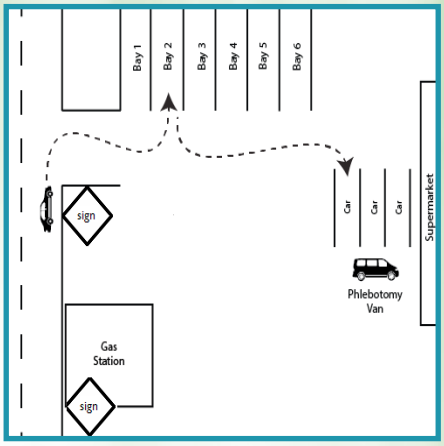
2013–2014 National Roadside Study of Alcohol and Drug Use by Drivers

DRUG RESULTS



U.S. Department of Transportation
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16. Abstract

This was a nationally representative study to estimate the prevalence of alcohol and other drug use among drivers. Drugs studied included 98 over-the-counter, prescription, and illegal substances. Drivers were randomly selected at 60 sites (300 locations) across the continental United States. Data were collected during one 2-hour Friday daytime session (either 9:30 to 11:30 a.m. or 1:30 to 3:30 p.m.) and four 2-hour nighttime periods (10 p.m. to midnight and 1 to 3 a.m. on both Friday and Saturday nights). Participation was voluntary and anonymous. Data included observational, self-report, and breath alcohol tests from 9,455 drivers, oral fluid samples from 7,881 drivers, and blood samples from 4,686 drivers. This report focuses on drug test results and provides results of combined alcohol and drug use. Results are compared to the 2007 National Roadside Study, for the first time presenting trend data on drug-positive driving. Using data from both oral fluid and blood samples, overall, 22.3 percent of daytime drivers and 22.5 percent of nighttime drivers were drug-positive. Delta-9-tetrahyrdacannabinol (THC), the active component of marijuana, was the most frequent drug, with 8.7 percent of daytime drivers and 12.7 percent of nighttime drivers testing positive. When comparing the 2013-2014 results to the same drugs tested for in 2007, an increase in nighttime drug prevalence was found between the 2007 and 2013-2014 NRS, from 16.3 percent to 20.1 percent, a statistically significant finding. This study estimated drug prevalence. A positive result for any drug does not necessarily mean the driver was impaired at the time of testing, only that the drug was present in the body. Data from this study cannot be used to draw conclusions about drug-impaired driving.

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To those who helped conduct this study, including the thousands of anonymous participants, we express our sincere gratitude.

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List of Acronyms and Abbreviations

BrAC ..... breath alcohol concentration
DRUID ..... Driving Under the Influence of Drugs, Alcohol and Medicines
FARS ..... Fatality Analysis Reporting System
g/210L..... grams per 210 liter
GC/MS..... gas chromatography-mass spectrometry
GES ..... General Estimates System
IIHS ..... Insurance Institute for Highway Safety
LC/MS ..... liquid chromatography-mass spectrometry
N/A..... not applicable
NASS..... National Automotive Sampling System
NHTSA..... National Highway Traffic Safety Administration
NIAAA ..... National Institute on Alcohol Abuse and Alcoholism
NIDA..... National Institute on Drug Abuse
NIJ..... National Institute of Justice
NRS ..... National Roadside Study
PAS..... passive alcohol sensor
PBT..... preliminary breath test
PCP..... Phencyclidine
PIRE ..... Pacific Institute for Research and Evaluation
Ref ..... reference category
SNRI..... serotonin norepinephrine reuptake inhibitors
SSRI ..... selective serotonin reuptake inhibitor
THC..... delta-9 tetrahydrocannabinol

Executive Summary

Background and Purpose

The National Highway Traffic Safety Administration (NHTSA) contracted with the Pacific Institute for Research and Evaluation (PIRE) to conduct the fifth National Roadside Study (NRS) to estimate the prevalence of alcohol and drug use by drivers[1] and to determine how this prevalence has changed over time. This report focuses on drug testing results from analysis of oral fluid and blood samples. It also incorporates breath alcohol data to provide results of combined alcohol and drug use. Data collection was conducted between June 2013 and March 2014. Results are compared to the 2007 NRS, for the first time presenting trend data on drug-positive driving. Details about the 2013–2014 methodology and alcohol results are presented in separate reports (Kelley-Baker et al., 2016; Ramirez et al., 2016).

Methodology

A stratified random sampling plan was developed to gather a sample representative of weekend drivers in the contiguous United States. Data were collected at five randomly selected locations in 60 sites (cities, large counties, or groups of counties) across the United States in one 2-hour Friday daytime session (either between 9:30 and 11:30 a.m. *or* between 1:30 and 3:30 p.m.) and four 2-hour nighttime sessions (both Friday and Saturday nights between 10 p.m. and midnight and between 1 and 3 a.m.). Of the 11,100 drivers eligible for participation:

- 9,455 drivers provided breath samples (2,361 daytime and 7,094 nighttime);
- 7,881 provided oral fluid samples (1,987 daytime and 5,894 nighttime); and
- 4,686 provided blood samples (1,263 daytime and 3,423 nighttime).

Drug results are categorized into oral fluid only, blood only, or oral fluid or blood combined.[2] In the tables, if a driver tested positive for one or more of the drugs either in the oral fluid, the blood analysis, or both, the test was categorized as drug-positive. "Testing" was a two-stage process. Biological samples were first screened for the presence of a drug. The screening process is a broad-range test to detect the presence of different drugs or drug classes. When a screening test was positive for the presence of a drug, the sample moved forward to a second test to positively identify the drug(s). If a sample (either oral fluid or blood sample) was positive for one

[1] This report uses the terms "driver" and "participant" interchangeably.
[2] Results for oral fluid only and blood only can be found in Appendices A and B, respectively.

of our selected drugs, it was categorized as drug-positive in our results. If drivers tested positive for any drug in both their oral fluid and blood samples, they were only counted once in the tabulations. Statistical significance is reported at the $p < .05$ level, which indicates that the probability of encountering a difference by chance is less than 5 percent.

The 2013–2014 NRS was designed to estimate drug prevalence and "drugs" include both over-the-counter and prescription medications (Medications) and illegal or illicit drugs (Illegal drugs). Prevalence is a measure of exposure. The potential size of the drug-impaired driving problem is a function of exposure times degree of impairment. This study was unable to measure impairment. Accordingly, data from this study alone cannot be used to draw conclusions about drug-impaired driving.

Many of the drugs analyzed in this study were the same as in the 2007 study, but the drug list was not identical. Also, improvements in analytical technology lowered detection levels for drug screenings since 2007. Thus, to compare the prevalence rates between 2007 and 2013–2014, we included in those specific analyses only the drugs tested for in both studies, and adjusted the 2013–2014 prevalence rates to reflect the drug detection levels from 2007. Because we had to change the testing criteria of the 2013–2014 results to make them comparable to the 2007 results, 2013–2014 prevalence rates in the trend analyses will not match the 2013–2014 (only) prevalence estimates. Also, some of the prevalence estimates in this section vary slightly from those reported in NHTSA's previously published Research Note on the 2013–2014 NRS (Berning, Compton, & Wochinger, 2015). These revisions are due to refined analyses since that publication. They do not change any of the general conclusions or findings of statistical significance.

Of special interest was marijuana use by drivers. We tested for the psychoactive substance delta-9-tetrahydrocannabinol (also known as THC), the active metabolite 11-Hydroxy-delta-9-tetrahydrocannabinol (also known as "hydroxy-THC" and noted as 11-OH-THC), and the inactive metabolite 11-nor-9-carboxy-delta-9-tetrahydrocannabinol (also known as "carboxy-THC" and noted as "THC-COOH"). This report presents data on THC and hydroxy-THC.[3]

Results were tabulated by class, where drugs are grouped by their active ingredient or by the way they are used to treat a particular condition. There were six different classes –

[3] Carboxy-THC was tested for but was not included in the results in the body of this report as it is an inactive metabolite.

antidepressants, THC, narcotic analgesics, sedatives, stimulants, and other. In the drug class tables, THC is sorted into THC-positive and two subheadings: THC-positive only, and THC-positive plus other drug.

- *THC-positive* includes drivers positive for THC and/or its active metabolite, hydroxy-THC.
- *THC-positive only* includes drivers positive for THC and/or hydroxy-THC but no other drugs.
- *THC-positive plus any other drug* includes drivers positive for THC and/or hydroxy-THC in combination with another drug.

Results were also tabulated by category, where drugs are sorted into legal status. Drugs found in the illegal-only category are illegal to possess, produce, give away, or sell.[4] Drugs found in the medications-only category are obtained either over-the-counter or by prescription.

It is important to note that over-the-counter and prescription drugs can be used off prescription or to the point of abuse.

Summary of Results

Table ES-1 shows the overall drug prevalence by test type and time of day. Overall, 22.3 percent of daytime drivers were drug-positive and 22.5 percent of nighttime drivers were drug-positive in the combined oral fluid or blood. There was no statistically significant difference in overall prevalence between daytime and nighttime drivers by test type.

Table ES-1. Overall Drug Prevalence by Time of Day and Test Type

Time of Day	*N*	% Drug-Positive Oral Fluid Test	*N*	% Drug-Positive Blood Test	*N*	% Drug-Positive Oral Fluid or Blood Test
Day	1,987	18.9	1,263	21.6	1,991	22.3
Night	5,894	19.8	3,423	21.3	5,907	22.5

N's are unweighted; percentages are weighted.

Table ES-2 compares daytime drug category prevalence to nighttime drug category prevalence. The prevalence of medications only is significantly higher ($p < .05$) among daytime than nighttime drivers.

[4] As data was collected in 2013, THC is categorized as illegal in this report.

Table ES-2. Drug Prevalence in Oral Fluid or Blood by Time of Day and Drug Category (Percentage by Column)

Time of Day	Drug Category	***N***	**%**
Day	Illegal-only	172	9.3
	Medications-only	238	10.7*
	Illegal & Medications	44	2.3
	Total drug-negative	1,537	77.7
	Total drug-positive	454	22.3
Night (Ref)	Illegal-only	745	13.2
	Medications-only	396	7.4*
	Illegal & Medications	104	2.0
	Total drug-negative	4,662	77.5
	Total drug-positive	1,245	22.5

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
*Statistically significant difference ($p < .05$).

Table ES-3 shows drug prevalence by time of day, drug class, and gender. Males had a significantly higher THC-positive prevalence compared with females (12.1% males versus 5.5% females, $p < .05$) and a significantly higher THC-positive-only compared with females (9.7% males versus 4.1% females, $p < .05$) in the daytime. Males also had significantly higher THC-positive prevalence (14.6% males versus 9.4% females, $p < .05$) and significantly higher THC-positive-only compared with females (11.7% males versus 7.4% females, $p < .05$) in the nighttime sample. There were no other statistically significant differences by drug class, gender and time of day ($p < .05$).

Table ES-3. Drug Prevalence in Oral Fluid or Blood by Time of Day, Drug Class, and Gender (Percentage by Column)

Time of Day	Drug Class	Males %	Females (Ref) %	Total %
		N = 999	*N* = 940	*N* = 1,939
	THC-positive	12.1*	5.5	8.9
	THC-positive only	9.7*	4.1	6.9
	THC-positive plus any other drug	2.4	1.4	2.0
	Antidepressants-only	1.5	2.9	2.2
Day	Narcotic analgesics-only	3.2	2.8	3.0
	Sedatives-only	1.1	1.3	1.2
	Stimulants-only	1.8	1.4	1.6
	Other-only	1.6	2.8	2.2
	More than one class	2.1	5.2	3.6
	Total drug-negative	76.7	78.2	77.4
	Total drug-positive	23.3	21.9	22.6
		N = 3,536	*N* = 2,316	*N* = 5,852
	THC-positive	14.6*	9.4	12.5
	THC-positive only	11.7*	7.4	10.0
	THC-positive plus any other drug	2.9	2.0	2.5
	Antidepressants-only	0.7	1.2	0.9
Night	Narcotic analgesics-only	2.1	2.6	2.3
	Sedatives-only	0.8	1.7	1.2
	Stimulants-only	1.9	2.0	2.0
	Other-only	1.5	1.7	1.6
	More than one class	1.3	2.9	1.9
	Total drug-negative	77.0	78.5	77.7
	Total drug-positive	22.9	21.5	22.4

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
THC-positive includes results from THC and hydroxy-THC.
"More than one class" excludes drivers who tested positive for THC.
*Statistically significant difference ($p < .05$).

Table ES-4 presents the distribution of breath alcohol concentration (BrAC) levels by drug category for drug-positive drivers. Nighttime drivers in the medications only category were statistically more likely to have zero BrAC levels than those in the illegal only drug category (97.8% versus 86.8%, $p < .05$). In addition, nighttime drivers in the medications only category were statistically less likely than those in the illegal only category to have BrACs both at the .001 - .079 grams per 210 liter (g/210L) range and at .08 g/210L or higher ($p < .05$). Differences in the daytime sample were not analyzed because of small sample sizes reflecting the rarity of drivers

who were positive for both alcohol and other drugs during the daytime hours. Although drugs were found approximately as frequently among daytime and nighttime drivers, the use of alcohol among drivers was concentrated among nighttime drivers.

Table ES-4. BrAC among Drug-Positive Drivers in Oral Fluid or Blood by Time of Day and Drug Category (Percentage by Row)

Time of Day	Drug Category	*N*	BrAC (g/210L) % .00	% .001 - .079	% ≥ .08
Day	Illegal-only (Ref)	172	94.6	2.9	2.5
	Medications-only	238	99.4	0.0	0.6
	Illegal & Medications	44	100.0	0.0	0.0
Night	Illegal-only (Ref)	745	86.8	10.7	2.6
	Medications-only	396	97.8*	2.1*	0.1*
	Illegal & Medications	104	90.5	7.8	1.6

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
Statistical analyses involving daytime alcohol-positive drivers were not conducted because of small sample sizes.
Medications include prescription and over-the-counter drugs.
*Statistically significant difference ($p < .05$).

Tables ES-5 to ES-7 compare data from 2007 with the 2013–2014 NRS. The drugs analyzed in 2013–2014 were not identical to those in 2007. Additionally, changes in drug testing technology allowed significantly lower detection thresholds for some drugs in 2013–2014 relative to their levels in 2007. Thus, to compare the 2013-2014 data to 2007, the 2007 drug test menu and detection limits are used to evaluate drug prevalence in both studies. The 2013-2014 data with 2007 testing criteria are labeled "2013-2014 NRS (Comparable)". We estimated and compared 95-percent confidence intervals for all prevalence estimates.

Table ES-5 shows that the overall prevalence of nighttime drug-positive driving by drug category showed a statistically significant increase from 2007 to 2013–2014, from 16.3 percent to 20.1 percent ($p < .05$).

Table ES-5. Comparing 2007 to 2013–2014 NRS: Nighttime Drug Prevalence in Oral Fluid or Blood by Drug Category (Percentage by Column)

Drug Category	2007 NRS		2013–2014 NRS (Comparable)	
	N	%	*N*	%
Illegal-only	621	11.3	741	13.2
Medications-only	277	3.9	279	5.1
Illegal & Medications	78	1.1	98	1.9
Total drug-negative	4,934	83.7	4,789	79.9*
Total drug-positive	976	16.3	1,118	20.1*

N's are unweighted; percentages are weighted.
*Statistically different from 2007 NRS (based on 95% Confidence Intervals).

Table ES-6 shows the nighttime drug prevalence by drug class. There were statistically significant increases in the prevalence of THC-positive, THC-positive only, and THC-positive plus other drug drivers in 2013–2014 compared to 2007 ($p < .05$). The prevalence of THC-positive increased from 8.7 percent to 12.7 percent (an increase of 46%); the prevalence of THC-positive only increased from 6.8 percent to 10.3 percent (an increase of 51.5%) and the prevalence of THC-positive plus other drugs increased from 1.8 percent to 2.3 percent (an increase of 27.8%). There was also a statistically significant increase in total drug-positive driving (from 16.3% to 20.1%), and a statistically significant decrease in total drug-negative driving (from 83.7% to 79.9%). None of the other drug classes showed a statistically significant difference.

Table ES-6. Comparing 2007 to 2013–2014 NRS: Nighttime Drug Prevalence in Oral Fluid or Blood by Drug Class (Percentage by Column)

Drug Class	2007 NRS		2013–2014 NRS (Comparable)	
	N	%	*N*	%
THC-positive	499	8.7	666	12.7*
THC-positive only	379	6.8	528	10.3*
THC-positive plus any other drug	120	1.8	138	2.3*
Stimulants-only	190	3.2	159	2.1
Narcotic Analgesics-only	104	1.6	125	2.2
Sedatives-only	56	0.8	31	0.8
Antidepressants-only	55	0.7	66	1.0
Other-only	14	0.3	4	0.2
More than one class	58	1.0	67	1.3
Total drug-negative	4,934	83.7	4,789	79.9*
Total drug-positive	976	16.3	1,118	20.1*

N's are unweighted; percentages are weighted.
THC-positive includes results from THC and hydroxy-THC.
"More than one class" excludes drivers who tested positive for THC.
*Statistically different from 2007 NRS (based on 95% Confidence Intervals).

Introduction

This report is one of three that summarizes the results of the 2013–2014 National Roadside Study (NRS) of Alcohol and Drug Use by Drivers. The National Highway Traffic Safety Administration (NHTSA) contracted with the Pacific Institute for Research and Evaluation (PIRE) to conduct this study. This report presents national prevalence estimates of drug-positive driving and alcohol-plus-drug-positive driving derived from the study, and compares them with the 2007 NRS, which was the first roadside study to estimate the prevalence of drug-positive driving in the Unites States. Another report describes the sampling plan and data-collection methodology (Kelley-Baker et al., 2016). A third report (Ramirez et al., 2016) presents the results for alcohol-positive driving.

Background

Data on drug-positive driving has lagged behind data on alcohol-positive driving partially due to a lack of suitable field technologies that could provide accurate measures of the vast number of drugs with the potential to impair driving. Studies of drugs and driving before 2007 used data from postmortem screenings of fatally injured drivers (Fatality Analysis Reporting System [FARS][5]), laboratory-based studies, and self-report data. The 2007 study was the first to provide national estimates of drug-positive driving using biological measures.

Before 2007, the roadside studies estimated prevalence of alcohol-positive driving. Since 2007, a variety of national and international efforts have been undertaken to better understand and address drug-positive driving. In 2010, the U.S. Office of National Drug Control Policy established a goal to reduce the prevalence of drug-positive driving by 10 percent by 2015 (Office of National Drug Control Policy, 2011). In Australia, random roadside breath testing for alcohol has been extended to include random testing for drugs (Boorman & Owens, 2010). In Europe, concern about drug-impaired driving led to the implementation of the 18-nation research project Driving Under the Influence of Drugs, Alcohol and Medicines (DRUID) (Schulze, Schumacher, Urmeew, & Auerbach, 2011). These efforts were in response to the increasing percentage of fatally injured drivers in Australia, Europe, and the United States found to be drug-positive (Hausken, Skurtveit,

[5] FARS is NHTSA's national census of fatalities resulting from motor vehicle crashes.

& Christophersen, 2004; Officer, 2009; Schiwy-Bochat, Bogusz, Vega, & Althoff, 1995; Vindenes, Strand, Kristoffersen, Boix, & Mørland, 2013).

Other than the 2007 NRS, there have been no national studies of alcohol- and/or drug-positive driving using objective samples (e.g., breath, urine, oral fluid, blood). The only other nationwide estimates of the prevalence of driving after drug use in the United States come from the 2012 National Survey on Drug Use and Health. That self-report study estimated 10.3 million people 12 years or older (or 3.9% of adolescents and adults) drove under the influence of illicit drugs during the past year, a proportion slightly higher than 2011's 3.7 percent.

National Roadside Studies

NHTSA established the NRS in 1973 to obtain breath alcohol concentrations (BrACs) of randomly selected drivers[6] and establish objective measures of drinking and driving. Since 1973, four studies have estimated the prevalence of drinking and driving, providing an opportunity to identify changes in prevalence over time.

1973, 1986, and 1996 National Roadside Studies

NHTSA sponsored the first NRS in 1973 (Wolfe, 1974), which was conducted by the University of Michigan's Highway Safety Research Institute. The Insurance Institute for Highway Safety (IIHS) sponsored the second NRS (Lund & Wolfe, 1991), which was conducted by the University of Michigan's Highway Safety Research Institute in 1986. In 1996, IIHS and NHTSA jointly sponsored the third NRS (Voas et al., 1998), which was conducted by PIRE. These first three studies used the same basic methodology, which included collecting data on Friday and Saturday nights via a brief verbal questionnaire and a breath sample to measure alcohol concentrations.

2007 National Roadside Study

NHTSA contracted with PIRE to conduct the fourth NRS, with additional funding from the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the National Institute on Drug Abuse (NIDA), and the National Institute of Justice (NIJ) (Lacey et al., 2009).

[6] This report uses the terms "driver" and "participant" interchangeably.

As in the three prior studies, the 2007 NRS included a verbal questionnaire and breath sample, but added a series of self-administered written surveys (funded by NIAAA, NIDA and NIJ), and collected oral fluid and blood samples to determine the presence of alcohol and other drugs in the driving population.[7] In addition to Friday and Saturday nights, the 2007 study collected data on Fridays during the day to increase understanding of when drugs and alcohol might be present. These additions made the 2007 study more comprehensive than the previous studies and produced the first national prevalence estimates of drug-positive driving.

Analyses of 2007's oral fluid and blood samples identified the presence of 75 drugs and metabolites (the remaining products after a drug is processed by the body), including over-the-counter, prescription, and illegal drugs with the potential to impair driving. Eleven percent of daytime drivers sampled were drug-positive; significantly lower than the 14.4 percent of nighttime drivers who were positive ($p < .01$).

When oral fluid drug category findings were combined with BrAC results for the daytime and nighttime, the drug-positive drivers who were also alcohol-positive were more likely to be positive for illegal drugs than for medications. In the daytime, 2.3 percent of drivers in the illegal drug category had BrACs between .00 and .079 grams per 210 liter (g/210L) compared to 0.4 percent of drivers in the medications category ($p < .05$). This was particularly true in the nighttime sample, in which 17.3 percent of drivers in the illegal drug category had BrACs between .00 and .079 g/210L compared to 6.3 percent in the medications category, and 5.7 percent had BrACs greater than .08 g/210L compared to 1.2 percent in the medications category ($p < .01$) (Lacey et al., 2009).

2013–2014 National Roadside Study

This current roadside study was funded by NHTSA with additional funding from NIDA and IIHS.[8] It replicated the basic methodology used in 2007, while strengthening the protocol, and added a questionnaire funded by NIDA.

[7] All selected drugs have the potential to impair driving-related skills.

[8] IIHS and NIDA funded the self-report portions of the National Roadside Study, including the Drug Abuse Screening Test (DAST), Drug Use Disorder (DUD), Alcohol Use Disorder (AUD), Drug Use and prescription drug surveys. NHTSA provided permission for PIRE to independently conduct these surveys during data collection after a determination was made that doing so would not detract or impede the NHTSA-funded activities.

Method

Sampling Design[9]

We constructed a sampling system to represent drivers in the 48 contiguous States. Even though some States had more than one site, and some States had no sites, all 60 sites as a whole provide representation of the country.

We sampled non-commercial vehicle drivers, including motorcycle drivers, during weekend nighttime periods and also one Friday daytime period.

The initial sample structure was taken from the National Automotive Sampling System/General Estimates System (NASS/GES) (NHTSA, 2006) to provide nationally representative estimates of highway crashes.

The following describes the sampling procedure:

1. *Selecting the primary sampling units (PSUs)—cities, large counties, or groups of counties—from within four regions of the United States and three levels of population density.* The PSUs (also referred to as sites in this report) were previously selected by NHTSA to develop a representative sample of motor vehicle crashes in the continental United States. A procedure was developed to identify alternate sites as needed (Kelley-Baker et al., 2016). We had 60 sites.
2. *Randomly selecting and numbering 30 specific one-square-mile grid areas within each PSU.* We recruited the cooperation of local law enforcement agencies that had jurisdiction over the selected grids. A police agency assisted in the selection of data collection locations and also provided onsite security for staff and participants.
3. *Identifying five locations from the 30 one-square-mile grid areas.* Locations required a large safe area, and sufficient traffic flow for an adequate number of participants. We had five data collection locations within each PSU.
4. *Randomly selecting drivers for the opportunity to participate.* The number of eligible vehicles was counted to determine the proportion of traffic passing by each location.

We sought the same number of drivers at each site, however the actual number of individuals driving past each location varied. To make the sample representative of the actual number of drivers, we applied statistical weighting as outlined below.

These procedures ensured that the probabilities of selecting a site, a study location within each PSU, and a driver at a location were known at each of the stages. Knowing this permitted the computation of the probability that a given driver would participate in the study. This was achieved by multiplying the sampling probabilities at each of the steps to obtain the final overall probability

[9] A full description of the sample selection process can be found in Kelley-Baker et al., 2016.

of being sampled. The weight given to each case in the final totals (sampling weight) was computed as the inverse of the sampling probability. This statistical procedure accounted for differences in the size of the driver population among PSUs. This ensured that the basic requirement of sampling theory—that any driver had an equal chance of being selected for the opportunity to participate—was met by adjusting for the biases inherent in the selection of locations within the sampling frame.

Most law enforcement agencies contacted did participate, but some were unable—mainly due to the lack of available officers. When a site was unable to participate, an alternative of the same type (e.g., city, large suburban area) was identified within the same geographic region as defined by NASS/GES that had similar characteristics.[10]

The 60 PSUs used in are shown in Figure 1.

Figure 1. The 2013–2014 NRS Sites

[10] For more information on site replacement, see Lacey, Kelley-Baker, Furr-Holden, Voas, Moore, et al., 2009, and Kelley-Baker et al., 2016. Similar site replacement strategies were followed in previous studies.

Differences Between Studies

Table 1 lists differences between the National Roadside Studies.

Table 1. Differences Among the 1973, 1986, 1996, 2007, and 2013–2014 NRS

	1973	1986	1996	2007	2013–2014
Number of nighttime participants	3,353	2,971	6,045	6,920	6,630
Number of daytime participants	N/A	N/A	N/A	2,174	2,174
Number of sites	24 sites	24 sites	24 sites	60 sites	60 sites
Data collection periods	Four 2-hour periods	Four 2-hour periods	Four 2-hour periods	Five 2-hour periods	Five 2-hour periods
Friday Daytime	N/A	N/A	N/A	9:30 to 11:30 a.m. *or* 1:30 to 3:30 p.m.	9:30 to 11:30 a.m. *or* 1:30 to 3:30 p.m.
Friday Nighttime	10 p.m. to Midnight and to 3 a.m.	10 p.m. to Midnight and 1 to 3 a.m.	10 p.m. to Midnight and 1 to 3 a.m.	10 p.m. to Midnight and 1 to 3 a.m.	10 p.m. to Midnight and 1 to 3 a.m.
Saturday Nighttime	10 p.m. to Midnight and 1 to 3 a.m.	10 p.m. to Midnight and 1 to 3 a.m.	10 p.m. to Midnight and 1 to 3 a.m.	10 p.m. to Midnight and 1 to 3 a.m.	10 p.m. to Midnight and 1 to 3 a.m.
Samples collected	▪ Breath	▪ Breath	▪ Breath	▪ Breath ▪ Oral fluid ▪ Blood*	▪ Breath ▪ Oral fluid ▪ Blood
Team composition	▪ 3 Teams ▪ 3 Data Collectors	▪ 3 Teams ▪ 3 Data Collectors	▪ 3 Teams ▪ 3 Data Collectors	▪ 6 Teams ▪ 1 Manager ▪ 6-8 Data Collectors ▪ 1 Phlebotomist	▪ 6 Teams ▪ 1 Manager ▪ 6 Data Collectors ▪ 1 to 2 Traffic Staff ▪ 1 Phlebotomist
Preliminary breath tester	▪ Intoximeter Alco-sensor; Omicron Intoxilyzer; Intoximeter Field Crimper	▪ Lion Alcolmeter S-D2	▪ CMI, Inc. Intoxilyzer SD-400	▪ CMI, Inc. Intoxilyzer PA-400	▪ PAS Systems International: Mark V Alcovisor
Passive alcohol sensor (PAS)	▪ N/A	▪ PAS Systems International: flashlight version PAS	▪ Public Services Technologies: PAS III	▪ PAS Systems International: PAS Vr.	▪ PAS Systems International: PAS Vr.
Number of drugs and metabolites tested	▪ N/A	▪ N/A	▪ N/A	▪ 75	▪ 98

	1973	1986	1996	2007	2013–2014
Survey data collection method(s)	▪ Paper/pencil	▪ Paper/pencil	▪ Paper/pencil	▪ Personal digital assistant: Tungsten E2 ▪ Paper/pencil ▪ Front seat passenger	▪ Tablet: Apple iPad2 ▪ Paper/pencil ▪ Front seat passenger

N/A—not applicable
*Blood samples were not collected at daytime sessions.

Data Collection

Protocol varied slightly depending upon the site.

In general, a driver was alerted to the study by signage and invited by the data collectors to participate. The data collector informed the prospective participant that he or she had done nothing wrong; that the study was voluntary, anonymous, and confidential; that the study concerned traffic safety; and that the driver could stop participating and leave at any time. If the individual agreed to participate, the data collector requested a breath sample (with a device that did not display results), then an oral fluid sample and to complete a self-administered questions on alcohol and drug use. Drivers were then asked to provide a blood sample. Drivers were offered monetary compensation depending on their level of participation as an incentive to participate.

Equipment

Data collectors and participants recorded responses on an Apple iPad2 tablet, through a special application that prompted each step of the protocol.

Front-seat passengers were offered $5 to complete a paper-and-pencil questionnaire on driving patterns, the DAST and the AUD. This strategy had the additional benefit of increasing driver participation rates and allowing drivers to focus on their own responses.

Impaired Driver Protocol

The research team identified any drivers impaired to a degree they could not properly consent for participation or who may have been unsafe to drive.

While talking with a driver, the data collector took a passive alcohol sensor (PAS) reading.[11] This reading, along with observations of the driver's behavior, helped identify drivers who may have been impaired.

[11] For the first 49 sites, two PAS readings were taken – one at the beginning of the consent process, and one again during the verbal questionnaire. In response to feedback on this methodology, for the last 11 sites, the PAS was administered only during the verbal questionnaire after consent to participate had been given.

The team manager observed the driver, and if warranted, expressed concern and requested a second breath test, now with a preliminary breath tester that displayed the result. If the driver blew a BrAC of .05 g/210L or higher, or otherwise indicated an inability to drive safely, the team got the driver home safely, at no charge.

The impaired driver protocol included:

- having another licensed occupant (if he or she was below .05 g/210L),
- calling a friend or relative to pick up the driver,
- calling a taxi (paid by the study),
- arranging for a hotel room (paid by the study), or
- calling a tow truck (paid by the study).

In the rare instance when a driver declined all options, the manager asked the onsite officer to repeat the options to the driver – in these cases, the subjects always accepted the offer for transportation. No driver was arrested as a result of participating.

Modification in the Recruitment Protocol

The protocol for the last 11 sites used a team member, as opposed to law enforcement officers, to alert drivers to the research bays.

The results were analyzed to determine whether the changes in protocol significantly influenced participation rates and results. Table 2 provides the drug-positive and -negative difference between the first 49 and last 11 sites. The prevalence of drug-positive drivers increased from 20.8 percent to 32.9 percent, a statistically significant change ($p < .05$). There was a corresponding statistically significant decrease ($p < .05$) in the prevalence of drug-negative drivers.

Table 2. Comparison of the Overall Drug Prevalence in the First 49 Sites and the Last 11 Sites

	First 49 Sites		Last 11 Sites		All Sites	
	N	%	*N*	%	*N*	%
Drug-positive	1,325	20.8	374	32.9*	1,699	22.5
Drug-negative	5,139	79.2	1,060	67.1*	6,199	77.5

N's are unweighted; percentages are weighted.
*Statistically significant difference at $p < .05$.

Converted Participants

A concern for roadside studies is drivers who have consumed alcohol or another drug may be less likely to participate. To address this possibility, we offered an additional $100 to a subsample of drivers[12] who initially declined to participate (Kelley-Baker et al., 2016).

Of the 555 attempts, 31.9 percent (177) participated and provided an oral fluid or blood sample. As Table 3 illustrates, of the 177 participants, 34.8 percent were drug-positive compared to 22.2 percent of the general participants; the difference was not statistically significant.

Table 3. Comparison of General Participants and Converted Decliners

	N	Drug-positive	Drug-negative
General participants	7,721	22.2%	77.8%
Converted decliners	177	34.8%	65.2%

*N*s are unweighted; percentages are weighted.

Data Analysis

One-way and two-way tables show drug prevalence among drivers by demographic groups (e.g., age, gender, race/ethnicity), driving situations (e.g., times of the day, vehicle type) and factors such as seat belt use. We used STATA v.11.

Weighting the Data

Information about traffic volume was not available for every PSU. Therefore, we followed previous established protocol and used the average annual frequency of drivers in fatal crashes for the years 2009–2012 as a proxy for the relative number of driver trips (Appendix C). The case weights reflected the probability that any driver selected for participation in the study would have been randomly sampled from the total driving trips occurring at each location. Within each PSU, a randomized cluster sampling strategy was used to weight the number of driver trips.

Each of the various sampling stages (or frames) required a separate calculation of probability, which then became a component of the final probability computation, reflecting all levels or frames. The total weighted number of the sample reflects the total number of eligible drivers entering the bays, including drivers who declined, adjusted to the estimated distribution of those drivers in the 48 contiguous States, by region and by population density. Error terms for the analyses were computed by STATA (Stata Corp., 2006).

[12] This protocol was only within the first 49 sites.

Unless indicated, sample size (*N*) refers to the actual, unweighted number of respondents; percentages are weighted. We compared prevalence rates relative to a reference category (generally, the category with the highest frequency).

Selection of Drugs for Screening and Analysis

This study examined drugs that have the *potential* to impair driving-related skills – over-the-counter, prescription, and illegal drugs. The drugs included marijuana, cocaine, amphetamines, opiates, and phencyclidine, which are all part of the Federal workplace drug testing program (known as the NIDA-5) and are components of a standard workplace drug-screening panel (National Institute on Drug Abuse, 2014). Additional drugs were in the Drugs and Human Performance Fact Sheets (National Highway Traffic Safety Administration, 2004) as presenting potential traffic safety risks. Testing positive for a drug does not necessarily mean a driver was impaired by the drug – many factors are involved with the determination of impairment. As such, this study provides data on the prevalence of drug presence in drivers; it does not discuss impairment.

Samples were sent to Immunalysis Corporation and screened for the presence of the selected drugs using ELISA microplate technology. Samples that screened positive underwent confirmatory testing using gas chromatography-mass spectrometry (GC/MS) or liquid chromatography-mass spectrometry (LC/MS) technology (Moore, Rana, and Coulter, 2007; Moore et al., 2006). Screening and confirmation levels are presented in Table 4.

Table 4. Drugs and Minimum Detection Concentrations

Drug Category	Drug	Minimum Concentration Oral Fluid		Minimum Concentration Blood	
		Screen (ng/mL‖)	Confirm (ng/mL)	Screen (ng/mL)	Confirm (ng/mL)
Illegal	Amphetamine/Methamphetamine (MDMA, MDA, MDEA, Methamphetamine, Amphetamine†)	25	10	20	10
Medication	Phentermine	25	10	20	10
Medication	Antidepressants (Amitriptyline, Nortriptyline †, Amoxapine*, Cyclobenzaprine*‡, Dothiepin*, Doxepin §, *Desmethyldoxepin* §, Imipramine, Desipramine †, Protriptyline §, Trimipramine, Citalopram*, Paroxetine*, Venlafaxine*, Mianserine*, Mirtazepine*, Trazodone*)	25	10	25	10
Medication	Antihistamines (Chlorpheniramine*, Diphenhydramine*, Doxylamine*)	25	10	25	10
Medication	Antipsychotics (Chlorpromazine)	25	10	25	10
Medication	Barbiturates (Phenobarbital, Pentobarbital, Secobarbital, Butalbital)	50	50	100	100
Medication	Benzodiazepines (Alprazolam, Bromazepam, Chlordiazepoxide, Diazepam †, Nordiazepam †, Oxazepam †, Temazepam †, Clonazepam, Estazolam ‡, Flunitrazepam, Flurazepam, Lorazepam, Midazolam, Nitrazepam, Phenazepam*, Triazolam)	5	1	20	10
Medication	Buprenorphine* (*Norbuprenorphine**)	5	2	1	1
Illegal	Cannabinoids/Marijuana (delta-9-tetrahydrocannabinol [THC], 11-OH-THC)	4	2	10	1
Illegal	THC-COOH	.05	.02	10	1
Medication	Carisoprodol (Meprobamate †)	50	50	500	500

Drug Category	Drug	Minimum Concentration Oral Fluid		Minimum Concentration Blood	
		Screen (ng/mL‖)	Confirm (ng/mL)	Screen (ng/mL)	Confirm (ng/mL)
Illegal	Cocaine (Cocaine, *Cocaethylene*, *Benzoylecgonine*, *Norcocaine*)	20	8	25	10
Medication	Dextromethorphan (*Dextrorphan**)	50	20	50	20
Medication	Fentanyl* (*Norfentanyl*)	1	.50	1	.50
Medication	Fluoxetine (*Norfluoxetine**)	50	10	50	10
Illegal	Ketamine (*Norketamine*)	10	10	10	10
Medication	Meperidine (*Normeperidine*)	50	25	50	10
Medication	Methadone (*EDDP*)	50	20	50	10
Medication	Methylphenidate	10	10	10	10
Medication	Naltrexone*	40	10	25	10
Medication	Opiates/Opioids (Codeine †, Morphine †, Hydrocodone †, Hydromorphone †)	20	10	25	10
Illegal	6-AM (Heroin)	20	10	25	10
Medication	Oxycodone (Oxymorphone †)	20	10	25	10
Illegal	Phencyclidine	10	10	10	10
Medication	Propoxyphene (*Norpropoxyphene*)	20	10	20	10
	Synthetic Cannabinoids (AM-1220*, AM-2201*, AM-2232*, CP47497*, CP47497-C8*, HU-210*, JWH-018*, JWH-022*, JWH-073*, JWH-200*, JWH-250*, UR-144*, XLR-11*)	.25	.25	5	1
Medication	Sertraline	50	10	50	10
Medication	Tramadol (*Desmethyltramadol**)	50	25	50	10
Medication	Zolpidem	10	10	10	10

Metabolites are listed in italics.
Screening uses ELISA microplate, and confirmation uses GC/MS or LC/MS technology.
* Drugs new to the 2013–2014 National Roadside Study. Specific synthetic cannabinoids may be illegal in some jurisdictions.
† Drugs that can be either a metabolite or a drug on their own.
‡ Drugs screened using blood in 2007 that were also screened with oral fluid in 2013–2014.
§ Cyclobenzaprine* is not an antidepressant but cross-reacts with the screening procedure.
|| nanograms per milliliter.

Due to the large number of drugs tested, drugs were grouped by class and by category. Though some drugs could logically fall into more than one category,[13] we made the categories mutually exclusive and assigned each drug to only one category. Drug classes (Table 5) group drugs by the way they are used to treat a medical condition or by their active ingredient. For example, the narcotic analgesics class contains opioids that are used to treat pain by affecting the central nervous system (CNS) and pain receptors in the brain. There were 98 drugs and metabolites grouped into these classes.

Drug categories sort drugs into legal status (Table 4 and 6). Drugs found in the illegal only category are illegal to have, produce, give away, or sell, while drugs found in the medications only category can be obtained in most pharmacies either over-the-counter or by prescription. For this report, THC is classified as illegal (as it was illegal in all the States where we collected data at that time).

Description of Drug Classes

Antidepressants

Antidepressants include selective serotonin reuptake inhibitors (SSRIs), serotonin norepinephrine reuptake inhibitors (SNRIs), tricyclics, and tetracyclics. Antidepressants, most commonly in the form of SSRIs, such as fluoxetine (Prozac) and sertraline (Zoloft), can cause impairment, especially if present in high concentrations or if they are taken outside of medical need or therapeutic treatment. There is also an additional risk of impairment associated with combined use with alcohol (Kelly, Darke, & Ross, 2004). Tricyclic and tetracyclic antidepressants can cause drowsiness or sedation, and can impair psychomotor abilities. The sedating effect of antidepressants is greatest when beginning treatment or when the dose is increased (Ramaekers, 2003).

Cannabinoids

Cannabis, also known as marijuana, is a plant consisting of 483 known compounds and at least 84 other cannabinoids (a class of diverse chemical compounds that act on cannabinoid receptors in cells that repress neurotransmitter release in the brain). For this study, the

[13] For example, a prescription can be used illegally.

cannabinoids class includes the psychoactive substance in marijuana, delta-9 tetrahydrocannabinol (THC), and two metabolites of marijuana: its active metabolite 11-hydroxy-delta-9-tetrahydrocannabinol (also known as "hydroxy-THC," and noted as 11-OH-THC), and its inactive metabolite 11-nor-9-carboxy-delta-9-tetrahydrocannabinol (also known as "carboxy-THC" and noted as "THC-COOH"). Carboxy-THC was tested for, but was not included in the results in the body of this report, as it is inactive.

Cannabinoids have a variety of effects on humans and can be associated with stimulant, sedative, and hallucinogenic effects. Some studies have found that when THC is found in drivers in combination with alcohol, the impairing effect appears to be greater than with alcohol alone. However, both the experimental and epidemiologic evidence on cannabinoids' effects on driving are mixed. (Dubois, Mullen, Weaver, & Bédard, 2015).

In the drug class tables, THC is sorted into THC-positive and two subheadings: THC-positive only, and THC-positive plus other drug.

- *THC-positive* includes individuals positive for THC and/or its active metabolite, 11-hydroxy-delta-9-tetrahydrocannabinol (hydroxy-THC).
    - *THC-positive only* includes individuals positive for THC and/or hydroxy-THC but no other drugs.
    - *THC-positive plus any other drug* includes drivers positive for THC and/or hydroxy-THC in combination with another drug.

Narcotic Analgesics

Narcotic analgesics include methadone, opioids, and the opioid antagonist Naltrexone.

- Methadone is used medicinally for pain as well as opiate detoxification and maintenance. It is also a drug of abuse. EDDP (2-ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine) is its inactive metabolite.
- Opioids are narcotic analgesics that act on the opioid receptors in the brain, spinal cord, and digestive tract and are used as pain medications (e.g., oxycodone, hydrocodone). These drugs act as CNS depressants, which could have performance-decreasing effects, particularly when used in combination with other CNS depressants, such as alcohol and sedatives.
- Opiates are derived from the poppy plant and include 6-acetylmorphine (6-AM, an active metabolite of heroin), codeine, and morphine. Of these, 6-AM (heroin) is an illegal substance.
- Although not a narcotic analgesic, Naltrexone, an opioid antagonist, is used primarily for the treatment of alcohol and opioid dependence by blocking or reversing the effects of opioids.

Sedatives

Sedatives include barbiturates, benzodiazepines, muscle relaxants, and sleep aids.

- Barbiturates are widely prescribed CNS depressants, primarily for migraine pain and anti-epileptic medications. Because of their depressive effects, barbiturates are associated with delayed reaction times and possible loss of concentration, which can potentially affect driving performance (Yeakel & Logan, 2013).
- Benzodiazepines are prescribed to reduce anxiety, prevent seizures, and assist in sleep-related disorders. These drugs act as CNS depressants, can enhance the effects of alcohol, and have been associated with driver impairment (Bogstrand & Gjerde, 2014). The desired/therapeutic effect, for example, of lorazepam (Ativan) is sedation, which could have a detrimental effect on driving. The most commonly prescribed benzodiazepines are alprazolam (Xanax) and diazepam (Valium) (Center for Substance Abuse Research, 2013).

- Muscle relaxants, such as carisoprodol (Soma) and cyclobenzaprine (Flexeril), may cause drowsiness or dizziness. These side effects have been linked to weaving, stopping in traffic, and hitting parked cars and other stationary objects (Logan, Case, & Gordon, 2000).
- Sleep aids, such as zolpidem (Ambien), cause drowsiness and may cause dizziness. If consumed with alcohol, there is an increased likelihood of these side effects, which could have a detrimental effect on driving (Farkas, Unger, & Temple, 2013).

Stimulants

Substances in this drug class stimulate the central nervous system. Some medical uses include treatment for attention deficit hyperactivity disorder (ADHD), weight loss, and daytime drowsiness (narcolepsy). Although stimulants can be used legally for medical purposes, they are often used illicitly and abused. In this report amphetamine, methamphetamine, MDMA, MDA, MDEA, and cocaine are placed in the illegal only category.

- Amphetamines have been associated with crash occurrence and could be associated with driving impairment, both in the stimulation and withdrawal stages. During withdrawal especially, the drug may lead to fatigue (Hjälmdahl et al., 2012; Musshoff & Madea, 2012).
- While some studies with low doses of cocaine have shown performance enhancement in attention abilities, higher doses associated with recreational use demonstrated high risk behavior, speeding, off-road collisions, and inattentive driving. Cocaine effects wear off quickly, causing fatigue, sleepiness and inattention during the withdrawal phase (Couper & Logan, 2014)
- Ecstasy is a methylated amphetamine derivative with hallucinogenic properties.

Other Drug Class

This class includes antihistamines, antipsychotics, cough suppressants, ketamine, phencyclidine (PCP), and synthetic cannabinoids.

- Antihistamines are drugs that can have a depressive CNS effect (Hetland & Carr, 2014). This study tested for chlorpheniramine, diphenhydramine, and doxylamine.
- The cough suppressant dextromethorphan is a synthetic analog of codeine. In high doses, dexromethorphan is a CNS depressant and may have driving impairment effects (Logan, 2009).
- Ketamine is a tranquilizer that is sometimes used recreationally as a psychedelic and is associated with decrements in driving skills (Cheng, Ng, Chan, Mok, & Cheung, 2007).
- PCP has hallucinogenic and dissociative effects and is used as a recreational drug. It has serious performance-diminishing effects and has been found in impaired driving cases (Poklis, Maginn, & Barr, 1987).
- Synthetic cannabinoid receptor agonists simulate the effects of cannabinoids and can lead to performance deficits similar to those for cannabis, such as sedation, divided attention and impairment of fine motor skills (Musshoff et al., 2014).

More Than One Class

Drivers having two or more drugs from different classes are in this category. THC is not included in this category.

Description of Drug Categories

Illegal Only

The illegal only category includes individuals who tested positive for at least one drug that is illegal[14] to possess, produce, or sell (and no over-the-counter or prescription medications). The illegal drugs include cannabinoids/marijuana, cocaine, 6-AM (heroin), ketamine, methamphetamines, PCP, amphetamine, methamphetamine, MDMA, MDA, MDEA and synthetic cannabinoids.

Medications Only

This category is comprised of individuals who tested positive only for prescription and/or over-the-counter medications. The medications category includes methylphenidate, phentermine, sedatives, muscle relaxants, narcotic analgesics, antidepressants, antipsychotics, sleep aids, cough suppressants and antihistamines. Although classed as prescription medications and therefore legal, many of these drugs may be obtained illicitly and used off-prescription or recreationally.

Illegal and Medications

This category includes individuals who were positive for two or more drugs, with at least one drug falling into each of the categories above. To avoid double counting individual positive results, drivers positive for one or more illegal substances and one or more medicinal substances, are included in this combined category.

[14] At the time of the study, recreational use of THC was illegal in all States except for Washington and Colorado. However, neither State participated in the 2013–2014 NRS.

Table 5. Drug Class Composition—Oral Fluid and Blood Combined

Antidepressants	Cannabinoids	Narcotic Analgesics	Sedatives	Stimulants	Other
SSRIs and SNRIs	**Marijuana**	**Methadone**	**Barbiturates**	**ADHD Medications**	**Antihistamines**
Citalopram*	THC	Methadone	Butalbital	Methylphenidate	Chlorpheniramine*
Fluoxetine	*11-OH-THC*	*EDDP*§	Pentobarbital		Diphenhydramine*
Paroxetine*	*THC-COOH*§		Phenobarbital	**Amphetamines**	Doxylamine*
Sertraline		**Opiates**	Secobarbital	Amphetamine†	
Venlafaxine*		*6-AM (Heroin)*		MDA†	**Antipsychotics**
		Codeine†	**Benzodiazepines**	MDEA	Chlorpromazine*
Tricyclics		Morphine†	Alprazolam	MDMA	
Amitriptyline			Bromazepam	Methamphetamine	**Cough Suppressants**
Nortriptyline†		**Opioids**	Chlordiazepoxide	Phentermine	Dextromethorphan
Amoxapine‡		Buprenorphine*	Diazepam†		*Dextrorphan***
Dothiepin*		*Norbuprenorphine**	Nordiazepam†	**Cocaine**	
Doxepin‡		Fentanyl*	Oxazepam†	Cocaine	**Dissociative Anesthetics**
Desmethyldoxepin‡		*Norfentanyl**§	Temazepam†	*Benzoylecgonine*	Ketamine
Imipramine		Hydrocodone†	Clonazepam	*Cocaethylene*	*Norketamine*§
Desipramine†		Hydromorphone†	Estazolam‡	*Norcocaine*§	PCP
Protriptyline‡		Meperidine	Flunitrazepam		
Trimipramine		*Normeperidine*§	Flurazepam		**Synthetic Cannabinoids**
		Oxycodone	Lorazepam		AM-1220*
Tetracyclics		Oxymorphone†	Midazolam		AM-2201*
Mianserine*		Propoxyphene	Nitrazepam		AM-2232*
Mirtazepine*		*Norpropoxyphene*§	Phenazepam*		CP47497*
Trazodone*		Tramadol	Triazolam		CP47497-C8*
		Desmethyltramadol§*			HU-210*
			Muscle Relaxants		JWH-018*
		Opioid Antagonist	Carisoprodol		JWH-022*
		Naltrexone*	Meprobamate†		JWH-073*
			Cyclobenzaprine*		JWH-200*
					JWH-250*
			Sleep Aids		UR-144*
			Zolpidem		XLR-11*

Non-shaded entries are drugs identified through both blood and oral fluid analysis.
Shaded entries indicate drugs identified through blood analysis only.
Metabolites are listed in italics.
* Drugs new to 2013–2014.
† Drugs that can be either a metabolite or a drug on their own.
‡ Drugs screened using blood in 2007 that were also screened with oral fluid in 2013–2014.
§ Inactive metabolites not included in data analysis.

Table 6. Drug Category Composition—Oral Fluid and Blood Combined

Illegal		Over-the-Counter	Prescription		
Cannabinoids, Marijuana	**Stimulants, Amphetamines**	**Cough Suppressant**	**Stimulants, ADHD**	**Narcotic Analgesics, Methadone**	**Stimulants, Amphetamines**
THC	Amphetamine†	Dextromethorphan	Methylphenidate	Methadone	Phentermine
11-OH-THC	MDA†	*Dextrorphan**§		*EDDP*§	
THC-COOH§	MDMA		**Antipsychotics**		**Sleep Aids**
	MDEA	**Antihistamines**	Chlorpromazine*	**Sedatives, Muscle Relaxants**	Zolpidem
Stimulants, Cocaine	Methamphetamine	Chlorpheniramine*		Carisoprodol	
Cocaine		Diphenhydramine*	**Sedatives, Barbiturates**	Meprobamate†	**Antidepressants, SSRI and SNRIs**
Benzoylecgonine	**Dissociative Anesthetics**	Doxylamine*	Butalbital	Cyclobenzaprine*	Citalopram*
Cocaethylene	Ketamine		Phenobarbital		Fluoxetine
Norcocaine§	*Norketamine*§		Pentobarbital	**Narcotic Analgesics, Opiates**	Paroxetine*
	PCP		Secobarbital	Codeine	Sertraline
Synthetic Cannabinoids, Marijuana				Morphine†	Venlafaxine*
AM-1220*	**Narcotic Analgesics, Opiates**		**Sedatives, Benzodiazepines**		
AM-2201*	*6-AM (Heroin)*		Alprazolam	**Narcotic Analgesics, Opioids**	**Antidepressants, Tricyclics**
AM-2232*			Bromazepam	Buprenorphine*	Amitriptyline
CP47497*			Chlordiazepoxide	*Norbuprenorphine**	Nortriptyline†
CP47497-C8*			Diazepam†	Fentanyl*	Amoxapine‡
HU-210*			Nordiazepam†	*Norfentanyl**§	Dothiepin*
JWH-018*			Oxazepam†	Hydrocodone†	Doxepin‡
JWH-022*			Temazepam†	Hydromorphone†	*Desmethyldoxepin*‡
JWH-073*			Clonazepam	Meperidine	Imipramine
JWH-200*			Estazolam‡	*Normeperidine*§	Desipramine†
JWH-250*			Flunitrazepam	Oxycodone	Protriptyline‡
UR-144*			Flurazepam	Oxymorphone†	Trimipramine
XLR-11*			Lorazepam	Propoxyphene	
			Midazolam	*Norpropoxyphene*§	**Antidepressants, Tetracyclics**
			Nitrazepam	Tramadol	Mianserine*
			Phenazepam*	*Desmethyltramadol**§	Mirtazepine*
			Triazolam		Trazodone*
				Opioid Antagonist	
				Naltrexone*	

Nonshaded entries are drugs identified through both blood and oral fluid analysis.
Shaded entries indicate drugs identified through blood analysis only.
For analysis, prescription and over-the-counter drugs are combined and referred to as medications.
Metabolites are listed in italics.
* Drugs new to 2013–2014.
† Drugs which can be either a metabolite or a drug on their own.
‡ Drugs screened using blood in 2007 that were also screened with oral fluid in 2013–2014.
§ Inactive metabolites not included in data analysis.

Results

Drug estimates were based on a combination of oral fluid and blood results as the combined results provide the most robust estimate. Each driver with a positive oral fluid and blood sample was counted only once in the tabulations. Prevalence estimates were calculated for:

- drug classes and categories;
- alcohol in combination with drugs;
- observed seat belt or motorcycle helmet use in combination with drugs;
- synthetic cannabinoids; and
- individual drugs.

Some of the prevalence estimates in this section vary slightly from those reported in the NHTSA Research Note (Berning, Compton, & Wochinger, 2015). These revisions are the result of refined analyses conducted since that publication. They do not change any of the general conclusions or any findings of statistical significance based on data reported in the Research Note.

Unless stated, sample size (*N*) refers to the actual number of participants. Percentages are weighted to adjust for our sampling strategy and optimize the representativeness of our prevalence estimates. All tests of statistical significance account for this statistical weighting. The tables indicate differences between row or column proportions using 95-percent confidence intervals.[15] To present statistically significant differences in the tables, we compared prevalence rates relative to a reference category. The reference group is the level of a variable to which other levels are compared. Although any level can be the reference group, the ones here generally correspond to those used for the 2007 study.

Participation Rates

Participation was extremely high, at 79.3 percent of eligible drivers. Table 7 shows the number of oral fluid and blood samples collected in each study by time of day. In the 2013–2014 study, data collectors collected 7,881 oral fluid samples, which were matched to the response items

[15] A confidence interval refers to the range in which the "true value" of a variable of interest actually falls. Traditionally, confidence intervals are set to 95%. This would indicate that the researcher can state with 95% certainty that the "true value" of the variable of interest lies within the range provided.

and breath tests. This constitutes 71.0 percent of the 11,100 eligible drivers. In addition, 4,686 drivers provided a blood sample. This figure constitutes 42.2 percent of eligible drivers, a figure slightly higher than the 2007 NRS.

Table 7. Participating Drivers in All Five National Roadside Studies

				2007			2013–2014		
	1973	1986	1996	Daytime	Nighttime	Total	Daytime	Nighttime	Total
Signaled to enter location	--	3,260	6,480	3,516	9,553	13,069	3,385	10,782	14,167
Did not enter location*	--	217	182	933	1,016	1,949	711	2,134	2,845
Entered location	--	--	--	2,583	8,537	11,120	2,674	8,648	11,322
Eligible	3,698	3,043	6,298	2,525	8,384	10,909	2,617	8,483	11,100
Entered location and participated	3,353 90.7%†	2,971 97.6%†	6,045 96.0%†	2,174 86.1%†	6,920 82.5%†	9,094 83.4%†	2,174 83.1%†	6,630 78.2%†	8,804 79.3%†
Valid breath sample	3,192 86.3%†	2,850 93.7%†	6,028 95.7%†	2,254 89.3%†	7,159 85.4%†	9,413 86.3%†	2,361 90.2%†	7,094 83.6%†	9,455 85.2%†
Oral fluid sample	--	--	--	1,850 73.3%†	5,869 70.0%†	7,719 70.7%†	1,987 75.9%†	5,894 69.5%†	7,881 71.0%†
Blood sample	--	--	--	N/A‡	3,276 39.1%†	N/A‡	1,263 48.3%†	3,423 40.4%†	4,686 42.2%†

* When this number was not available (i.e., for six locations and 21 sessions), researchers estimated it based on the type of police involvement at the location.
† Percentage of eligible drivers.
‡ N/A (not applicable) because blood samples were not collected at daytime sessions.

Overall Drug Prevalence

The tables in this section are based on the 7,898 drivers (1,991 daytime drivers and 5,907 nighttime drivers) from whom an oral fluid or blood sample analyzed.[16]

Tabulations of drug prevalence by time of day (Table 8) showed that 22.3 percent of daytime drivers and 22.5 percent of nighttime drivers were drug-positive. This difference was not statistically significant.

[16] Counts may not total 7,898 within individual tables because of missing values for some variables.

Table 8. Drug Prevalence in Oral Fluid or Blood by Time of Day

Time of Day	*N*	% Drug-positive
Day	1,991	22.3
Night	5,907	22.5

Ns are unweighted; percentages are weighted.

Table 9 shows that there are no statistically significant differences in drug prevalence between data collection sessions.

Table 9. Drug Prevalence in Oral Fluid or Blood by Session

Session	*N*	% Drug-positive
1: Friday, 9:30 a.m. to 11:30 a.m. *or* 1:30 p.m. to 3:30 p.m.	1,991	22.3
2: Friday, 10 p.m. to Midnight	1,773	22.7
3: Friday, 1 a.m. to 3 a.m.	1,204	23.1
4: Saturday, 10 p.m. to Midnight	1,820	20.8
5: Saturday, 1 a.m. to 3 a.m.	1,110	25.3

Ns are unweighted; percentages are weighted.

Table 10 shows overall drug prevalence by time and geographical region. The Midwest had the highest percentage of daytime drug-positive drivers (26.2%). The percentage of daytime drug-positive drivers was significantly higher in the Midwest than in the West (16.0%, $p < .05$). The Midwest had the highest percentage of nighttime drug-positive drivers as well (30.4%) which was significantly higher than in the West (16.4%, $p < .05$). Nighttime drivers in the South (22.9%) were also significantly more likely than drivers in the West to be drug-positive ($p < .05$). Sample sizes differ between regions. See Appendix D for information on the regions.

Table 10. Drug Prevalence in Oral Fluid or Blood by Time of Day and Region

Time of Day	Region	*N*	% Drug-positive
Day	Midwest	484	26.2*
	Northeast	388	23.8
	South	469	23.1
	West (Ref)	650	16.0
	Total	1,991	22.3
Night	Midwest	1,425	30.4*
	Northeast	1,069	19.5
	South	1,523	22.9*
	West (Ref)	1,890	16.4
	Total	5,907	22.5

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
* Statistically significant differences ($p < .05$).
Because of missing records on the demographic values, totals (*N*) do not match those in other tables.

Results of overall drug prevalence by time of day and gender (Table 11) reveal no statistically significant differences.

Table 11. Drug Prevalence in Oral Fluid or Blood by Time of Day and Gender

Time of Day	Gender	*N*	% Drug-positive
Day	Males	999	23.3
	Females (Ref)	940	21.9
	Total	1,939	22.6
Night	Males	3,536	23.0
	Females (Ref)	2,316	21.5
	Total	5,852	22.4

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
Because of missing records on the demographic values, totals (*N*) do not match those in other tables.

Table 12 presents overall drug prevalence in the driving population by time of day and age. The age ranges are not equal in length but were constructed to categorize underage drivers (16–20 years), young drivers (21–34 years), middle-age drivers (35–44 years), late middle-age drivers (45–64 years), and older drivers (65+ years). Table 12 shows that drivers between the ages of 16 to 20 were least likely to test positive for drugs. Among both daytime and nighttime samples, there were no statistically significant differences among the age groups in drug prevalence.

Table 12. Drug Prevalence in Oral Fluid or Blood by Time of Day and Age Group

Time of Day	Age Group	*N*	% Drug-positive
Day	16–20	107	16.0
	21–34	541	24.6
	35–44	349	20.2
	45–64 (Ref)	671	22.9
	65+	256	20.0
	Total	1,924	22.1
Night	16–20	844	18.3
	21–34	2,589	25.2
	35–44	930	20.1
	45–64 (Ref)	1,228	22.9
	65+	178	16.3
	Total	5,769	22.6

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
Because of missing records on the demographic values, totals (*N*) do not match those in other tables.

Table 13 examines overall drug prevalence between gender, age group, or time of day. There were no statistically significant differences.

Table 13. Drug Prevalence in Oral Fluid or Blood by Time of Day, Gender, and Age Group

Time of Day	Gender	Age Group	*N*	% Drug-Positive
Day	Males	16–20	62	20.8
		21–34	262	28.7
		35–44	164	25.4
		45–64 (Ref)	326	19.2
		65+	166	18.2
		Total Males	980	22.7
	Females	16–20	44	7.9
		21–34	274	21.4
		35–44	184	15.8
		45–64 (Ref)	342	25.8
		65+	89	24.2
		Total Females	933	21.7
Night	Males	16–20	528	18.4
		21–34	1,594	26.7
		35–44	538	20.0
		45–64 (Ref)	696	21.4
		65+	110	13.4
		Total Males	3,466	22.9
	Females	16–20	312	15.9
		21–34	988	22.5
		35–44	390	20.2
		45–64 (Ref)	527	24.8
		65+	68	20.9
		Total Females	2,285	21.7

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
Because of missing records on the demographic values, totals (*N*) do not match those in other tables.

Comparisons by race and ethnicity (Table 14) show that the prevalence of drug positive driving was significantly lower for Asian drivers compared with White drivers in the daytime sample (23.4% versus 6.4%, respectively, $p < .05$), but not in the nighttime sample. The prevalence of drug-positive driving was significantly lower for Hispanic drivers compared with White drivers in the nighttime sample (13.5% vs. 22.2%, respectively, $p < .05$).

Table 14. Drug Prevalence in Oral Fluid or Blood by Time of Day and Race/Ethnicity

Time of Day	Race/Ethnicity	*N*	% Drug-positive
Day	African American	347	26.5
	Asian	58	6.4*
	Hispanic	207	11.4
	White (Ref)	1,161	23.4
	Other	87	24.1
	Total	1,860	22.4
Night	African American	1140	27.7
	Asian	246	11.7
	Hispanic	590	13.5*
	White (Ref)	3,157	22.2
	Other	356	20.2
	Total	5,489	22.4

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
Racial/ethnic groups other than "Hispanic" are always "non-Hispanic."
* Indicates statistically significant differences ($p < .05$).
Because of missing records on the demographic values, totals (*N*) do not match those in other tables.

There were no statistically significant drug prevalence differences among daytime drivers of various vehicle types (Table 15). At night, pickup drivers had a lower drug prevalence than passenger vehicle drivers, which was statistically significant (16.5% versus 24.3%, respectively, $p < .05$).

Table 15. Drug Prevalence in Oral Fluid or Blood by Time of Day and Vehicle Type

Time of Day	Vehicle Type	*N*	% Drug-Positive
Day	Passenger Vehicle (ref)	1,108	24.7
	Pickup	217	20.6
	Sport Utility Vehicle	437	20.0
	Van	31	28.0
	Minivan	130	17.5
	Motorcycle	12	6.8
	Other	3	0.0
	Unknown	8	17.5
	Total	1,946	22.5
Night	Passenger Vehicle (ref)	3,710	24.3
	Pickup	553	16.5*
	Sport Utility Vehicle	1,245	19.5
	Van	48	19.3
	Minivan	245	20.8
	Motorcycle	41	22.3
	Other	9	12.5
	Unknown	11	53.8
	Total	5,862	22.5

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
* Statistically significant differences ($p < .05$).
Because of missing records on the vehicle type, totals (*N*) do not match those in other tables.

Drug Prevalence by Drug Class

In this section, driver drug prevalence is presented by drug class.[17] Table 16 presents drug prevalence estimates by class, in overall daytime and nighttime driving samples, by region. The prevalence of THC-positive, THC-positive-only, and THC-positive plus any other drug in the Midwest was significantly higher than in the West among both daytime and nighttime drivers ($p < .05$). The prevalence of THC-positive and THC-positive only drivers in the South were significantly higher than in the West, but only among nighttime drivers ($p < .05$).

[17] Because some drivers tested positive for multiple drugs in more than one class, an additional, mutually exclusive group—"more than one class"—appears in the drug class tables. This was done to avoid double counting individual positive results. As we categorized some drivers in this "more than one class" group, the estimates in this section cannot be used to ascertain prevalence for any individual drug class. Detailed prevalence estimates for individual drugs are provided in Table 39.

Table 16. Drug Prevalence in Oral Fluid or Blood by Time of Day, Drug Class, and Region (Percentage by Column)

Time of Day	Drug Class	Midwest %	Northeast %	South %	West (Ref) %	All %
		N = 484	*N* = 388	*N* = 469	*N* = 650	*N* = 1,991
Day	THC-positive	14.9*	7.8	7.9	5.1	8.7
	THC-positive-only	11.4*	4.5	6.8	4.4	6.8
	THC-positive plus any other drug	3.5*	3.3	1.1	0.7	1.9
	Antidepressants-only	1.1	2.1	2.4	2.8	2.2
	Narcotic Analgesics-only	2.5	3.9	3.4	1.8	3.0
	Sedatives-only	1.0	2.0	1.4	0.2	1.2
	Stimulants-only	1.6	1.6	1.9	0.8	1.6
	Other-only	2.3	1.4	2.1	2.5	2.1
	More than one class	2.8	4.9	3.9	2.7	2.6
	Total drug-negative	73.8	76.2	76.9	84.0	77.7
	Total drug-positive	26.3	23.8	23.1	16.0	22.3
		N = 1,425	*N* = 1,069	*N* = 1,523	*N* = 1,890	*N* = 5,907
Night	THC-positive	20.5*	9.6	12.5*	7.6	12.6
	THC-positive only	16.0*	8.0	10.0*	5.9	10.0
	THC-positive plus any other drug	4.5*	1.6	2.5	1.7	2.6
	Antidepressants-only	0.9	0.9	0.8	1.1	0.9
	Narcotic Analgesics-only	2.6	2.9	2.0	2.0	2.3
	Sedatives-only	0.5	1.4	1.6	0.6	1.2
	Stimulants-only	2.3	1.7	1.7	2.6	2.0
	Other-only	1.2	1.3	2.1	1.2	1.6
	More than one class	2.4	1.7	2.1	1.3	1.9
	Total drug-negative	69.6	80.5	77.0	83.6	77.5
	Total drug-positive	30.4	19.5	23.0	16.4	22.5

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
"More than one class" excludes drivers who tested positive for THC.
* Statistically significant differences ($p < .05$).

Table 17 compares drug classes by time of day and gender. In the daytime, there was a significantly higher prevalence of THC-positive and THC-positive-only among male drivers than female drivers (12.1% males versus 5.5% females, and 9.7% males versus 4.1% females, $p < .05$). Males also had a significantly higher THC-positive and THC-positive only prevalence in the nighttime sample (14.6% males versus 9.4% females, and 11.7% males versus 7.4% females, $p < .05$). There were no other statistically significant differences by drug class, gender and time of day.

Table 17. Drug Prevalence in Oral Fluid or Blood by Time of Day, Drug Class, and Gender (Percentage by Column)

Time of Day	Drug Class	Males %	Females (Ref) %	Total %
Day		*N* = 999	*N* = 940	*N* = 1,939
	THC-positive	12.1*	5.5	8.9
	THC-positive only	9.7*	4.1	6.9
	THC-positive plus any other drug	2.4	1.4	2.0
	Antidepressants-only	1.5	2.9	2.2
	Narcotic analgesics-only	3.2	2.8	3.0
	Sedatives-only	1.1	1.3	1.2
	Stimulants-only	1.8	1.4	1.6
	Other-only	1.6	2.8	2.2
	More than one class	2.1	5.2	3.6
	Total drug-negative	76.7	78.2	77.4
	Total drug-positive	23.3	21.9	22.6
Night		*N* = 3,536	*N* = 2,316	*N* = 5,852
	THC-positive	14.6*	9.4	12.5
	THC-positive only	11.7*	7.4	10.0
	THC-positive plus any other drug	2.9	2.0	2.5
	Antidepressants-only	0.7	1.2	0.9
	Narcotic analgesics-only	2.1	2.6	2.3
	Sedatives-only	0.8	1.7	1.2
	Stimulants-only	1.9	2.0	2.0
	Other-only	1.5	1.7	1.6
	More than one class	1.3	2.9	1.9
	Total drug-negative	77.0	78.5	77.7
	Total drug-positive	22.9	21.5	22.4

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
"More than one class" excludes drivers who tested positive for THC.
* Statistically significant differences ($p < .05$).

When we examined drug classes by time of day and age (Table 18), we found that daytime drivers 16–20 and 21–34 years had a significantly higher prevalence of THC-positive and THC-positive- only than those in the 45–64 age (reference) group ($p < .05$). This was observed also among nighttime drivers in both the 16–20 and 21–34 age groups, where there was a significantly higher prevalence of THC-positive and THC-positive-only driving compared to the 45–64 year age group ($p < .05$). Drivers age 35-44 were significantly less likely than drivers age 45-64 to test positive for more than one drug class in the daytime sample ($p < .05$), but not in the nighttime sample. Drivers age 16-20 were significantly less likely than drivers age 45-64 to test positive for

narcotic analgesics and drivers age 21-34 were significantly less likely to test positive for more than one drug class in the nighttime sample ($p < .05$), but not in the daytime sample. There were no other statistically significant differences based on age, drug class and time of day.

Table 18. Drug Prevalence in Oral Fluid or Blood by Time of Day, Drug Class, and Age Group (Percentage by Column)

Time of Day	Drug Class	16–20 years %	21–34 years %	35–44 years %	45–64 years (Ref) %	65+ years %	Total %
		N = 107	*N* = 541	*N* = 349	*N* = 671	*N* = 256	*N* = 1,924
Day	THC-positive	15.0*	11.6*	8.6	5.8	5.3	8.4
	THC-positive only	14.2*	8.8*	6.7	3.8	4.4	6.4
	THC-positive plus any other drug	0.8	2.8	1.9	2.0	0.9	2.0
	Antidepressants-only	0.0	1.4	2.7	2.9	2.2	2.2
	Narcotic Analgesics-only	0.0	3.0	3.6	3.3	3.0	3.0
	Sedatives-only	0.0	1.0	0.2	1.9	1.8	1.2
	Stimulants-only	0.0	2.4	2.4	1.0	1.3	1.6
	Other-only	1.0	1.9	1.3	2.3	3.9	2.1
	More than one class	0.0	3.4	1.3*	5.7	2.6	3.5
	Total drug-negative	84.0	75.4	79.9	77.1	80.0	77.9
	Total drug-positive	16.0	24.6	20.2	22.9	20.0	22.1
		N = 844	*N* = 2,589	*N* = 930	*N* = 1,228	*N* = 178	*N* = 5,769
Night	THC-positive	15.0*	16.9*	9.0	6.9	0.4	12.6
	THC-positive only	12.6*	13.9*	6.3	5.1	0.4	10.1
	THC-positive plus any other drug	2.4	3.9	2.7	1.8	0.0	2.5
	Antidepressants-only	0.4	0.5	1.1	1.8	1.7	0.9
	Narcotic Analgesics-only	0.5*	1.9	2.4	3.9	4.3	2.3
	Sedatives-only	1.0	0.8	2.1	1.3	1.3	1.2
	Stimulants-only	1.0	2.1	1.5	2.6	2.3	2.0
	Other-only	0.5	1.5	1.7	2.3	2.9	1.6
	More than one class	0.0	1.4*	2.3	4.0	3.4	2.0
	Total drug-negative	81.7	74.8	79.9	77.1	83.7	77.4
	Total drug-positive	18.3	25.2	20.1	22.9	16.3	22.6

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
"More than one class" excludes drivers who tested positive for THC.
* Statistically significant differences ($p < .05$).

Drug Prevalence by Category

In this section, we present prevalence estimates by drug category, with tables presenting mutually exclusive drug categories: illegal only, medications only, illegal and medications, and drug-negative. To determine the proportion of drivers who tested positive for at least one drug, the values for both the illegal only and medications only can be added to the illegal and medications category. Note that while the medications only category includes both prescription and over-the-counter drugs, there were too few positive results for the latter group to permit separate analyses. Also, while drugs listed as medications are often prescribed, this does not preclude their illegal use and misuse.

Table 19 compares daytime drug category prevalence to nighttime drug category prevalence. The prevalence of medications only is significantly higher ($p < .05$) among daytime than nighttime drivers.

Table 19. Drug Prevalence in Oral Fluid or Blood by Time of Day and Drug Category (Percentage by Column)

Time of Day	Drug Category	*N*	%
Day	Illegal-only	172	9.3
	Medications-only	238	10.7*
	Illegal & Medications	44	2.3
	Total drug-negative	1,537	77.7
	Total drug-positive	454	22.3
Night (Ref)	Illegal-only	745	13.2
	Medications-only	396	7.4
	Illegal & Medications	104	2.0
	Total drug-negative	4,662	77.5
	Total drug-positive	1,245	22.5

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
* Significant differences ($p < .05$).

Table 20 looks only at daytime drug category prevalence. The prevalence of medications only compared to illegal only drugs (the reference group), was significantly higher during the daytime ($p < .05$). The prevalence of the combined illegal drugs and medications category was significantly lower than the prevalence of illegal only drugs among daytime drivers ($p < .05$).

Table 20. Drug Prevalence in Oral Fluid or Blood by Time of Day (day) and Drug Category (Percentage by Column)

Time of Day	Drug Category	*N*	%
Day	Illegal only (Ref)	172	9.3
	Medications only	238	10.7*
	Illegal & Medications	44	2.3*
	Total drug-negative	1,537	77.7
	Total drug-positive	454	22.3

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
* Significant differences ($p < .05$).

Table 21 looks only at nighttime drug category prevalence. The prevalence of medications only compared to illegal-only drugs (the reference group), was significantly lower at night ($p < .05$). The prevalence of the combined illegal drugs and medications-only category was significantly lower than the prevalence of illegal-only drugs among nighttime drivers ($p < .05$).

Table 21. Drug Prevalence in Oral Fluid or Blood by Time of Day (night) and Drug Category (Percentage by Column)

Time of Day	Drug Category	*N*	%
Night	Illegal only (Ref)	745	13.2
	Medications only	396	7.4*
	Illegal & Medications	104	2.0*
	Total drug-negative	4,662	77.5
	Total drug-positive	1,245	22.5

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
* Significant differences ($p < .05$).

Table 22 compares prevalence across regions. Prevalence of illegal drugs-only was significantly higher among drivers in the Midwest than in the West, both in the daytime and nighttime samples ($p < .05$). The prevalence of the combined illegal drugs and medications category was also significantly higher among drivers in the Midwest compared with those in the West among nighttime drivers ($p < .05$). There were no other statistically significant differences by region and drug category.

Table 22. Drug Prevalence in Oral Fluid or Blood by Time of Day, Region, and Drug Category (Percentage by Column)

Time	Region	Drug Category	*N*	%
Day	Midwest	Illegal-only	54	13.9*
		Medications-only	56	10.3
		Illegal & Medications	8	2.1
		Total drug-negative	366	73.8
		Total drug-positive	118	26.2
	Northeast	Illegal-only	40	7.9
		Medications-only	44	12.2
		Illegal & Medications	9	3.8
		Total drug-negative	295	76.2
		Total drug-positive	93	23.8
	South	Illegal-only	40	9.7
		Medications-only	61	11.0
		Illegal & Medications	13	2.5
		Total drug-negative	355	76.9
		Total drug-positive	114	23.1
	West (Ref)	Illegal-only	38	5.6
		Medications-only	77	9.5
		Illegal & Medications	14	0.9
		Total drug-negative	521	84.0
		Total drug-positive	129	16.0
Night	Midwest	Illegal-only	209	19.4*
		Medications-only	106	7.3
		Illegal & Medications	30	3.7*
		Total drug-negative	1,080	69.6
		Total drug-positive	345	30.4
	Northeast	Illegal-only	115	10.5
		Medications-only	73	7.8
		Illegal & Medications	16	1.3
		Total drug-negative	865	80.5
		Total drug-positive	204	19.5
	South	Illegal-only	192	12.8
		Medications-only	124	8.3
		Illegal & Medications	36	1.9
		Total drug-negative	1,171	77.1
		Total drug-positive	352	22.9
	West (Ref)	Illegal-only	229	10.1
		Medications-only	93	5.5
		Illegal & Medications	22	0.8
		Total drug-negative	1,546	83.6
		Total drug-positive	344	16.4

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
* Statistically significant difference ($p < .05$).

Table 23 shows prevalence by drug category, gender and time of day. The prevalence of illegal drugs-only was significantly higher among males compared with females among both daytime and nighttime drivers ($p < .05$).

Table 23. Drug Prevalence in Oral Fluid or Blood by Time of Day, Gender, and Drug Category (Percentage by Column)

Time of Day	Gender	Drug Category	*N*	%
Day	Male	Illegal-only	119	13.0*
		Medications-only	96	8.3
		Illegal & Medications	19	2.1
		Total drug-negative	765	76.7
		Total drug-positive	234	23.3
	Female (Ref)	Illegal-only	50	5.9
		Medications-only	135	13.3
		Illegal & Medications	24	2.7
		Total drug-negative	731	78.2
		Total drug-positive	209	21.8
Night	Male	Illegal-only	528	15.4*
		Medications-only	184	5.6
		Illegal & Medications	57	1.9
		Total drug-negative	2,767	77.0
		Total drug-positive	769	23.0
	Female (Ref)	Illegal-only	205	9.6
		Medications-only	210	9.9
		Illegal & Medications	45	1.9
		Total drug-negative	1,856	78.5
		Total drug-positive	460	21.5

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
* Statistically significant differences ($p < .05$).

Table 24 compares drug categories by age and time of day. Among daytime drivers, illegal-only drug prevalence was highest among drivers in the 16–20 age group, followed by the 21–34 group; both were significantly higher than the prevalence among drivers 45–64 ($p < .05$). Among nighttime drivers, the prevalence of the illegal-only category was significantly higher among drivers in the 16–20 and 21–34 age groups compared with the 45–64 group ($p < .05$ and $p < .01$, respectively).

The prevalence of the medications only category was significantly lower for the 16–20 age group compared to the 45–64 age group, among both daytime and nighttime drivers ($p < .05$). The prevalence of the medications-only category was significantly lower for the 21–34 age group compared to the 45–64 group, but only among nighttime drivers ($p < .05$). Note that in many drug categories, the sample size was small in certain age groups.

Table 24. Drug Prevalence in Oral Fluid or Blood by Time of Day, Age Group, and Drug Category (Percentage by Column)

Time of Day	Age	Drug Category	*N*	%
Day	16–20	Illegal-only	20	15.4*
		Medications-only	1	0.6*
		Illegal & Medications	0	0.0
		Total drug-negative	86	84.0
		Total drug-positive	21	16.0
	21–34	Illegal-only	66	12.9*
		Medications-only	43	8.8
		Illegal & Medications	13	2.9
		Total drug-negative	419	75.4
		Total drug-positive	122	24.6
	35–44	Illegal-only	31	10.0
		Medications-only	48	9.3
		Illegal & Medications	3	0.8
		Total drug-negative	267	79.9
		Total drug-positive	82	20.1
	45–64 (Ref)	Illegal-only	40	5.6
		Medications-only	95	13.6
		Illegal & Medications	25	3.7
		Total drug-negative	511	77.1
		Total drug-positive	160	22.9
	65+	Illegal-only	9	5.6
		Medications-only	42	13.6
		Illegal & Medications	2	0.9
		Total drug-negative	203	80.0
		Total drug-positive	53	20.0

Time of Day	Age	Drug Category	*N*	%
Night	16–20	Illegal-only	123	15.0*
		Medications-only	16	2.5*
		Illegal & Medications	5	0.8
		Total drug-negative	700	81.7
		Total drug-positive	144	18.3
	21–34	Illegal-only	424	17.8*
		Medications-only	117	5.0*
		Illegal & Medications	51	2.4
		Total drug-negative	1,997	74.8
		Total drug-positive	592	25.2
	35–44	Illegal-only	60	7.9
		Medications-only	84	9.3
		Illegal & Medications	24	2.9
		Total drug-negative	762	79.9
		Total drug-positive	168	20.1
	45–64 (Ref)	Illegal-only	113	8.0
		Medications-only	148	13.4
		Illegal & Medications	21	1.5
		Total drug-negative	946	77.1
		Total drug-positive	282	22.9
	65+	Illegal-only	5	2.7
		Medications-only	26	13.7
		Illegal & Medications	0	0.0
		Total drug-negative	147	83.7
		Total drug-positive	31	16.3

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
* Statistically significant difference ($p < .05$).

Drug Prevalence and BrAC

This section presents the results of the combined oral fluid and blood drug testing analyses for drugs, combined with the breath alcohol concentrations (BrAC) for alcohol.[18] Categories for BrAC by grams per 210 liter (g/210L) are:

- ".00" (BrAC less than .005 g/210L);
- ".005 - .079" (BrAC greater than .00, up to .079 g/210L); and
- "≥ .08" (BrAC at .08 g/210L and higher).

Table 25 compares drivers by time of day (day versus night), drug result (positive versus negative) and BrAC level. Drug- positive drivers are more likely to be alcohol-positive than are

[18] More complete information on the alcohol results (not including drug results) is available in Ramirez et al., 2016.

drug-negative drivers ($p < .05$) for both daytime and nighttime drivers. Specifically, 99.7 percent of drug-negative drivers were also alcohol-negative, a statistically significantly higher proportion than the proportion of drug-positive drivers who were not alcohol-positive (97.5%) ($p < .05$).

Table 25. Drug Prevalence in Oral Fluid or Blood by Time of Day and BrAC (Percentage by Row)

Time of Day	Drug Result	*N*	BrAC (g/210L)		
			% .00	% .005 - .079	% ≥ .08
Day	Positive	454	97.5*	1.2	1.3
	Negative (ref)	1,537	99.7	0.1	0.2
	Total	1,991	99.2	0.4	0.4
Night	Positive	1,245	90.7*	7.6	1.7
	Negative (ref)	4,662	94.0	5.1	0.9
	Total	5,907	93.3	5.7	1.1

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
* Statistically significant differences ($p < .05$) between the prevalence of zero BrAC levels for drug-positive drivers relative to those testing negative for drugs, within time of day.

Table 26 presents the distribution of BrAC levels by age group for drug-positive drivers. There were no statistically significant differences between age groups in the nighttime sample. Comparisons among daytime drug-positive drivers were not undertaken because of the small number of alcohol-positive results ($n = 15$).

Table 26. BrAC among Drug-Positive Drivers in Oral Fluid or Blood by Time of Day and Age (Percentage by Row)

Time of Day	Age	*N*	BrAC (g/210L)		
			% .00	% .005 - .079	% ≥ .08
Day	16–20	21	100.0	0.0	0.0
	21–34	122	94.3	3.1	2.7
	35–44	82	99.5	0.0	0.6
	45–64 (Ref)	160	97.8	0.9	1.3
	65+	53	100.0	0.0	0.0
	Total	438	97.3	1.3	1.4
Night	16–20	144	93.6	5.9	0.4
	21–34	592	89.2	9.8	1.0
	35–44	168	91.2	3.5	5.3
	45–64 (Ref)	282	92.4	5.8	1.8
	65+	31	93.1	6.9	0.0
	Total	1,217	90.8	7.5	1.7

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
Age range categories vary in number of years.
Statistical analyses involving daytime alcohol-positive drivers were not conducted because of small sample sizes.

Table 27 presents the distribution of breath alcohol concentration (BrAC) levels by drug category for drug-positive drivers. Nighttime drivers in the medications-only category were statistically more likely to have no alcohol than those in the illegal-only drug category (97.8% versus 86.8%, $p < .05$). In addition, nighttime drivers in the medications only category were statistically less likely than those in the illegal-only category to have BrACs both at the .005 - .079 g/210L range and at .08 g/210L or higher ($p < .05$). Differences in the daytime sample were not analyzed because of small sample sizes reflecting the rarity of drivers who were positive for both alcohol and other drugs during the daytime hours. Although drugs were found approximately as frequently among daytime and nighttime drivers, the use of alcohol among drivers was concentrated among nighttime drivers.

Table 27. BrAC among Drug-Positive Drivers in Oral Fluid or Blood by Time of Day and Drug Category (Percentage by Row)

Time of Day	Drug Category	*N*	BrAC (g/210L) % .00	% .005 - .079	% ≥ .08
Day	Illegal only (Ref)	172	94.6	2.9	2.5
	Medications only	238	99.4	0.0	0.6
	Illegal & Medications	44	100.0	0.0	0.0
Night	Illegal only (Ref)	745	86.8	10.7	2.6
	Medications only	396	97.8*	2.1*	0.1*
	Illegal & Medications	104	90.5	7.8	1.6

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
Statistical analyses involving daytime alcohol-positive drivers were not conducted because of small sample sizes.
* Statistically significant differences ($p < .05$) between the prevalence of zero BrAC levels for drug-positive drivers in other categories relative to illegal only drivers, within time of day.

Table 28 presents the BrAC findings for all drivers (both drug-positive and drug-negative) by drug category, age and time of day. Due to the number of groupings (and thus, relatively small sample sizes), caution should be exercised in interpreting the findings, especially among the daytime driving sample. There were no statistically significant differences by drug category, time of day, and age.

Table 28. Driver BrAC in Oral Fluid or Blood by Time of Day, Age, and Drug Category (Percentage by Row)

Time of Day	Age	Drug Category	*N*	BrAC (g/210L)		
				% .00	% .005 - .079	% ≥ .08
Day	16–20	Illegal-only	20	100.0	0.0	0.0
		Medications-only	1	100.0	0.0	0.0
		Illegal & Medications	0	NA	NA	NA
		Total drug-negative	86	100.0	0.0	0.0
		Total drug-positive	21	100.0	0.0	0.0
	21–34	Illegal-only	66	90.3	5.9	3.8
		Medications-only	43	98.2	0.0	1.9
		Illegal & Medications	13	100.0	0.0	0.0
		Total drug-negative	419	99.9	0.1	0.0
		Total drug-positive	122	98.5	0.8	0.7
	35–44	Illegal-only	31	100.0	0.0	0.0
		Medications-only	48	98.8	0.0	1.2
		Illegal & Medications	3	100.0	0.0	0.0
		Total drug-negative	267	99.4	0.3	0.3
		Total drug-positive	82	99.4	0.3	0.4
	45–64 (Ref)	Illegal-only	40	91.0	3.6	5.4
		Medications-only	95	100.0	0.0	0.0
		Illegal & Medications	25	100.0	0.0	0.0
		Total drug-negative	511	99.9	0.1	0.0
		Total drug-positive	160	99.4	0.3	0.3
	65+	Illegal-only	9	100.0	0.0	0.0
		Medications-only	42	100.0	0.0	0.0
		Illegal & Medications	2	100.0	0.0	0.0
		Total drug-negative	203	99.8	0.0	0.2
		Total drug-positive	53	99.8	0.0	0.2
Night	16–20	Illegal-only	123	92.2	7.2	0.5
		Medications-only	16	100.0	0.0	0.0
		Illegal & Medications	5	100.0	0.0	0.0
		Total drug-negative	700	97.3	2.7	0.0
		Total drug-positive	144	96.6	3.3	0.1
	21–34	Illegal-only	424	88.1	10.6	1.4
		Medications-only	117	93.7	6.3	0.0
		Illegal & Medications	51	88.7	11.3	0.0
		Total drug-negative	1,997	92.5	6.2	1.3
		Total drug-positive	592	91.7	7.1	1.2
	35–44	Illegal-only	60	80.1	6.7	13.2
		Medications-only	84	99.1	0.6	0.4
		Illegal & Medications	24	95.9	4.1	0.0
		Total drug-negative	762	94.8	4.3	0.9
		Total drug-positive	168	94.1	4.1	1.8
	45–64	Illegal-only	113	81.8	14.9	3.2
		Medications-only	148	99.7	0.3	0.0
		Illegal & Medications	21	83.4	6.2	10.4
		Total drug-negative	946	94.7	4.4	0.9
		Total drug-positive	282	94.2	4.8	1.1
	65+	Illegal-only	5	57.7	42.3	0.0
		Medications-only	26	100.0	0.0	0.0
		Illegal & Medications	0	NA	NA	NA
		Total drug-negative	147	90.5	8.4	1.1
		Total drug-positive	31	90.9	8.1	0.9

N's are unweighted; percentages are weighted.
N/A—Not applicable because no participants fell within these cells, thus making computation meaningless.

We also examined BrAC and drug category by gender and time of day (Table 29). Nighttime male and female drivers who tested positive for medications-only had a significantly higher "no alcohol" rate than those testing positive for illegal-drugs-only ($p < .05$). Fewer nighttime male and female drivers who tested positive for medications-only had BrACs between .005-.079 g/210L and ≥ .08 g/210L, but there were too few cases to permit significance testing. Small sample sizes also precluded valid statistical testing on the daytime sample.

Table 29. BrAC of Drivers in Oral Fluid or Blood by Time of Day, Gender, and Drug Category (Percentage by Row)

Time of Day	Gender	Drug Category	*N*	BrAC (g/210L)		
				% .00	% .005 - .079	% ≥ .08
Day	Males	Illegal-only (Ref)	119	92.7	3.9	3.5
		Medications-only	96	99.0	0.0	1.0
		Illegal & Medications	19	100.0	0.0	0.0
		Total drug-negative	765	99.6	0.2	0.2
		Total drug-positive	234	98.7	0.7	0.7
	Females	Illegal-only(Ref)	50	98.7	0.9	0.4
		Medications-only	135	99.7	0.0	0.3
		Illegal & Medications	24	100.0	0.0	0.0
		Total drug-negative	731	100.0	0.0	0.0
		Total drug-positive	209	99.9	0.1	0.1
Night	Males	Illegal-only (Ref)	528	86.0	11.0	3.1
		Medications-only	184	96.0*	4.0	0.0
		Illegal & Medications	57	84.9	12.2	2.9
		Total drug-negative	2,767	93.2	6.1	0.7
		Total drug-positive	769	92.1	6.8	1.1
	Females	Illegal-only (Ref)	205	90.6	8.0	1.4
		Medications-only	210	99.3*	0.6	0.1
		Illegal & Medications	45	97.6	2.4	0.0
		Total drug-negative	1,856	95.1	3.8	1.2
		Total drug-positive	460	95.1	3.9	1.1

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
* Statistically significant differences ($p < .05$).

Observed Seat Belt and Motorcycle Helmet Use

Tables 30 to 32 present drug test results by observed seat belt use. Note that almost all daytime and nighttime drivers (99%) used seat belts. In Table 30, there were no statistically significant associations between drug-positive driving and seat belt use in the daytime sample.

However, among nighttime drivers who did not wear a seat belt, a significantly higher percentage tested positive for drugs (45.2% compared with 22.1%, $p < .05$).

Table 30. Drug Prevalence of Driver Seat Belt Use in Oral Fluid or Blood by Time of Day (Percentage by Row)

Driver Seat Belt Observation		*N*	% Drug-negative	% Drug-positive
Day	Yes (Ref)	1,894	77.4	22.6
	No	21	73.0	27.0
	Total	1,915		
Night	Yes (Ref)	5,735	77.9	22.1
	No	55	54.8	45.2*
	Total	5,790		

N's are unweighted; percentages are weighted.
Ref: Denotes the category used for comparisons in some analyses.
* Statistically significant difference ($p < .05$).

Table 31 shows drug prevalence by drug class, observed seat belt use and time of day. Table 32 shows drug prevalence by drug category, observed seat belt use, and time of day. Small sample sizes precluded statistical analysis of the results in Tables 31 and 32.

Table 31. Driver Drug Class Prevalence in Oral Fluid or Blood by Seat Belt Use and Time of Day (Percentage by Row)

Driver Seat Belt Observation		*N*	% Anti-depressants	% THC	% Narcotic Analgesics	% Sedatives	% Stimulants	% Other	% >1 Drug Class	% Negative
Day	Yes	1,894	2.3	7.0	3.0	1.1	1.6	2.2	5.3	77.4
	No	21	0.0	8.3	0.0	0.0	0.0	0.0	18.7	73.0
Night	Yes	5,735	0.9	9.7	2.3	1.2	2.0	1.6	4.5	77.9
	No	55	0.0	31.8	3.3	0.0	0.4	0.0	9.7	54.8

N's are unweighted; percentages are weighted.

Table 32. Driver Drug Category Prevalence in Oral Fluid or Blood by Seat Belt Use and Time of Day (Percentage by Row)

Driver Seat Belt Observation		*N*	% Illegal-only	% Illegal & Medications	% Medications-only	% Negative
Day	Yes	1,894	9.6	2.2	10.8	77.4
	No	21	11.6	15.5	0.0	73.0
Night	Yes	5,735	12.8	1.9	7.4	77.9
	No	55	35.8	3.4	6.0	54.8

N's are unweighted; percentages are weighted.

Table 33 shows the number of motorcyclists sampled were very small, thus limiting our ability to perform meaningful statistical comparisons. However, we display daytime and nighttime helmet use (for the operator) by drug prevalence overall, by drug class, and by drug category in Tables 33 to 35.

Table 33. Drug Prevalence of Motorcycle Operators in Oral Fluid or Blood by Helmet Use and Time of Day (Percentage by Row)

Helmet Use		*N*	% Drug-negative	% Drug-positive
Day	Yes	9	92.3	7.8
	No	3	100.0	0.0
Night	Yes	24	89.3	10.7
	No	16	60.3	39.7

N's are unweighted; percentages are weighted.

Table 34. Drug Class Prevalence of Motorcycle Operators in Oral Fluid or Blood by Helmet Use and Time of Day (Percentages by Row)

Helmet Use		*N*	% Anti-depressants	% THC	% Narcotic Analgesics	% Sedatives	% Stimulants	% Other	% >1 Drug Class	% Negative
Day	Yes	9	0.0	0.0	7.8	0.0	0.0	0.0	0.0	92.3
	No	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Night	Yes	24	0.0	3.9	4.6	0.0	2.2	0.0	0.0	89.3
	No	16	10.9	16.4	0.0	0.0	3.7	0.0	8.7	60.3

N's are unweighted; percentages are weighted.

Table 35. Drug Category Prevalence of Motorcycle Operators in Oral Fluid or Blood by Helmet Use and Time of Day (Percentages by Row)

Helmet Use		*N*	% Illegal-only	% Illegal & Medications	% Medications-only	% Negative
Day	Yes	9	0.0	0.0	7.8	92.3
	No	3	0.0	0.0	0.0	100.0
Night	Yes	24	6.1	0.0	4.6	89.3
	No	16	20.1	6.2	13.4	60.3

N's are unweighted; percentages are weighted.

Synthetic Cannabinoids

There has been growing concern, especially in some regions of the country, about increased use of synthetic cannabinoids. Tables 36 to 38 present the prevalence of synthetic cannabinoids. The number of drivers who tested positive for synthetic cannabinoids was very small ($N = 15$). Given this small number, statistical analyses and meaningful contrasts for these drugs were not appropriate. Nevertheless, because of the interest the public may have on this group of drugs, the prevalence of synthetic cannabinoids by region and demographics is shown in Tables 36, 37, and 38.

Table 36. Prevalence of Synthetic Cannabinoids in Oral Fluid or Blood by Region

Region	*N*	Positive *N*	% Drug-positive
Midwest	1,909	3	0.1
Northeast	1,457	4	0.2
South	1,992	2	0.1
West	2,540	6	0.3
Total	7,898	15	0.2

N's are unweighted; percentages are weighted.

Table 37. Prevalence of Synthetic Cannabinoids in Oral Fluid or Blood by Gender

Gender	*N*	Positive *N*	% Drug-positive
Female	3,256	5	0.1
Male	4,535	9	0.2
Total	7,791	14	0.1

N's are unweighted; percentages are weighted.

Table 38. Prevalence of Synthetic Cannabinoids in Oral Fluid or Blood by Age Group

Age	*N*	Positive *N*	% Drug-positive
16–20	951	2	0.3
21–34	3,130	4	0.2
35–44	1,279	3	0.1
45–64	1,899	5	0.2
65+	434	1	0.0
Total	7,693	15	0.2

N's are unweighted; percentages are weighted.

Individual Drug Prevalence Estimates

Table 39 presents prevalence estimates for each drug independent of whether other drugs were found in an individual driver. Thus, a driver who tested positive for THC and cocaine would appear twice in Table 39.

Table 39 shows that the most frequently encountered single drug in oral fluid or blood in both daytime and nighttime was THC. THC was detected in 8.7 percent of daytime drivers and 12.7 percent of nighttime drivers. Opioids and their metabolites were the second most prevalent drugs, detected in 5.5 percent of daytime drivers and 4.7 percent of nighttime drivers. During the daytime, the next most frequently encountered drug class was antidepressants (3.5%), followed by benzodiazepines (2.6%). Among nighttime drivers, cocaine and amphetamines/stimulants were the third most prevalent drugs (2.2%).

Antidepressant use was significantly more prevalent among daytime than nighttime drivers (3.5% versus 1.6%, $p < .05$). There were no statistically significant differences between daytime and nighttime drivers in the use of THC, cocaine, opioids, amphetamines/stimulants, benzodiazepines, or antihistamines. Small sample sizes precluded valid statistical testing for the remaining drugs.

Table 39. Drug Prevalence in Oral Fluid or Blood among Daytime and Nighttime Drivers

Drug Category	Drug	Daytime *N* = 1,991		Nighttime *N* = 5,907 (Ref)	
		N	%	*N*	%
	Cannabinoids	163	8.7	666	12.7
Illegal	THC (Marijuana)	163	8.7	666	12.7
Illegal	11-OH-THC (all also positive for THC)	70	3.5	250	5.1
	Cocaine	32	1.6	136	2.2
Illegal	Cocaine	27	1.4	123	2.0
Illegal	Benzoylecgonine	29	1.4	123	2.0
Illegal	Cocaethylene	3	0.2	21	0.3
	Opioids	112	5.5	252	4.7
Medication §	Codeine	9	0.6	16	0.3
Illegal	6-AM (Heroin)	5	0.4	21	0.4
Medication	Naltrexone	1	0.0	1	0.0
Medication	Buprenorphine	10	0.6	27	0.5
Medication	Norbuprenorphine	8	0.4	17	0.4
Medication	Fentanyl	3	0.2	10	0.1
Medication	Hydrocodone	49	1.8	98	1.8
Medication	Hydromorphone	0	0.0	1	0.0
Medication	Meperidine	0	0.0	0	0.0
Medication	Methadone	4	0.2	12	0.2
Medication	Morphine	13	0.6	33	0.7
Medication	Oxycodone	27	1.3	47	0.8
Medication	Oxymorphone	0	0.0	0	0.0
Medication	Propoxyphene	0	0.0	0	0.0
Medication	Tramadol	24	1.4	41	0.7
	Amphetamines/Stimulants	46	2.3	168	2.2
Illegal	MDMA	0	0.0	2	0.0
Illegal	MDA	0	0.0	1	0.0
Illegal	MDEA	0	0.0	0	0.0
Illegal	Amphetamine	28	1.5	126	1.5
Illegal	Methamphetamine	11	0.3	71	0.7
Medication	Phentermine	10	0.4	26	0.6
Medication	Methylphenidate	4	0.2	6	0.1
	Dissociative Anesthetics	2	0.2	5	0.2
Illegal	Ketamine	1	0.2	0	0.0
Illegal	PCP	1	0.0	5	0.2
	Benzodiazepines	49	2.6	81	1.9
	Alprazolam	20	1.3	32	0.8
Medication	Bromazepam	0	0.0	1	0.0
Medication	Chlordiazepoxide	2	0.1	4	0.1
Medication	Clonazepam	6	0.4	15	0.4
Medication	Diazepam	17	0.7	21	0.5

Drug Category	Drug	Daytime *N* = 1,991		Nighttime *N* = 5,907 (Ref)	
		N	%	*N*	%
Medication	Nordiazepam	19	0.8	30	0.8
Medication	Lorazepam	3	0.1	4	0.2
Medication	Oxazepam	5	0.2	5	0.1
Medication	Estazolam	0	0.0	0	0.0
Medication	Flunitrazepam	0	0.0	0	0.0
Medication	Flurazepam	0	0.0	0	0.0
Medication	Midazolam	0	0.0	0	0.0
Medication	Nitrazepam	0	0.0	0	0.0
Medication	Phenazepam	0	0.0	0	0.0
Medication	Triazolam	0	0.0	0	0.0
Medication	Temazepam	4	0.4	7	0.2
	Antidepressants	82	3.5*	99	1.6
Medication	Amitriptyline	9	0.4	12	0.3
Medication	Nortriptyline	8	0.3	13	0.3
Medication	Fluoxetine	26	1.1	30	0.6
Medication	Imipramine	1	0.1	2	0.1
Medication	Desipramine	2	0.1	1	0.0
Medication	Amoxapine	0	0.0	0	0.0
Medication	Dothiepin	0	0.0	0	0.0
Medication	Doxepin	0	0.0	0	0.0
Medication	Desmethyldoxepin	0	0.0	0	0.0
Medication	Protriptyline	0	0.0	0	0.0
Medication	Trimipramine	0	0.0	0	0.0
Medication	Mianserine	0	0.0	0	0.0
Medication	Mirtazepine	0	0.0	1	0.0
Medication	Trazodone	8	0.3	7	0.1
Medication	Citalopram	10	0.4	9	0.2
Medication	Paroxetine	1	0.0	0	0.0
Medication	Venlafaxine	2	0.1	2	0.0
Medication	Sertraline	30	1.2	44	0.6
	Barbiturates	6	0.6	22	0.3
Medication	Butalbital	6	0.6	20	0.3
Medication	Pentobarbital	0	0.0	0	0.0
Medication	Secobarbital	0	0.0	0	0.0
Medication	Phenobarbital	0	0.0	2	0.0

Drug Category	Drug	Daytime N = 1,991		Nighttime N = 5,907 (Ref)	
		N	%	*N*	%
	Muscle Relaxants	16	0.6	19	0.4
Medication	Carisoprodol	2	0.1	7	0.1
Medication	Cyclobenzaprine	12	0.5	10	0.2
Medication	Meprobamate	3	0.1	9	0.1
	Sleep Aids				
Medication	Zolpidem	10	0.5	5	0.1
	Cough Suppressants				
Medication	Dextromethorphan	8	0.3	14	0.3
	Antihistamines	71	3.0	104	2.0
Medication	Chlorpheniramine	11	0.1	13	0.2
Medication	Diphenhydramine	63	2.9	91	1.7
Medication	Doxylamine	7	0.3	10	0.2
	Antipsychotics				
Medication	Chlorpromazine	0	0.0	0	0.0
	Synthetic Cannabinoids	8	0.2	7	0.2
Illegal	AM-1220	1	0.0	0	0.0
Illegal	AM-2201	4	0.0	4	0.1
Illegal	AM-2232	0	0.0	0	0.0
Illegal	CP47497	0	0.0	0	0.0
Illegal	CP47497-C8	1	0.0	0	0.0
Illegal	HU-210	0	0.0	0	0.0
Illegal	JWH-018	4	0.1	3	0.1
Illegal	JWH-022	3	0.0	1	0.0
Illegal	JWH-073	3	0.1	3	0.1
Illegal	JWH-200	1	0.0	0	0.0
Illegal	JWH-250	1	0.0	2	0.0
Illegal	XLR-11	2	0.0	4	0.1
Illegal	UR-144	1	0.1	3	0.1
	Number of Drug-positives[†]	816		2,185	
	Number of Drivers Testing Positive[††]	454	22.3	1,245	22.5

N's are unweighted; percentages are weighted.

Ref: Denotes the category used for comparisons in some analyses.

* Indicates statistically significant differences ($p < .05$).

[†] Indicates the total number of positive screenings regardless of how many substances were found in each driver.

[††] Indicates number and percentage of drivers who screened positively for at least one substance.

§ Drugs with the "Medication" designation are also legal although these drugs may be obtained illicitly and used recreationally or for self-medication.

Comparing the 2007 and 2013–2014 Data

The list of drugs analyzed for 2013–2014 was not identical to 2007. Additionally, changes in drug testing technology allowed significantly lower detection thresholds for a number of drugs in 2013–2014 relative to 2007 (Appendix E). To facilitate comparisons, Tables 40 to 43 use only drugs tested for in both studies and recalculated prevalence estimates for the 2013–2014 study using the 2007 cutoff levels. We used 95-percent confidence intervals for all prevalence estimates.

Table 40 shows that the overall prevalence of nighttime drug-positive driving by drug category increased by a statistically significant margin from 2007 to 2013–2014, from 16.3 percent to 20.1 percent ($p < .05$).

Table 40. Comparing 2007 to 2013–2014 NRS: Nighttime Drug Prevalence in Oral Fluid or Blood by Drug Category (Percentage by Column)

	2007 NRS		2013–2014 NRS (Comparable)	
Drug Category	*N*	%	*N*	%
Illegal-only	621	11.3	741	13.2
Medications-only	277	3.9	279	5.1
Illegal & medications	78	1.1	98	1.9
Total drug-negative	4,934	83.7	4,789	79.9*
Total drug-positive	976	16.3	1,118	20.1*

N's are unweighted; percentages are weighted.
* Statistically significant difference from 2007 NRS (based on 95% Confidence Intervals).

Table 41 shows the nighttime drug prevalence by drug class. There were a statistically significant increases in the prevalence of THC-positive, THC-positive-only, and THC-positive plus any other drug drivers in 2013–2014 compared to 2007 ($p < .05$). The prevalence of THC-positive increased from 8.7 percent to 12.7 percent (an increase of 46%); the prevalence of THC-positive-only increased from 6.8% to 10.3% (an increase of 51%) and the prevalence of THC-positive plus any other drugs increased from 1.8 percent to 2.3 percent (an increase of 28%). There was also a statistically significant increase in total drug-positive driving (from 16.3% to 20.1%) and a statistically significant decrease in total drug-negative driving (from 83.7% to 79.9%). None of the other drug classes showed a statistically significant difference.

Table 41. Comparing 2007 to 2013–2014 NRS: Nighttime Drug Prevalence in Oral Fluid or Blood by Drug Class (Percentage by Column)

Drug Class	2007 NRS		2013–2014 NRS (Comparable)	
	N	%	*N*	%
THC-positive	499	8.7	666	12.7*
THC-positive-only	379	6.8	528	10.3*
THC-positive plus any other drug	120	1.8	138	2.3*
Stimulants-only	190	3.2	159	2.1
Narcotic Analgesics-only	104	1.6	125	2.2
Sedatives-only	56	0.8	31	0.8
Antidepressants-only	55	0.7	66	1.0
Other-only	14	0.3	4	0.2
More than one class	58	1.0	67	1.3
Total drug-negative	4,934	83.7	4,789	79.9*
Total drug-positive	976	16.3	1,118	20.1*

N's are unweighted; percentages are weighted.
THC-positive includes results from THC and hydroxy-THC.
"More than one class" excludes drivers who tested positive for THC.
* Statistically different from 2007 NRS (based on 95% Confidence Intervals).

Table 42 shows changes in the prevalence of drug-positive drivers by BrAC level between 2007 and 2013–2014. Among nighttime drivers with no alcohol, there was a statistically significant increase in the prevalence of drug-positive driving and a statistically significant decrease in drug-negative driving. Specifically, the prevalence of nighttime drug-positives among alcohol negative drivers increased from 14.6 percent to 19.4 percent in combined oral fluid or blood; the prevalence of nighttime drug-negatives among drivers with no alcohol decreased from 85.4 percent to 80.6 percent ($p < .05$).

Table 42. Comparing 2007 to 2013–2014 NRS: Nighttime Drug Results and BrAC Levels in Oral Fluid or Blood (Percentage by Column)

	2007 NRS				2013–2014 NRS (Comparable)			
	BrAC (g/210L)				BrAC (g/210L)			
Drug Result	% .00	% .005 – .079	% ≥ .08	All	% .00	% .005 – .079	% ≥ .08	All
	N = 5,241	*N* = 536	*N* = 131	*N* = 5,908	*N* = 5,501	*N* = 331	*N* = 75	*N* = 5,907
Positive	14.6	29.3	31.8	16.3	19.4*	29.8	34.8	20.1
Negative	85.4	70.7	68.2	83.7	80.6*	70.2	65.2	79.9

N's are unweighted; percentages are weighted.
* Statistically different from 2007 NRS (based on 95% Confidence Intervals).

Table 43 shows changes in the prevalence of all THC-positive drivers by BrAC level between 2007 and 2013–2014. Among nighttime drivers with no alcohol, there was a statistically significant increase in the prevalence of THC-positive driving and a statistically significant decrease in THC-negative driving. Specifically, the prevalence of nighttime THC-positives among alcohol negative drivers increased from 7.6 percent to 11.9 percent. The prevalence of nighttime THC-negatives among drivers with no alcohol decreased from 92.4 percent to 88.1 percent ($p < .05$).

Table 43. Comparing 2007 to 2013–2014 NRS: Nighttime Drug Results and BrAC Levels in Oral Fluid or Blood (Percentage by Column)

	2007 NRS				2013–2014 NRS (Comparable)			
	BrAC (g/210L)				BrAC (g/210L)			
THC Result	% .00	% .005 – .079	% ≥ .08	All	% .00	% .005 – .079	% ≥ .08	All
	N = 5,241	*N* = 536	*N* = 131	*N* = 5,908	*N* = 5,501	*N* = 331	*N* = 75	*N* = 5,907
Positive	7.6	17.6	16.5	8.7	11.9*	21.2	29.9	12.7*
Negative	92.4	82.4	83.5	91.3	88.1*	78.8	70.1	87.4*

N's are unweighted; percentages are weighted.
* Statistically different from 2007 NRS (based on 95% Confidence Intervals).

Discussion

The results of the 2013–2014 National Roadside Study estimate alcohol- and drug-positive driving prevalence based on objective biological measures. It is important to emphasize that drug presence does not equal impairment. Some drugs linger in the body long after their impairing effects on driving have passed. Additionally, the wide variety of drugs tested in this study includes medications that may actually improve the driving of certain individuals (such as those taking Ritalin to treat narcolepsy).

Prevalence is a measure of exposure. The potential size of the drug-impaired-driving problem is a function of exposure times degree of impairment.

The intent of this study was to make a careful estimate of drug prevalence; not determine whether drugs affect driving performance or have an impact on crash risk. Such questions must be determined (and are being examined) in other studies.

Improvements in screening and confirmation testing that took place between 2007 and 2013 made the detection of drugs at very low levels possible. Additionally, a wider range of drugs were tested for in 2013–2014 to better capture new patterns of drug use (for instance, synthetic cannabinoids, which were not tested for in 2007). Although necessary to accurately reflect drug-positive driving, the technical improvements adopted in this study also created a challenge in comparing the 2007 and 2013—2014 results.

This study was conducted approximately 6 years after completion of the 2007 NRS, providing the first opportunity compare driver drug prevalence over time. Because we only sampled drivers on Friday day and weekend nights, the results presented in this report may not be representative of the driving population throughout the rest of the week.

Participation rates were high. In total, 85.2 percent (90.2% during the day and 83.6% at night) of eligible drivers contacted provided a valid breath sample to test for alcohol. Of eligible drivers, 71 percent (75.9% during the day and 69.5% at night) provided an oral fluid sample, and 42.2 percent (48.3% during the day and 40.4% at night) provided a blood sample to test for drugs. A non-participant conversion attempt was implemented in the first 49 sites to provide further incentive to those drivers who initially declined participation. Of the 177 drivers who then participated, 34.8 percent were drug-positive compared to 22.2 percent of the general participants – the difference was not statistically significant. However, for the drivers who still declined participation, we have no measure of their drug status, meaning that there may be

underestimation in drug prevalence. Also, in some instances, low sample sizes in the daytime precluded us from making meaningful comparisons.

Drug Prevalence

There was virtually no difference in overall drug prevalence between daytime and nighttime drivers (22.3% for daytime and 22.5% for nighttime drivers) (Table 8). The overall drug prevalence results include drivers who test positive for illegal drugs, medications or both.

The prevalence of illegal drugs-only was significantly higher among males than females among both daytime and nighttime drivers, ($p < .05$) (Table 23). The prevalence of medications only compared to the prevalence of illegal drugs-only, was significantly higher during the daytime and significantly lower among nighttime drivers ($p < .05$) (Tables 20 and 21).

The prevalence of the medications only category was significantly lower for the 16–20 age group compared to the 45–64 group, among both daytime and nighttime drivers ($p < .05$). The prevalence of the medications only category was significantly lower for the 21–34 age group compared to the 45–64 group, but only among nighttime drivers ($p < .05$) (Table 24).

THC was the most prevalent drug, detected in 8.7 percent of daytime drivers and 12.7 percent of nighttime drivers (Table 39). Opioids and their metabolites were the second most prevalent drugs, detected in 5.5 percent of daytime drivers and 4.7 percent of nighttime drivers. During the day, the next most frequently encountered drug class was antidepressants (3.5%), followed by benzodiazepines (2.6%). Among nighttime drivers, cocaine and amphetamines/stimulants were the third most prevalent drugs (2.2%) (Table 39).

Due to the growing concern, especially in some regions of the country, about increased use of synthetic cannabinoids, this study tested for a number of known examples of synthetic cannabinoids. As presented in Tables 36 to 38, the number of drivers who tested positive for the synthetic cannabinoids was very small ($N = 15$). The chemical makeup of these –synthetic compounds change frequently. Accordingly, the particular compounds that were tested for may have become obsolete and the new synthetics that were in use at the time were not included in our testing. It is possible that this study underestimates the use of synthetic cannabinoids.

2007 and 2013–2014 Comparisons

Overall, the prevalence of drug-positive nighttime driving increased significantly between 2007 and 2013–2014. For comparable drugs between the two studies, there was a statistically significant increase in total drug-positive nighttime driving, from 16.3 percent in 2007 to 20.1

percent in 2013–2014 ($p < .05$). There was also a statistically significant decrease in total drug-negative nighttime driving, from 83.7 percent to 79.9 percent ($p < .05$) (Table 40).

There were statistically significant increases in the prevalence of THC-positive, THC-positive only, and THC-positive plus any other drug drivers in 2013–2014 compared to 2007 ($p < .05$). The prevalence of THC-positive increased from 8.7 percent to 12.7 percent (an increase of 46%); the prevalence of THC-positive only increased from 6.8 percent to 10.3 percent (an increase of 51%); and the prevalence of THC-positive plus any other drugs increased from 1.8 percent to 2.3 percent (an increase of 28%). None of the other drug classes showed a statistically significant difference (Table 41).

Changes in the prevalence of THC may reflect a rapidly changing landscape across the United States. Since 2007, there have been dramatic changes in State laws regarding legalized use of marijuana for medical or recreational purposes. As of June 2016, a total of 23 States, the District of Columbia and Guam had operational marijuana and cannabis programs for medical use. Four States (Alaska, Colorado, Oregon and Washington) and the District of Columbia have legalized marijuana for recreational use.

Among nighttime drivers with no alcohol, there was a statistically significant increase in the prevalence of drug-positive driving and a statistically significant decrease in drug-negative driving. Specifically, the prevalence of nighttime drug-positives among drivers with no alcohol increased from 14.6 percent in 2007 to 19.4 percent in 2013-2014 in combined oral fluid or blood; the prevalence of nighttime drug-negatives among drivers with no alcohol decreased from 85.4 percent in 2007 to 80.6 percent in 2013-2014 ($p < .05$) (Table 42).

Among nighttime drivers with no alcohol, there was a statistically significant increase in the prevalence of THC-positive driving and a statistically significant decrease in THC-negative driving from 2007 to 2013-2014. Specifically, the prevalence of nighttime THC-positives among drivers with no alcohol increased from 7.6 percent in 2007 to 11.9 percent in 2013-2014. The prevalence of nighttime THC-negatives among drivers with no alcohol decreased from 92.4 percent in 2007 to 88.1 percent in 2013-2014 ($p < .05$) (Table 43).

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APPENDIX A: ORAL FLUID ONLY TABLES

Table 1. Drug Prevalence by Time of Day in Oral Fluid

Time of Day	N	% Drug-Positive
Day	1,987	18.9
Night	5,894	19.8

In this table, N's are unweighted; percentages are weighted.

Table 2. Drug Prevalence by Session in Oral Fluid

Session	N	% Drug-Positive
1: Friday, 9:30 a.m. to 11:30 a.m. or 1:30 p.m. to 3:30 p.m.	1,987	18.9
2: Friday, 10 p.m. to Midnight	1,768	19.8
3: Friday, 1 a.m. to 3 a.m.	1,198	21.1
4: Saturday, 10 p.m. to Midnight	1,819	18.2
5: Saturday, 1 a.m. to 3 a.m.	1,109	21.9

In this table, N's are unweighted; percentages are weighted.

Table 3. Drug Prevalence by Time of Day and Region in Oral Fluid

Time of Day	Region	N	% Drug Positive
Day	Midwest	484	22.3
	Northeast	386	20.8
	South	467	19.7
	West	650	12.7
	Total	1,987	18.9
Night	Midwest	1,423	27.2
	Northeast	1,066	18.0
	South	1,519	19.7
	West	1,886	14.1
	Total	5,894	19.8

In this table, N's are unweighted; percentages are weighted.

Table 4. Drug Prevalence by Time of Day and Gender in Oral Fluid

Time of Day	Gender	N	% Drug-Positive
Day	Males	997	20.6
	Females	939	17.5
	Total	1,936	19.1
Night	Males	3,530	20.7
	Females	2,309	18.0
	Total	5,839	19.6

In this table, N's are unweighted; percentages are weighted.

Table 5. Drug Prevalence by Time of Day and Age in Oral Fluid

Time of Day	Age	N	% Drug Positive
Day	16–20	107	15.2
	21–34	540	21.3
	35–44	349	15.9
	45–64	670	18.4
	65+	255	18.4
	Total	1,921	18.5
Night	16–20	841	15.7
	21–34	2,582	22.3
	35–44	928	17.7
	45–64	1,227	19.7
	65+	178	13.9
	Total	5,756	19.8

In this table, N's are unweighted; percentages are weighted.

Table 6. Drug Prevalence by Time of Day, Age, and Gender in Oral Fluid

Time of Day	Gender	Age	N	% Drug Positive
Day	Males	16–20	62	20.6
		21–34	262	26.1
		35–44	164	19.2
		45–64	325	16.8
		65+	165	16.6
		Total	978	19.9
	Females	16–20	44	5.9
		21–34	273	17.3
		35–44	184	13.2
		45–64	342	19.7
		65+	89	22.4
		Total	932	17.4
Night	Males	16–20	526	16.0
		21–34	1,590	24.3
		35–44	538	17.5
		45–64	696	19.5
		65+	110	9.9
		Total	3,460	20.6
	Females	16–20	311	12.9
		21–34	985	18.8
		35–44	388	18.0
		45–64	526	20.1
		65+	68	20.2
		Total	2,278	18.2

In this table, N's are unweighted; percentages are weighted.

Table 7. Drug Prevalence by Time of Day and Race/Ethnicity in Oral Fluid

Time of Day	Race/Ethnicity	N	% Drug Positive
Day	African-American	346	21.8
	Asian	58	4.8
	Hispanic	207	7.1
	White	1,159	20.1
	Other	87	21.5
	Total	1,857	18.7
Night	African-American	1137	25.1
	Asian	246	8.3
	Hispanic	590	11.8
	White	3,150	19.4
	Other	354	18.1
	Total	5,477	19.7

In this table, N's are unweighted; percentages are weighted.
Racial/Ethnic groups other than "Hispanic" are always "non-Hispanic."

Table 8. Drug Prevalence by Time of Day and Vehicle Type in Oral Fluid

Time of Day	Vehicle Type	N	% Drug Positive
Day	Passenger Vehicle	1,108	20.9
	Pickup	217	20.2
	SUV	434	15.3
	Van & Minivan	161	17.1
	Motorcycle	12	6.8
	Total	1,932	19.1
Night	Passenger Vehicle	3,702	21.0
	Pickup	552	15.3
	SUV	1,243	17.4
	Van & Minivan	291	18.7
	Motorcycle	41	17.9
	Total	5,829	19.6

In this table, N's are unweighted; percentages are weighted.

Table 9. Drug Prevalence by Class, Time of Day, and Region in Oral Fluid

Time of Day	Drug Class	Midwest %	Northeast %	South %	West %	All %
		N = 484	N = 386	N = 467	N = 650	N = 1,987
Day	Antidepressants-only	0.4	0.4	1.3	1.1	0.9
	Cannabinoids/ Marijuana-only	9.8	4.2	6.1	4.0	6.0
	Narcotic Analgesics-only	2.8	3.1	3.6	2.2	3.1
	Sedatives-only	1.7	1.8	1.1	0.10	1.1
	Stimulants-only	1.1	2.6	1.6	1.0	1.6
	Other-only	2.4	1.5	2.5	1.8	2.1
	More than 1 Class	4.1	7.3	3.4	2.8	4.1
	Total drug-positive	22.3	20.8	19.7	12.7	18.9
	Total drug-negative	77.7	79.2	80.3	87.3	81.1
		N = 1,423	N = 1,066	N = 1,519	N = 1,886	N = 5,894
Night	Antidepressants-only	0.1	0.2	0.3	0.3	0.3
	Cannabinoids/ Marijuana-only	14.3	7.8	9.0	5.2	9.1
	Narcotic Analgesics-only	3.0	3.1	1.5	1.9	2.2
	Sedatives-only	0.6	1.2	1.1	0.5	0.9
	Stimulants-only	2.4	1.5	2.1	2.6	2.2
	Other-only	1.2	1.3	2.1	1.2	1.6
	More than 1 Class	5.6	2.8	3.6	2.4	3.7
	Total drug-positive	27.2	18.0	19.7	14.1	19.8
	Total drug-negative	72.8	82.0	80.3	85.9	80.2

In this table, N's are unweighted; percentages are weighted.

"More than 1 Class" – Drivers testing positive for more than one drug class are counted only in this category.

Table 10. Drug Prevalence by Class, Time of Day, and Gender in Oral Fluid

Time of Day	Drug Class	Males %	Females %	Total %
Day		N = 997	N = 939	N = 1,936
	Antidepressants-only	0.2	1.6	0.9
	Cannabinoids/ Marijuana-only	9.2	3.0	6.1
	Narcotic Analgesics-only	3.5	2.5	3.0
	Sedatives-only	0.9	1.5	1.2
	Stimulants-only	2.0	1.2	1.6
	Other-only	2.0	2.3	2.2
	More than 1 Class	2.9	5.4	4.1
	Total drug-positive	20.6	17.5	19.1
	Total drug-negative	79.4	82.5	80.9
Night		N = 3,530	N = 2,309	N = 5,839
	Antidepressants-only	0.2	0.4	0.3
	Cannabinoids/ Marijuana-only	11.0	6.2	9.0
	Narcotic Analgesics-only	1.9	2.5	2.2
	Sedatives-only	0.6	1.4	0.9
	Stimulants-only	2.1	2.1	2.1
	Other-only	1.4	1.8	1.6
	More than 1 Class	3.6	3.6	3.6
	Total drug-positive	20.7	18.0	19.6
	Total drug-negative	79.3	82.0	80.4

In this table, N's are unweighted; percentages are weighted.

"More than 1 Class" – Drivers testing positive for more than one drug class are counted only in this category.

Table 11. Drug Prevalence by Class, Time of Day, and Age in Oral Fluid

Time of Day	Drug Class	16–20 %	21–34 %	35–44 %	45–64 %	65+ %	Total %
Day		N = 107	N = 540	N = 349	N = 670	N = 255	N = 1,921
	Antidepressants-only	0.0	0.4	1.3	0.8	2.0	0.9
	Cannabinoids/ Marijuana-only	13.5	8.4	4.3	3.1	4.4	5.6
	Narcotic Analgesics-only	0.0	2.8	3.4	3.3	3.6	3.0
	Sedatives-only	0.0	1.2	0.2	2.1	0.4	1.2
	Stimulants-only	0.0	1.7	2.6	1.4	1.4	1.6
	Other-only	1.0	1.6	1.5	2.5	4.0	2.1
	More than 1 Class	0.8	5.1	2.6	5.1	2.7	4.1
	Total drug-positive	15.2	21.3	15.9	18.4	18.4	18.5
	Total drug-negative	84.8	78.7	84.1	81.6	81.6	81.5
Night		N = 841	N = 2,582	N = 928	N = 1,227	N = 178	N = 5,756
	Antidepressants-only	0.2	0.1	0.1	0.5	1.5	0.3
	Cannabinoids/ Marijuana-only	11.3	12.2	6.4	4.9	0.0	9.2
	Narcotic Analgesics-only	0.3	1.5	2.2	4.3	4.7	2.2
	Sedatives-only	0.3	0.8	1.9	0.8	0.6	0.9
	Stimulants-only	0.9	2.4	1.7	2.6	2.3	2.1
	Other-only	0.5	1.5	1.9	2.0	2.9	1.6
	More than 1 Class	2.2	3.7	3.5	4.6	1.9	3.6
	Total drug-positive	15.7	22.3	17.7	19.7	13.9	19.8
	Total drug-negative	84.3	77.7	82.3	80.3	86.1	80.2

In this table, N's are unweighted; percentages are weighted.

"More than 1 Class" – Drivers testing positive for more than one drug class are counted only in this category.

Table 12. Drug Prevalence by Category Time of Day in Oral Fluid

Time of Day	Drug Category	N	%
Day	Illegal-only	156	8.4
	Medications-only	199	8.8
	Illegal & Medications	30	1.7
	Negative	1,602	81.1
	Total	1,987	100.0
Night	Illegal-only	704	12.4
	Medications-only	320	5.9
	Illegal & Medications	78	1.5
	Negative	4,792	80.2
	Total	5,894	100.0

In this table, N's are unweighted; percentages are weighted.

Medications include prescription and over-the-counter drugs.

Table 13. Drug Prevalence by Category, Time of Day, and Region in Oral Fluid

Time	Region	Drug Category	N	%
Day	Midwest	Illegal-only	45	11.5
		Medications-only	50	9.3
		Illegal & Medications	5	1.5
		Negative	384	77.7
		Total	484	100.0
	Northeast	Illegal-only	38	7.6
		Medications-only	37	10.1
		Illegal & Medications	7	3.1
		Negative	304	79.2
		Total	386	100.0
	South	Illegal-only	36	8.9
		Medications-only	50	9.0
		Illegal & Medications	9	1.8
		Negative	372	80.3
		Total	467	100.0
	West	Illegal-only	37	5.3
		Medications-only	62	6.8
		Illegal & Medications	9	0.6
		Negative	542	87.3
		Total	650	100.0
Night	Midwest	Illegal-only	196	17.8
		Medications-only	91	6.5
		Illegal & Medications	23	2.9
		Negative	1,113	72.8
		Total	1,423	100.0
	Northeast	Illegal-only	110	10.2
		Medications-only	58	6.8
		Illegal & Medications	12	1.0
		Negative	886	82.0
		Total	1,066	100.0
	South	Illegal-only	181	12.2
		Medications-only	98	6.1
		Illegal & Medications	28	1.4
		Negative	1,212	80.3
		Total	1,519	100.0
	West	Illegal-only	217	9.3
		Medications-only	73	4.3
		Illegal & Medications	15	0.5
		Negative	1,581	85.9
		Total	1,886	100.0

In this table, N's are unweighted; percentages are weighted.
Medications include prescription and over-the-counter drugs.

Table 14. Drug Prevalence by Category, Time of Day, and Gender in Oral Fluid

Time of Day	Gender	Drug Category	N	%
Day	Male	Illegal-only	115	12.6
		Medications-only	84	7.0
		Illegal & Medications	10	1.0
		Negative	788	79.4
		Total	997	100.0
	Female	Illegal-only	39	4.6
		Medications-only	107	10.5
		Illegal & Medications	20	2.5
		Negative	773	82.5
		Total	939	100.0
Night	Male	Illegal-only	503	14.9
		Medications-only	148	4.3
		Illegal & Medications	44	1.5
		Negative	2,835	79.3
		Total	3,530	100.0
	Female	Illegal-only	190	8.5
		Medications-only	170	8.1
		Illegal & Medications	32	1.4
		Negative	1,917	82.0
		Total	2,309	100.0

In this table, N's are unweighted; percentages are weighted.
Medications include prescription and over-the-counter drugs.

Table 15. Drug Prevalence by Category, Time of Day, and Age in Oral Fluid

Time of Day	Age	Drug Category	N	%
Day	16–20	Illegal-only	17	14.6
		Medications-only	1	0.6
		Illegal & Medications	0	0.0
		Negative	89	84.8
		Total	107	100.0
	21–34	Illegal-only	61	11.9
		Medications-only	37	7.0
		Illegal & Medications	9	2.3
		Negative	433	78.7
		Total	540	100.0
	35–44	Illegal-only	26	7.4
		Medications-only	39	7.7
		Illegal & Medications	3	0.8
		Negative	281	84.1
		Total	349	100.0
	45–64	Illegal-only	37	5.2
		Medications-only	76	10.8
		Illegal & Medications	15	2.4
		Negative	542	81.6
		Total	670	100.0
	65+	Illegal-only	9	5.6
		Medications-only	37	11.9
		Illegal & Medications	2	0.9
		Negative	207	81.6
		Total	255	100.0
Night	16–20	Illegal-only	113	13.8
		Medications-only	11	1.3
		Illegal & Medications	4	0.7
		Negative	713	84.3
		Total	841	100.0
	21–34	Illegal-only	397	16.5
		Medications-only	92	4.1
		Illegal & Medications	38	1.8
		Negative	2,055	77.7
		Total	2,582	100.0
	35–44	Illegal-only	61	8.3
		Medications-only	67	7.4
		Illegal & Medications	19	2.0
		Negative	781	82.3
		Total	928	100.0
	45–64	Illegal-only	110	7.8
		Medications-only	123	10.8
		Illegal & Medications	14	1.1
		Negative	980	80.3
		Total	1,227	100.0
	65+	Illegal-only	4	2.3
		Medications-only	22	11.6
		Illegal & Medications	0	0.0
		Negative	152	86.1
		Total	178	100.0

In this table, N's are unweighted; percentages are weighted.

Medications include prescription and over-the-counter drugs.

Table 16. Drug Prevalence by Time of Day and BrAC in Oral Fluid

Time of Day	Drug Result	N	BrAC (g/dL)		
			% .00	% .005 - .079	% ≥ .08
Day	Positive	385	97.0	1.4	1.6
	Negative	1,602	99.7	0.1	0.2
	Total	1,987	99.2	0.4	0.4
Night	Positive	1,102	89.8	8.4	1.9
	Negative	4,792	94.1	5.0	0.9
	Total	5,894	93.2	5.7	1.1

In this table, N's are unweighted; percentages are weighted.

Table 17. Drug Prevalence by Time of Day and BrAC in Oral Fluid (Percentages Calculated by Column)

Time of Day	Drug Result	BrAC (g/dL)			
		% .00	% .005 - .079	% ≥ .08	% All
Day		N = 1,972	N = 7	N = 8	N = 1,987
	Positive	18.5	73.4	69.1	18.9
	Negative	81.5	26.6	30.9	81.1
Night		N = 5,488	N = 331	N = 75	N = 5,894
	Positive	19.0	29.1	34.8	19.8
	Negative	81.0	70.9	65.2	80.2

In this table, N's are unweighted; percentages are weighted.

Table 18. BrAC Among Drug-Positive Drivers by Time of Day and Age in Oral Fluid

Time of Day	Age	N	BrAC (g/dL)		
			% .00	% .005 - .079	% ≥ .08
Day	16–20	18	100.0	0.0	0.0
	21–34	107	93.3	3.6	3.1
	35–44	68	99.3	0.0	0.7
	45–64	128	97.3	1.1	1.6
	65+	48	100.0	0.0	0.0
	Total positive	369	96.8	1.5	1.7
Night	16–20	128	92.6	6.9	0.5
	21–34	527	88.5	10.4	1.1
	35–44	147	89.9	4.0	6.1
	45–64	247	91.3	6.6	2.1
	65+	26	91.9	8.1	0.0
	Total positive	1,075	89.9	8.2	1.9

In this table, N's are unweighted; percentages are weighted.

Table 19. BrAC Among Drug-Positive Drivers by Drug Category and Time of Day in Oral Fluid (Percentage by Row)

Time of Day	Drug Category	N	BrAC (g/dL)		
			% .00	% .005 - .079	% ≥ .08
Day	Illegal-only	156	94.1	3.2	2.8
	Medications-only	199	99.3	0.0	0.7
	Illegal & Medications	30	100.0	0.0	0.0
Night	Illegal-only	704	85.8	11.5	2.7
	Medications-only	320	97.6	2.4	0.1
	Illegal & Medications	78	92.3	5.5	2.2

In this table, N's are unweighted; percentages are weighted.
Medications include prescription and over-the-counter drugs.

Table 20. Driver BrAC by Drug Category, Time of Day, and Age in Oral Fluid

Time of Day	Age	Drug Category	N	BrAC (g/dL)		
				% .00	% .005 - .079	% ≥ .08
Day	16–20	Illegal-only	17	100.0	0.0	0.0
		Medications-only	1	100.0	0.0	0.0
		Illegal & Medications	0	NA	NA	NA
		Negative	89	100.0	0.0	0.0
		Total	107	100.0	0.0	0.0
	21–34	Illegal-only	61	89.5	6.4	4.1
		Medications-only	37	97.7	0.0	2.3
		Illegal & Medications	9	100.0	0.0	0.0
		Negative	433	99.9	0.1	0.0
		Total	540	98.5	0.8	0.7
	35–44	Illegal-only	26	100.0	0.0	0.0
		Medications-only	39	98.6	0.0	1.5
		Illegal & Medications	3	100.0	0.0	0.0
		Negative	281	99.4	0.3	0.3
		Total	349	99.4	0.3	0.4
	45–64	Illegal-only	37	90.4	3.9	5.8
		Medications-only	76	100.0	0.0	0.0
		Illegal & Medications	15	100.0	0.0	0.0
		Negative	542	99.9	0.1	0.0
		Total	670	99.4	0.3	0.3
	65+	Illegal-only	9	100.0	0.0	0.0
		Medications-only	37	100.0	0.0	0.0
		Illegal & Medications	2	100.0	0.0	0.0
		Negative	207	99.8	0.0	0.2
		Total	255	99.8	0.0	0.2
Night	16–20	Illegal-only	113	91.5	7.9	0.6
		Medications-only	11	100.0	0.0	0.0
		Illegal & Medications	4	100.0	0.0	0.0
		Negative	713	97.4	2.6	0.0
		Total	841	96.6	3.3	0.1
	21–34	Illegal-only	397	87.0	11.5	1.5
		Medications-only	92	92.8	7.2	0.0
		Illegal & Medications	38	92.5	7.5	0.0
		Negative	2,055	92.6	6.2	1.2
		Total	2,582	91.7	7.1	1.2
	35–44	Illegal-only	61	81.1	6.4	12.5
		Medications-only	67	98.8	0.8	0.5
		Illegal & Medications	19	94.0	6.0	0.0
		Negative	781	95.0	4.2	0.9
		Total	928	94.1	4.1	1.8
	45–64	Illegal-only	110	80.3	16.4	3.3
		Medications-only	123	99.8	0.2	0.0
		Illegal & Medications	14	84.5	1.9	13.7
		Negative	980	94.9	4.3	0.8
		Total	1,227	94.2	4.8	1.1
	65+	Illegal-only	4	51.2	48.8	0.0
		Medications-only	22	100.0	0.0	0.0
		Illegal & Medications	0	NA	NA	NA
		Negative	152	90.8	8.1	1.1
		Total	178	90.9	8.1	0.9

In this table, N's are unweighted; percentages are weighted.
Medications include prescription and over-the-counter drugs.

Table 21. BrAC of Drivers by Drug Category, Gender, and Time of Day in Oral Fluid

Time of Day	Gender	Drug Category	N	BrAC (g/dL)		
				% .00	% .005 - .079	% ≥ .08
Day	Males	Illegal-only	115	92.4	4.0	3.6
		Medications-only	84	98.8	0.0	1.3
		Illegal & Medications	10	100.0	0.0	0.0
		Negative	788	99.6	0.2	0.2
		Total	997	98.7	0.7	0.7
	Females	Illegal-only	39	98.4	1.1	0.5
		Medications-only	107	99.6	0.0	0.4
		Illegal & Medications	20	100.0	0.0	0.0
		Negative	773	100.0	0.0	0.0
		Total	939	99.9	0.1	0.1
Night	Males	Illegal-only	503	85.0	11.8	3.2
		Medications-only	148	95.2	4.8	0.0
		Illegal & Medications	44	88.8	7.4	3.8
		Negative	2,835	93.3	6.0	0.7
		Total	3,530	92.1	6.8	1.1
	Females	Illegal-only	190	90.0	8.5	1.6
		Medications-only	170	99.3	0.6	0.2
		Illegal & Medications	32	96.7	3.4	0.0
		Negative	1,917	95.2	3.7	1.1
		Total	2,309	95.1	3.9	1.1

In this table, N's are unweighted; percentages are weighted.
Medications include prescription and over-the-counter drugs.

Table 22: Drug Prevalence of Driver Seat Belt Use by Time of Day in Oral Fluid

Driver Seat Belt Observation		N	% Drug Negative	% Drug Positive
Day	Yes	1,892	80.9	19.1
	No	21	74.9	25.1
Night	Yes	5,722	80.7	19.3
	No	55	54.8	45.2

In this table, N's are unweighted; percentages are weighted.

Table 23. Driver Drug Class Prevalence by Seat Belt Use and Time of Day in Oral Fluid (Percentages Calculated by Row)

Driver Seat Belt Observation		N	% Antidepressants only	% Cannabinoids/ Marijuana only	% Narcotic Analgesic only	% Sedatives only	% Stimulants only	% Other only	% >1 Drug Class	% Negative
Day	Yes	1,892	0.8	6.2	3.0	1.2	1.7	2.3	4.0	80.9
	No	21	0.0	6.4	0.0	0.0	0.0	0.0	18.7	74.9
Night	Yes	5,777	0.3	8.7	2.2	0.9	2.1	1.6	3.6	80.7
	No	55	0.0	31.8	4.8	0.0	3.6	0.0	5.0	54.8

In this table, N's are unweighted; percentages are weighted.

Table 24. Driver Drug Category Prevalence by Seat Belt Use and Time of Day in Oral Fluid (Percentages Calculated by Row)

Driver Seat Belt Observation		N	% Illegal-only	% Illegal & Medications	% Medications -only	% Negative
Day	Yes	1,892	8.7	1.6	8.8	80.9
	No	21	9.6	15.5	0.0	74.9
Night	Yes	5,722	12.0	1.4	5.9	80.7
	No	55	35.8	3.4	6.0	54.8

In this table, N's are unweighted; percentages are weighted.
Medications include prescription and over-the-counter drugs

Table 25. Drug Prevalence of Motorcycle Operators by Helmet Use and Time of Day in Oral Fluid

Helmet Use		N	% Drug-Negative	% Drug-Positive
Day	Yes	9	92.3	7.8
	No	3	100.0	0.0
Night	Yes	24	89.3	10.7
	No	16	71.3	28.8

In this table, Ns are unweighted; percentages are weighted.

Table 26. Drug Class Prevalence of Motorcycle Operators by Helmet Use and Time of Day (Percentages Calculated by Row)

Helmet Use		N	% Antidepressants-only	% Cannabinoids/ Marijuana-only	% Narcotic Analgesic-only	% Sedatives-only	% Stimulants-only	% Other-only	% >1 Drug Class	% Negative
Day	Yes	9	0.0	0.0	7.8	0.0	0.0	0.0	0.0	92.3
	No	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Night	Yes	24	0.0	3.9	4.6	0.0	2.2	0.0	0.0	89.3
	No	16	0.0	16.4	0.0	0.0	3.7	0.0	8.7	71.3

In this table, N's are unweighted; percentages are weighted.

Table 27. Drug Category Prevalence of Motorcycle Operators by Helmet Use and Time of Day in Oral Fluid

Helmet Use		N	% Illegal-only	% Illegal & Medications	% Medications-only	% Negative
Day	Yes	9	0.0	0.0	7.8	92.3
	No	3	0.0	0.0	0.0	100.0
Night	Yes	24	6.1	0.0	4.6	89.3
	No	16	20.1	6.2	2.5	71.3

In this table, N's are unweighted; percentages are weighted.

Table 28. Prevalence of Synthetic Cannabinoids by Region in Oral Fluid

Region	N	% Drug-Positive
Midwest	1,907	0.1
Northeast	1,452	0.2
South	1,986	0.1
West	2,536	0.3
Total	7,881	0.2

In this table, N's are unweighted; percentages are weighted.

Table 29. Prevalence of Synthetic Cannabinoids by Gender in Oral Fluid

Gender	N	% Drug-Positive
Female	3,248	0.1
Male	4,527	0.1
Total	7,775	0.1

In this table, N's are unweighted; percentages are weighted.

Table 30. Prevalence of Synthetic Cannabinoids by Age in Oral Fluid

Age	N	% Drug-Positive
16–20	948	0.3
21–34	3,122	0.1
35–44	1,277	0.1
45–64	1,897	0.2
65+	433	0.0
Total	7,677	0.2

In this table, N's are unweighted; percentages are weighted.

Table 31. Drug Prevalence among Daytime and Nighttime Drivers in Oral Fluid

Drug	Daytime N = 1,987		Nighttime N = 5,894	
	N	%	N	%
Cannabinoids/ Marijuana	137	7.4	600	11.3
THC (Marijuana)	137	7.4	600	11.3
11-OH-THC (all also positive for THC)	0	0.0	0	0.0
Cocaine	30	1.5	128	2.2
Cocaine	27	1.4	120	2.0
Benzoylecgonine	27	1.3	115	2.0
Cocaethylene	3	0.2	20	0.3
Opioids	107	5.1	230	4.2
Codeine	9	0.6	16	0.3
Heroin	5	0.4	21	0.4
Naltrexone	1	0.0	1	0.0
Buprenorphine	7	0.4	13	0.2
Norbuprenorphine	3	0.2	2	0.0
Fentanyl	2	0.1	10	0.1
Hydrocodone	49	1.9	93	1.7
Hydromorphone	0	0.0	1	0.0
Meperidine	0	0.0	0	0.0
Methadone	3	0.2	12	0.2
Morphine	12	0.6	31	0.6
Oxycodone	25	1.1	47	0.8
Oxymorphone	0	0.0	0	0.0
Propoxyphene	0	0.0	0	0.0
Tramadol	23	1.3	38	0.7
Amphetamines/Stimulants	39	1.9	158	2.1
MDMA	0	0.0	2	0.0
MDA	0	0.0	1	0.0
MDEA	0	0.0	0	0.0
Amphetamine	24	1.3	116	1.4
Methamphetamine	9	0.3	69	0.7
Phentermine	9	0.2	23	0.5
Methylphenidate	3	0.2	5	0.1
Dissociative Anesthetics	2	0.2	5	0.2
Ketamine	1	0.2	0	0.0
PCP	1	0.0	5	0.2
Benzodiazepines	36	2.2	61	1.4
Alprazolam	16	1.1	30	0.7
Bromazepam	0	0.0	1	0.0
Chlordiazepoxide	1	0.0	3	0.0
Clonazepam	4	0.4	14	0.4
Diazepam	8	0.4	9	0.1

Drug	Daytime N = 1,987		Nighttime N = 5,894	
	N	%	N	%
Nordiazepam	13	0.6	13	0.3
Lorazepam	2	0.1	4	0.2
Oxazepam	2	0.1	1	0.0
Estazolam	0	0.0	0	0.0
Flunitrazepam	0	0.0	0	0.0
Flurazepam	0	0.0	0	0.0
Midazolam	0	0.0	0	0.0
Nitrazepam	0	0.0	0	0.0
Phenazepam	0	0.0	0	0.0
Triazolam	0	0.0	0	0.0
Temazepam	2	0.2	1	0.0
Antidepressants	39	1.7	26	0.4
Amitriptyline	9	0.4	8	0.2
Nortriptyline	8	0.3	10	0.2
Fluoxetine	8	0.4	6	0.1
Imipramine	1	0.1	1	0.0
Desipramine	2	0.1	1	0.0
Amoxapine	0	0.0	0	0.0
Dothiepin	0	0.0	0	0.0
Doxepin	0	0.0	0	0.0
Desmethyldoxepin	0	0.0	0	0.0
Protriptyline	0	0.0	0	0.0
Trimipramine	0	0.0	0	0.0
Mianserine	0	0.0	0	0.0
Mirtazepine	0	0.0	0	0.0
Trazodone	3	0.1	1	0.0
Citalopram	3	0.2	2	0.0
Paroxetine	0	0.0	0	0.0
Venlafaxine	2	0.1	2	0.0
Sertraline	14	0.6	6	0.1
Barbiturates	5	0.5	16	0.2
Butalbital	5	0.5	15	0.2
Pentobarbital	0	0.0	0	0.0
Secobarbital	0	0.0	0	0.0
Phenobarbital	0	0.0	1	0.0
Pain Drugs	13	0.3	14	0.3
Carisoprodol	2	0.1	6	0.1
Cyclobenzaprine	9	0.2	6	0.1
Meprobamate	3	0.1	7	0.1
Sleep Aids	2	0.1	1	0.0
Zolpidem	2	0.1	1	0.0
Cough Suppressants	8	0.3	14	0.3
Dextromethorphan	8	0.3	14	0.3

Drug	Daytime N = 1,987		Nighttime N = 5,894	
	N	%	N	%
Antihistamines	69	2.8	100	1.8
Chlorpheniramine	11	0.1	13	0.2
Diphenhydramine	61	2.7	88	1.6
Doxylamine	6	0.1	9	0.1
Antipsychotics	0	0.0	0	0.0
Chlorpromazine	0	0.0	0	0.0
Synthetic Cannabinoids	8	0.2	6	0.1
AM-1220	0	0.0	0	0.0
AM-2201	4	0.0	2	0.1
AM-2232	0	0.0	0	0.0
CP47497	0	0.0	0	0.0
CP47497-C8	1	0.0	0	0.0
HU-210	0	0.0	0	0.0
JWH-018	3	0.0	2	0.1
JWH-022	3	0.0	1	0.0
JWH-073	3	0.1	3	0.1
JWH-200	0	0.0	0	0.0
JWH-250	1	0.0	1	0.0
XLR-11	2	0.0	3	0.1
UR-144	1	0.1	2	0.1
All Drug Positives	603		1648	
All Tested Drivers	385	18.9	1,102	19.8

In this table, N's are unweighted; percentages are weighted.

APPENDIX B: BLOOD-ONLY TABLES

Table 1. Drug Prevalence by Time of Day in Blood

Time of Day	N	% Drug-Positive
Day	1,263	21.6
Night	3,423	21.3

In this table, N's are unweighted; percentages are weighted.

Table 2. Drug Prevalence by Session in Blood

Session	N	% Drug-Positive
1: Friday, 9:30 a.m. to 11:30 a.m. or 1:30 p.m. to 3:30 p.m.	1,263	21.6
2: Friday, 10 p.m. to Midnight	1,048	20.8
3: Friday, 1 a.m. to 3 a.m.	692	19.8
4: Saturday, 10 p.m. to Midnight	1,075	20.6
5: Saturday, 1 a.m. to 3 a.m.	608	26.0

In this table, N's are unweighted; percentages are weighted.

Table 3. Drug Prevalence by Time of Day and Region in Blood

Time of Day	Region	N	% Drug-Positive
Day	Midwest	305	24.4
	Northeast	247	20.9
	South	299	22.7
	West	412	16.4
	Total	1,263	21.6
Night	Midwest	821	31.1
	Northeast	590	16.4
	South	873	21.5
	West	1,139	14.9
	Total	3,423	21.3

In this table, N's are unweighted; percentages are weighted.

Table 4. Drug Prevalence by Time of Day and Gender in Blood

Time of Day	Gender	N	% Drug-Positive
Day	Males	609	20.6
	Females	631	23.3
	Total	1,240	21.7
Night	Males	2,013	20.9
	Females	1,374	21.4
	Total Nighttime	3,387	21.1

In this table, percentages are weighted.

Table 5. Drug Prevalence by Time of Day and Age in Blood

Time of Day	Age	N	% Drug-Positive
Day	16–20	58	20.2
	21–34	358	28.1
	35–44	236	21.0
	45–64	436	20.1
	65+	151	12.4
	Total	1,239	21.7
Night	16–20	425	21.4
	21–34	1,559	23.6
	35–44	563	18.7
	45–64	729	20.1
	65+	99	16.8
	Total	3,375	21.6

In this table, N's are unweighted; percentages are weighted.

Table 6. Drug Prevalence by Time of Day, Age, and Gender in Blood

Time of Day	Gender	Age	N	% Drug-Positive
Day	Males	16–20	36	26.2
		21–34	166	33.9
		35–44	110	30.4
		45–64	195	15.9
		65+	97	12.4
		Total	604	23.5
	Females	16–20	21	8.3
		21–34	190	23.5
		35–44	126	13.1
		45–64	238	22.9
		65+	53	12.7
		Total	628	20.1
Night	Males	16–20	273	20.4
		21–34	943	23.4
		35–44	321	19.3
		45–64	402	17.3
		65+	63	19.0
		Total	2,002	21.0
	Females	16–20	148	18.1
		21–34	612	23.3
		35–44	240	18.1
		45–64	325	23.5
		65+	36	13.0
		Total	1,361	21.6

In this table, N's are unweighted; percentages are weighted.

Table 7. Drug Prevalence by Time of Day and Race/Ethnicity in Blood

Time of Day	Race/Ethnicity	N	% Drug-Positive
Day	African-American	258	23.6
	Asian	28	11.0
	Hispanic	127	12.3
	White	731	23.3
	Other	52	19.3
	Total	1,196	22.0
Night	African-American	743	25.4
	Asian	141	12.2
	Hispanic	331	13.8
	White	1,775	21.5
	Other	231	13.4
	Total	3,221	21.2

In this table, N's are unweighted; percentages are weighted.
Racial/Ethnic groups other than "Hispanic" are always "non-Hispanic."

Table 8. Drug Prevalence by Time of Day and Vehicle Type in Blood

Time of Day	Vehicle Type	N	% Drug-Positive
Day	Passenger Vehicle	725	24.3
	Pickup	121	14.8
	SUV	279	20.8
	Van & Minivan	106	15.4
	Motorcycle	5	0.0
	Total	1,236	21.7
Night	Passenger Vehicle	2,174	23.4
	Pickup	308	14.8
	SUV	710	17.1
	Van & Minivan	173	19.4
	Motorcycle	16	18.8
	Total	3,381	21.1

In this table, N's are unweighted; percentages are weighted.

Table 9. Drug Prevalence by Class, Time of Day, and Region in Blood

Time of Day	Drug Class	Midwest %	Northeast %	South %	West %	All %
		N = 305	N = 247	N = 299	N = 412	N = 1,263
Day	Antidepressants-only	2.1	3.2	2.8	5.6	3.2
	Cannabinoids/ Marijuana-only	11.9	5.0	7.1	4.3	7.2
	Narcotic Analgesics-only	0.8	3.4	4.0	1.1	2.7
	Sedatives-only	1.1	0.5	1.9	0.2	1.2
	Stimulants-only	1.7	1.2	1.7	0.9	1.4
	Other-only	1.0	1.1	1.8	1.9	1.5
	More than 1 Class	5.8	6.6	3.4	2.4	4.4
	Total drug-positive	24.4	20.9	22.7	16.4	21.6
	Total drug-negative	75.6	79.1	77.3	83.6	78.4
		N = 821	N = 590	N = 873	N = 1,139	N = 3,423
Night	Antidepressants-only	1.5	1.4	1.2	1.6	1.4
	Cannabinoids/ Marijuana-only	17.8	7.0	9.6	6.0	10.2
	Narcotic Analgesics-only	2.3	2.6	2.6	2.0	2.4
	Sedatives-only	1.0	1.8	1.5	0.4	1.2
	Stimulants-only	2.7	1.2	1.3	2.0	1.7
	Other-only	0.8	0.5	1.2	0.6	0.9
	More than 1 Class	5.0	2.0	4.1	2.2	3.5
	Total drug-positive	31.1	16.4	21.5	14.8	21.3
	Total drug-negative	68.9	83.7	78.5	85.1	78.7

In this table, N's are unweighted; percentages are weighted.

"More than 1 Class" – Drivers testing positive for more than one drug class are counted only in this category.

Table 10. Drug Prevalence by Class, Time of Day, and Gender in Blood

Time of Day	Drug Class	Males %	Females %	Total %
		N = 609	N = 631	N = 1,240
Day	Antidepressants-only	2.5	3.9	3.2
	Cannabinoids/ Marijuana-only	10.4	4.2	7.2
	Narcotic-Analgesics-only	3.7	1.8	2.7
	Sedatives-only	1.3	1.1	1.2
	Stimulants-only	1.0	2.0	1.5
	Other-only	1.0	2.1	1.6
	More than 1 Class	3.6	5.0	4.3
	Total drug-positive	23.3	20.1	21.7
	Total drug-negative	76.7	79.9	78.4
		N = 2,013	N = 1,374	N = 3,387
Night	Antidepressants-only	1.2	1.8	1.4
	Cannabinoids/ Marijuana-only	11.4	8.0	10.0
	Narcotic Analgesics-only	2.4	2.5	2.4
	Sedatives-only	0.8	1.9	1.2
	Stimulants-only	1.6	1.9	1.8
	Other-only	0.8	0.8	0.8
	More than 1 Class	2.7	4.5	3.5
	Total drug-positive	20.9	21.4	21.1
	Total drug-negative	79.1	78.6	78.9

In this table, N's are unweighted; percentages are weighted.

"More than 1 Class" – Drivers testing positive for more than one drug class are counted only in this category.

Table 11. Drug Prevalence by Class, Time of Day, and Age in Blood

Time of Day	Drug Class	16–20 %	21–34 %	35–44 %	45–64 %	65+ %	Total %
		N = 58	N = 358	N = 236	N = 436	N = 151	N = 1,239
	Antidepressants-only	0.0	1.6	3.0	5.2	2.2	3.2
	Cannabinoids/ Marijuana-only	20.2	11.2	7.1	3.7	3.8	7.3
	Narcotic Analgesics-only	0.0	3.2	4.7	2.4	0.3	2.7
Day	Sedatives-only	0.0	1.6	0.6	1.0	2.3	1.2
	Stimulants-only	0.0	2.5	0.5	1.8	0.3	1.5
	Other-only	0.0	2.4	1.4	1.3	1.1	1.6
	More than 1 Class	0.0	5.7	3.7	4.7	2.4	4.3
	Total drug-positive	20.2	28.1	21.0	20.1	12.4	21.7
	Total drug-negative	79.8	71.9	79.0	79.9	87.6	78.3
		N = 425	N = 1,559	N = 563	N = 729	N = 99	N = 3,375
	Antidepressants-only	0.6	0.8	1.9	3.2	0.8	1.4
	Cannabinoids/ Marijuana-only	16.8	13.7	6.8	3.2	0.7	10.3
	Narcotic Analgesics-only	0.5	2.3	2.5	3.3	5.2	2.4
Night	Sedatives-only	1.4	0.6	1.4	2.2	2.4	1.2
	Stimulants-only	1.0	1.8	1.5	2.2	3.5	1.8
	Other-only	0.0	0.9	0.4	1.5	0.2	0.8
	More than 1 Class	1.2	3.4	4.4	4.6	4.0	3.6
	Total drug-positive	21.4	23.6	18.7	20.1	16.8	21.5
	Total drug-negative	78.6	76.5	81.3	79.9	83.2	78.5

In this table, N's are unweighted; percentages are weighted.

"More than 1 Class" – Drivers testing positive for more than one drug class are counted only in this category.

Table 12. Drug Prevalence by Category Time of Day in Blood

Time of Day	Drug Category	N	%
	Illegal-only	107	8.9
	Medications-only	133	10.8
Day	Illegal & Medications	25	1.9
	Negative	998	78.4
	Total	1,263	100.0
	Illegal-only	367	12.4
	Medications-only	221	7.2
Night	Illegal & Medications	53	1.8
	Negative	2,782	78.7
	Total	3,423	100.0

In this table, N's are unweighted; percentages are weighted.

Medications include prescription and over-the-counter drugs.

Table 13. Drug Prevalence by Category, Time of Day, and Region in Blood

Time	Region	Drug Category	N	%
Day	Midwest	Illegal-only	35	13.8
		Medications-only	29	8.8
		Illegal & Medications	5	1.8
		Negative	236	75.6
		Total	305	100.0
	Northeast	Illegal-only	26	7.2
		Medications-only	23	10.1
		Illegal & Medications	5	3.7
		Negative	193	79.1
		Total	247	100.0
	South	Illegal-only	23	8.8
		Medications-only	38	12.3
		Illegal & Medications	7	1.6
		Negative	231	77.3
		Total	299	100.0
	West	Illegal-only	23	5.1
		Medications-only	43	10.4
		Illegal & Medications	8	0.9
		Negative	338	83.6
		Total	412	100.0
Night	Midwest	Illegal-only	106	20.3
		Medications-only	67	7.8
		Illegal & Medications	16	3.1
		Negative	632	68.9
		Total	821	100.0
	Northeast	Illegal-only	50	8.4
		Medications-only	38	7.1
		Illegal & Medications	7	0.9
		Negative	495	83.7
		Total	590	100.0
	South	Illegal-only	100	11.6
		Medications-only	61	7.8
		Illegal & Medications	18	2.2
		Negative	694	78.5
		Total	873	100.0
	West	Illegal-only	111	8.7
		Medications-only	55	5.5
		Illegal & Medications	12	0.7
		Negative	961	85.1
		Total	1,139	100.0

In this table, N's are unweighted; percentages are weighted.

Medications include prescription and over-the-counter drugs.

Table 14. Drug Prevalence by Category, Time of Day, and Gender in Blood

Time of Day	Gender	Drug Category	N	%
Day	Male	Illegal-only	70	12.2
		Medications-only	58	9.5
		Illegal & Medications	10	1.7
		Negative	471	76.7
		Total	609	100.0
	Female	Illegal-only	35	5.9
		Medications-only	73	12.1
		Illegal & Medications	14	2.1
		Negative	509	79.9
		Total	631	100.0
Night	Male	Illegal-only	250	14.0
		Medications-only	101	5.6
		Illegal & Medications	24	1.4
		Negative	1,638	79.1
		Total	2,013	100.0
	Female	Illegal-only	111	9.7
		Medications-only	119	9.5
		Illegal & Medications	27	2.2
		Negative	1,117	78.6
		Total	1,374	100.0

In this table, N's are unweighted; percentages are weighted.
Medications include prescription and over-the-counter drugs.

Table 15. Drug Prevalence by Category, Time of Day, and Age in Blood

Time of Day	Age	Drug Category	N	%
Day	16–20	Illegal-only	12	20.2
		Medications-only	0	0.0
		Illegal & Medications	0	0.0
		Negative	46	79.8
		Total	58	100.0
	21–34	Illegal-only	48	14.0
		Medications only	29	10.9
		Illegal & Medications	8	3.2
		Negative	273	71.9
		Total	358	100.0
	35–44	Illegal-only	17	8.6
		Medications-only	33	11.5
		Illegal & Medications	2	1.0
		Negative	184	79.0
		Total	236	100.0
	45–64	Illegal-only	26	5.5
		Medications-only	53	12.6
		Illegal & Medications	13	2.0
		Negative	344	79.9
		Total	436	100.0
	65+	Illegal-only	3	3.8
		Medications-only	16	8.3
		Illegal & Medications	1	0.3
		Negative	131	87.6
		Total	151	100.0
Night	16–20	Illegal-only	66	17.7
		Medications-only	7	2.6
		Illegal & Medications	3	1.1
		Negative	349	78.6
		Total	425	100.0
	21–34	Illegal-only	215	16.5
		Medications-only	71	5.0
		Illegal & Medications	25	2.0
		Negative	1,248	76.5
		Total	1,559	100.0
	35–44	Illegal-only	33	8.1
		Medications-only	45	7.9
		Illegal & Medications	11	2.7
		Negative	474	81.3
		Total	563	100.0
	45–64	Illegal-only	45	5.2
		Medications-only	84	13.5
		Illegal & Medications	13	1.4
		Negative	587	79.9
		Total	729	100.0
	65+	Illegal-only	4	4.2
		Medications-only	13	12.6
		Illegal & Medications	0	0.0
		Negative	82	83.2
		Total	99	100.0

In this table, N's are unweighted; percentages are weighted.

Medications include prescription and over-the-counter drugs.

Table 16. Drug Prevalence by Time of Day and BrAC in Blood
(Percentages Calculated by Row)

Time of Day	Drug Result	N	BrAC (g/dL) % .00	BrAC (g/dL) % .005 - .079	BrAC (g/dL) % ≥ .08
Day	Positive	265	97.1	1.3	1.7
	Negative	998	99.7	0.2	0.1
	Total	1,263	99.1	0.4	0.5
Night	Positive	641	91.0	7.1	1.9
	Negative	2,782	95.6	3.7	0.7
	Total	3,423	94.6	4.4	1.0

In this table, N's are unweighted; percentages are weighted.

Table 17. Drug Prevalence by Time of Day and BrAC in Blood
(Percentages Calculated by Column)

Time of Day	Drug Result	BrAC (g/dL) % .00	BrAC (g/dL) % .005 - .079	BrAC (g/dL) % ≥ .08	% All
Day		N = 1,253	N = 5	N = 5	N = 1,263
	Positive	21.1	64.0	78.8	21.6
	Negative	78.9	36.0	21.2	78.4
Night		N = 3,251	N = 140	N = 32	N = 3,423
	Positive	20.5	34.5	42.5	21.3
	Negative	79.5	65.6	57.5	78.7

In this table, N's are unweighted; percentages are weighted.

Table 18. BrAC Among Drug-Positive Drivers by Time of Day and Age in Blood

Time of Day	Age	N	BrAC (g/dL)		
			% .00	% .005 - .079	% ≥ .08
Day	16–20	12	100.0	0.0	0.0
	21–34	85	93.9	3.6	2.6
	35–44	52	100.0	0.0	0.0
	45–64	92	97.8	0.0	2.2
	65+	20	100.0	0.0	0.0
	Total positive	261	97.0	1.3	1.7
Night	16–20	76	90.9	9.1	0.0
	21–34	311	89.1	10.2	0.7
	35–44	89	90.0	0.8	9.1
	45–64	142	96.7	1.9	1.5
	65+	17	87.6	12.4	0.0
	Total positive	635	90.9	7.2	2.0

In this table, percentages are weighted.

Table 19. BrAC Among Drug-Positive Drivers by Drug Category and Time of Day in Blood (Percentage by Row)

Time of Day	Drug Category	N	BrAC (g/dL)		
			% .00	% .005 - .079	% ≥ .08
Day	Illegal-only	107	92.9	3.1	4.1
	Medications-only	133	100.0	0.0	0.0
	Illegal & Medications	25	100.0	0.0	0.0
Night	Illegal-only	367	87.9	9.3	2.8
	Medications-only	221	96.4	3.5	0.1
	Illegal & Medications	53	90.2	6.8	3.0

In this table, N's are unweighted; percentages are weighted.
Medications include prescription and over-the-counter drugs.

Table 20. Driver BrAC by Drug Category, Time of Day, and Age in Blood

Time of Day	Age	Drug Category	N	BrAC (g/dL)		
				% .00	% .005 - .079	% ≥ .08
Day	16–20	Illegal-only	12	100.0	0.0	0.0
		Medications-only	0	NA	NA	NA
		Illegal & Medications	0	NA	NA	NA
		Negative	46	100.0	0.0	0.0
		Total	58	100.0	0.0	0.0
	21–34	Illegal-only	48	87.7	7.1	5.2
		Medications-only	29	100.0	0.0	0.0
		Illegal & Medications	8	100.0	0.0	0.0
		Negative	273	99.9	0.1	0.0
		Total	358	98.2	1.1	0.7
	35–44	Illegal-only	17	100.0	0.0	0.0
		Medications-only	33	100.0	0.0	0.0
		Illegal & Medications	2	100.0	0.0	0.0
		Negative	184	99.0	0.5	0.5
		Total	236	99.2	0.4	0.4
	45–64	Illegal-only	26	91.8	0.0	8.2
		Medications-only	53	100.0	0.0	0.0
		Illegal & Medications	13	100.0	0.0	0.0
		Negative	344	99.8	0.2	0.0
		Total	436	99.4	0.2	0.5
	65+	Illegal-only	3	100.0	0.0	0.0
		Medications-only	16	100.0	0.0	0.0
		Illegal & Medications	1	100.0	0.0	0.0
		Negative	131	99.7	0.0	0.3
		Total	151	99.7	0.0	0.3
Night	16–20	Illegal-only	66	89.1	11.0	0.0
		Medications-only	7	100.0	0.0	0.0
		Illegal & Medications	3	100.0	0.0	0.0
		Negative	349	98.6	1.5	0.0
		Total	425	96.9	3.1	0.0
	21–34	Illegal-only	215	88.7	10.4	1.0
		Medications-only	71	90.3	9.7	0.0
		Illegal & Medications	25	89.3	10.7	0.0
		Negative	1,248	93.3	5.6	1.1
		Total	1,559	92.3	6.7	1.0
	35–44	Illegal-only	33	77.7	1.9	20.4
		Medications-only	45	99.3	0.0	0.7
		Illegal & Medications	11	100.0	0.0	0.0
		Negative	474	97.0	2.2	0.8
		Total	563	95.7	2.0	2.3
	45–64	Illegal-only	45	96.5	2.9	0.6
		Medications-only	84	99.2	0.8	0.0
		Illegal & Medications	13	73.0	8.5	18.5
		Negative	587	97.3	2.5	0.2
		Total	729	97.2	2.4	0.5
	65+	Illegal-only	4	50.2	49.8	0.0
		Medications-only	13	100.0	0.0	0.0
		Illegal & Medications	0	NA	NA	NA
		Negative	82	96.0	1.9	2.1
		Total	99	94.6	3.7	1.7

In this table, N's are unweighted; percentages are weighted.
Medications include prescription and over-the-counter drugs.

Table 21. BrAC of Drivers by Drug Category, Gender, and Time of Day in Blood

Time of Day	Gender	Drug Category	N	BrAC (g/dL)		
				% .00	% .005 - .079	% ≥ .08
Day	Males	Illegal-only	70	89.3	4.7	6.0
		Medications-only	58	100.0	0.0	0.0
		Illegal & Medications	10	100.0	0.0	0.0
		Negative	471	99.4	0.4	0.3
		Total	609	98.2	0.9	0.9
	Females	Illegal-only	35	99.4	0.0	0.6
		Medications-only	73	100.0	0.0	0.0
		Illegal & Medications	14	100.0	0.0	0.0
		Negative	509	99.9	0.1	0.0
		Total	631	99.9	0.1	0.0
Night	Males	Illegal-only	250	87.6	8.1	4.3
		Medications-only	101	93.6	6.5	0.0
		Illegal & Medications	24	77.5	15.6	6.8
		Negative	1,638	94.6	4.8	0.6
		Total	2,013	93.3	5.5	1.2
	Females	Illegal-only	111	92.6	7.2	0.2
		Medications-only	119	98.7	1.1	0.2
		Illegal & Medications	27	100.0	0.0	0.0
		Negative	1,117	96.9	2.2	0.9
		Total	1,374	96.7	2.5	0.8

In this table, N's are unweighted; percentages are weighted.
Medications include prescription and over-the-counter drugs.

Table 22: Drug Prevalence of Driver Seat Belt Use by Time of Day in Blood

Driver Seat Belt Observation		N	% Drug-Negative	% Drug-Positive
Day	Yes	1,209	78.4	21.6
	No	16	72.8	27.2
Night	Yes	3,312	79.4	20.6
	No	39	53.1	46.9

In this table, N's are unweighted; percentages are weighted.

Table 23. Driver Drug Class Prevalence by Seat Belt Use and Time of Day in Blood (Percentages Calculated by Row)

Driver Seat Belt Observation		N	% Antidepressants-only	% Cannabinoids/ Marijuana-only	% Narcotic Analgesic-only	% Sedatives-only	% Stimulants-only	% Other-only	% >1 Drug Class	% Negative
Day	Yes	1,209	3.3	7.4	2.8	1.0	1.5	1.6	3.9	78.4
	No	16	0.0	4.3	0.0	0.0	0.0	0.0	22.9	72.8
Night	Yes	3,312	1.4	9.6	2.4	1.3	1.7	0.8	3.5	79.4
	No	39	1.9	34.2	2.7	0.0	2.1	0.0	5.9	53.1

In this table, N's are unweighted; percentages are weighted.

Table 24. Driver Drug Category Prevalence by Seat Belt Use and Time of Day in Blood (Percentages Calculated by Row)

Driver Seat Belt Observation		N	% Illegal-only	% Illegal & Medications	% Medications-only	% Negative
Day	Yes	1,209	9.2	1.8	10.7	78.4
	No	16	7.5	9.6	10.2	72.8
Night	Yes	3,312	11.7	1.8	7.2	79.4
	No	39	38.2	2.0	6.7	53.1

In this table, N's are unweighted; percentages are weighted.
Medications include prescription and over-the-counter drugs

Table 25. Drug Prevalence of Motorcycle Operators by Helmet Use and Time of Day in Blood

Helmet Use		N	% Drug-Negative	% Drug-Positive
Day	Yes	4	100.0	0.0
	No	1	100.0	0.0
Night	Yes	9	90.8	9.2
	No	6	67.3	32.7

In this table, percentages are weighted.

Table 26. Drug Class Prevalence of Motorcycle Operators by Helmet Use and Time of Day in Blood (Percentages Calculated by Row)

Helmet Use		N	% Antidepressants-only	% Cannabinoids/ Marijuana-only	% Narcotic Analgesic-only	% Sedatives -only	% Stimulants -only	% Other-only	% >1 Drug Class	% Negative
Day	Yes	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	No	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Night	Yes	9	0.0	9.2	0.0	0.0	0.0	0.0	0.0	90.8
	No	6	23.5	0.0	0.0	0.0	9.2	0.0	0.0	67.3

In this table, percentages are weighted.

Table 27: Drug Category Prevalence of Motorcycle Operators by Helmet Use and Time of Day in Blood

Helmet Use		N	% Illegal-only	% Illegal & Medications	% Medications -only	% Negative
Day	Yes	4	0.0	0.0	0.0	100.0
	No	1	0.0	0.0	0.0	100.0
Night	Yes	9	9.2	0.0	0.0	90.8
	No	6	9.2	0.0	23.5	67.3

In this table, percentages are weighted.

Table 28: Prevalence of Synthetic Cannabinoids by Region in Blood

Region	N	% Drug Positive
Midwest	1,126	0.0
Northeast	837	0.1
South	1,172	0.1
West	1,551	0.1
Total	4,686	0.1

In this table, N's are unweighted; percentages are weighted.

Table 29: Prevalence of Synthetic Cannabinoids by Gender in Blood

Gender	N	% Drug Positive
Female	2,005	0.0
Male	2,622	0.0
Total	4,627	0.0

In this table, N's are unweighted; percentages are weighted.

Table 30: Prevalence of Synthetic Cannabinoids by Age in Blood

Age	N	% Drug Positive
16–20	483	0.6
21–34	1,917	0.1
35–44	799	0.0
45–64	1,165	0.0
65+	250	0.0
Total	4,614	0.1

In this table, N's are unweighted; percentages are weighted.

Table 31. Drug Prevalence among Daytime and Nighttime Drivers in Blood

Drug	Daytime N = 1,263		Nighttime N = 3,423	
	N	%	N	%
Cannabinoids/ Marijuana	107	8.9	335	11.9
THC (Marijuana)	107	8.9	333	11.8
11-OH-THC (all also positive for THC)	70	5.6	250	8.7
Cocaine	13	0.8	54	1.6
Cocaine	3	0.1	28	0.9
Benzoylecgonine	13	0.8	54	1.6
Cocaethylene	1	0.2	3	0.1
Opioids	45	4.4	121	4.1
Codeine	2	0.3	3	0.1
Heroin	0	0.0	1	0.1
Naltrexone	0	0.0	0	0.0
Buprenorphine	8	0.7	23	0.8
Norbuprenorphine	8	0.7	16	0.7
Fentanyl	2	0.3	5	0.1
Hydrocodone	10	0.7	35	1.2
Hydromorphone	0	0.0	0	0.0
Meperidine	0	0.0	0	0.0
Methadone	4	0.3	7	0.3
Morphine	6	0.7	18	0.7
Oxycodone	9	0.7	11	0.5
Oxymorphone	0	0.0	0	0.0
Propoxyphene	0	0.0	0	0.0
Tramadol	10	1.5	25	0.8
Amphetamines/Stimulants	27	2.3	74	1.7
MDMA	0	0.0	0	0.0
MDA	0	0.0	0	0.0
MDEA	0	0.0	0	0.0
Amphetamine	16	1.4	52	1.0
Methamphetamine	4	0.1	34	0.6
Phentermine	7	0.5	11	0.4
Methylphenidate	2	0.3	1	0.0
Dissociative Anesthetics	1	0.1	3	0.2
Ketamine	0	0.0	0	0.0
PCP	1	0.1	3	0.2
Benzodiazepines	33	2.5	47	2.1
Alprazolam	11	1.1	15	0.7
Bromazepam	0	0.0	0	0.0
Chlordiazepoxide	1	0.1	3	0.1
Clonazepam	5	0.5	6	0.3
Diazepam	17	1.2	17	0.9

Drug	Daytime N = 1,263		Nighttime N = 3,423	
	N	%	N	%
Nordiazepam	16	1.1	21	0.9
Lorazepam	1	0.0	1	0.0
Oxazepam	5	0.3	5	0.2
Estazolam	0	0.0	0	0.0
Flunitrazepam	0	0.0	0	0.0
Flurazepam	0	0.0	0	0.0
Midazolam	0	0.0	0	0.0
Nitrazepam	0	0.0	0	0.0
Phenazepam	0	0.0	0	0.0
Triazolam	0	0.0	0	0.0
Temazepam	2	0.3	7	0.3
Antidepressants	65	4.3	84	2.2
Amitriptyline	4	0.4	8	0.3
Nortriptyline	5	0.4	9	0.3
Fluoxetine	25	1.7	26	0.8
Imipramine	1	0.1	1	0.1
Desipramine	1	0.1	0	0.0
Amoxapine	0	0.0	0	0.0
Dothiepin	0	0.0	0	0.0
Doxepin	0	0.0	0	0.0
Desmethyldoxepin	0	0.0	0	0.0
Protriptyline	0	0.0	0	0.0
Trimipramine	0	0.0	0	0.0
Mianserine	0	0.0	0	0.0
Mirtazepine	0	0.0	1	0.1
Trazodone	6	0.4	6	0.1
Citalopram	9	0.6	7	0.3
Paroxetine	1	0.1	0	0.0
Venlafaxine	0	0.0	1	0.0
Sertraline	23	1.4	40	0.8
Barbiturates	3	0.5	11	0.3
Butalbital	3	0.5	10	0.3
Pentobarbital	0	0.0	0	0.0
Secobarbital	0	0.0	0	0.0
Phenobarbital	0	0.0	1	0.0
Pain Drugs	8	0.6	12	0.3
Carisoprodol	0	0.0	4	0.1
Cyclobenzaprine	7	0.5	6	0.2
Meprobamate	1	0.0	6	0.1
Sleep Aids	9	0.7	5	0.2
Zolpidem	9	0.7	5	0.2
Cough Suppressants	0	0.0	0	0.0
Dextromethorphan	0	0.0	0	0.0

Drug	Daytime N = 1,263		Nighttime N = 3,423	
	N	%	N	%
Antihistamines	21	1.6	31	1.1
Chlorpheniramine	0	0.0	0	0.0
Diphenhydramine	21	1.6	29	1.0
Doxylamine	1	0.3	3	0.1
Antipsychotics	0	0.0	0	0.0
Chlorpromazine	0	0.0	0	0.0
Synthetic Cannabinoids	14	0.0	3	0.1
AM-1220	1	0.0	0	0.0
AM-2201	1	0.0	2	0.0
AM-2232	0	0.0	0	0.0
CP47497	0	0.0	0	0.0
CP47497-C8	0	0.0	0	0.0
HU-210	0	0.0	0	0.0
JWH-018	1	0.0	1	0.0
JWH-022	0	0.0	0	0.0
JWH-073	0	0.0	1	0.0
JWH-200	1	0.0	0	0.0
JWH-250	0	0.0	1	0.0
XLR-11	0	0.0	3	0.1
UR-144	0	0.0	2	0.1
All Drug Positives	392		911	
All Tested Drivers	265	21.6	641	21.3

In this table, N's are unweighted; percentages are weighted.

APPENDIX C. WEIGHTING THE DATA

The objective of the 2013–2014 National Roadside Study (NRS) was to estimate the prevalence of alcohol- and drug-positive drivers on the Nation's roads during Friday days and weekend nights. Because a truly random sample—in which every driver has an equal probability of being selected—is impossible, statisticians used multi-stage system for weighting.

The weighting reflected known distributions of the overall population by geographic region and urban/rural population density and reflects the probability that any driver included in the study would have been randomly sampled from among the population of driving trips[19] during the study hours.

Primary Sampling Units

The first sampling stage selected sizeable geographical areas in the contiguous States, where study sites were randomly selected. These geographical areas called "Primary Sampling Units" (PSUs) or sites were single counties, clusters of contiguous and roughly homogenous counties, or large cities with metropolitan areas. Statisticians used NHTSA's National Automotive Sampling System (NASS) to select 60 PSUs. The NASS PSUs that constitute the General Estimates System (GES) are drawn from the population of potential PSUs which included 1,193 geographic units.[20] PSUs were selected reflecting the likelihood that was proportional to their contribution to the overall population's composition, or what is termed a "Probability Proportionate to Size" (PPS) scheme. If equally sized random samples are taken within each PSU and then weighted by each case within each PSU according to the PSU's relative proportional size, the composite estimate for the entire population would approximate the distribution of individual cases that would have been sampled under an ideal (but pragmatically impossible) simple random sample.

The 2013–2014 NRS used a set of 60 PSUs previously chosen from a sampling frame designed according to the principles for NASS's General Estimates System (GES) project. Using the GES PSUs was appropriate for the NRS because (a) there is an established history of cooperation from police jurisdictions in these sites, increasing the likelihood that permission

[19] Driving Trips as the Units of Population: For the 2007 and 2013–2014 studies, a sample was drawn for Friday daytime drivers between 9:30 a.m.-11:30 a.m. *or* 1:30 p.m.-3:30 p.m. The statistical population we wished to infer, that is, drivers who were actually on the road traveling during those hours, not the overall U.S. population, or geographical areas, or U.S. licensed drivers generally. Thus, if it were possible to take a completely perfect random sample, the population of observational units to be sampled— the units to be shuffled and randomly drawn from a hat—from which we could obtain a representative random sample of driving trips during those hours. These trips (and their drivers) were linked to and correlated with population generally, and "located" within geographically defined areas. To represent Friday daytime and weekend nighttime trips, the sampling frames needed to be treated as separate but parallel populations rather than more generally representative of population or of geography.

[20] A handful of these units have been re-drawn or merged in the years since the schema was developed.

could be obtained; (b) the PSUs for the 1996 and 2007 NRS studies were from this set; and (c) doing so would allow comparisons between the NRS study to national crash estimates which use the same sampling sites. NASS provided one of the best estimates of driving trips and driving exposure.

Data collection required the cooperation of officials in that site, such as police agencies and the State Highway Safety Office. Although most sites that were initially contacted participated, 19 declined, requiring replacement sites. Each replacement was selected from PSU candidates that had been narrowed from the 1,193 geographic entities to match the general characteristics of the PSU being replaced (i.e., by region of the country, county, or city population size, injury crash experience, and economic factors). This strategy precluded replacing a site with an inappropriate match, for example, replacing Los Angeles with Dubuque, Iowa. Replacement sites had general geographic and demographic comparability to the distribution and diversity of the original GES sites. The replacement was weighted in accordance with the original GES scheme for PSU weights, using the same overall PPS measure as was applied to those GES PSUs that allowed data collection. To account for the amount of variance associated with sampling stage, the study's analyses took into account the "resampling" of replacement PSUs from the 1,193 geographic entities from which GES's PSUs were originally drawn.

Additionally, to ensure that there were no geographic regional biases, PPS-based weighting of PSUs was performed separately by region, and then adjusted to reflect the national distribution of drivers by region. This was not necessary if cooperating PSUs were of similar relative size across regions, but because of the weighting for large mega-cities (e.g., New York City, Chicago, Los Angeles, Houston), having more such cooperating PSUs in one region (West) and fewer or none in another region could produce a sample more representative of the West than of the entire nation. While this was not an issue in 2007, it was a factor in 2013–2014.

Definition of "Size" for PSU Weighting

In consultation with the Insurance Institute for Highway Safety (IIHS) who established the 1996 NRS methods for weighting sites, we determined that the crash experience (annual frequency of drivers in injury crashes) of a particular geographic locale was a better reflection of driver trips than mere population. Not only was this likely to be a much better surrogate measure or indicator of trips than population, but it also provided a smaller error term for the sampling frame (Lestina et al., 1999). Note that a PSU with more crash injuries is "bigger" than another county/city PSU with fewer crashes. Therefore, in a PPS sampling design, the subject cases in

that "bigger" PSU needed to be weighted to reflect a higher probability of being in a crash than a "smaller" PSU. How much bigger (or smaller) must be determined via those crash injury totals.

The 1996 study (Voas et al., 1998) benefited from a national census of crash statistics that NASS had recently performed to revise the GES sampling. NASS had collected detailed injury crash tallies for the 1,195 geographical clusters that constituted the population of potential PSUs.[21] The 1996 study used these recently collected crash statistics for their PSU weighting; however, because no recent census by county clusters had been performed in the decade after that, we obtained similar crash statistics from the States and counties for the most recent years available.

This updating of county and city crash statistics needed for PSU weighting was facilitated by State crash databases, some of which are then shared with NHTSA for the State Data System (SDS) program. Additionally, PIRE obtained other States' crash data files for various other crash analysis projects. From those files, we identified the appropriate counts of drivers involved in known injury crashes (coded as K, A, B using the police crash report KABCO coding scheme used by all States, as defined by the American National Standards Institute) separately for many of the geographic unit or county clusters that defined our study PSUs. For the remaining PSUs in 2007 without access to their State crash files, we tracked down the statistics either from published annual reports, via direct query to State Departments of Transportation (DOTs) or State police officials or, occasionally, from those county or city police departments that had complete jurisdiction over the entire PSU.

For the 2013-2014 NRS, however, the data gap was much larger and tracking down the missing information was more difficult. We could obtain access to fewer of these crash data in 2013–2014 than we could for the 2007 study, preventing this information from being as reliable a metric in 2013–2014 as it was in the past. We relied on much of the same injury crash data gathered for the 2007 study's weighting, which were updated with a heavier reliance on a surrogate measure—namely, FARS crashes for the four most recent years available (2009–2012), to track population shifts that had taken place since 2007.[22]

Secondary Sampling Frames (within PSUs)

The ideal strategy would take a random sample of all driver trips occurring within the data collection time window. However, it is not possible to identify the geographic distribution

[21] There were two more geographic units in the early 1990s than there are today.

[22] We adjusted via extrapolation those crash totals we had used from 2005/2006 using the complete 1993 and 1995 data we obtained from NHTSA, plus the current years' FARS totals and historic population changes from the U.S. Census for these counties for each year between 1990 to 2013.

of that population without knowing the area of each trip (the process of data collection would be impossible to implement). However, in a randomized cluster sampling scheme, similar in principle to the selection of PSUs throughout the country, we randomly selected four[23] geographic locations within a PSU's boundaries with equal probability of selection. For each PSU, we divided a map of the entire PSU into 30 square-mile grids, and then selected one daytime and four nighttime of those grids at random. A logistically appropriate roadway location was chosen in each of those five random grids by the manager. This resulted in a sampling frame in which a specific roadway location had a probability of being selected equal to every other roadway location in the PSU boundaries. All the driver trips passing through the selected points were treated as cluster samples, and the relative probability of any driver (or driver trip) being sampled was calculated from traffic-flow counts at each site.

The information for random grid locations and traffic flow was incorporated into the case weights to reflect both the probability that any driver trip taking place within that cluster would be sampled into the data collection area; and the differential weights among clusters, based on the sheer volume of driver trips they contained (essentially, a nested level of PPS sampling within PSU). The result of this stage of served to reconstitute the estimated distribution of driving trips by day of week and time of night within a PSU, to reflect not only the relative driver-trip densities, but also the differential probabilities that any given driver could be sampled. (The count of drivers being sampled was defined as any eligible driver directed into the bays, including drivers who declined to participate, as well as those who did not complete the study but gave a single breath test only.)

Some situations required deviations from the sampling design. Not all randomly selected one-square-mile grid contained roads with sufficient traffic volume to make data collection worthwhile, and some contained no roads at all, such as lakes, mountains, or private property. A few were deemed unsafe by local police.

There was occasional replacement selection of random grid-square clusters. Some PSUs covered vast geographic areas but contained few roadways with sufficient traffic. The probability that a given geographic square, randomly sampled, might contain any single driver trip was equal for all driver trips (before the square's selection is known). The relative traffic density of all squares within a PSU was not known and not knowable (realistically). The traffic volume counts obtained at locations were the best measure of the effect of cluster at this level, and these drivers' differential probabilities of having been selected. Traffic volume was estimated at each location

[23] Actually, there were a total of five: one daytime location and four nighttime locations. However, because the day sample and the night samples represent two different populations of interest, which will not be combined for any analysis, we treated them as though they were separate studies.

by a team member or officer using a hand-held counter to determine the number of passing vehicles.

Intended Data Collection Numbers: Oversampled and Undersampled Quotas

Once a PSU was weighted for PPS, it was assumed that the goal of 25 cases per location would be sampled so that the location would not be over- or under-represented due to chance fluctuations in data collection success (i.e., more experienced data collection teams, extreme weather conditions, an anomalous event in the neighborhood, or an unusual volume of traffic). This meant that data "blocks" within each sampling frame or nested level were to be comprised of an equal quota of eligible drivers. To the extent that any PSU had more or fewer eligible drivers sampled, the weights were adjusted to correct for over- or under-sampled quotas.

Case Weights

For each driver participating in the study, the case weight reflects the product of a joint set of probabilities, which reflect the probability that a particular driver—relative to all others who participated—would be selected for the study from among the pool of drivers in the contiguous United States. The case weight is actually an inverse of the probability of being selected, relative to all other cases.

Each of the various frames that were sampled, as previously described, required a separate calculation of probability, which then became a component of the final probability computation reflecting all the frames. The total weighted sample size (N) was identical to the total number of eligible drivers entering the bays, including drivers who declined to participate, but was adjusted to reflect the estimated distribution of those drivers in the 48 contiguous States. Error terms for the analyses were computed by STATA (2006) to account for the differential weights and the amount of variance attributable to the sampling frames.

Daytime Sample

Most of the procedures above applied to daytime data collection as well; however, with only one daytime location randomly selected from each PSU, descriptions accounting and adjusting for multiple sites/locations within a PSU do not apply.

Weights for daytime study cases were calculated separately from nighttime cases, as though the daytime portion were a quasi-separate study.

APPENDIX D.
DESCRIPTION OF GEOGRAPHICAL REGIONS

Geographical Regions in the 2013-2014 National Roadside Study

South	Midwest	Northeast	West
Alabama	**Illinois**	**Massachusetts**	**California**
Bibb County	Will County	Hampshire County	Contra Costa County
St. Claire County		Middlesex County	Los Angeles City
	Indiana	Plymouth County	Los Angeles County
Florida	Lake County		Orange County
Fort Lauderdale		**New Jersey**	(Anaheim)
Dade County	**Iowa**	Camden County	San Jose (city)
Palm Beach County	Howard County	Jersey City	San Mateo County
		Newark (city)	Santa Barbara County
Kentucky	**Kansas**		Ventura County
Harlan & Letcher	Wichita County	**New York**	
Counties		Monroe County	**New Mexico**
	Michigan	Schenectady County	Bernalillo County
Louisiana	Detroit	Syracuse	Lincoln County
East Baton Rouge	Genesee County	Ulster County	
	Wayne County		**Oklahoma**
Maryland		**Pennsylvania**	Oklahoma City (city)
Charles & Prince	**Missouri**	Westmoreland	
George's Counties	St. Charles	County	**Texas**
	County	Montgomery County	Hood County
North Carolina	St. Louis	Allegheny County	Dallas (city)
Cleveland County	County		Dallas County
Greensboro			Ft. Worth
Orange County	**Nebraska**		
Wake County	Douglas County		**Utah**
			Davis County
Tennessee	**Ohio**		(Bountiful)
Memphis (city)	Clark County		Salt Lake City
Knox County	Franklin County		
Tipton County	Logan County		
	Lorain County		
	Preble County		

APPENDIX E.
SCREENING AND CONFIRMATION LEVELS, 2007 VERSUS 2013-2014

2007 & 2013-2014 NRS: Oral Fluid

Drug Class	2007		2013-2014	
	Screen	Confirm	Screen	Confirm
Alcohol *(*Ethyl Alcohol*)*	20mg/dL	20mg/dL	20mg/dL	20mg/dL
Amphetamine/Methamphetamine *(*MDMA, MDA †, MDEA, Methamphetamine, Amphetamine †, Phentermine*)*	50	50	25	10
Antidepressants (Amitriptyline, Nortriptyline †, Amoxapine*, Cyclobenzaprine*§, Dothiepin*, Doxepin ‡, *Desmethyldoxepin* ‡, Imipramine, Desipramine †, Protriptyline ‡, Trimipramine, Citalopram*, Paroxetine*, Venlafaxine*, Mianserine*, Mirtazepine*, Trazodone*)	25	25	25	10
Antihistamines (Chlorpheniramine*, Diphenhydramine*, Doxylamine*)			25	10
Barbiturates *(*Phenobarbital, Pentobarbital, Secobarbital, Butalbital*)*	50	50	50	50
Benzodiazepines *(*Alprazolam, Bromazepam, Chlordiazepoxide, Diazepam †, Nordiazepam †, Oxazepam †, Temazepam †, Clonazepam, Estazolam‡, Flunitrazepam, Flurazepam, Lorazepam, Midazolam, Nitrazepam, Phenazepam*, Triazolam*)*	10	10	5	1
Buprenorphine* *(Norbuprenorphine*)*			5	2
Cannabinoids *(*THC*)*	4	2	4	2
THC-COOH			0.05	0.02
Synthetic Cannabinoids (AM-1220*, AM-2201*, AM-2232*, CP47497*, CP47497-C8*, HU-210*, JWH-018*, JWH-022*, JWH-073*, JWH-200*, JWH-250*, UR-144*, XLR-11*)			0.25	0.25
Carisoprodol *(*Meprobamate †*)*	100	50	50	50
Cocaine (Cocaine*, Cocaethylene, Benzoylecgonine, Norcocaine*)	20	8	20	8
Dextromethorphan	50	20	50	20
Fentanyl*			1	0.5
Fluoxetine	50	25	50	10
Ketamine*			10	10
Meperidine	50	25	50	25
Methadone (Methadone, *EDDP)*	50	20	50	20
Methylphenidate	10	10	10	10
Naltrexone*			40	10
Opiates/Opioids (*6-AM*, Codeine †, Morphine †, Hydrocodone †, Hydromorphone †*)*	40	10	20	10
Oxycodone *(*Oxymorphone †*)*	25	10	20	10
Phencyclidine	10	10	10	10
Propoxyphene	20	10	20	10
Sertraline	50	25	50	10
Tramadol	50	25	50	25
Zolpidem	10	10	10	10

Metabolites are listed in italics.

* Drugs not analyzed in 2007 NRS.

† Drugs which can be either a metabolite or a drug on their own.

‡ Drugs screened using blood in 2007 that were also screened with oral fluid in 2013-2014.

§ Cyclobenzaprine* is not an antidepressant but cross reacts with the screening procedure.

2007 & 2013-2014 NRS: Blood

Drug Class	2007		2013-2014	
	Screen	Confirm	Screen	Confirm
Alcohol *(*Ethyl Alcohol*)*	20mg/dL	20mg/dL	20mg/dL	20mg/dL
Amphetamine/Methamphetamine *(*MDMA, MDA, MDEA, Methamphetamine, Amphetamine †, Phentermine*)*	25	10	20	10
Antidepressants (Amitriptyline, Nortriptyline †, Amoxapine*, Cyclobenzaprine*‡, Dothiepin*, Doxepin §, *Desmethyldoxepin* §, Imipramine, Desipramine †, Protriptyline §, Trimipramine, Citalopram*, Paroxetine*, Venlafaxine*, Mianserine*, Mirtazepine*, Trazodone*)	25	10	25	10
Antihistamines (Chlorpheniramine*, Diphenhydramine*, Doxylamine*)			25	10
Barbiturates *(*Phenobarbital, Pentobarbital, Secobarbital, Butalbital*)*	500	500	100	100
Benzodiazepines *(*Alprazolam, Bromazepam, Chlordiazepoxide, Diazepam †, Nordiazepam †, Oxazepam †, Temazepam †, Clonazepam, Estazolam ‡, Flunitrazepam, Flurazepam, Lorazepam, Midazolam, Nitrazepam, Phenazepam*, Triazolam*)*	20	10	20	10
Buprenorphine* (*Norbuprenorphine**)			1	1
Cannabinoids *(*THC*, THC-COOH, 11-OH-THC)*	10	1	10	1
Synthetic Cannabinoids (AM-1220*, AM-2201*, AM-2232*, CP47497*, CP47497-C8*, HU-210*, JWH-018*, JWH-022*, JWH-073*, JWH-200*, JWH-250*, UR-144*, XLR-11*)			5	1
Carisoprodol (Meprobamate *†)*	500	500	500	500
Cocaine (Cocaine*, Cocaethylene, Benzoylecgonine, Norcocaine*)	25	10	25	10
Dextromethorphan *(Dextrorphan*)*	50	20	50	20
Fentanyl* *(Norfentanyl)*			1	0.5
Fluoxetine *(Norfluoxetine*)*	50	10	50	10
Ketamine *(Norketamine)*			10	10
Meperidine *(Normeperidine)*	50	10	50	10
Methadone (*EDDP)*	50	10	50	10
Methylphenidate	10	10	10	10
Naltrexone*			25	10
Opiates/Opioids (*6-AM*, Codeine †, Morphine †, Hydrocodone †, Hydromorphone †)	25	10	25	10
Oxycodone *(*Oxymorphone †*)*	25	10	25	10
Phencyclidine	10	10	10	10
Propoxyphene *(Norpropoxyphene)*	20	10	20	10
Sertraline	50	10	50	10
Tramadol *(Desmethyltramadol*)*	50	10	50	10
Zolpidem	10	10	10	10

Metabolites are listed in italics.

* Drugs not analyzed in 2007 NRS.

† Drugs which can be either a metabolite or a drug on their own.

‡ Drugs screened using blood in 2007 that were also screened with oral fluid in 2013-2014.

§ Cyclobenzaprine* is not an antidepressant but cross reacts with the screening procedure.

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