Impaired Driving Safety Commission

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Impaired Driving Safety Commission

Public Act 350 of 2016 (effective: 3-21-2017) created the Impaired Driving Safety Commission Act. The Commission was created within the Michigan State Police (MSP) pursuant to the Act and is required to research and recommend a scientifically supported threshold of Δ^9-THC bodily content to provide evidence for per se impaired driving in the state of Michigan.

Impaired Driving Safety Commission: Members

Appointed by Governor Rick Snyder, the Commission consisted of six members:

- The Director of the Michigan State Police: **Col. Kriste Kibbey Etue**
- The MSP Director's designated representative: **Lt. Col. Richard Arnold**
- A qualified and registered patient under the Michigan Medical Marihuana Act: **Ms. Margeaux Bruner**
- A forensic toxicologist: **Mr. Nicholas J. Fillinger**
- A professor from a public research university in this state: **Dr. Carol Ann Cook Flannagan,** whose expertise is in traffic safety
- A professor from a public research university in this state: **Dr. Norbert E. Kaminski**, professor of pharmacology and toxicology, whose expertise is in the area of cannabis pharmacology and toxicology
- A physician licensed under the Public Health Code: **Dr. William Ray Morrone**

Impaired Driving Safety Commission: Process

- Public Meetings throughout 2018 and into March 2019
- Review of current and past scientific peer-reviewed literature
- Expert speaker presentations in areas of specific relevance
  - Michigan criminal law
  - Impaired driving prosecution, defense, investigation, and enforcement
  - Substance abuse treatment
  - Traffic safety research, analysis, and programming
  - Pharmacology and Toxicology
  - Forensic toxicology

Impaired Driving Safety Commission: Areas Reviewed

- Status of medical and recreational marihuana laws and driving per se limits: in Michigan and across the nation
- Pharmacokinetics of Δ^9-THC
- Behavioral effects of Δ^9-THC
- THC impairment and relationship to traffic safety
- Public attitudes toward marihuana and driving
- Δ^9-THC and driving in Michigan
- Standardized Field Sobriety Tests
- Blood levels of Δ^9-THC and impairment

Impaired Driving Safety Commission: Recommendations

- No scientifically established threshold of Δ^9 THC bodily content to provide evidence for per se impaired driving in the state of Michigan
- Use of roadside sobriety test(s) to determine whether a driver is impaired
- Additional training for licensed police officers to increase officers' ability to observe and identify the signs of driver impairment
  - Advanced Roadside Impaired Driving Enforcement (ARIDE) training program
  - Drug Recognition Expert (DRE) training program

Metabolism, disposition, and kinetics of delta-9-tetrahydrocannabinol in men and women

Monroe E. Wall, Ph.D., Brian M. Sadler, Ph.D., Dolores Brine, B.S., Harold Taylor, B.S., and Mario Perez-Reyes, M.D.

Research Triangle Park and Chapel Hill, N.C.

Research Triangle Institute, Research Triangle Park, and School of Medicine, University of North Carolina, Chapel Hill

Clinical Pharmacology and Therapeutics 34:(3) 352-363, 1983

*Supplemented with:

Drug Disposition 42 (4): 327,2003 (review)

Journal of Analytical Toxicology, 32: 160, 2008

CHARACTERISTICS OF VOLUNTEERS

	Men		Women	
	IV	Oral	IV	Oral
Age (yr)	23 ± 2	25.8 ± 5.1	23 ± 3	21.5 ± 4.4
Wt (kg)	72 ± 9	66.2 ± 8.7	54 ± 7	56.4 ± 1.7
Height (cm)	175 ± 6	175 ± 6.9	163 ± 7	165 ± 5.5
THC dose	4 mg	20 mg	2.2 mg	15 mg
N	6	6	6	6

Δ^9-THC in Plasma of Men after Oral or Intravenous Administration

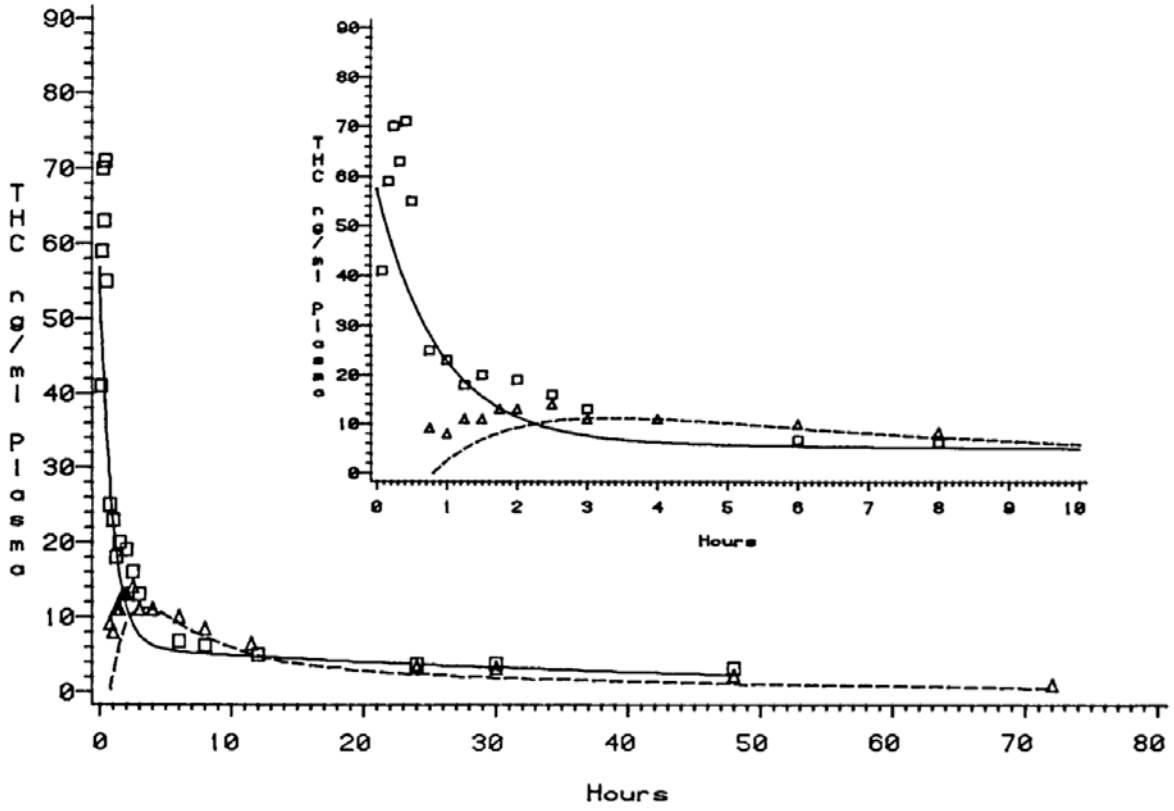


Fig. 2. Observed and calculated concentrations of Δ^9-THC in plasma of men. Data represent means of six subjects for oral (Δ) and intravenous (□) Δ^9-THC. Corresponding calculated curves (oral ----; intravenous —) were constructed from weighted parameter means from individually fitted plasma data.

	$t_{1/2}$ (hr)
Rapid disposition phase	
i.v.	0.6
oral	0.9
Terminal phase	
i.v.	36
oral	25

Δ^9-THC in Plasma of Women after Oral or Intravenous Administration

Clin. Pharmacol. Ther.
September 1983

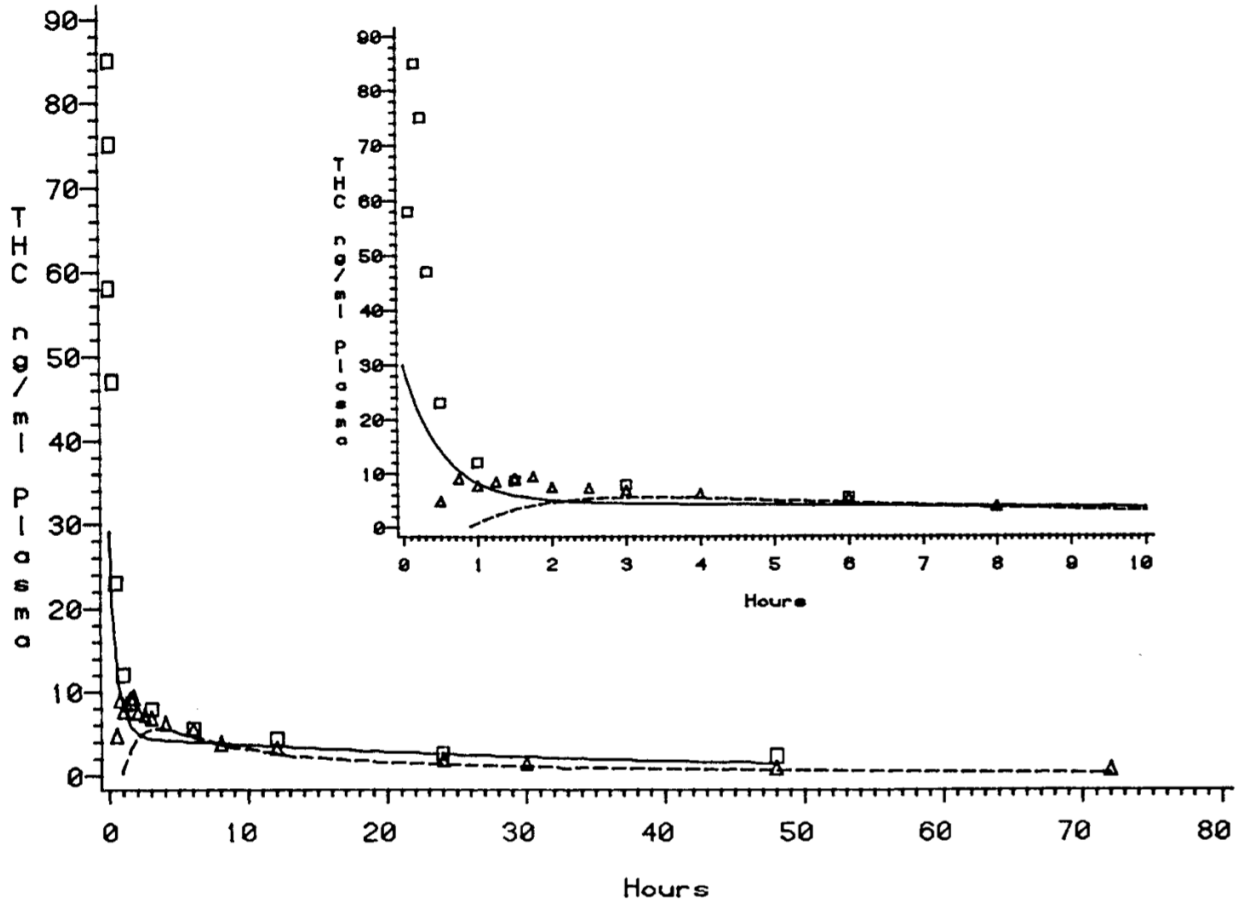


Fig. 1. Observed and calculated concentrations of Δ^9-THC in plasma of women. Data represent means of six subjects for oral (Δ) and intravenous (□) Δ^9-THC. Corresponding calculated curves (oral----; intravenous —) were constructed from weighted parameter means from individual fitted plasma data.

	$t_{1/2}$ (hr)
Rapid disposition phase	
i.v.	0.4
oral	0.7
Terminal phase	
i.v.	29
oral	25

Heavy Regular User
“more than 1 joint /day”

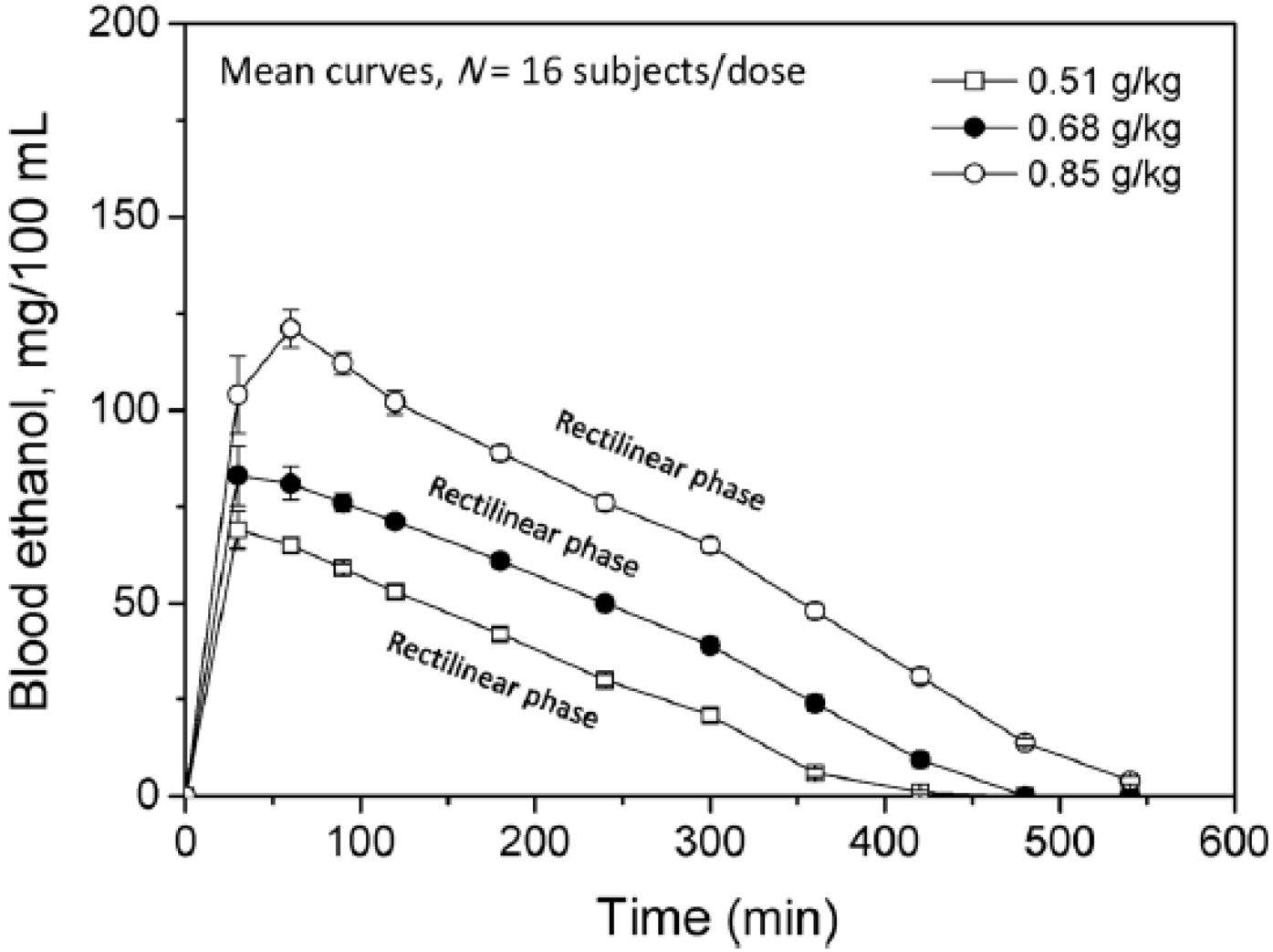
Table I. Serum Analysis for THC, OH-THC, Free, and Glucuronidated THCCOOH (ng/mL) in Heavy, Regular Users of Cannabis (group 1) 24–48 h and More Than 48 h After Discontinuation of Drug Use*

Subject	Sex	BMI	THC (ng/mL)	OH-THC (ng/mL)	THCCOOH (ng/mL)	THCCOOglu (ng/mL)
24–48 h after last drug use						
1	m	26.3	2.2	nd	25	141
2	f	19.2	1.3	positive	52	160
3	m	28.9	nd	nd	14	163
4	m	21.8	1.2	nd	42	153
5	f	17.9	nd	nd	nd	9
6	m	24.7	2.3	1.1	43	211
7	m	23.7	nd	nd	6	45
8	m	26.6	nd	nd	11	118
9	m	21.4	1.9	positive	281	539
10	m	17.9	4.6	1.4	297	1048
11	m	28.7	6.4	2.4	92	356
12	m	22.1	1.0	nd	6	128
> 48 h after last drug use						
13	m	21.6	nd	nd	50	150
14	m	21.5	nd	nd	17	40
15	m	21.2	nd	nd	nd	7
16	m	30.7	2.0	positive	63	268

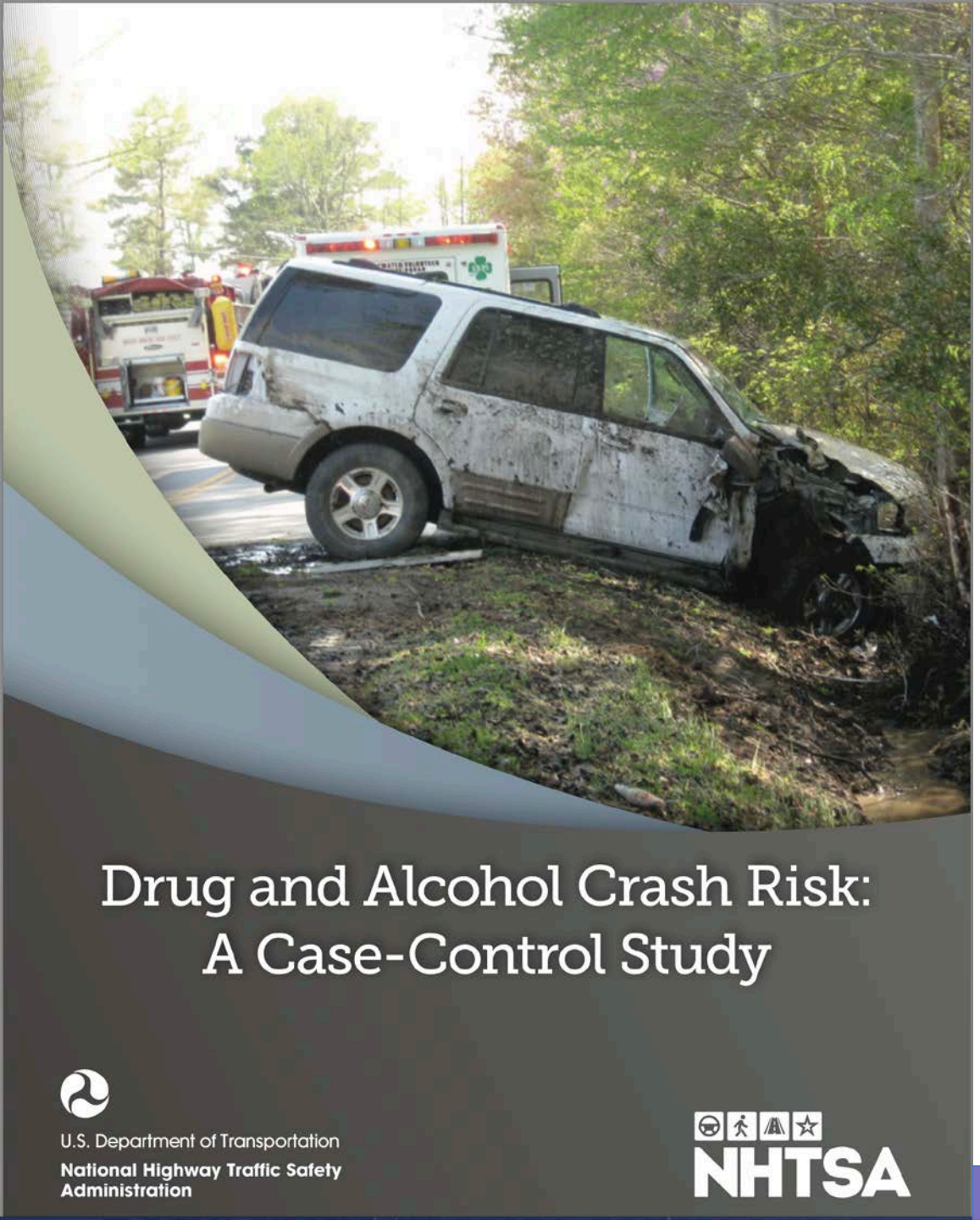
* BMI: body mass index; nd: not detectable (LOD: 0.3 ng THC or OH-THC/mL serum, 1.0 ng THCCOOH/mL serum); positive: finding above 0.3 ng THC or OH-THC/mL serum, and below the LOQ (1.0 ng THC or OH-THC/mL serum).

Journal of Analytical Toxicology,Vol. 32, March 2008

Concentration-Time Profile of Ethanol In Blood



A.W. Jones Forensic Sci 2019



Lacey, J. H., Kelley-Baker, T., Berning, A., Romano, E., Ramirez, A., Yao, J., ,… & Compton, R. (2016, December). Drug and alcohol crash risk: A case-control study (Report No. DOT HS 812 355). Washington, DC: National Highway Traffic Safety Administration.

Study Conducted in Virginia Beach, VA

- Study was conducted for over 20 months with research team responding to crashes 24 hours per day 7 days per week.
- Data was collected from more than 3,000 crash-involved drivers and over 6,000 control drivers.
- Study was case controlled

U.S. Department of Transportation
National Highway Traffic Safety Administration

TRAFFIC SAFETY FACTS
Research Note

NHTSA
www.nhtsa.gov

DOT HS 812 117 Behavioral Safety Research February 2015

Drug and Alcohol Crash Risk

Richard P. Compton and Amy Berning

Table 3

Unadjusted Odds Ratios Between Drug Class Use and Crash Risk

Drug of Interest	Unadjusted Odds Ratio	P Value
THC (Marijuana)	1.25	0.01
Sedatives	1.30	0.06
Narcotic Analgesics	1.15	0.26
Antidepressants	1.06	0.75
Stimulants	1.01	0.40
Illegal Drugs	1.21	0.01
Legal Drugs	1.07	0.43

The risk of crash involvement for each category and class of drug is compared to the crash involvement rate for drug-negative drivers. An odds ratio of 1.00 means the crash involvement rate is the same. P Values from logistic regression (Wald Test). Shading indicates statistical significance.

Table 4

Adjusted Odds Ratios Between Drug Class Use and Crash Risk (Adjusted for Demographic Variables: Age, Gender And Race/Ethnicity)

Drug of Interest	Adjusted Odds Ratio	95% CI*	P Value
THC (Marijuana)	1.05	0.86 – 1.27	0.65
Antidepressants	0.87	0.57 – 1.32	0.51
Narcotic Analgesics	1.14	0.85 – 1.51	0.39
Sedatives	1.27	0.93 – 1.75	0.13
Stimulants	0.94	0.72 – 1.22	0.64
Illegal Drugs	1.04	0.88 – 1.23	0.65
Legal Drugs	1.03	0.84 – 1.27	0.79

The risk of crash involvement for each category and class of drug is compared to the crash involvement rate for drug-negative drivers. An odds ratio of 1.00 means the crash involvement rate is the same. *(CI = Confidence Interval).

Table 5

Adjusted Odds Ratios Between Drug Use and Crash Risk (Adjusted for Demographic Variables and Alcohol Use)

Drug of Interest	Adjusted Odds Ratio	95% CI*	P Value
THC (Marijuana)	1.00	0.83 – 1.22	0.98
Antidepressants	0.86	0.56 – 1.33	0.50
Narcotic Analgesics	1.17	0.87 – 1.56	0.30
Sedatives	1.19	0.86 – 1.64	0.29
Stimulants	0.92	0.70 – 1.19	0.51
Illegal Drugs	0.99	0.84 – 1.18	0.99
Legal Drugs	1.02	0.83 – 1.26	0.83

The risk of crash involvement for each category and class of drug is compared to the crash involvement rate for drug-negative drivers. An odds ratio of 1.00 means the crash involvement rate is the same. *(CI = Confidence Interval)

Table 6

Contribution of Alcohol and Drugs to Crash Risk

Drug and Alcohol Use	Adjusted Odds Ratio	95% CI*	P Value
No Alcohol / No Drug	1.00		
No Alcohol / Positive Drug	1.02	0.88 – 1.17	0.83
Positive Alcohol (< 0.05) / No Drug	0.84	0.55 – 1.29	0.43
Positive Alcohol (< 0.05) Positive Drug	1.03	0.55 – 1.94	0.93
Positive Alcohol (≥ 0.05) / No Drug	6.75	4.20 – 10.84	<0.0001
Positive Alcohol (≥ 0.05) / Positive Drug	5.34	2.75 – 10.37	<0.0001

Shading indicates statistical significance. Reference for all conditions was no drug and no alcohol. *CI = Confidence Interval