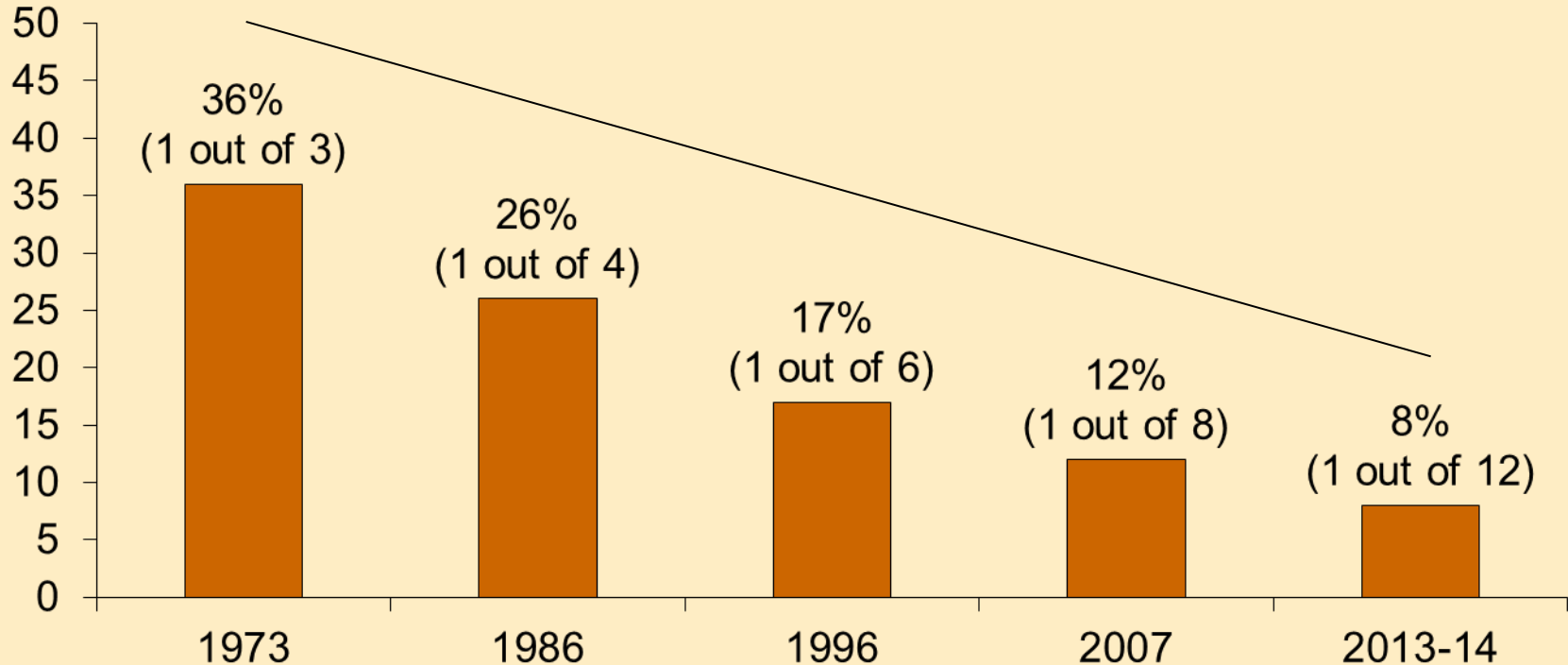
[Sources: Sewell (2012), Yale University, Review of Literature; Li (2011), Meta-Analysis, Columbia University]



THC Not Like Alcohol

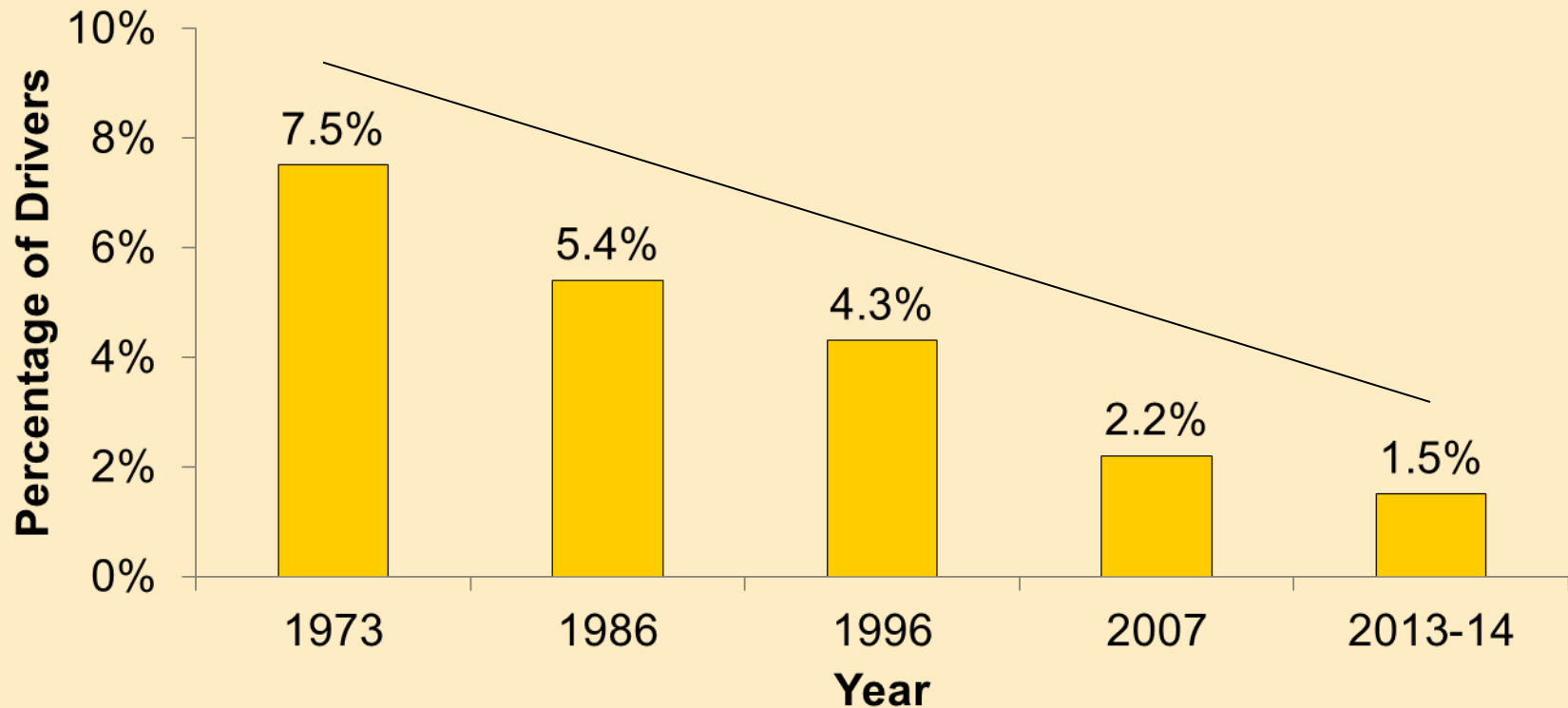
- Concentration of THC in the blood rises very rapidly after smoking marijuana and peaks in the blood after about 20-30 minutes. Then the concentration drops rapidly.
- However, the subjective “high” and measured impairment remain for 1-2 hours.
- So THC measured in the blood has no relationship to impairment.

Percent of Drivers on the Road with Positive BAC Levels (BAC \geq .01) (Weekend Evenings)



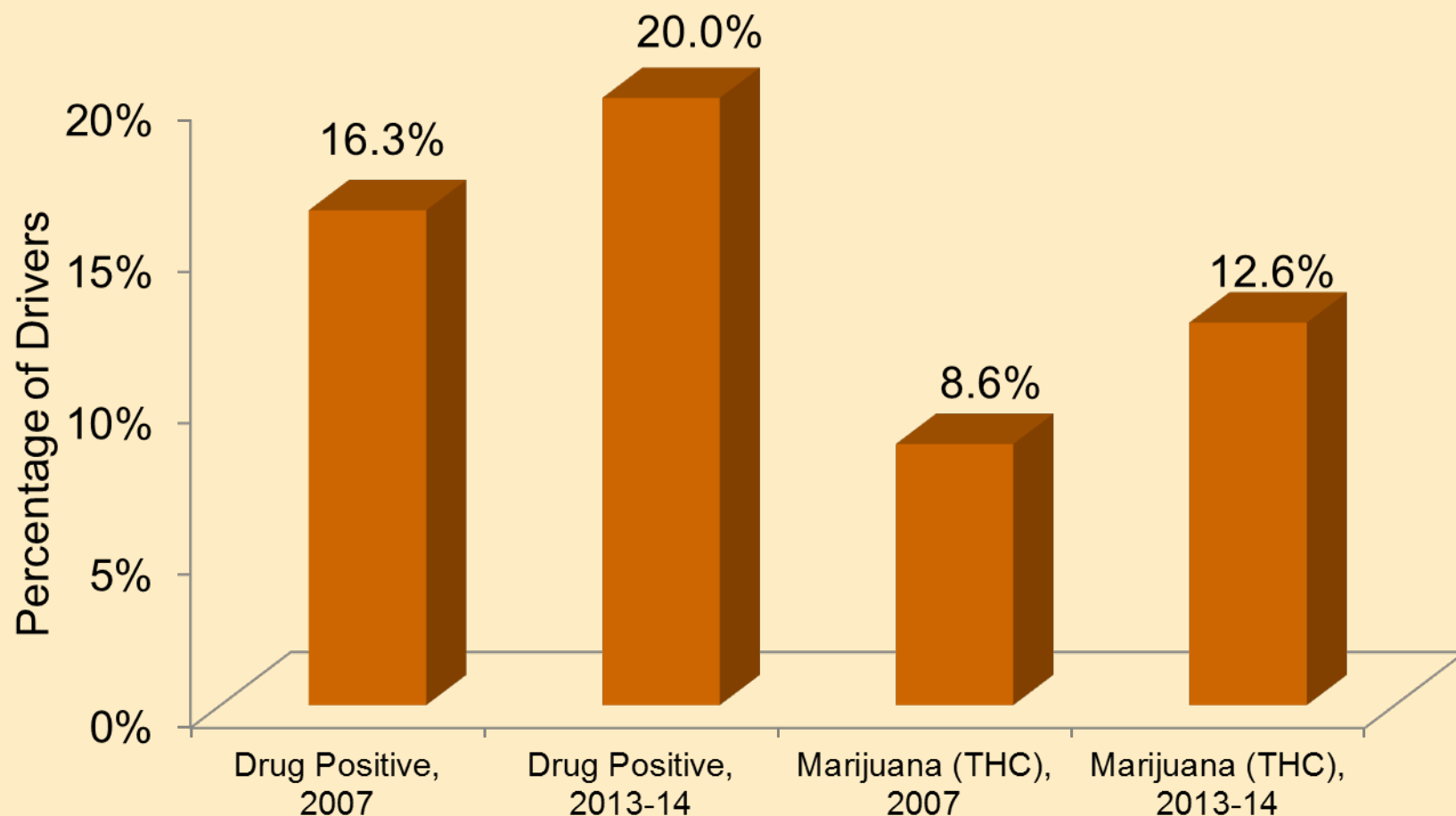
Source: National Roadside Surveys

Percentage of Weekend Nighttime Drivers with BACs ≥ 0.08 g/dL* in the Five National Roadside Surveys



*During the period from 1973 through 1996, the States had BAC limits that ranged from 0.08 to 0.15 g/dL


Percentage of Drivers on U.S. Roads in 2007 and 2013-14 with Drugs Other than Alcohol (Oral Fluid and Blood)



ALCOHOL and THC

- The **odds of being in a crash** for drivers with **THC** (marijuana) in their systems is **1.05** (adjusted for age & gender) compared to drivers with no THC.
- The odds of being in a crash for a driver with a **BAC = .05 is 2.07** (adjusted for age & gender) compared to drivers with a BAC = .00.
- The odds of being in a crash for drivers with a **BAC = .08 is 3.93** (adjusted for age & gender) compared to drivers with a BAC = .00.
- The odds of being in a crash for drivers with a **BAC = .15 is 12.18** (adjusted for age & gender) compared to drivers with a BAC = .00.

Source: NHTSA, Compton & Berning (2015), DOT HS 812-117



Prevalence of Marijuana in Seriously and Fatally Injured Crash Victims

- **21%** of drivers had **THC** in their system at the time of the crash **before** the COVID-19 pandemic. That increased to **33% during** the pandemic.
- **22%** of drivers had **alcohol** in their system **before** the COVID-19 pandemic. That increased to **28% during** the pandemic.
- **19%** of pedestrians had **THC** in their system **before** the pandemic. That increased to **31% during** the pandemic.



What Are the Implications for Traffic Safety?

- Marijuana **impairs some** driving skills:
 - Tracking
 - Unexpected events difficult to handle
- Combination of alcohol and THC **exacerbates** impairment effects
- Acute cannabis (THC) consumption can **increase the risk of a crash** involving serious injury or death according to some studies
- But the risk of being killed in a single vehicle crash at .02-.04 BACs is **3 to 4 times** that of a sober driver

Hand-Held Ion Mobility Spectrometers (IMS)

Lightweight Chemical
Detector

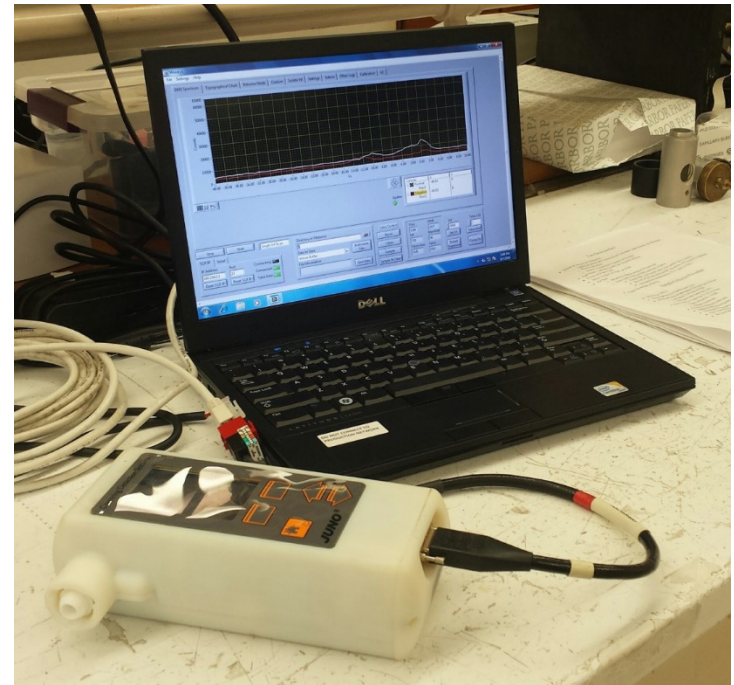


RAID-M



Ion Mobility Spectrometers Field Prototype

- Detects vapor-phase chemicals
 - Flash-vaporized THC from breath
- Low ng level of material are able to be detected, including THC
- Onboard computer or tethered to laptop





Summary and Conclusions

- Continue to monitor the States where recreational marijuana is legal very closely.
- **Balance** our limited enforcement resources between alcohol-DWI and drug-DUI enforcement
- Establish **separate statutes** for alcohol-DWI and drug-DUI (DUID) and **more severe sanctions** for the combination of alcohol and DUID



Minimum Legal Purchase Age

Based upon the effectiveness of MLDA-21 concerning alcohol in the U.S.:

- **Use** marijuana, **lose** driver's license (90 days)
- No amount (**zero tolerance**) of THC in system if driving
- **Age of seller** should also be 21
- **Fake ID Retailer Support:** ID scanners, distinctive drivers' licenses, confiscate fake IDs



Minimum Legal Purchase Age

Study sponsored by the Insurance Institute for Highway Safety (IIHS):

- Conducted by NORC in cooperation with the University of Minnesota
- “An Examination of the Minimum Legal Marijuana Use Age 21 Laws and Their Enforcement in California: A State Where Recreational Marijuana is Legal.”
- Submitted for publication in the *Journal of Studies on Alcohol and Drugs*



California MLMU-21 Study

OBJECTIVE:

Assess the ease of access to marijuana by underage patrons

- Documented the MLMU-21 Laws in the State
- Conducted a Random Survey of 25 Law Enforcement Agencies in the State
- Sent pseudo-underage patrons into 50 randomly selected licensed recreational marijuana outlets (3 turned out to be medical marijuana only)



California MLMU-21 Study

RESULTS:

- Pseudo-underage patrons were required to show age identification to enter the outlets in all 47 (100%) of the recreational outlets visited.
- Law enforcement agencies do not consider enforcement of the recreational marijuana market a priority and depend upon retail store security to enforce MLMU-21



California MLMU-21 Study

RESULTS:

- Only 15 of the 47 outlets visited used electronic ID scanners
- Only 13 stores had signs outside indicating that entry was prohibited for persons under age 21
- Penalty for furnishing marijuana to underage: up to 6 months in jail and a fine up to \$500



California MLMU-21 Study

CONCLUSIONS:

- Licensed California recreational marijuana outlets appear to avoid selling to underage customers.
- However, according to a recent published scientific study and numerous news reports, there are hundreds, if not thousands, of illicit marijuana dispensaries in California.
- Future research should focus on whether youth are obtaining marijuana from illicit stores.



SUMMARY

How Can We Limit Marijuana Impaired Driving in Legal States?

- Enforce the minimum legal purchase age (**MLPA**) [**21 in the US**].
- Enforce drugged driving using **roadside saliva testing**.
- Establish a **standardized field sobriety test** (SFST) for THC.
- Establish a **DUID Visual Detection Guide** similar to the NHTSA guide for alcohol



Additional References

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- Elslande, Fournier & Jaffard (2012). Influence of Cannabis on Fatal Traffic Crashes. *Transportation Research Record: Journal of the Transportation Research Board*, No. 2281, Transportation Research Board of the National Academies, Washington, DC, 43-50.



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