

WASHINGTON
Traffic Safety
COMMISSION

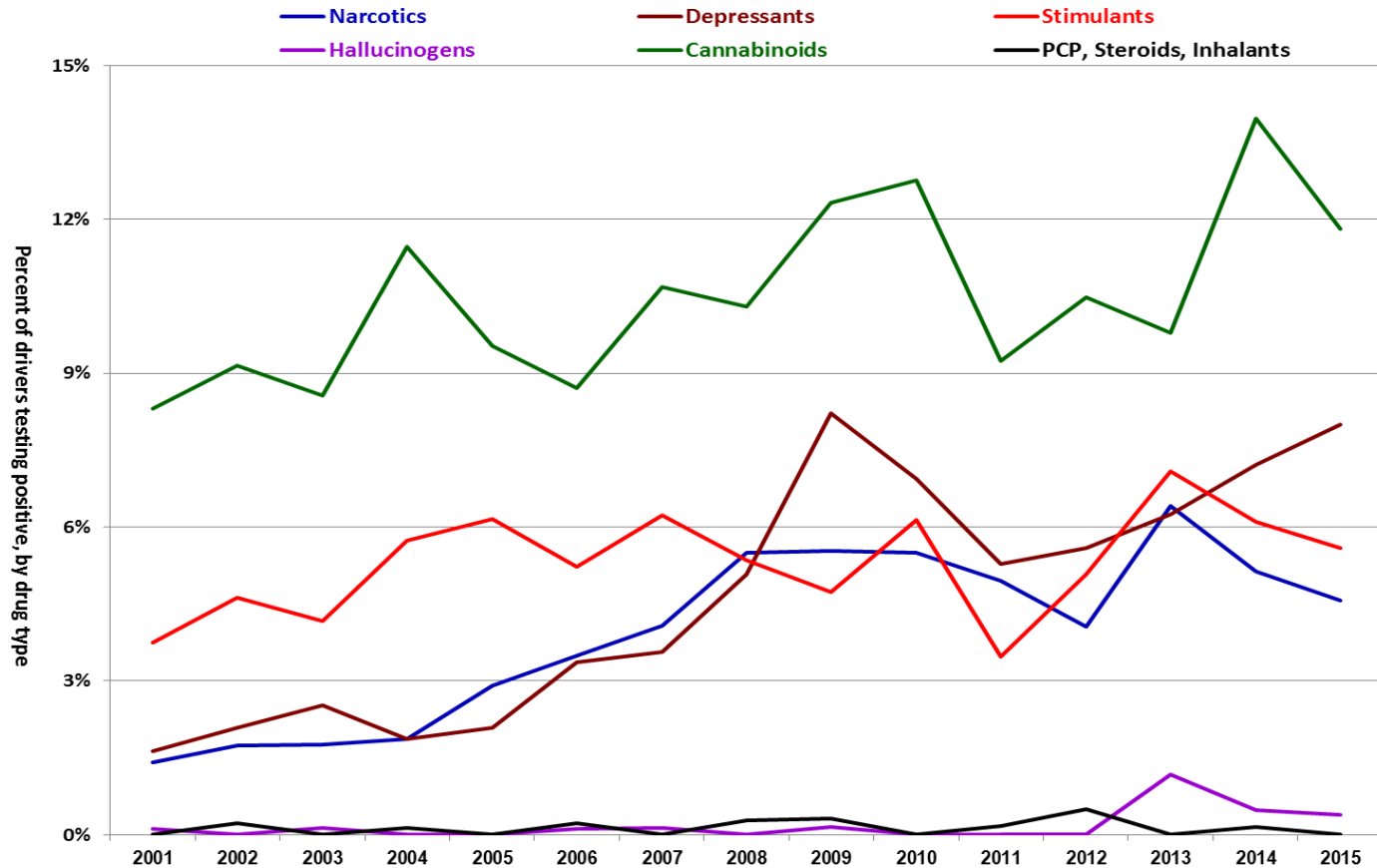
Marijuana Involvement in Fatal Crashes

Staci Hoff, PhD
Research Director
shoff@wtsc.wa.gov
(360) 349-4849

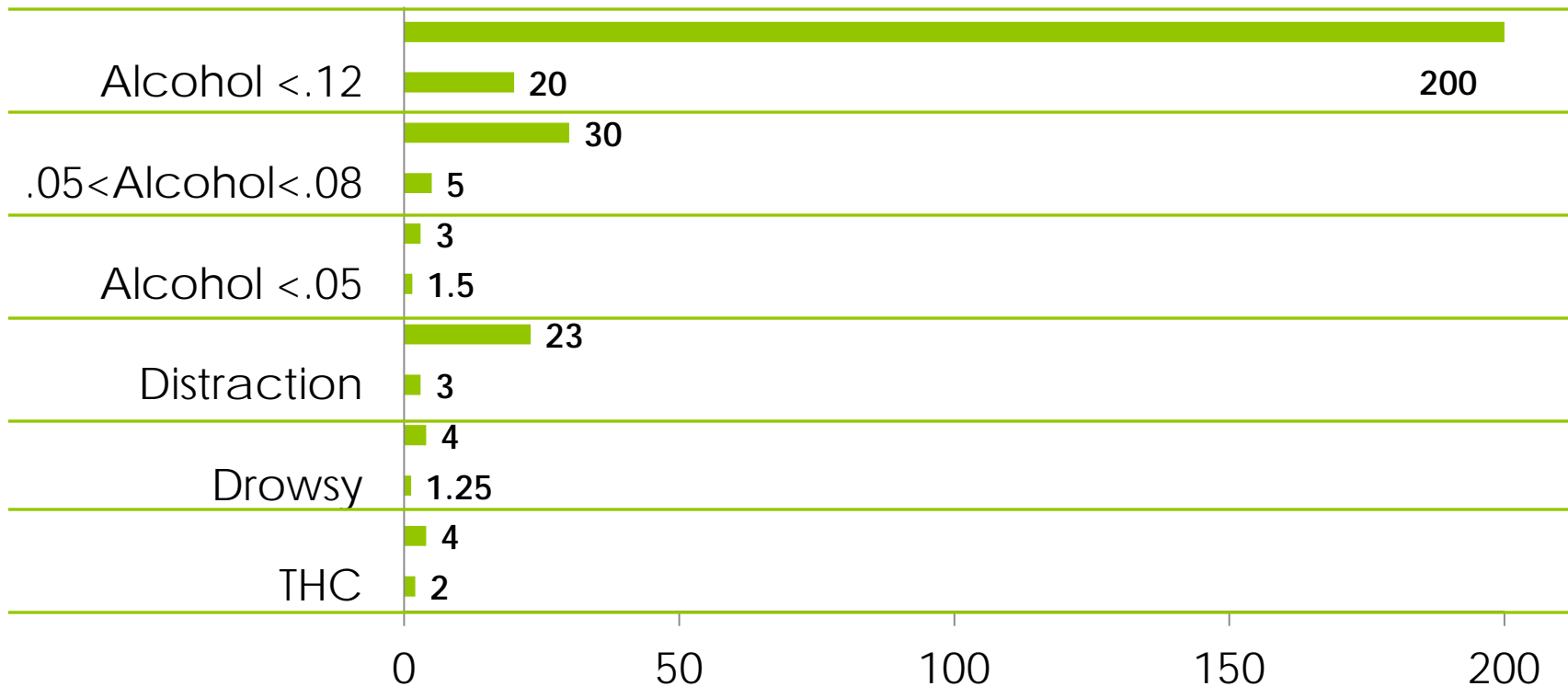
Marijuana Has Always Been the Dominate Drug in Fatal Crashes

Drug-Test Results of Drivers in Fatal Crashes, 2001-2015pre

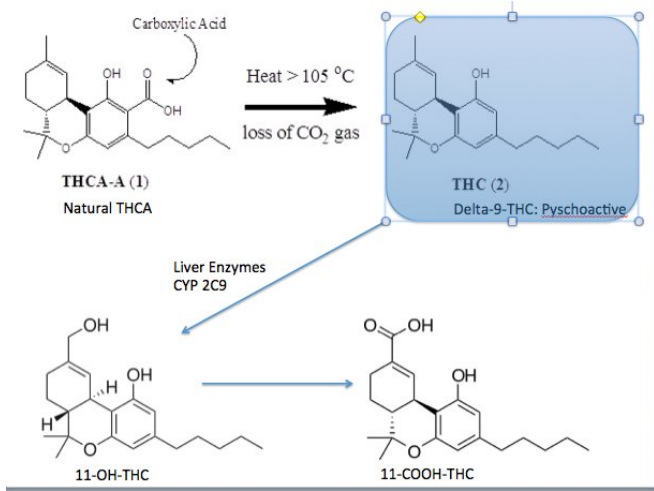
By Year and Drug Class



Does Marijuana Use Increase Crash Risk??



The Problem with Data

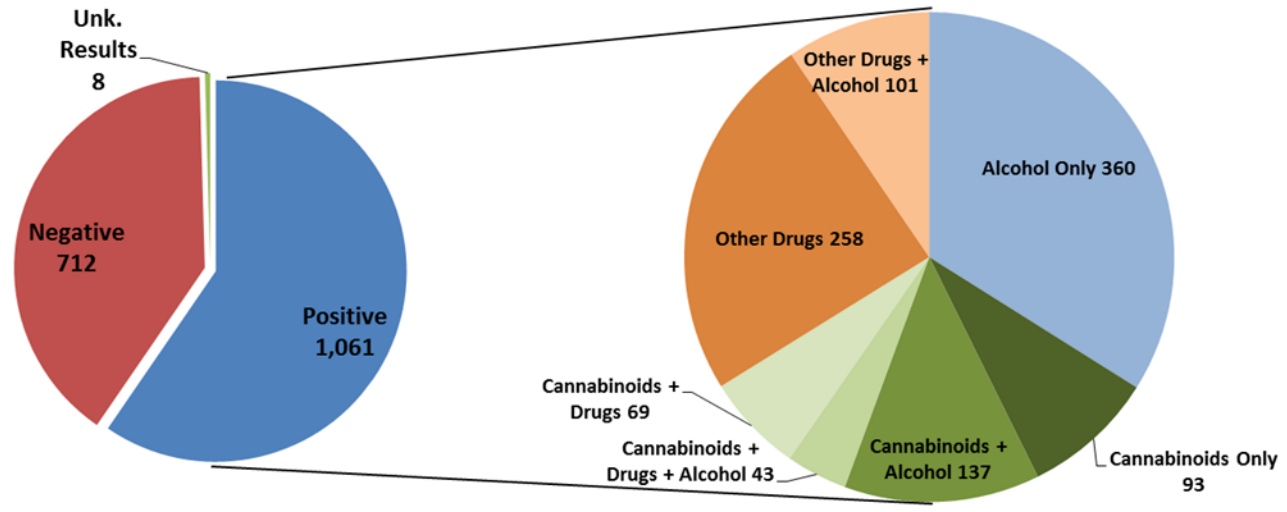
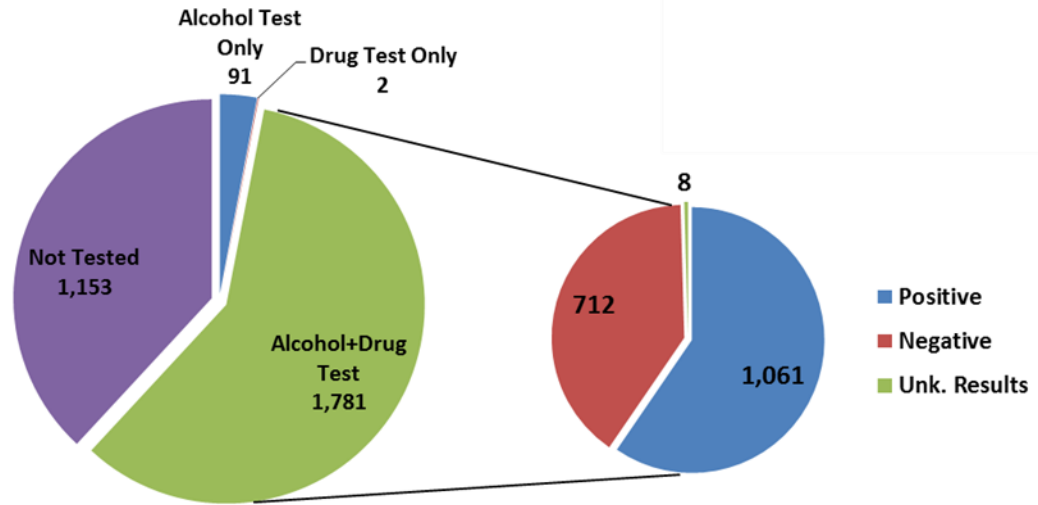


Delta 9
Hashish Oil
Hashish
Marijuana/Marihuana
Marinol
Tetrahydrocannabinols (THC)
Cannabinoid (Type Unk)

WTSC-RADD



- Reviewed all toxicology paper reports and manually entered full toxicology outcomes into spreadsheet
- Worked with Dr. Couper to abstract the information for surviving drivers
- Abstracted full toxicology for everyone in fatal crashes who had toxicology testing (drivers, occupants, non-motorists)
- Married to the original FARS record for in-depth fatal crash analysis
- Initial report focused on data years 2010-2014, DRIVERS (<http://wtsc.wa.gov/research-data/traffic-safety-studies/>)



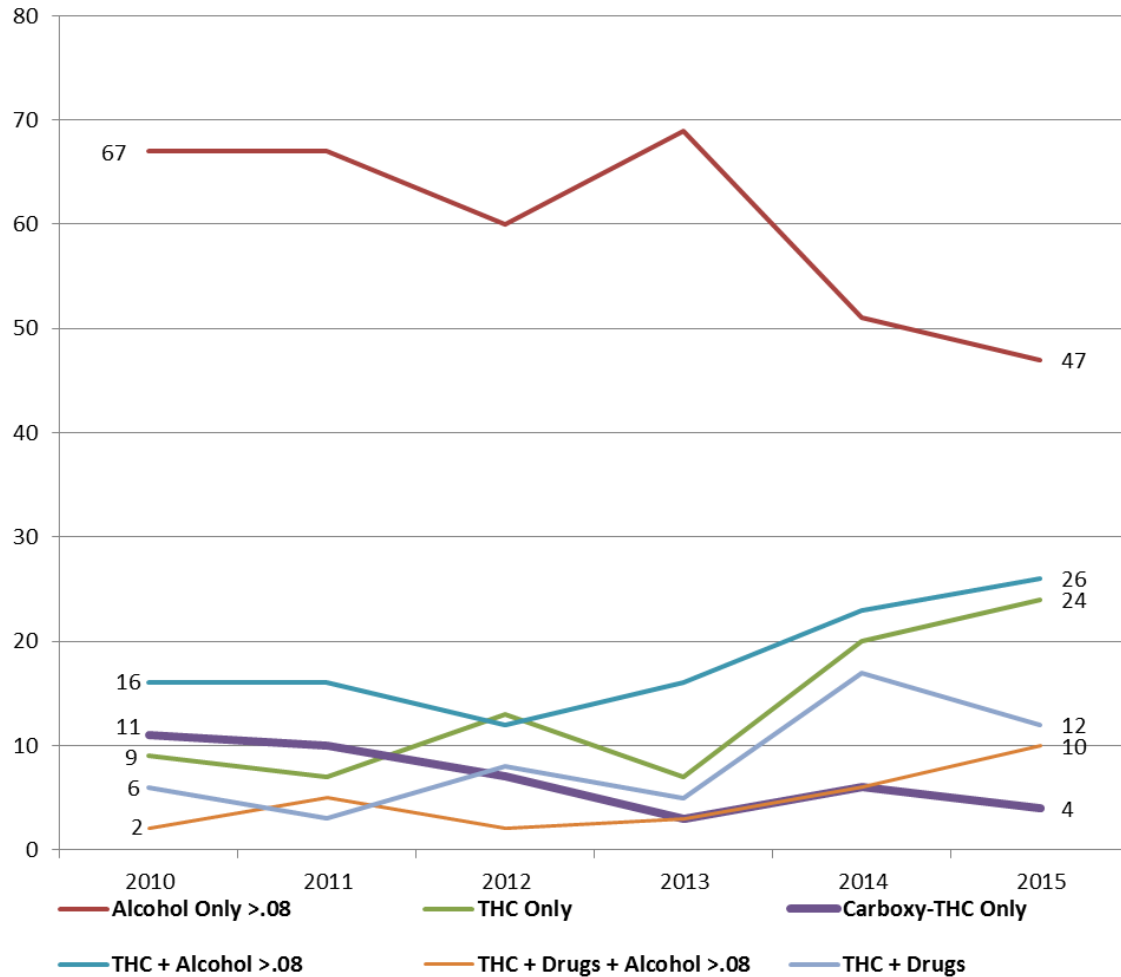
TEST STATUS	Driver Category 1	Sample	Driver Category 2	Sample	Driver Category 3	Sample
Not Tested	Not Tested	1,153	Not Tested	1,153	Not Tested	1,153
Tested - Negative	No Drugs, No Alcohol	712	No Drugs, No Alcohol	712	No Drugs, No Alcohol	712
Tested – Positive (1,773) Excluding Alcohol Test Only (91), Drug Test Only (2), Tested with Unknown Results (8)	Alcohol Only	360	Alcohol Only <.079	46	Alcohol Only <.079	46
			Alcohol Only ≥.08	314		
	Cannabinoids Only	93	THC Only	56	+24 in 2015 = 80 total drivers with THC ONLY	
			Carboxy-THC Only	37		
	Cannabinoids + Alcohol Only	137	THC + Alcohol	96	THC + Alcohol <.079	13
					THC + Alcohol ≥.08	83
			Carboxy-THC + Alcohol	41	Carboxy-THC + Alcohol	41
	Cannabinoids + Drugs + Alcohol	43	THC + Drugs + Alcohol	24	THC + Drugs + Alcohol <.079	6
					THC + Drugs + Alcohol ≥.08	18
			Carboxy-THC + Drugs + Alcohol	19	Carboxy-THC + Drugs + Alcohol	19
	Cannabinoids + Drugs Only	69	THC + Drugs	39	THC + Drugs	39
			Carboxy-THC + Drugs	30	Carboxy-THC + Drugs	30
	Other Drugs Only	258	Other Drugs Only	258	Other Drugs Only	258
Other Drugs + Alcohol Only	101	Other Drugs + Alcohol Only	101	Other Drugs + Alcohol Only	101	
Total Driver Sample, 2010-2014						2,926



Toxicology Outcomes	2010	2011	2012	2013	2014	*2015pre
Not Tested	219	226	224	212	272	375
No Drugs, No Alcohol	147	151	151	147	116	155
Alcohol Only <.079	15	8	6	7	10	10
Alcohol Only >.080	67	67	60	69	51	47
THC Only	9	7	13	7	20	24
Carboxy-THC Only	11	10	7	3	6	4
THC + Alcohol <.079	3	1	0	3	6	5
THC + Alcohol >.080	16	16	12	16	23	26
Carboxy-THC + Alcohol	12	6	11	9	3	1
THC + Drugs + Alcohol <.079	0	0	1	2	3	5
THC + Drugs + Alcohol >.080	2	5	2	3	6	10
Carboxy-THC + Drugs + Alcohol	10	2	5	2	0	1
THC + Drugs	6	3	8	5	17	12
Carboxy-THC + Drugs	10	5	3	7	5	4
Other Drugs Only	47	42	46	71	52	77
Other Drugs + Alcohol Only	20	18	19	20	24	18

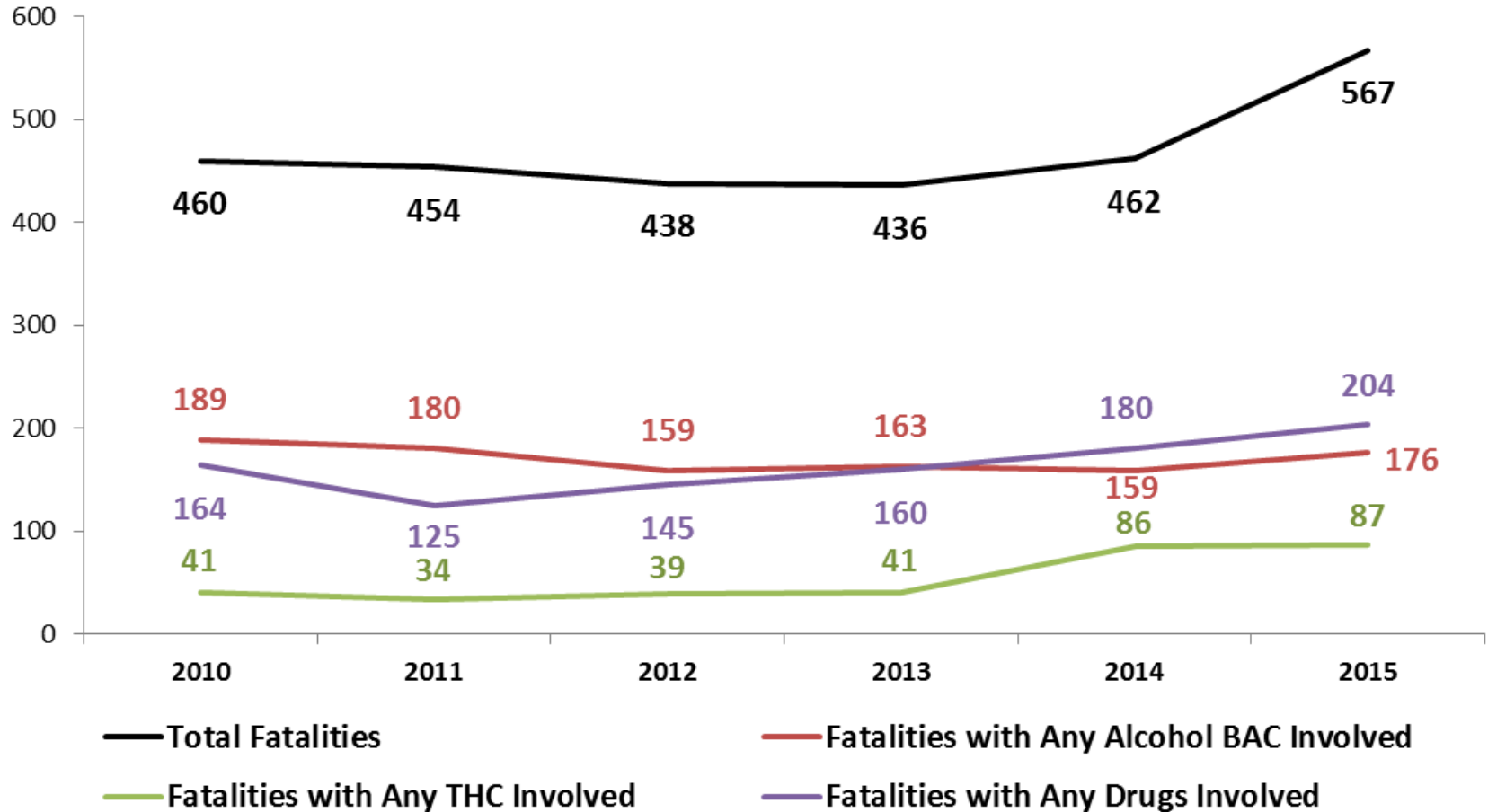


Number of Drivers Involved in Fatal Crashes by Select Drug Test Outcomes



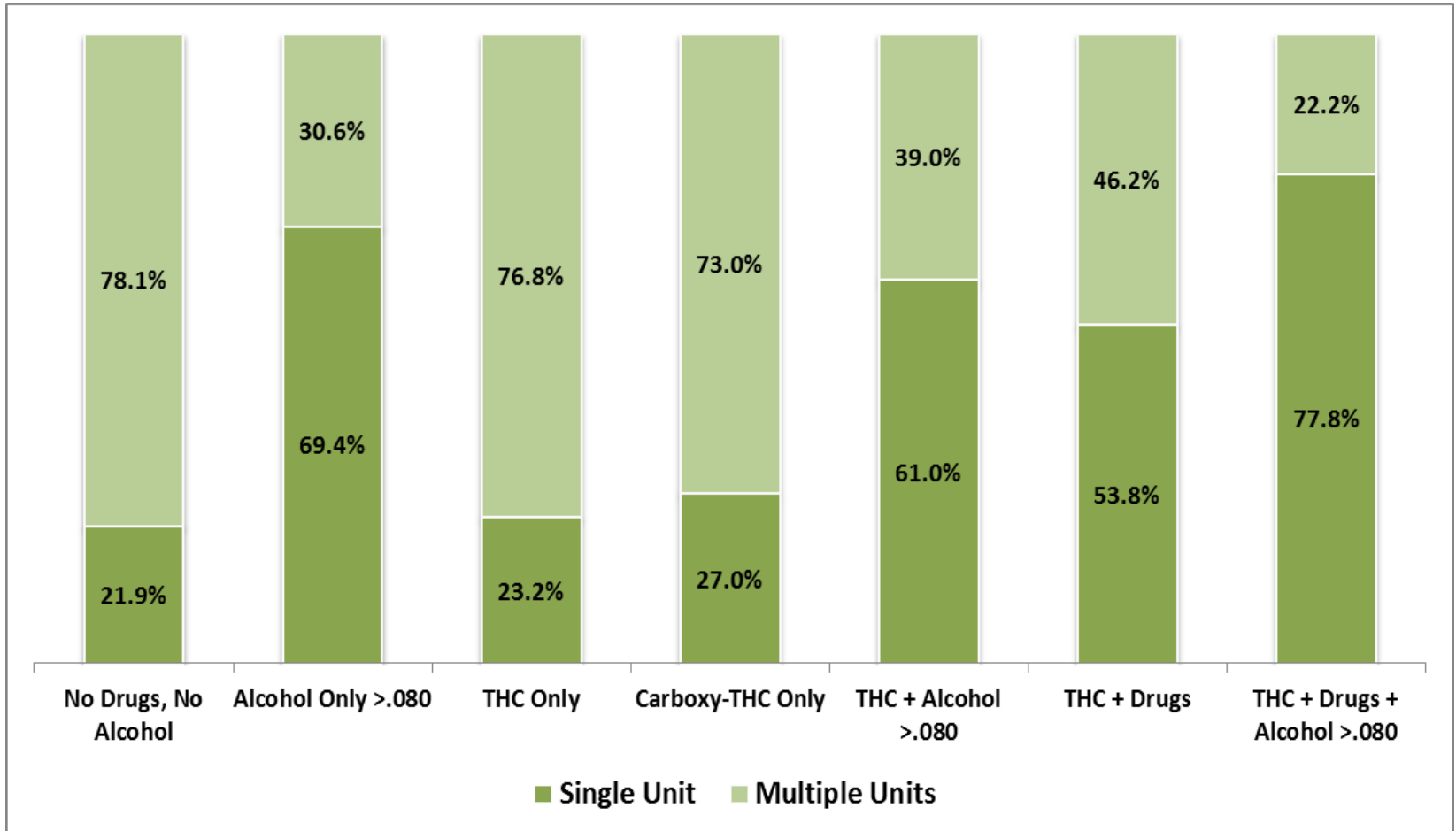


Traffic Fatalities Involving Alcohol and Drugs

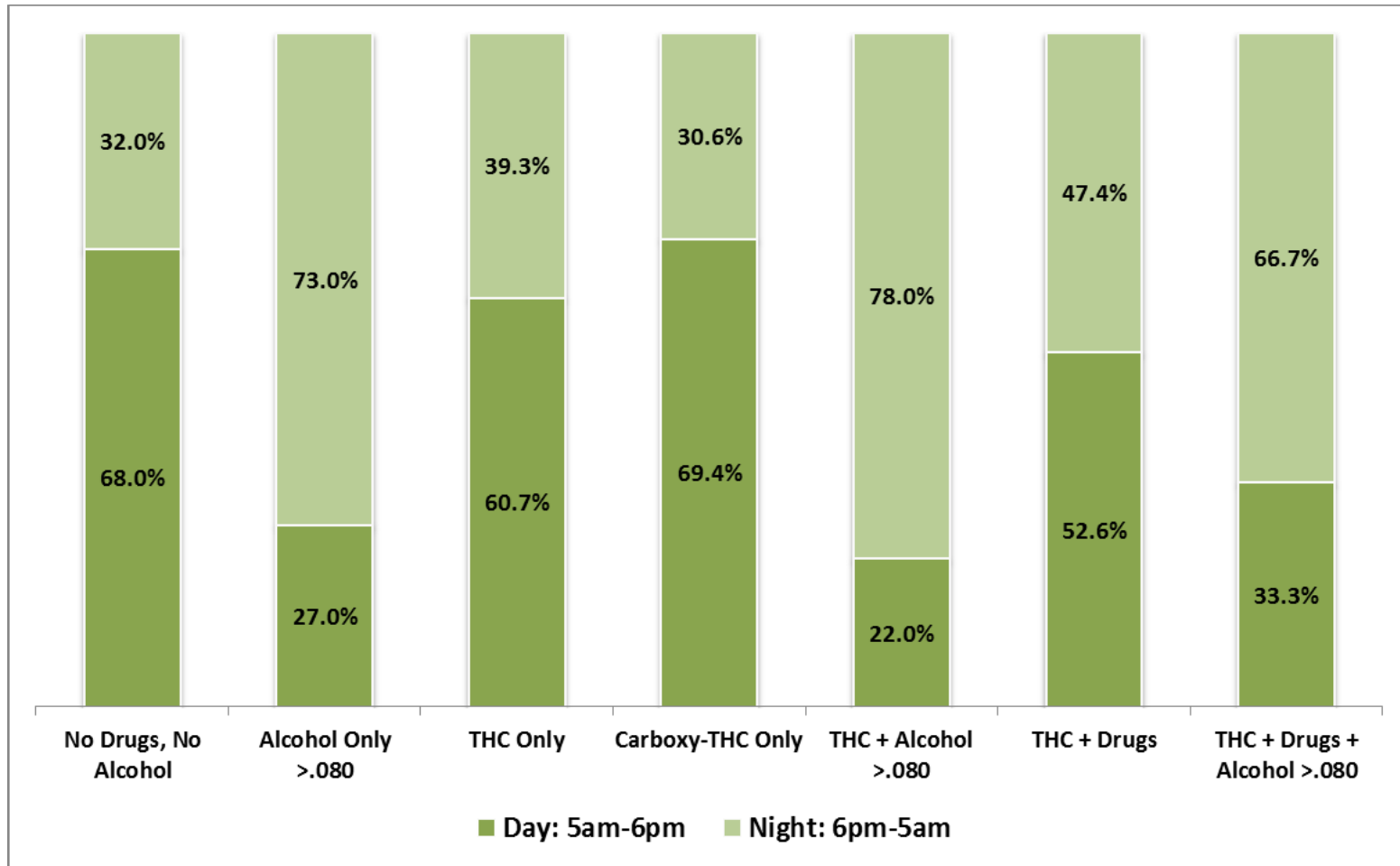




Number of Units Involved

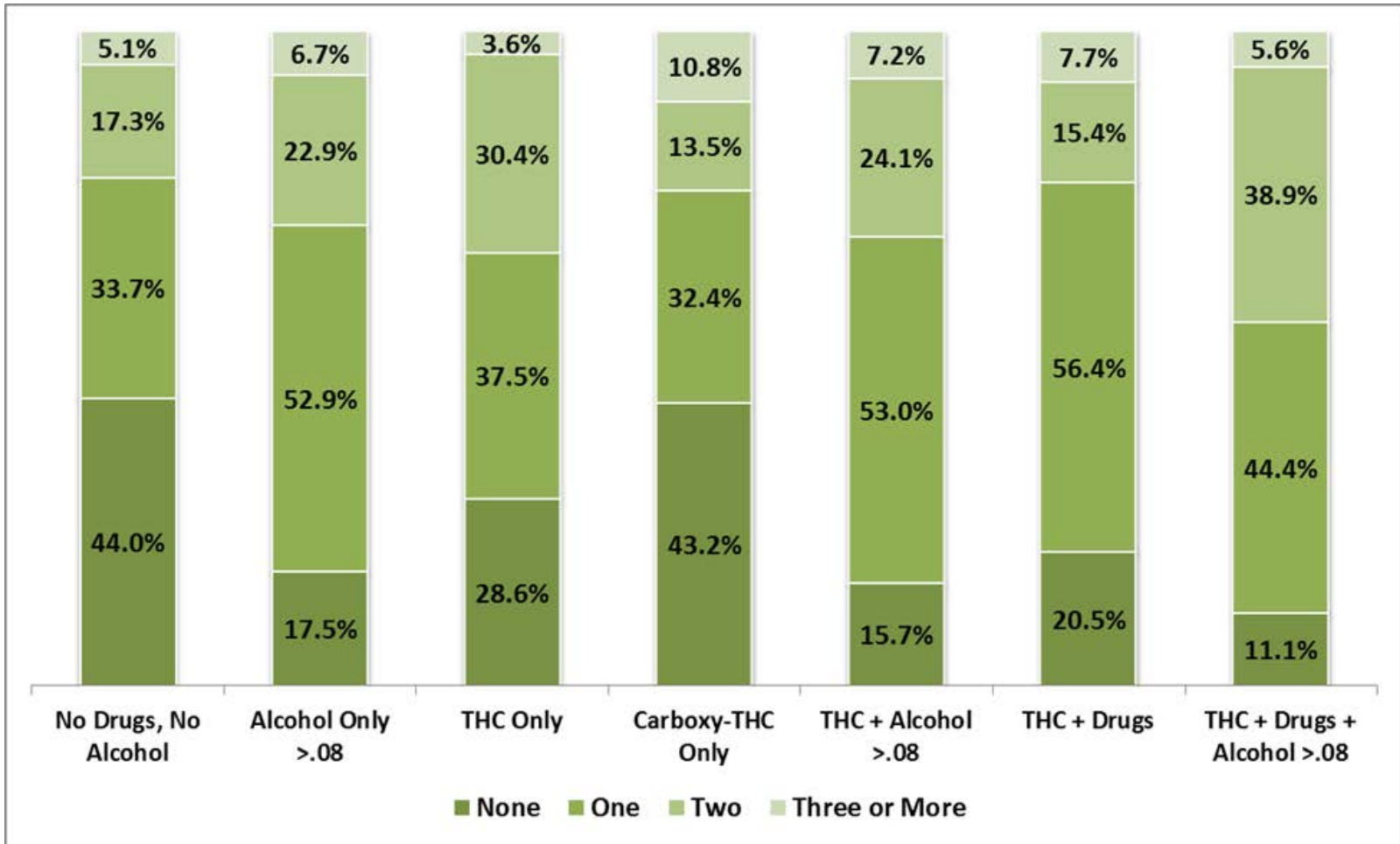


Day versus Night Crashes

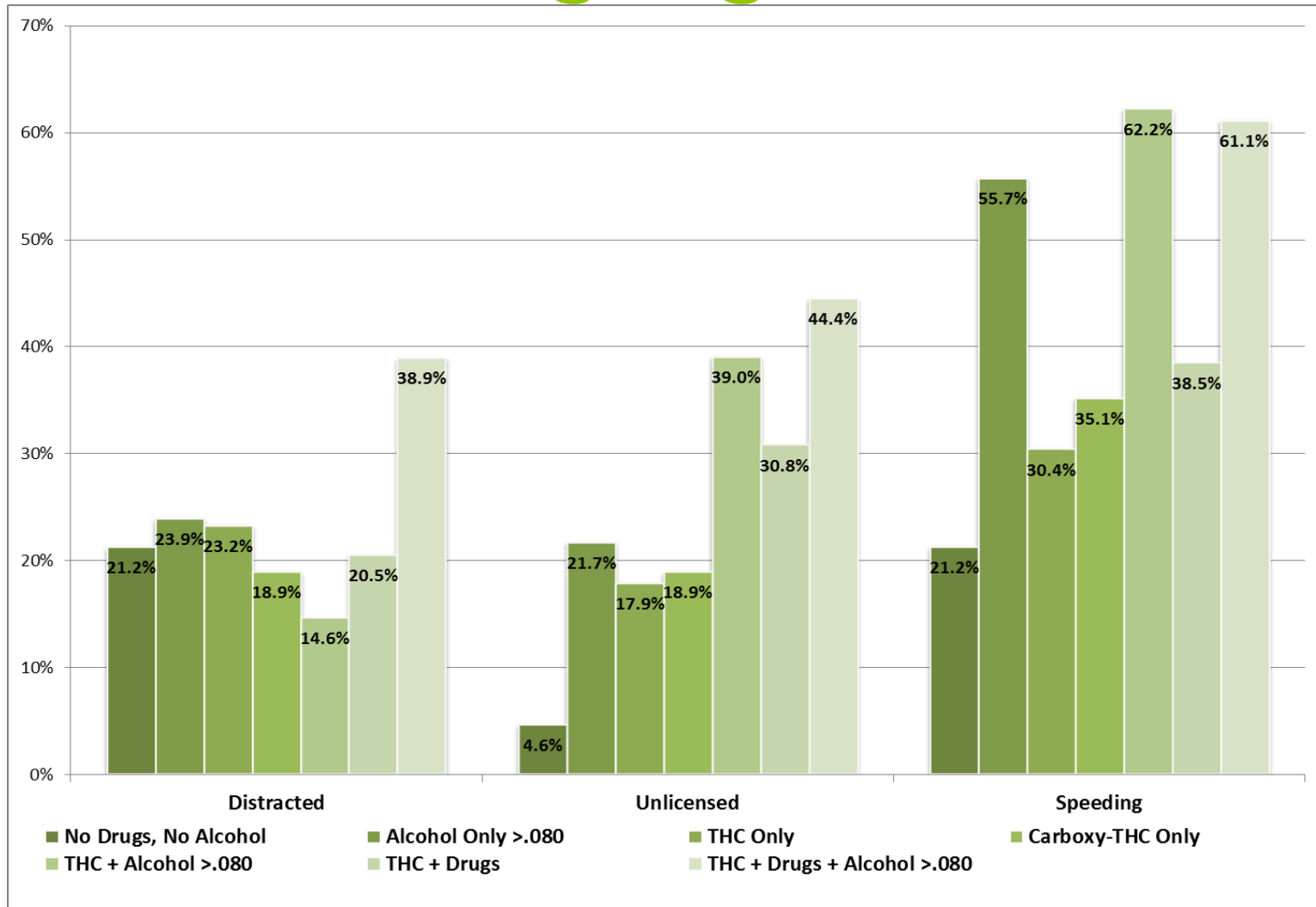




Number of Driver Contributing Circumstances

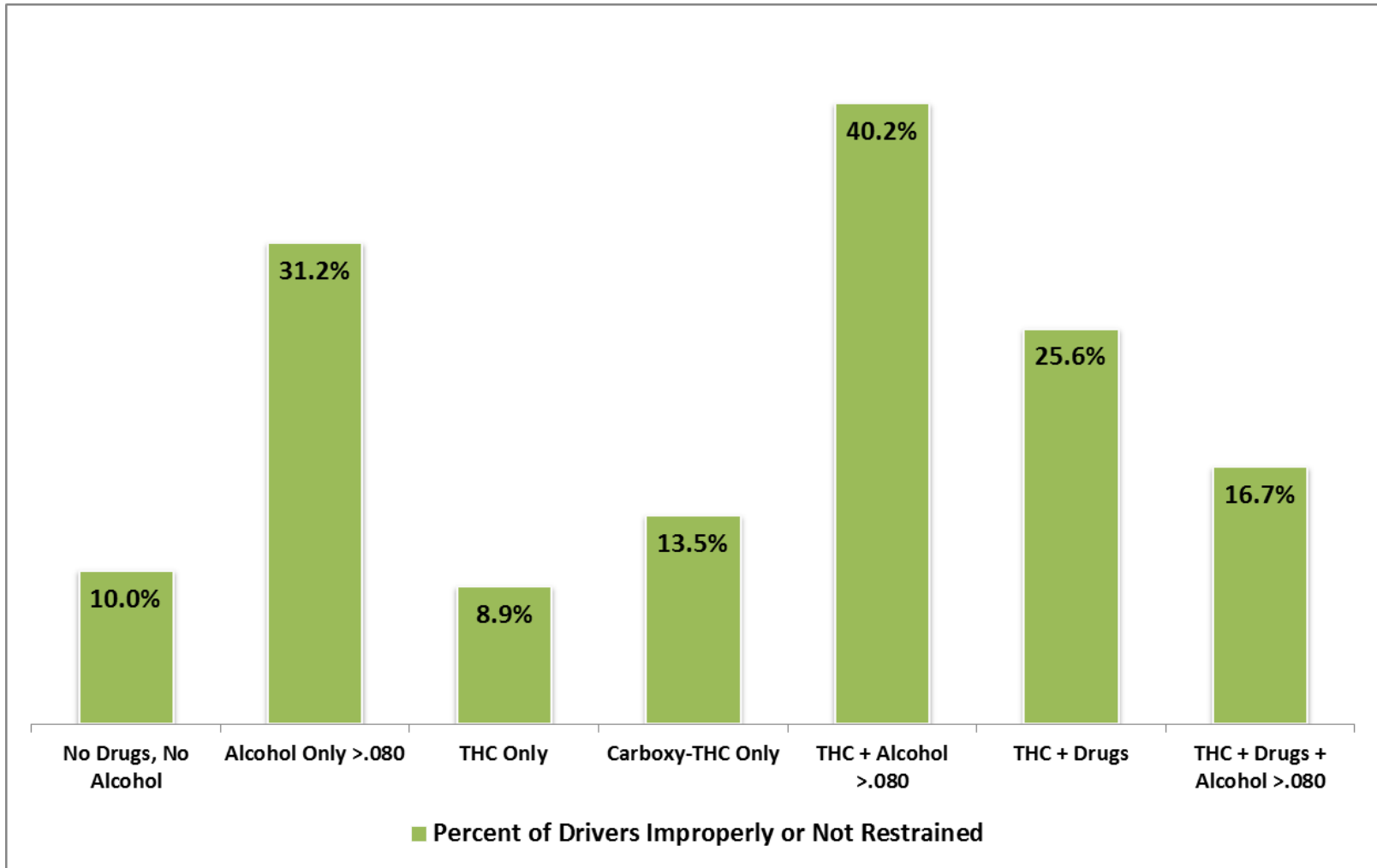


Co-Occurring High Risk Factors





Unrestrained Drivers



THC versus Carboxy-THC and per se

Marijuana Result	2010	2011	2012	2013	2014	2015
Any Cannabinoid	81	56	63	59	89	94
THC \geq 5 ng/ml	24	19	23	19	38	43
	29.6%	33.9%	36.5%	32.2%	42.7%	45.7%
THC <5 ng/ml	12	13	12	18	37	36
	14.8%	23.2%	19.0%	30.5%	41.6%	38.3%
THC Result Unk	0	0	1	1	0	6
Any Delta-9 THC	36	32	36	38	75	85
	44.4%	57.1%	57.1%	64.4%	84.3%	90.4%
Carboxy-THC	45	24	27	21	14	9
	55.6%	42.9%	42.9%	35.6%	15.7%	9.6%



What's Next?

- Time Series, Regression Modeling and Culpability Analysis including 2015 data
- Review other person types (occupants, non-motorists), complete full drug result validation
- Traffic fatality quarterly reports (<http://wtsc.wa.gov/research-data/quarterly-target-zero-data/>) to include THC distinguished
- Continue to gather full toxicology data, Toxicology linked to other crash severities
- Data Users – AAA, IIHS, WSU, WSIPP