Characteristics of Drug Use among Drivers in the City of Houston

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National Survey on Drug Use and Health (NSDUH)

- In 2015, 9.7 million people aged 12 or older reported driving under the influence of illicit drugs over the past year.

- The age group 26+ had the highest rate of driving under the influence of illicit drugs.

City of Houston

- **United States Census, 2015**
  - 2,296,224 million people live in Houston.
  - Most populous city in Texas.
  - Fourth most populous city in the United States.

Objective

- Provide important regional information to better understand the demographic profile of drug-impaired drivers in Houston, Texas.

Case Selection

588 cases
- Total number of toxicology-related cases analyzed by HFSC in 2015.

457 cases
- Exclusion of cases that did not have blood samples analyzed.

425 cases
- Exclusion of cases that are not driving-related.

Data Collection

Location of Offense

Offense Type

Suspect Information

Confirmatory Results

Data Analysis

- Prevalence of drugs per case

- Drug concentrations
  - Mean
  - Median
  - Range

- Demographic Analysis
  - Sex
  - Race/Ethnicity
  - Age

Demographic Breakdown

Sex

Male	79%
Female	21%

Race/Ethnicity

White	60%
Black	30%
Hispanic	3%
Asian	4%

Age

17-25	27%
26-40	51%
41-60	19%
61+	2%

Prevalence of 20 Most Common Drugs in Houston

Drug	Prevalence
Cannabinoids	143
Alprazolam/α-HA	114
Hydrocodone	53
Cocaine/BE/EME/CE	52
Phencyclidine	43
Carisoprodol/Meprobamate	25
Amphetamine	21
Clonazepam/7-AC	20
Methamphetamine	18
Hydromorphone	16
Diazepam/Nordiazepam	14
Codeine	13
Morphine	13
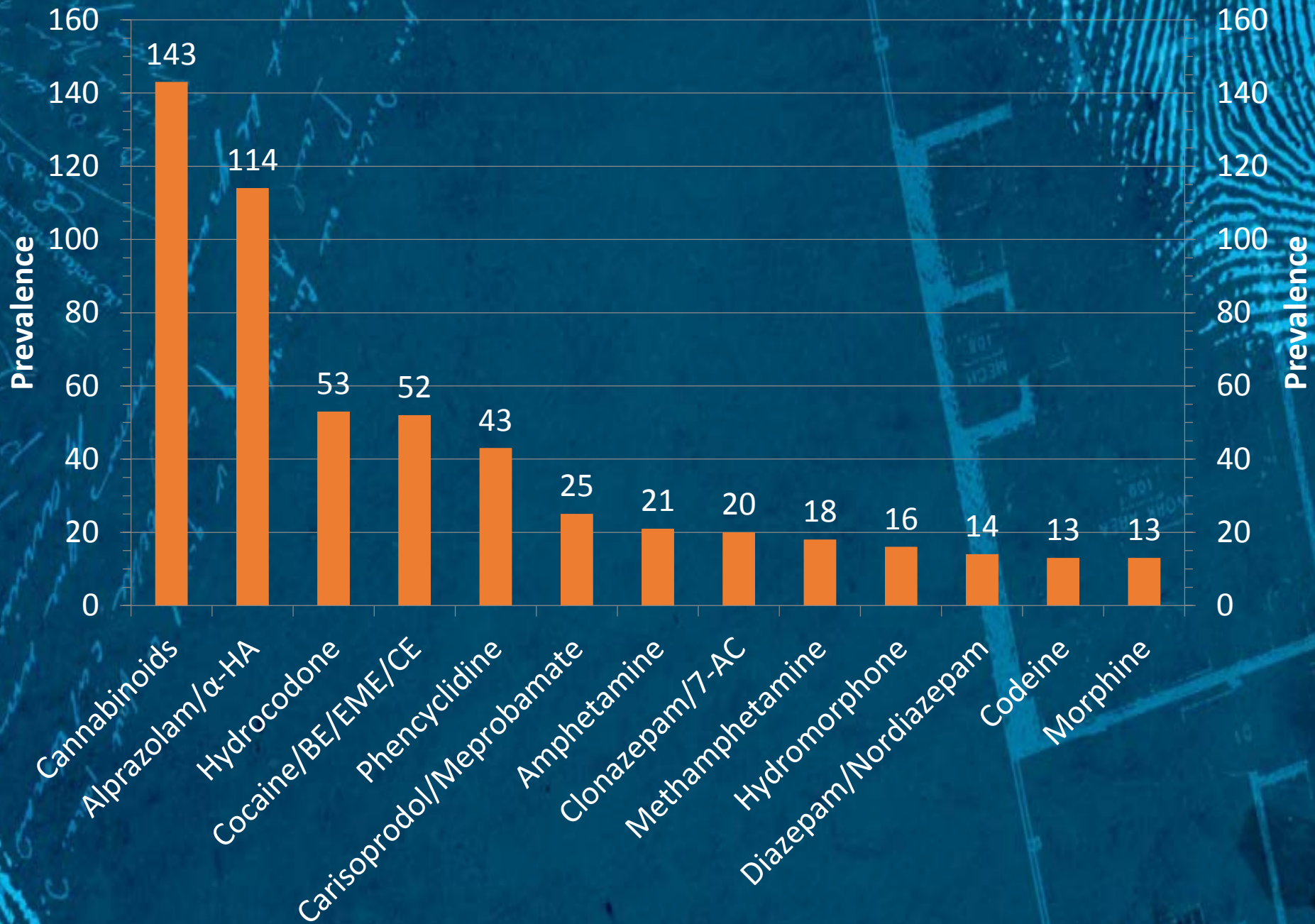
Drug	[Mean] (ng/mL)	[Median] (ng/mL)	[Range] (ng/mL)	Number of Positive Cases
Δ9-THC	3.8	2.9	0.5-17	104
11-nor-9-Carboxy-THC	41	29	5.2-200	143
11-Hydroxy-THC	2.4	1.8	0.5-7.2	42
Alprazolam	67	49	5.6-450	114
α-Hydroxyalprazolam	8.0	6.5	5.2-14	4
Hydrocodone	65	45	6.4-311	53
Cocaine	49	38	15-120	11
Benzoylecgonine	967	327	15-5000	50
Ecgonine Methyl Ester	50	51	15-96	10
Cocaethylene	18	15	15-25	8
Phencyclidine	44	39	7.3-92	43
Carisoprodol	4.5	4.6	0.5-17	25
Meprobamate	21	17	3.0-55	25
Amphetamine	44	30	6.4-180	21
Clonazepam	21	13	2.5-48	19
7-Aminoclonazepam	27	19	6.7-69	19
Methamphetamine	71	26	10-500	18
Hydromorphone	2.6	2.0	1.0-7.7	16
Diazepam	195	105	21-520	10
Nordiazepam	204	92	23-950	13
Codeine	102	68	5.6-290	13
Morphine	34	16	5-160	13

Sex Demographic Analysis

	Drugs	% (N) of Positives	Mean Age
Males (N=336)	Cannabinoids	37% (123)	33
	Alprazolam	25% (84)	
	Cocaine	12% (41)	
Females (N=89)	Alprazolam	34% (30)	35
	Cannabinoids	23% (20)	
	Hydrocodone	16% (14)	

Race/Ethnicity Demographic Analysis

	Drugs	% (N) of Positives	Mean Age
White (N=256)	Cannabinoids	33% (85)	33
	Alprazolam	28% (72)	
	Hydrocodone	13% (34)	
Black (N=129)	Cannabinoids	35% (45)	35
	Phencyclidine	28% (36)	
	Alprazolam	19% (25)	
Asian (N=15)	Alprazolam	40% (6)	31
	Cocaine	20% (3)	
	Cannabinoids/PCP/Amphet	7% (1)	
Hispanic (N=12)	Cannabinoids	33% (4)	27
	Alprazolam	25% (3)	
	Cocaine	8% (1)	

Age Demographic Analysis

	Drugs	% (N) of Positives	Mean Age
Aged 17-25 (N=115)	Cannabinoids	50% (57)	22
	Alprazolam	41% (47)	
	Cocaine	7% (8)	
Aged 26-40 (N=217)	Cannabinoids	36% (79)	32
	Alprazolam	24% (51)	
	Phencyclidine	17% (36)	
Aged 41-60 (N=81)	Alprazolam	19% (15)	49
	Hydrocodone	17% (14)	
	Cocaine	11% (9)	
Aged 61+ (N=10)	Cannabinoids	30% (3)	66
	Cocaine/Hydrocodone	20% (2)	
	Alpraz/Cariso/Clonaz/Diaz	10% (1)	

Demographics within Drug Groups

Drug Group (N)	Sex, %		Race/Ethnicity, %				Age, year, Mean (Range)	
	M	F	W	B	A	H		
Cannabinoids (143)	86	14	59	31	1	3	29	(17-64)
Alprazolam (114)	74	26	63	22	5	3	30	(17-64)
Hydrocodone (53)	74	26	64	36	0	0	38	(22-64)
Cocaine (52)	79	21	62	29	6	2	33	(20-64)
Phencyclidine (43)	70	30	14	84	2	0	35	(22-49)
Carisoprodol (25)	68	32	64	36	0	0	40	(27-63)

National and International Drug Prevalence

- **Logan et al., 2013**
  - Surveyed 96 forensic laboratories across United States to determine the most prevalent drugs amongst drug impaired drivers.

- **Legrand et al., 2013**
  - Determined the prevalence of drugs in driving-related cases in Belgium, Denmark, Finland, Italy, Lithuania and the Netherlands.

National Prevalence

Drug(s)	Number of Positive Cases
Cannabinoids (3)	143
Alprazolam	114
Hydrocodone	53
Cocaine (4)	52
Phencyclidine	43
Carisoprodol/Meprobamate	25
Amphetamine	21
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Methamphetamine	18
Hydromorphone	16
Diazepam/Nordiazepam	14
Codeine	13
Morphine	13

Prevalence of top 20 drugs in Houston in 2015

Logan et al., 2013 →

Drug(s)	Number of Labs that Report Drug in Top 20
THC and Metabolites	13
Alprazolam	13
Diazepam/Nordiazepam	13
Cocaine and Metabolites	13
Morphine	13
Oxycodone	12
Hydrocodone	12
Carisoprodol/Meprobamate	11
Zolpidem	11
Methamphetamine	9
Clonazepam	9
Amphetamine	9
Methadone	9
Lorazepam	9
Codeine	7
Diphenhydramine	6
Tramadol	6
Phencyclidine	5
Hydromorphone	5
Citalopram	4

International Prevalence

Drug(s)	Number of Positive Cases
Cannabinoids (3)	143
Alprazolam	114
Hydrocodone	53
Cocaine (4)	52
Phencyclidine	43
Carisoprodol/Meprobamate	25
Amphetamine	21
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Morphine	13

Prevalence of top 20 drugs in Houston in 2015

Drug	Number of Positive Cases
THC	68
Morphine	58
Nordiazepam	46
Amphetamine	45
Diazepam	41
Cocaine	36
Clonazepam	30
Methadone	29
Codeine	18
Oxazepam	14
Lorazepam	13
Methamphetamine	11
Zolpidem	11
Zopiclone	8
Alprazolam	6
MDMA	5
Flunitrazepam	4
MDA	1
6-Acetylmorphine	1
MDEA	0

Legrand et al., 2013 →

Conclusions

- In 2015, cannabinoids were the most prevalent drugs detected in driving-related cases in Houston (34%, N=143).

- Alprazolam was the most prevalent drug for female (32%, N=30), Asian (15%, N=6) and age 41-60 (19%, N= 15) demographics.

Conclusions

- Phencyclidine was the fifth most prevalent drug detected in Houston in 2015 (10%, N=43).
  - National Drug Intelligence Center, 2004
    - Houston is a known PCP hot spot
    - Other locations include San Francisco, Baltimore, Washington D.C. and Philadelphia
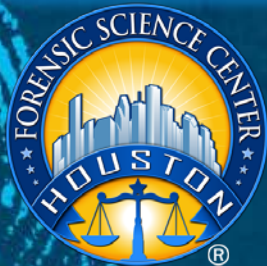
Conclusions

- Predominant Suspect Demographics:
  - Male (79%, N=336)
  - White (60%, 256)
  - 26-40 years old (mean 33 years)

- List of most prevalent drugs in Houston shows similarities to other laboratories across the United States as well as across Europe.

Acknowledgements

- Sam Houston State University

- Houston Forensic Science Center
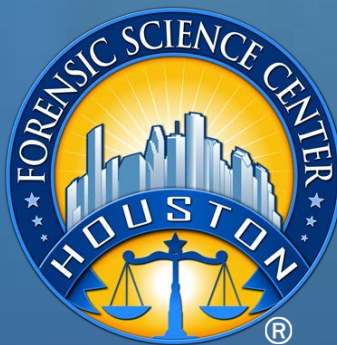
- Houston Police Department

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Questions?

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