

Drug Testing Index™

A comprehensive analysis of workplace
drug use trends

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The Quest Diagnostics Drug Testing Index (DTI) reveals insights into patterns of drug use among the American workforce. **Published annually for more than 25 years, the Drug Testing Index examines positivity rates for workplace drugs tested by the company on behalf of employers.** Quest Diagnostics publishes these findings as a public service for government, employers, policymakers, and the general public.

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Increases in Illicit Drugs, Including Cocaine, Drive Workforce Drug Positivity to Highest Rate in 12 Years



Cocaine, marijuana, and methamphetamine use is up broadly among United States workforce across multiple specimen types and testing populations

Drug use in the American workforce, fueled by illicit drugs, reached the highest positivity rate in 12 years, according to an analysis of more than ten million workforce drug test results by Quest Diagnostics, the world's leading provider of diagnostic information services.

The annual Quest Diagnostics Drug Testing Index™ (DTI) was presented at the Drug and Alcohol Testing Industry Association (DATIA) annual conference in Orlando, Florida. Overall positivity in urine drug testing among the combined U.S. workforce in 2016 was 4.2 percent, a five percent relative increase over last year's rate of 4.0 percent, and the highest annual positivity rate since 2004 (4.5%).

“This year's findings are remarkable because they show increased rates of drug positivity for the most common illicit drugs across virtually all drug test specimen types and in all testing populations,” said Barry Sample, PhD, senior director, science and technology, Quest Diagnostics Employer Solutions. “Our analysis suggests that employers committed to creating a safe, drug-free work environment should be alert to the potential for drug use among their workforce.”

Cocaine Continues Upward Trend

The positivity rate in urine testing for cocaine increased for the fourth consecutive year in the general U.S. workforce, and for the second consecutive year in the federally-mandated, safety-sensitive workforce. Cocaine positivity increased 12 percent in 2016, reaching a seven-year high of 0.28 percent, compared to 0.25 percent in 2015 in the general U.S. workforce, and seven percent among federally-mandated, safety-sensitive workers to 0.28 percent, compared to 0.26 percent in 2015.

“Once again, the DTI statistics reveal the ongoing threat to workplace safety posed by substance abuse. While the national dialogue swirls around marijuana and opiate issues, we find cocaine—a substance with well-established dangers—continuing its troubling upswing not just in the general workforce, but in safety-sensitive jobs with federally-mandated testing,” said Matt Nieman, General Counsel, Institute for a Drug-Free Workplace and Principal, Jackson Lewis P.C. “That positive test results for cocaine persist, let alone are increasing, should serve as a reminder to employers and employees that there is no substitute for vigilance in any effective effort to thwart the potential impacts of workplace substance abuse.”

In both the federally-mandated, safety-sensitive and the general U.S. workforces, the positivity rate for cocaine in post-accident urine drug tests was more than twice that of pre-employment drug tests, and was also higher than the rate in random drug tests.



“While a positive test doesn’t prove drug use caused the accident, it raises the question as to whether it played a role,” said Dr. Sample.

Marijuana Positivity Increases Dramatically Over Last Three Years; Increases in Colorado and Washington Double the National Average

Marijuana positivity continued its upward climb in both the federally-mandated, safety-sensitive and general U.S. workforces. In oral fluid testing, which detects recent drug use, marijuana positivity increased nearly 75 percent, from 5.1 percent in 2013 to 8.9 percent in 2016 in the general U.S. workforce. Marijuana positivity also increased in both urine testing (2.4% in 2015 versus 2.5% in 2016) and hair testing (7.0% in 2015 versus 7.3% in 2016) in the same population.

Marijuana positivity increases significantly in three years.

2016 was the first year that marijuana positivity in Colorado and Washington outpaced the national average.



Among the federally-mandated, safety-sensitive workforce, which only utilizes urine testing, marijuana positivity increased nearly ten percent (0.71% in 2015 versus 0.78% in 2016), the largest year-over-year increase in five years.

In Colorado and Washington, the first states in which recreational marijuana use was legalized, the overall urine positivity rate for marijuana outpaced the national average in 2016 for the first time since the statutes took effect. The increase was more pronounced in Colorado, which increased 11 percent (2.61% in 2015 versus 2.90% in 2016), than in Washington, which increased nine percent (2.82% in 2015 versus 3.08% in 2016). The national positivity rate for marijuana in the general U.S. workforce in urine testing

increased four percent (2.4% in 2015 compared to 2.5% in 2016).

“We have been tracking the trends in marijuana positivity in states that have passed medical and recreational marijuana use statutes for several years now. 2016 is the first year since Colorado and Washington approved recreational use that the rates of year-over-year change were sharply higher than the national average,” said Dr. Sample.

Methamphetamine Positivity Remains High

Amphetamines (which includes amphetamine and methamphetamine) positivity continued its year-over-year

upward trend, increasing more than eight percent in urine testing in both the general U.S. and federally-mandated, safety-sensitive workforces compared to 2015. Throughout the last decade, this rise has been driven primarily by amphetamine use, which includes certain prescription drugs such as Adderall®.

Although methamphetamine positivity in urine testing declined between 2005 and 2008, the positivity rate plateaued between 2008 and 2012, and has increased steadily since. Between 2012 and 2016, it climbed 64 percent in the general U.S. workforce and 14 percent among federally-mandated, safety-sensitive workers. In oral fluid, methamphetamines positivity increased 75 percent between 2013 (0.24%) and 2016 (0.42%).

Heroin Detection Plateaus in General U.S. Workforce, While Prescription Opiate Detection Declines

After four straight years of increases, in 2016, urine testing positivity for heroin, indicated by the presence of the 6-acetylmorphine (6-AM) metabolite, held steady in the general U.S. workforce and declined slightly among federally-mandated, safety-sensitive workers.

Prescription opiate positivity—including hydrocodone, hydromorphone and oxycodones—declined in urine testing among the general U.S. workforce. Oxycodones have exhibited four consecutive years of declines, dropping 28 percent from 0.96 percent in 2012 to 0.69 percent in 2016. Hydrocodone and hydromorphone both showed double-digit declines in both 2015 and 2016 (0.92% in 2015 to 0.81% in



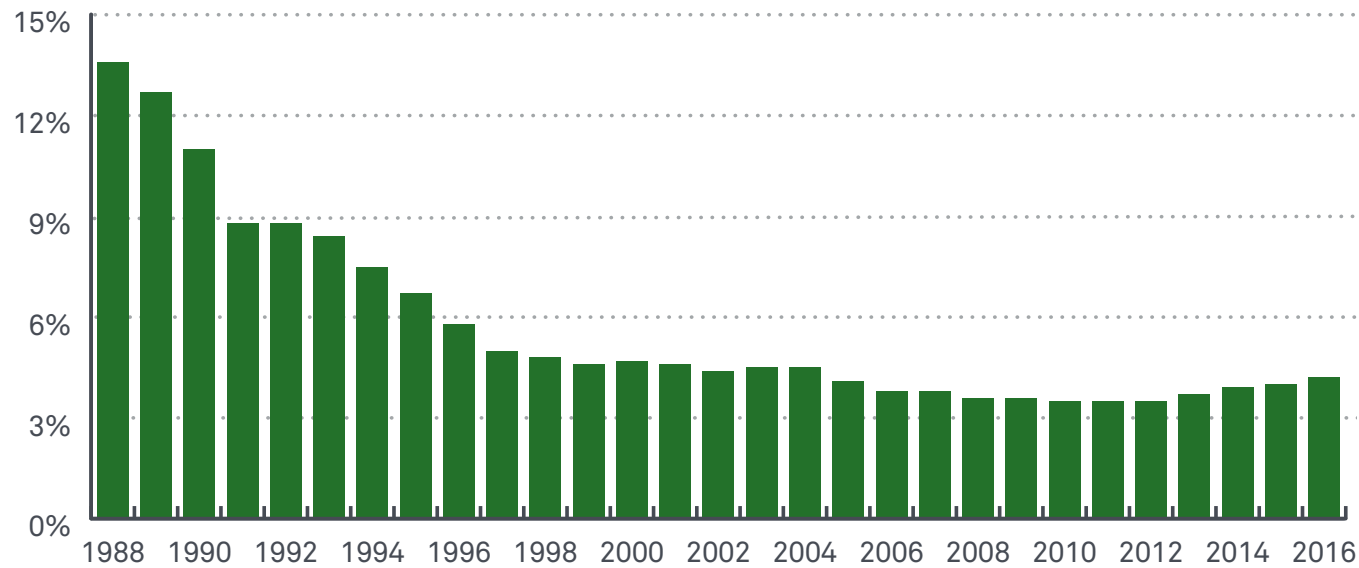
2016) and (0.67% in 2015 to 0.59% in 2016), respectively. In recent years, state and federal authorities have instituted efforts to more tightly control opiate prescribing in order to address the opioid crisis.

The strengths of the Quest Diagnostics Drug Testing Index analysis include its large sample size, the longitudinal nature of the monitoring, a testing population that is generally reflective of the U.S. workforce, and the quality of the company's drug testing services to confirm positive results. Limitations include the selection of the testing population, which is reflective only of results from employers that perform drug testing, and a lack of exact cross-specimen comparisons due to variations in substances for which employers test. Quest Diagnostics Drug Testing Index reports involve analysis of de-identified results from urine, oral fluid, and hair drug tests.

Methamphetamine positivity in urine drug tests increased 64 percent since 2012 in general U.S. workforce.

Annual Positivity Rates

Urine Drug Tests - For Combined U.S. Workforce



Nearly 9 million tests from January to December 2016

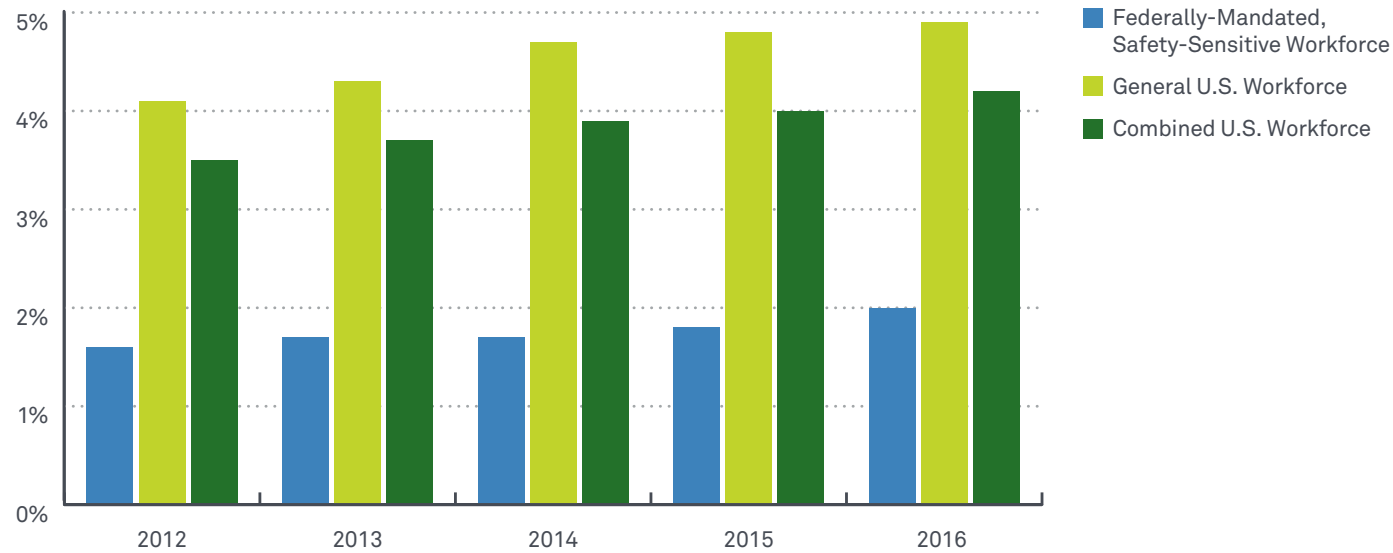
Year	Drug Positivity Rate
1988	13.6%
1989	12.7%
1990	11.0%
1991	8.8%
1992	8.8%
1993	8.4%
1994	7.5%
1995	6.7%
1996	5.8%
1997	5.0%

Year	Drug Positivity Rate
1998	4.8%
1999	4.6%
2000	4.7%
2001	4.6%
2002	4.4%
2003	4.5%
2004	4.5%
2005	4.1%
2006	3.8%
2007	3.8%

Year	Drug Positivity Rate
2008	3.6%
2009	3.6%
2010	3.5%
2011	3.5%
2012	3.5%
2013	3.7%
2014	3.9%
2015	4.0%
2016	4.2%

Positivity Rates by Testing Category

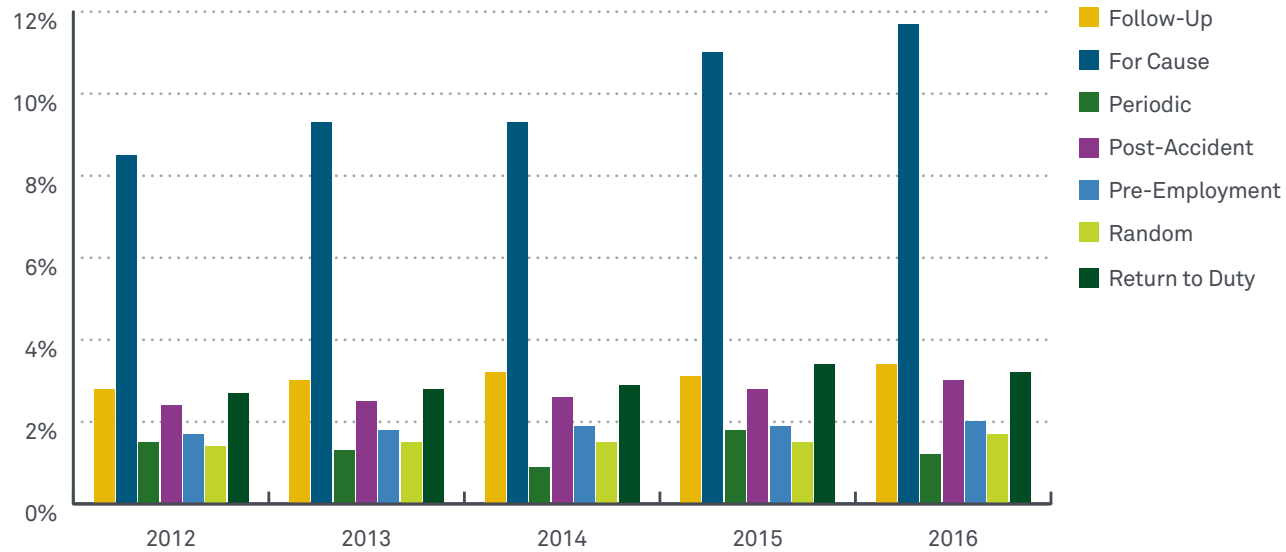
Urine Drug Tests



Testing Category	2012	2013	2014	2015	2016
Federally-Mandated, Safety-Sensitive Workforce	1.6%	1.7%	1.7%	1.8%	2.0%
General U.S. Workforce	4.1%	4.3%	4.7%	4.8%	4.9%
Combined U.S. Workforce	3.5%	3.7%	3.9%	4.0%	4.2%

Positivity Rates by Testing Reason

Urine Drug Tests – For Federally-Mandated, Safety-Sensitive Workforce

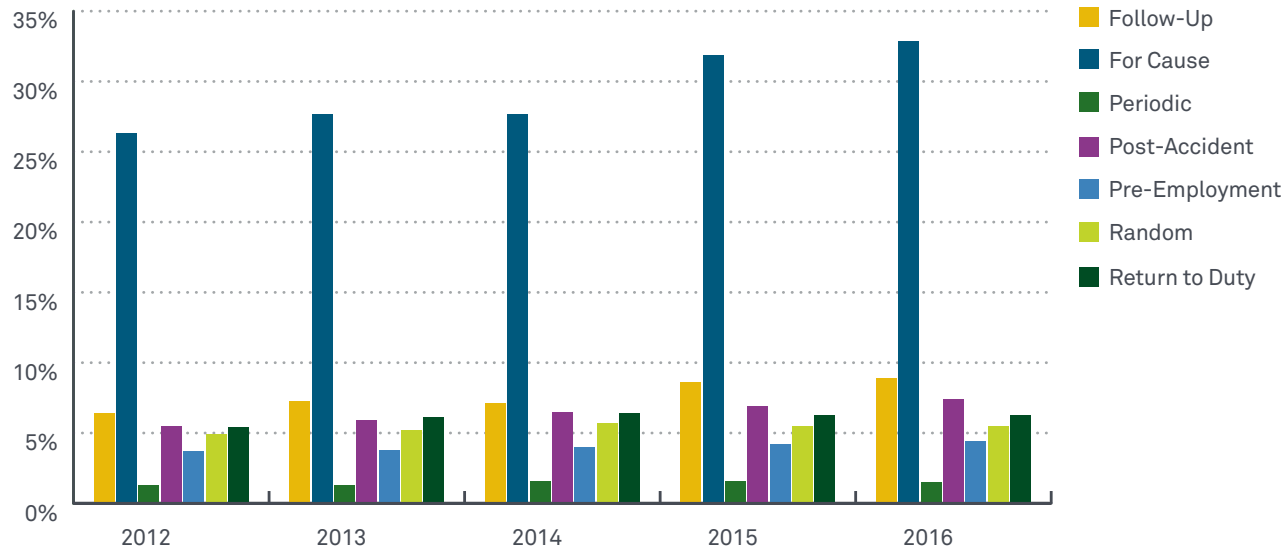


More than 2.2 million tests from January to December 2016

Testing Reason	2012	2013	2014	2015	2016
Follow-Up	2.8%	3.0%	3.2%	3.1%	3.4%
For Cause	8.5%	9.3%	9.3%	11.0%	11.7%
Periodic	1.5%	1.3%	0.9%	1.8%	1.2%
Post-Accident	2.4%	2.5%	2.6%	2.8%	3.0%
Pre-Employment	1.7%	1.8%	1.9%	1.9%	2.0%
Random	1.4%	1.5%	1.5%	1.5%	1.7%
Return to Duty	2.7%	2.8%	2.9%	3.4%	3.2%

Positivity Rates by Testing Reason

Urine Drug Tests – For General U.S. Workforce

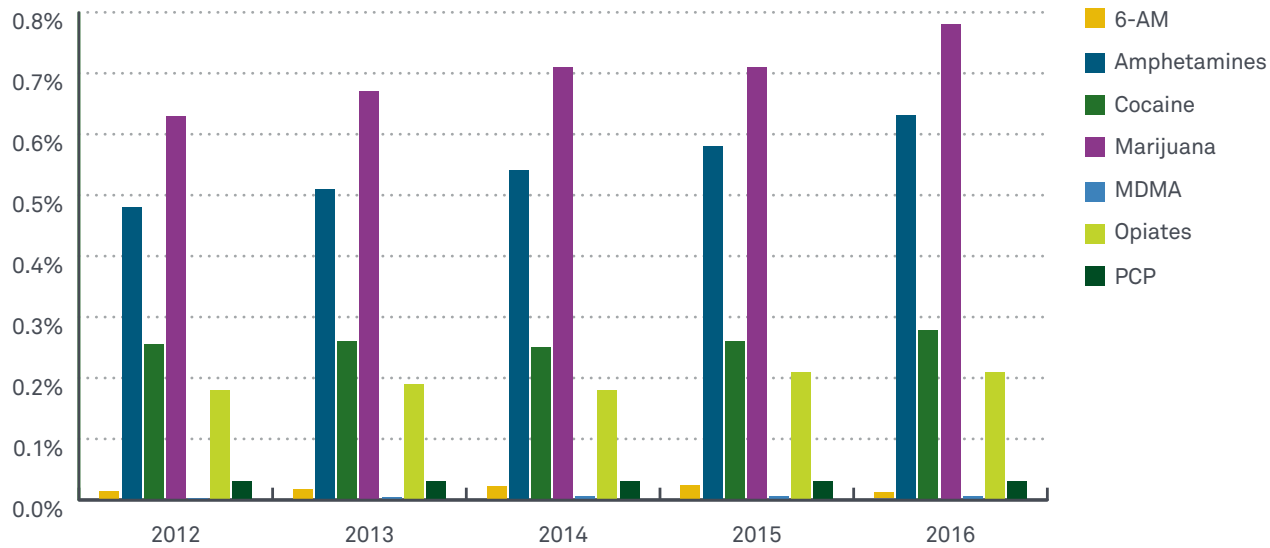


More than 6.5 million tests from January to December 2016

Testing Reason	2012	2013	2014	2015	2016
Follow-Up	6.4%	7.3%	7.1%	8.6%	8.9%
For Cause	26.3%	27.7%	27.7%	31.9%	32.9%
Periodic	1.3%	1.3%	1.6%	1.6%	1.5%
Post-Accident	5.5%	5.9%	6.5%	6.9%	7.4%
Pre-Employment	3.7%	3.8%	4.0%	4.2%	4.4%
Random	4.9%	5.2%	5.7%	5.5%	5.5%
Return to Duty	5.4%	6.1%	6.4%	6.3%	6.3%

Positivity Rates by Drug Category

Urine Drug Tests – For Federally-Mandated, Safety-Sensitive Workforce, as a Percentage of All Such Tests

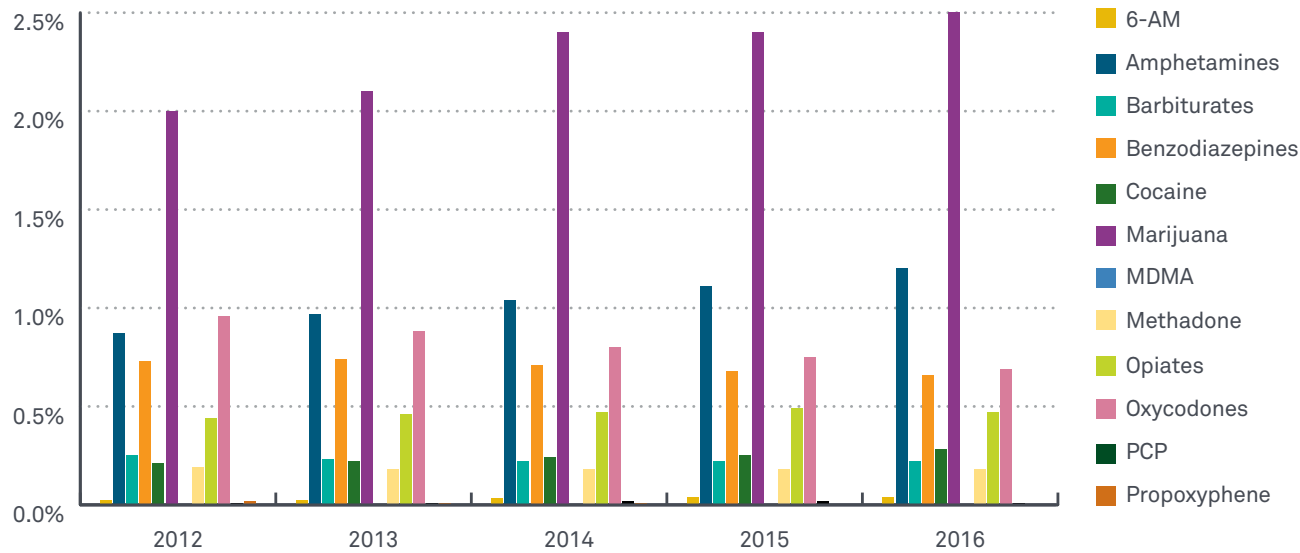


More than 2.2 million tests from January to December 2016

Drug Category	2012	2013	2014	2015	2016
6-AM	0.014%	0.017%	0.022%	0.023%	0.021%
Amphetamines	0.48%	0.51%	0.54%	0.58%	0.63%
Cocaine	0.27%	0.26%	0.25%	0.26%	0.28%
Marijuana	0.63%	0.67%	0.71%	0.71%	0.78%
MDMA	0.003%	0.004%	0.005%	0.005%	0.005%
Opiates	0.18%	0.19%	0.18%	0.21%	0.21%
PCP	0.03%	0.03%	0.03%	0.03%	0.03%

Positivity Rates by Drug Category

Urine Drug Tests – For General U.S. Workforce, as a Percentage of All Such Tests



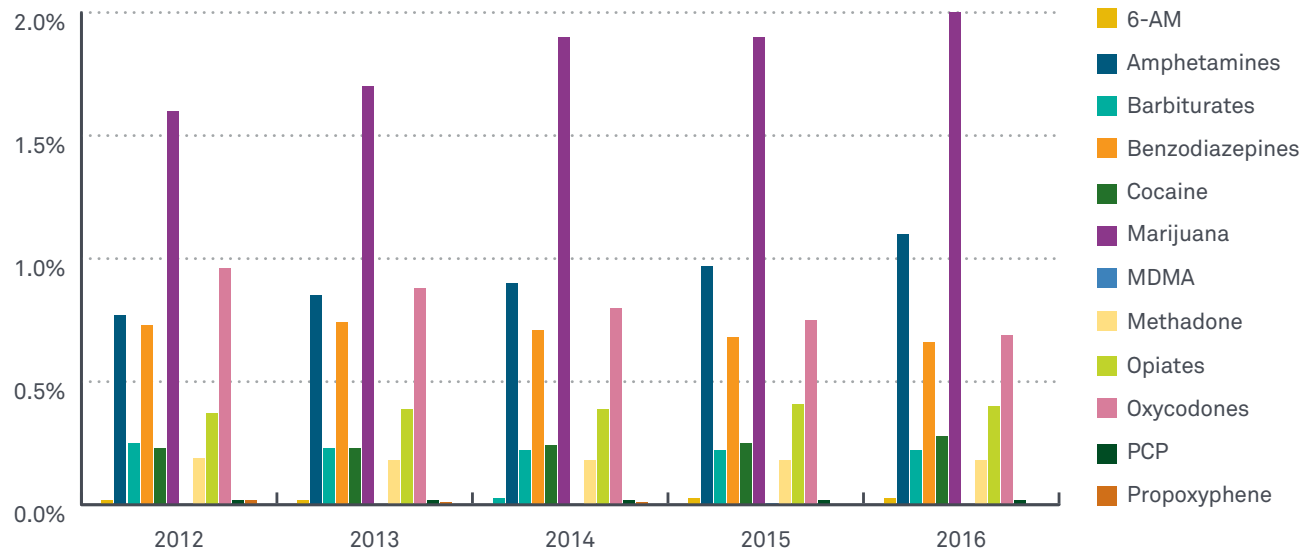
More than 6.5 million tests from January to December 2016

Drug Category	2012	2013	2014	2015	2016
6-AM	0.022%	0.023%	0.031%	0.037%	0.037%
Amphetamines	0.87%	0.97%	1.04%	1.11%	1.20%
Barbiturates	0.25%	0.23%	0.22%	0.22%	0.22%
Benzodiazepines	0.73%	0.74%	0.71%	0.68%	0.66%
Cocaine	0.21%	0.22%	0.24%	0.25%	0.28%
Marijuana	2.0%	2.1%	2.4%	2.4%	2.5%

Drug Category	2012	2013	2014	2015	2016
MDMA	0.001%	0.002%	0.003%	0.005%	0.004%
Methadone	0.19%	0.18%	0.18%	0.18%	0.18%
Opiates	0.44%	0.46%	0.47%	0.49%	0.47%
Oxycodones	0.96%	0.88%	0.80%	0.75%	0.69%
PCP	0.01%	0.01%	0.02%	0.02%	0.01%
Propoxyphene	0.02%	0.01%	0.01%	0.00%	0.00%

Positivity Rates by Drug Category

Urine Drug Tests – For Combined U.S. Workforce, as a Percentage of All Such Tests



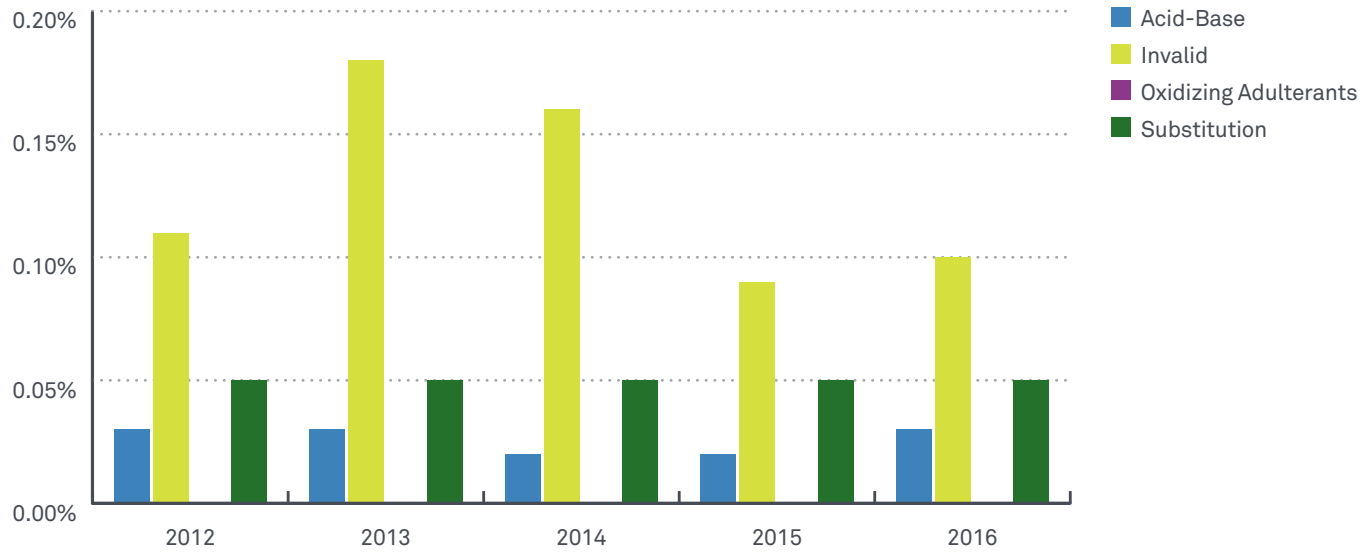
Nearly 9 million tests from January to December 2016

Drug Category	2012	2013	2014	2015	2016
6-AM	0.017%	0.020%	0.025%	0.028%	0.028%
Amphetamines	0.77%	0.85%	0.90%	0.97%	1.10%
Barbiturates	0.25%	0.23%	0.22%	0.22%	0.22%
Benzodiazepines	0.73%	0.74%	0.71%	0.68%	0.66%
Cocaine	0.23%	0.23%	0.24%	0.25%	0.28%
Marijuana	1.6%	1.7%	1.9%	1.9%	2.0%

Drug Category	2012	2013	2014	2015	2016
MDMA	0.002%	0.003%	0.004%	0.005%	0.004%
Methadone	0.19%	0.18%	0.18%	0.18%	0.18%
Opiates	0.37%	0.39%	0.39%	0.41%	0.40%
Oxycodones	0.96%	0.88%	0.80%	0.75%	0.69%
PCP	0.02%	0.02%	0.02%	0.02%	0.02%
Propoxyphene	0.02%	0.01%	0.01%	0.00%	0.00%

Non-Negative Rates by Specimen Validity Test (SVT)* Category

Urine Drug Tests – For Federally-Mandated, Safety-Sensitive Workforce, as a Percentage of All Such Tests



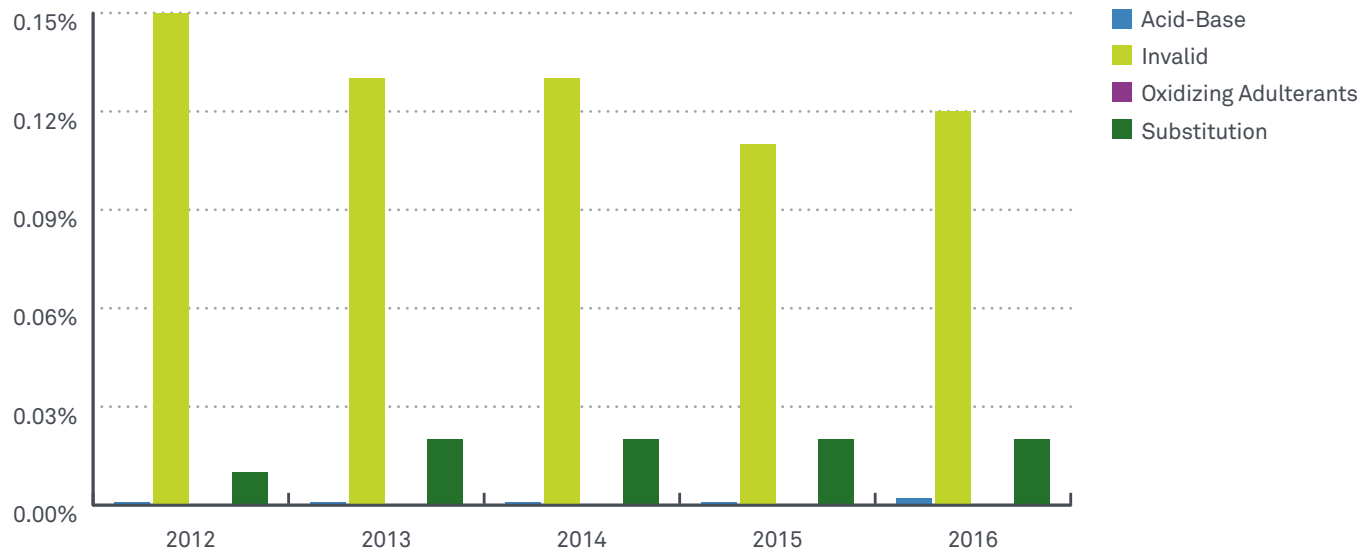
More than 2.2 million tests from January to December 2016

SVT Category	2012	2013	2014	2015	2016
Acid-Base	0.03%	0.03%	0.02%	0.02%	0.03%
Invalid	0.11%	0.18%	0.16%	0.09%	0.10%
Oxidizing Adulterants	0.000%	0.000%	0.000%	0.000%	0.000%
Substitution	0.05%	0.05%	0.05%	0.05%	0.05%

*Specimen validity testing is the evaluation of a specimen to determine if it is consistent with a normal human specimen. Tests for specimen validity include tests to determine whether a specimen is adulterated or substituted.

Non-Negative Rates by SVT Category

Urine Drug Tests – For General U.S. Workforce, as a Percentage of All Such Tests

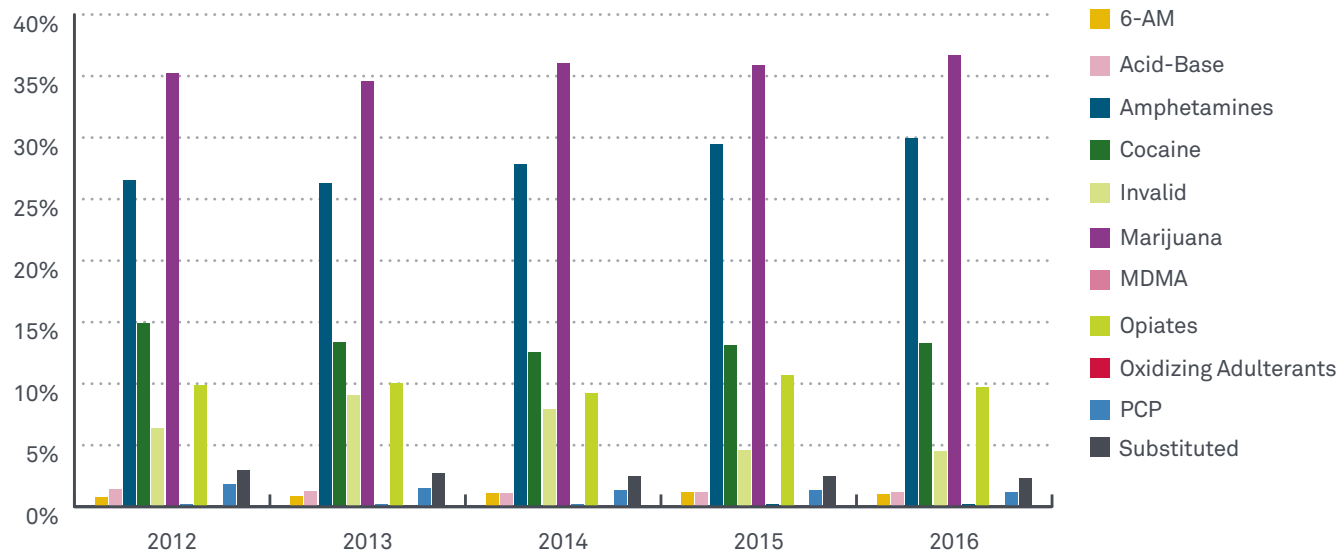


More than 6.5 million tests from January to December 2016

SVT Category	2012	2013	2014	2015	2016
Acid-Base	0.001%	0.001%	0.001%	0.001%	0.002%
Invalid	0.15%	0.13%	0.13%	0.11%	0.12%
Oxidizing Adulterants	0.000%	0.000%	0.000%	0.000%	0.000%
Substitution	0.01%	0.02%	0.02%	0.02%	0.02%

Non-Negative Rates by Drug/SVT Category

Urine Drug Tests – For Federally-Mandated, Safety-Sensitive Workforce, as a Percentage of All Non-Negatives



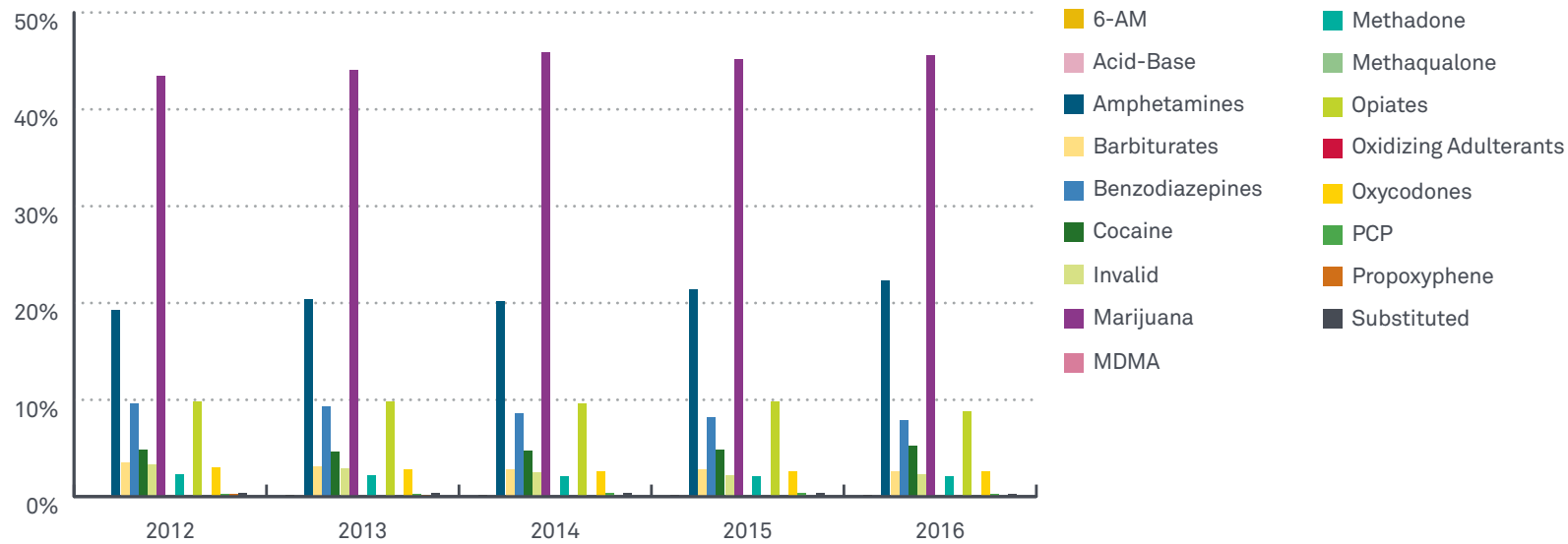
More than 45 thousand non-negative test results from January to December 2016

Drug/SVT Category	2012	2013	2014	2015	2016
6-AM	0.75%	0.87%	1.12%	1.14%	0.99%
Acid-Base	1.40%	1.30%	1.08%	1.14%	1.20%
Amphetamines	26.50%	26.30%	27.87%	29.45%	29.94%
Cocaine	14.90%	13.40%	12.58%	13.11%	13.27%
Invalid	6.36%	9.10%	7.95%	4.59%	4.49%
Marijuana	35.24%	34.60%	36.08%	35.91%	36.70%

Drug/SVT Category	2012	2013	2014	2015	2016
MDMA	0.17%	0.21%	0.24%	0.24%	0.21%
Opiates	9.90%	10.0%	9.24%	10.66%	9.69%
Oxidizing Adulterants	0.000%	0.000%	0.000%	0.000%	0.000%
PCP	1.80%	1.50%	1.31%	1.31%	1.21%
Substituted	3.00%	2.70%	2.51%	2.45%	2.30%

Non-Negative Rates by Drug/SVT Category

Urine Drug Tests – For General U.S. Workforce, as a Percentage of All Non-Negatives



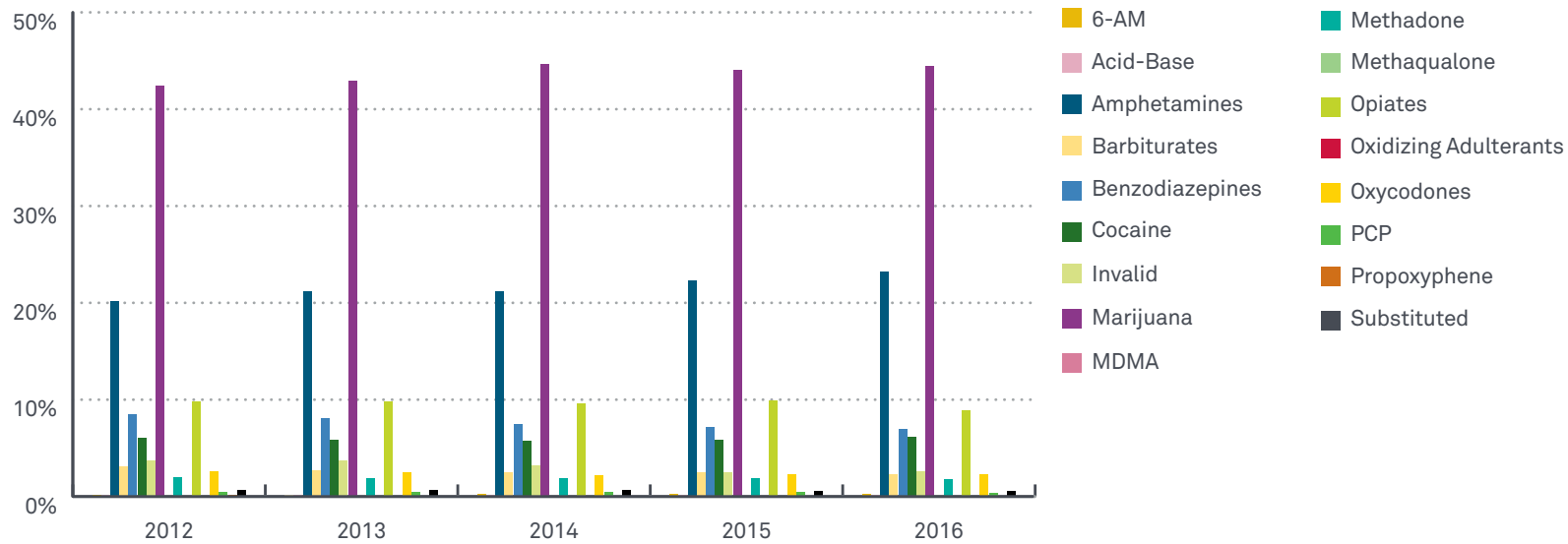
More than 350 thousand non-negative test results from January to December 2016

Drug/SVT Category	2012	2013	2014	2015	2016
6-AM	0.09%	0.11%	0.14%	0.16%	0.15%
Acid-Base	0.03%	0.03%	0.03%	0.03%	0.03%
Amphetamines	19.30%	20.40%	20.20%	21.34%	22.33%
Barbiturates	3.50%	3.10%	2.84%	2.83%	2.61%
Benzodiazepines	9.60%	9.30%	8.56%	8.21%	7.84%
Cocaine	4.80%	4.60%	4.70%	4.85%	5.24%
Invalid	3.30%	2.90%	2.53%	2.22%	2.29%
Marijuana	43.40%	44.00%	45.91%	45.19%	45.53%
MDMA	0.01%	0.01%	0.02%	0.03%	0.03%

Drug/SVT Category	2012	2013	2014	2015	2016
Methadone	2.30%	2.20%	2.13%	2.12%	2.05%
Methaqualone	0.000%	0.000%	0.000%	0.000%	0.000%
Opiates	9.80%	9.80%	9.63%	9.80%	8.74%
Oxidizing Adulterants	0.000%	0.000%	0.000%	0.000%	0.000%
Oxycodones	3.00%	2.80%	2.55%	2.57%	2.61%
PCP	0.30%	0.30%	0.36%	0.31%	0.24%
Propoxyphene	0.23%	0.11%	0.06%	0.03%	0.02%
Substituted	0.31%	0.32%	0.35%	0.32%	0.28%

Non-Negative Rates by Drug/SVT Category

Urine Drug Tests – For Combined U.S. Workforce, as a Percentage of All Non-Negatives



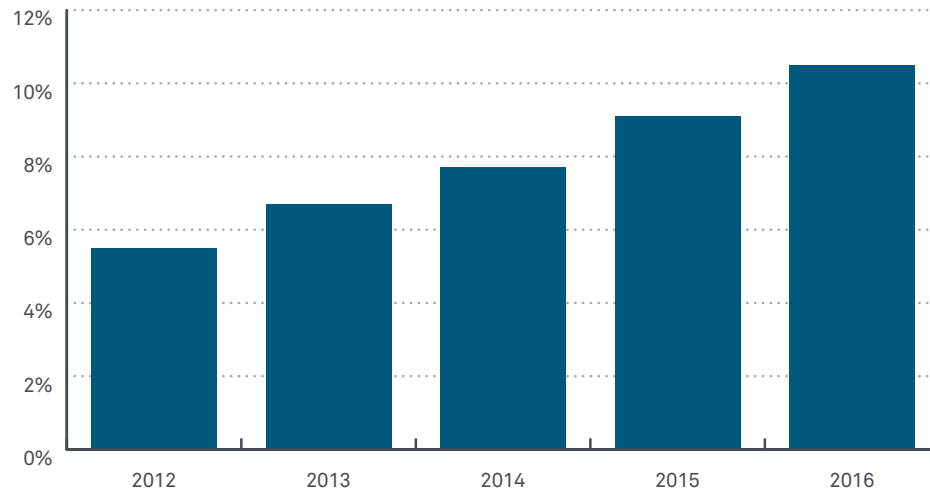
More than 400 thousand non-negative test results from January to December 2016

Drug/SVT Category	2012	2013	2014	2015	2016
6-AM	0.17%	0.20%	0.26%	0.28%	0.25%
Acid-Base	0.20%	0.19%	0.16%	0.16%	0.17%
Amphetamines	20.20%	21.20%	21.16%	22.34%	23.23%
Barbiturates	3.10%	2.70%	2.48%	2.48%	2.30%
Benzodiazepines	8.50%	8.10%	7.48%	7.19%	6.92%
Cocaine	6.00%	5.80%	5.69%	5.87%	6.19%
Invalid	3.70%	3.70%	3.21%	2.51%	2.55%
Marijuana	42.40%	42.90%	44.67%	44.05%	44.49%
MDMA	0.03%	0.04%	0.05%	0.06%	0.05%

Drug/SVT Category	2012	2013	2014	2015	2016
Methadone	2.00%	1.90%	1.86%	1.86%	1.81%
Methaqualone	0.000%	0.000%	0.000%	0.000%	0.000%
Opiates	9.80%	9.80%	9.59%	9.91%	8.85%
Oxidizing Adulterants	0.000%	0.000%	0.000%	0.000%	0.000%
Oxycodones	2.60%	2.50%	2.23%	2.25%	2.30%
PCP	0.48%	0.44%	0.48%	0.43%	0.36%
Propoxyphene	0.20%	0.10%	0.06%	0.03%	0.02%
Substituted	0.63%	0.62%	0.62%	0.58%	0.52%

Positivity Rates by Testing Category

Oral Fluid Drug Tests – For General U.S. Workforce

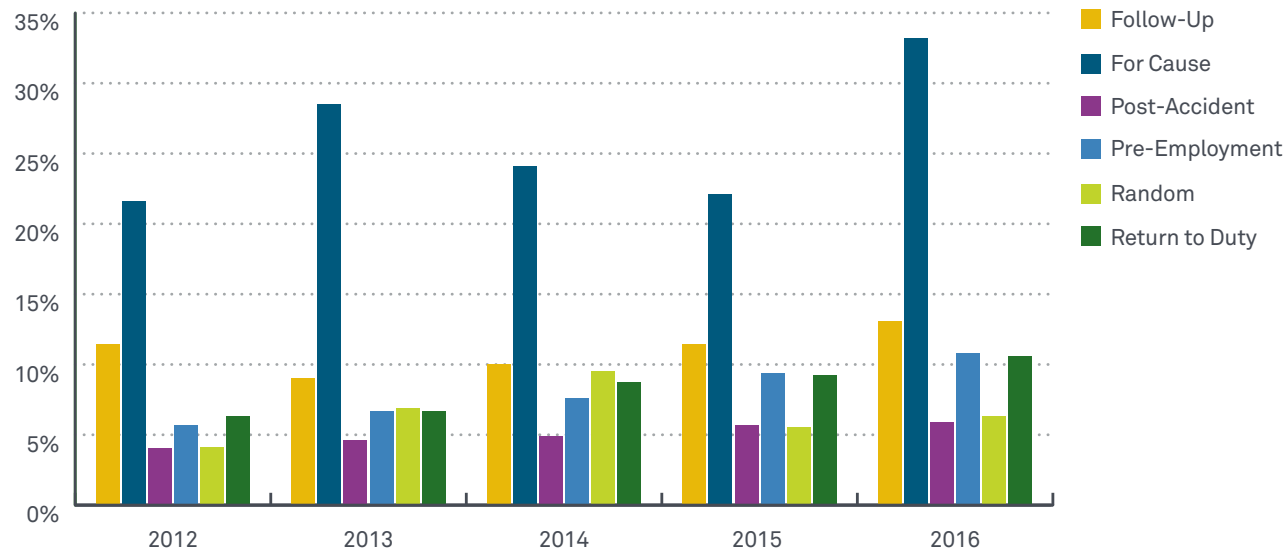


More than 1.3 million tests from January to December 2016

Testing Category	2012	2013	2014	2015	2016
General U.S. Workforce	5.5%	6.7%	7.7%	9.1%	10.5%

Positivity Rates by Testing Reason

Oral Fluid Drug Tests – For General U.S. Workforce

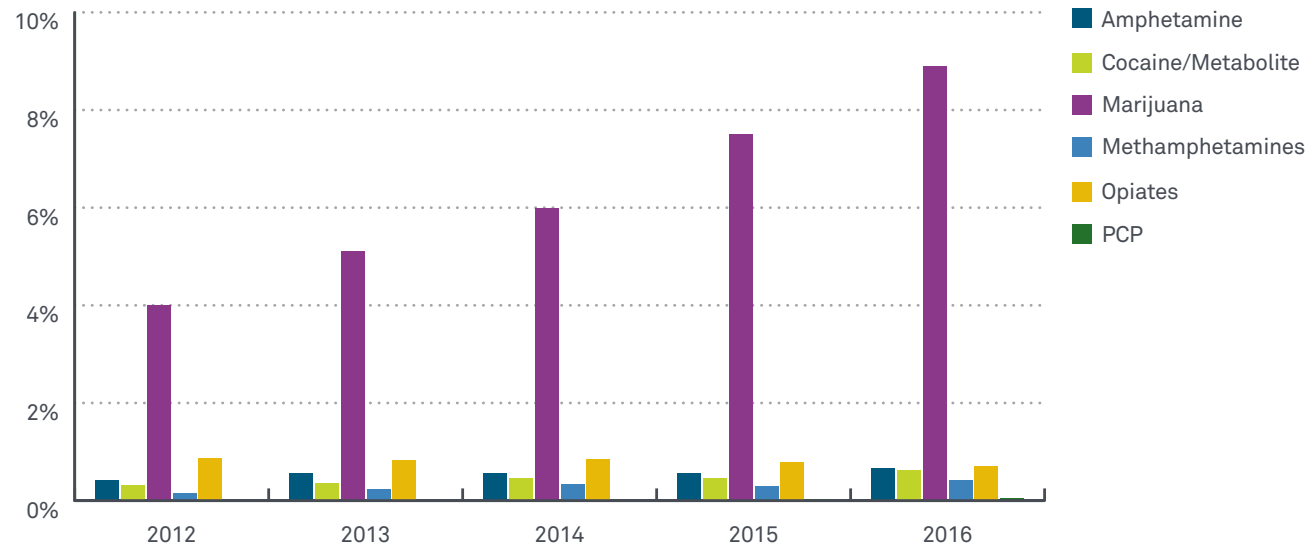


More than 1.3 million tests from January to December 2016

Testing Reason	2012	2013	2014	2015	2016
Follow-Up	11.4%	9.0%	10.0%	11.4%	13.1%
For Cause	21.6%	28.5%	24.1%	22.1%	33.2%
Post-Accident	4.0%	4.6%	4.9%	5.7%	5.9%
Pre-Employment	5.7%	6.7%	7.6%	9.4%	10.8%
Random	4.1%	6.9%	9.5%	5.5%	6.3%
Return to Duty	6.3%	6.7%	8.7%	9.2%	10.6%

Positivity Rates by Drug Category

Oral Fluid Drug Tests – For General U.S. Workforce

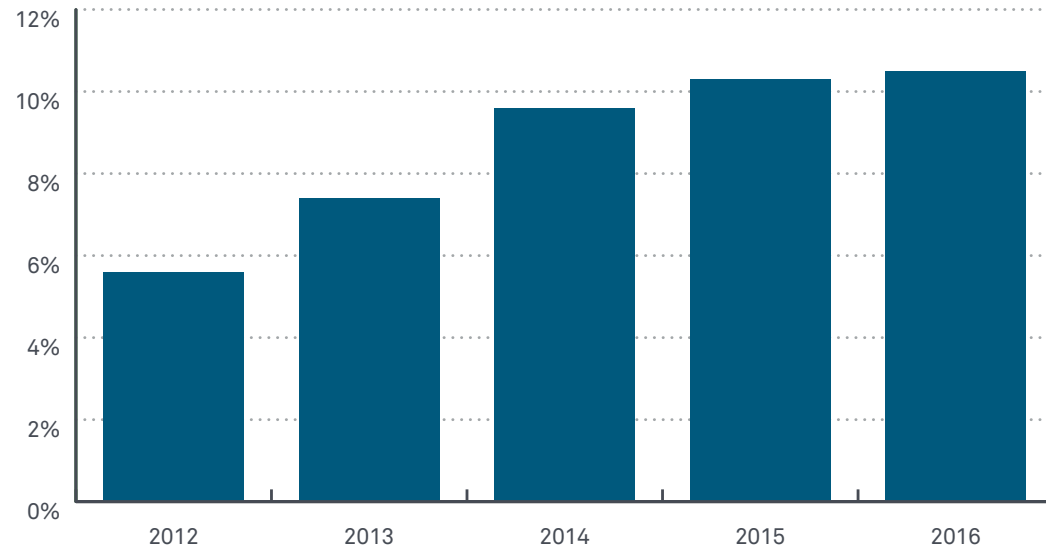


More than 1.3 million tests from January to December 2016

Drug Category	2012	2013	2014	2015	2016
Amphetamine	0.43%	0.57%	0.57%	0.56%	0.66%
Cocaine/Metabolite	0.31%	0.36%	0.47%	0.46%	0.63%
Marijuana	4.0%	5.1%	6.0%	7.5%	8.9%
Methamphetamines	0.16%	0.24%	0.33%	0.29%	0.42%
Opiates	0.88%	0.83%	0.85%	0.78%	0.71%
PCP	0.02%	0.02%	0.02%	0.04%	0.05%

Positivity Rates by Testing Category

Hair Drug Tests – For General U.S. Workforce

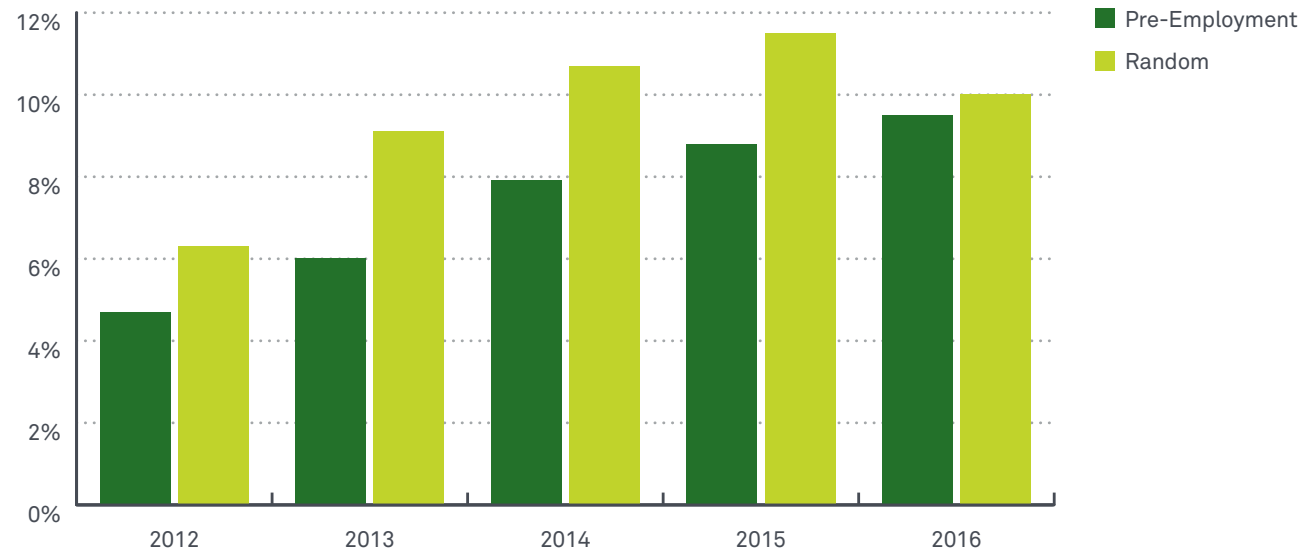


More than 170 thousand tests from January to December 2016

Testing Category	2012	2013	2014	2015	2016
General U.S. Workforce	5.6%	7.4%	9.6%	10.3%	10.5%

Positivity Rates by Testing Reason

Hair Drug Tests – For General U.S. Workforce

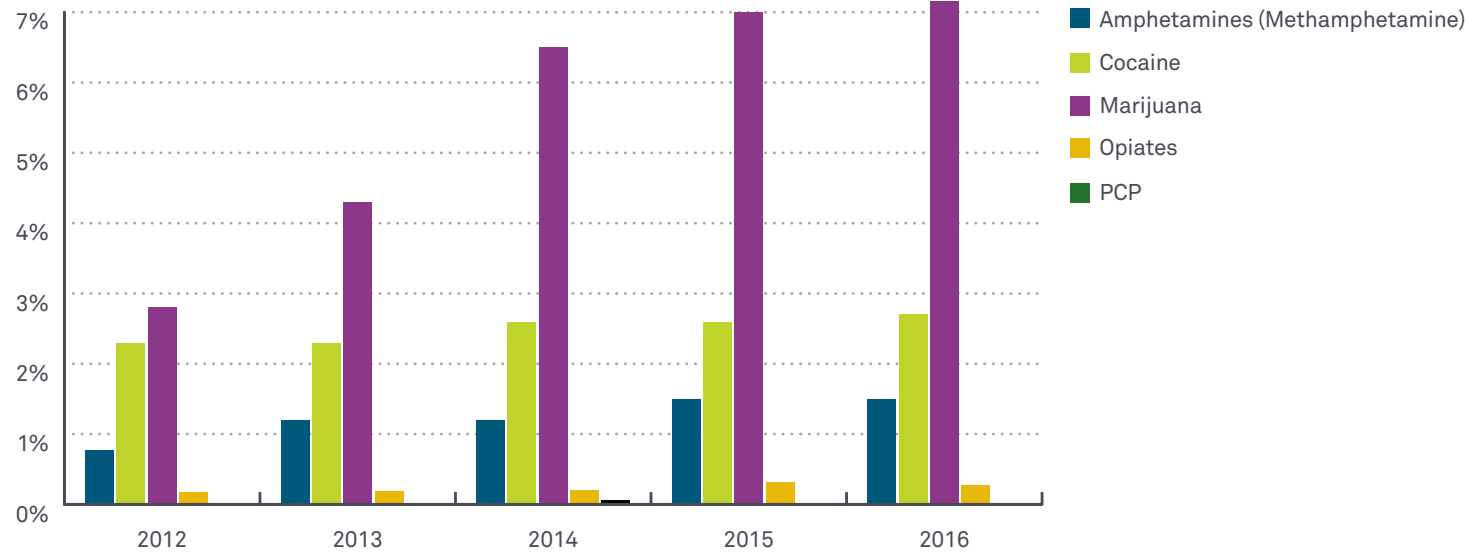


More than 170 thousand tests from January to December 2016

Testing Reason	2012	2013	2014	2015	2016
Pre-Employment	4.7%	6.0%	7.9%	8.8%	9.5%
Random	6.3%	9.1%	10.7%	11.5%	10.0%

Positivity Rates by Drug Category

Hair Drug Tests – For General U.S. Workforce



More than 170 thousand tests from January to December 2016

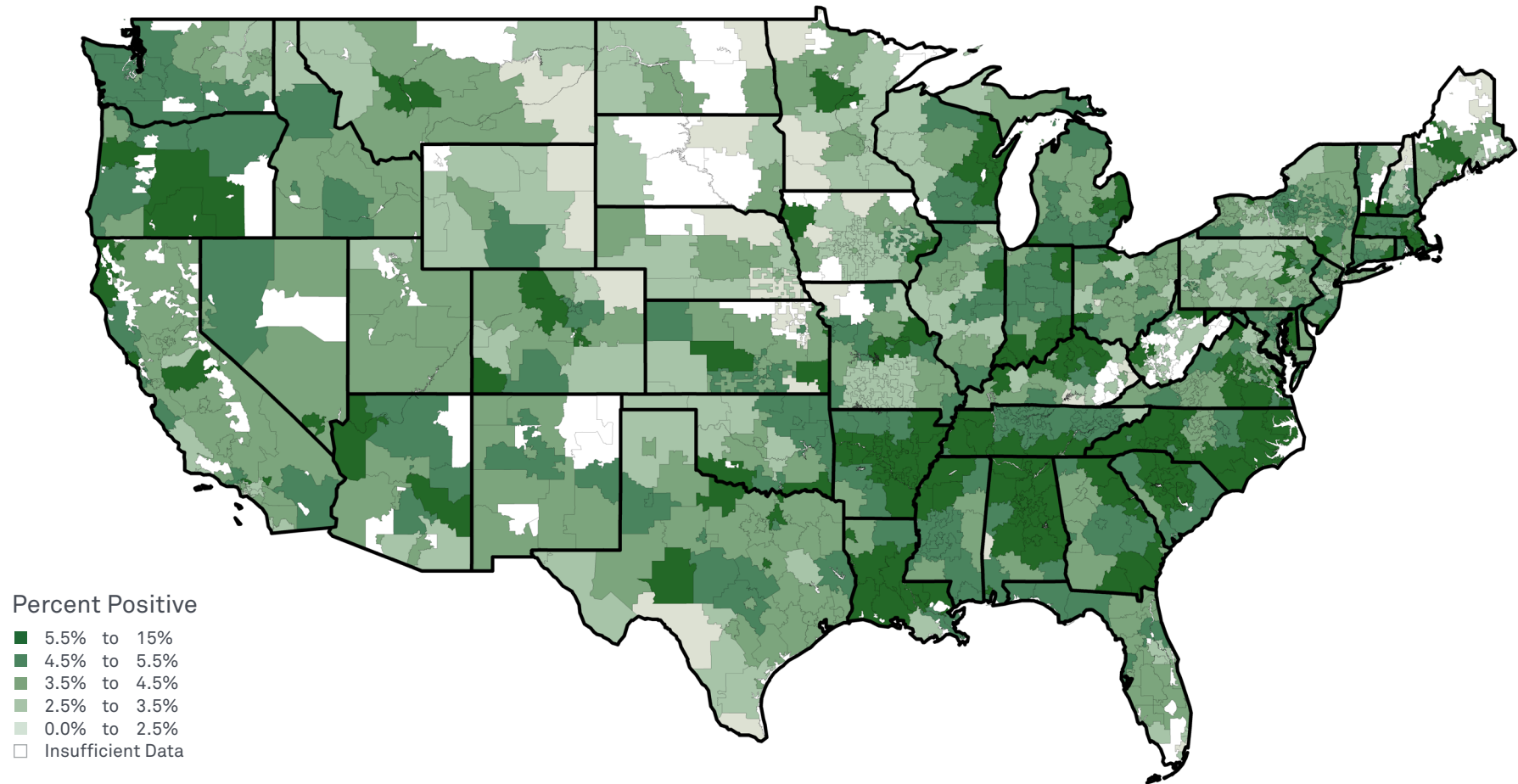
Drug Category	2012	2013	2014	2015	2016
Amphetamines (Methamphetamine)	0.77%	1.2%	1.2%	1.5%	1.5%
Cocaine	2.3%	2.3%	2.6%	2.6%	2.7%
Marijuana	2.8%	4.3%	6.5%	7.0%	7.3%
Opiates	0.18%	0.19%	0.21%	0.32%	0.27%
PCP	0.01%	0.02%	0.06%	0.01%	0.01%

3-Digit Zip Code Drug Positivity Maps

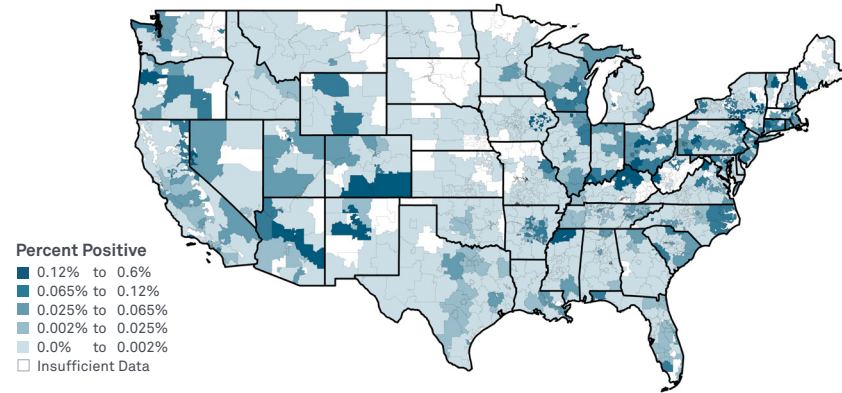
Urine Drug Tests

January - December 2016

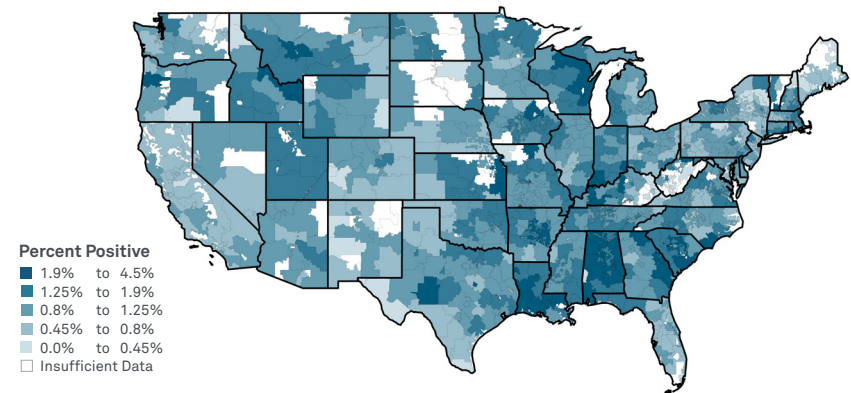
Overall Positivity



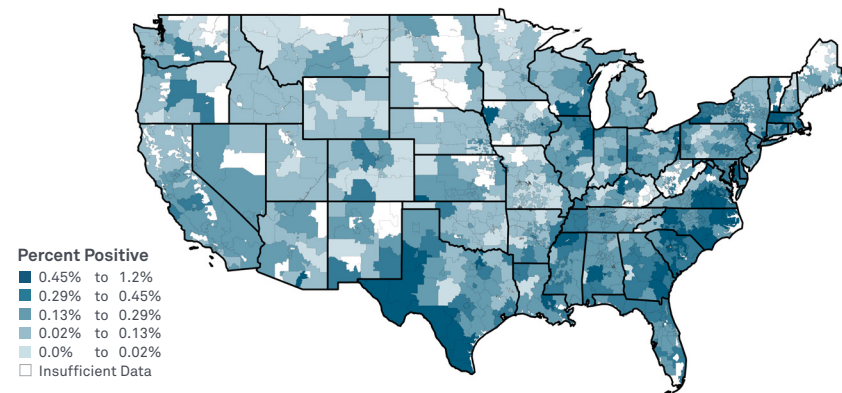
6-AM Positivity



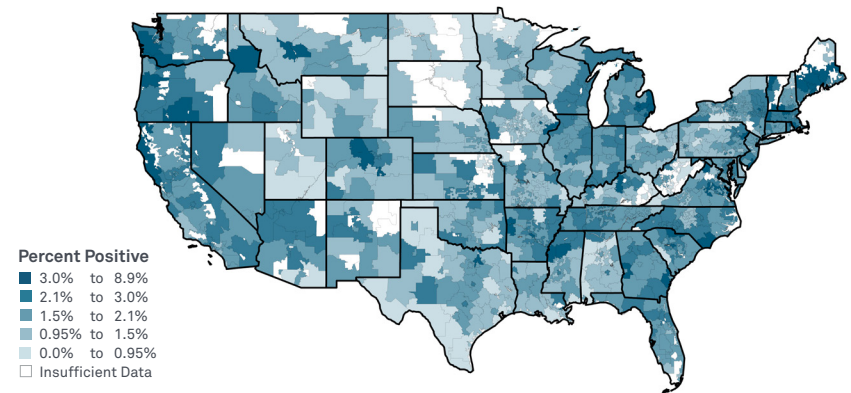
Amphetamines Positivity



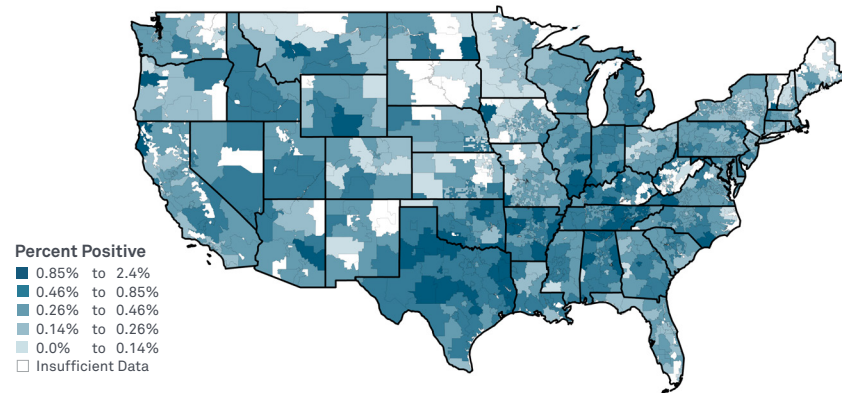
Cocaine Positivity



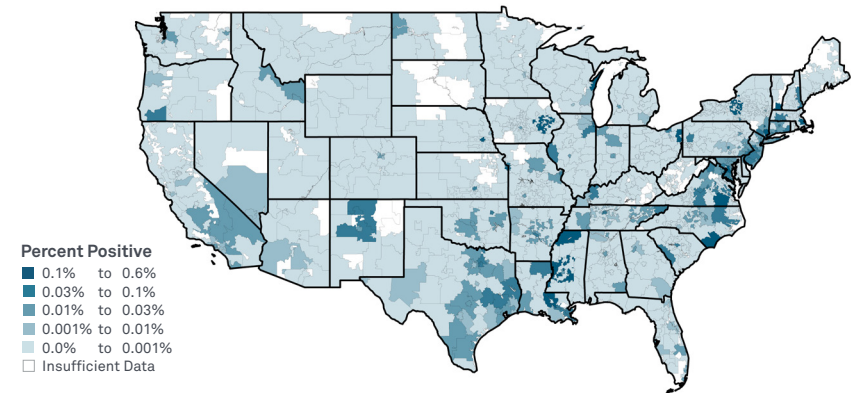
Marijuana Positivity



Opiates Positivity



PCP Positivity





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