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**TRUCKING  
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**A Longitudinal and Statistical  
Assessment of Hair vs. Urine  
Testing Efficacy**

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# Introduction

## REPORT HIGHLIGHTS

Drawing from over 1 million pre-employment urine and hair drug screens administered from 2017-2023, hair testing uncovers:

1 **14x**  
More Drug Positives

2 Hair's positivity rate is significantly greater than urine

3 Hair detects significantly more cocaine, opioids, amphetamines, marijuana, and ecstasy

Researchers from the University of Tennessee and University of Central Arkansas utilized data provided by members of The Alliance for Driver Safety and Security, commonly known as the Trucking Alliance, to highlight hair testing's ability to identify drivers engaged in lifestyle drug use. Cargo Transporters, Dupre Logistics, JB Hunt, KLLM, Knight/Swift, Maverick USA, and Schneider National independently provided 76,622 matched pre-employment drug test results from calendar year 2023. Researchers also utilized data from 2017-2023 to obtain a total sample of 1,013,494 total drug tests.

This report specifically compares the efficacy of urine v. hair testing by examining:

1. Hair v. urine positivity rate differences for drugs tested in a 5-panel drug screen
2. Hair v. urine positivity rate differences by age group
3. Hair v. urine positivity rate differences by state

Drawing from over 1 million pre-employment urine and hair drug screens administered from 2017-2023, hair testing uncovers:

- 24x more opioid users,
- 23x more cocaine users, and
- 13x more amphetamine/methamphetamine users.

In 2023, hair testing uncovered 14x more drug positives. Statistical analysis indicates:

- Hair's positivity rate is significantly greater than urine.
- Hair detects significantly more cocaine, opioids, amphetamines/methamphetamines, marijuana, and ecstasy.

**NOTE: PCP DIFFERENCE WAS NOT SIGNIFICANT DUE TO SMALL NUMBER OF POSITIVES**

Further, hair testing uncovered more positive drug tests across every examined age group and detected more drugs in every U.S. state where drug positives were detected. Based on a sample of over 1 million drug tests, we conclude hair testing is superior to urine based on its demonstrated ability to detect significantly more drug users, across all drugs examined, across all ages, and across all states.

To the extent federal agencies wish to improve roadway safety by disqualifying drivers who use drugs, we recommend that carriers be allowed to submit pre-employment hair test results to the Drug and Alcohol Clearinghouse.

# Testing Overview

In 2023, hair testing had a 14X higher positivity rate and detected more of every type of drug

Table 1: 2023 Pre-employment Drug Screen Results

Drug Testing Results	Hair	Urine	Difference
No. of Tests	38,311	38,311	--
No. of Positive Tests	1,391	102	1,209
% Positive	3.63%	0.27%	14x

No. of Positive Tests that Contained:	Hair	Urine	Difference
Marijuana	555	127	428
Cocaine	530	18	512
Opioids	222	11	211
Amphetamines/Methamphetamines	192	10	182
MDMA (ecstasy)	32	1	31
Phencyclidine (PCP)	3	0	3

*RED = Hair detected drug more frequently than urine*

Hair testing's positivity rate is statistically greater than urine

Statistical analyses were conducted to determine whether the differences between hair and urine were significant. Results indicate hair testing yields a significantly higher overall positivity rate ( $t = 145.93$ ;  $p < 0.000$ ) and:

- detects significantly more cocaine ( $t = 30.18$ ;  $p < 0.000$ )
- detects significantly more marijuana ( $t = 28.40$ ;  $p < 0.000$ ),
- detects significantly more opioids ( $t = 15.55$ ;  $p < 0.000$ )
- detects significantly more amphetamines/methamphetamines ( $t = 15.11$ ;  $p < 0.000$ ),
- detects significantly more ecstasy ( $t = 5.62$ ;  $p < 0.000$ )

# Overall Testing



*Hair testing uncovered more positive drug tests across every examined age group and detected more drugs in every U.S. state where drug positives were detected. Based on a sample of over 1 million drug tests, we conclude hair testing is superior to urine based on its demonstrated ability to detect significantly more drug users, across all drugs examined, across all ages, and across all states*

**Table 3: 2017-23 Pre-employment Drug Screen Results**

Drug Test Results	2017	2018	2019	2020	2021	2022	2023	Total
No. of Urine Tests	56,469	92,193	85,650	68,025	88,021	85,946	38,311	514,615
No. of Hair Tests	56,160	91,556	73,904	66,875	84,611	87,462	38,311	498,879
No. of Positive Urine Tests	298	651	845	478	403	446	102	3,223
No. of Positive Hair Tests	2,921	5,957	4,746	4,009	4,362	4,727	1,391	28,113
% Positive Urine Tests	0.50%	0.71%	0.99%	0.70%	0.46%	0.52%	0.27%	0.63%
% Positive Hair Tests	5.20%	6.51%	6.42%	5.99%	5.16%	5.40%	3.63%	5.64%
Difference (Hair-Urine)	4.70% (10x)	5.80% (9x)	5.43% (7x)	5.29% (9x)	4.70% (11x)	4.88% (10x)	3.36% (14x)	5.01% (9x)

**Based on over 1 million drug tests, hair detects 24X more opioids and 23X more cocaine**

# Hair vs. Urine Testing Efficacy

How much more effective was hair testing at detecting drugs than urine testing?\*

**5x**

More effective in testing for marijuana  
10,618 vs. 2,179

**23x**

More effective in testing for cocaine  
10,380 vs. 443

**13x**

More effective in testing for amphetamines/  
methamphetamines  
4,965 vs. 375

**24x**

More effective in testing for opioids  
6,912 vs. 283

**57x**

More effective in testing for MDMA  
228 vs. 4

**3x**

More effective in testing for PCP  
49 vs. 16

*\*2017-2023 Pre-Employment Drug Screening Results*



*From 2017-2023, there were 514,615 urine tests and 498,879 hair tests done during pre-employment screening. During that time, there were 3,223 (0.63%) positive urine tests, and 28,113 (5.64%) positive hair tests.*

# Testing by Age

## Hair detects more drugs for every age group

Table 4: Drug Use by Age

Age Group	Type of Test	n	Marijuana	Cocaine	Amphetamines/ Methamphetamines	Opioids	MDMA (Ecstasy)	PCP	Total
18-24	Hair	119	72	36	8	3	4	0	136
	Urine	8	6	1	0	0	0	0	7
			<b>66</b>	<b>35</b>	<b>8</b>	<b>3</b>	<b>4</b>	<b>0</b>	<b>129</b>
25-34	Hair	527	290	165	54	61	14	0	584
	Urine	50	35	5	3	3	0	0	46
			<b>255</b>	<b>160</b>	<b>51</b>	<b>58</b>	<b>14</b>	<b>0</b>	<b>538</b>
35-44	Hair	399	133	149	55	84	12	1	434
	Urine	19	9	3	2	3	1	0	18
			<b>124</b>	<b>146</b>	<b>53</b>	<b>81</b>	<b>11</b>	<b>1</b>	<b>416</b>
45-54	Hair	272	84	132	44	38	2	1	290
	Urine	13	11	0	0	0	0	0	11
			<b>73</b>	<b>132</b>	<b>44</b>	<b>38</b>	<b>2</b>	<b>1</b>	<b>290</b>
55-64	Hair	160	24	87	34	27	0	1	173
	Urine	6	1	2	1	2	0	0	6
			<b>23</b>	<b>85</b>	<b>33</b>	<b>25</b>	<b>0</b>	<b>1</b>	<b>167</b>
65+	Hair	57	19	20	12	10	0	0	61
	Urine	1	0	0	0	0	0	0	0
			<b>19</b>	<b>20</b>	<b>12</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>61</b>



# Testing by State

## Hair detects more drugs for every age group

Table 5: Drug Use by State

State	Type of Test	Marijuana	Cocaine	Amphetamines/ Methamphetamines	Opioids	MDMA (Ecstasy)	PCP
Alabama	Hair	11	11	5	7	0	0
	Urine	1	0	0	0	0	0
		<b>10</b>	<b>11</b>	<b>5</b>	<b>7</b>	<b>0</b>	<b>0</b>
Arkansas	Hair	18	6	7	5	0	0
	Urine	1	0	0	1	0	0
		<b>17</b>	<b>6</b>	<b>7</b>	<b>4</b>	<b>0</b>	<b>0</b>
Arizona	Hair	10	11	13	4	0	1
	Urine	0	0	0	0	0	0
		<b>10</b>	<b>11</b>	<b>13</b>	<b>4</b>	<b>0</b>	<b>1</b>
California	Hair	43	57	44	18	3	0
	Urine	3	4	1	0	0	0
		<b>40</b>	<b>53</b>	<b>43</b>	<b>18</b>	<b>3</b>	<b>0</b>
Colorado	Hair	11	1	7	2	0	0
	Urine	1	0	0	1	0	0
		<b>10</b>	<b>1</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>0</b>
Connecticut	Hair	3	8	0	2	0	0
	Urine	0	0	0	0	0	0
		<b>3</b>	<b>8</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>
District of Columbia	Hair	0	0	0	0	0	0
	Urine	0	0	0	0	0	0
		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Deleware	Hair	1	0	0	0	0	0
	Urine	0	0	0	0	0	0
		<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Florida	Hair	23	23	4	11	0	0
	Urine	1	0	0	1	0	0
		<b>22</b>	<b>23</b>	<b>4</b>	<b>10</b>	<b>0</b>	<b>0</b>
Georgia	Hair	52	59	7	28	2	0
	Urine	3	0	0	3	0	0
		<b>49</b>	<b>59</b>	<b>7</b>	<b>25</b>	<b>2</b>	<b>0</b>
Iowa	Hair	4	2	2	1	0	0
	Urine	1	0	0	0	0	0
		<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>

# Testing by State

Table 5: Drug Use by State, continued

State	Type of Test	Marijuana	Cocaine	Amphetamines/ Methamphetamines	Opioids	MDMA (Ecstasy)	PCP
Idaho	Hair	2	0	1	0	0	0
	Urine	0	0	0	0	0	0
		<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
Illinois	Hair	52	48	6	12	23	0
	Urine	5	0	0	0	1	0
		<b>47</b>	<b>48</b>	<b>6</b>	<b>12</b>	<b>22</b>	<b>0</b>
Indiana	Hair	21	21	5	5	1	0
	Urine	2	1	0	0	0	0
		<b>19</b>	<b>20</b>	<b>5</b>	<b>5</b>	<b>1</b>	<b>0</b>
Kansas	Hair	2	3	1	0	0	0
	Urine	0	0	0	0	0	0
		<b>2</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
Kentucky	Hair	9	5	3	2	0	0
	Urine	2	0	0	0	0	0
		<b>7</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>
Louisiana	Hair	10	5	8	8	0	0
	Urine	0	1	1	0	0	0
		<b>10</b>	<b>4</b>	<b>7</b>	<b>8</b>	<b>0</b>	<b>0</b>
Massachusetts	Hair	3	8	0	4	0	0
	Urine	0	0	0	0	0	0
		<b>3</b>	<b>8</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>
Maryland	Hair	10	13	0	2	0	0
	Urine	2	0	0	1	0	0
		<b>8</b>	<b>13</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
Maine	Hair	0	0	0	0	0	0
	Urine	0	0	0	0	0	0
		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Michigan	Hair	23	17	5	5	1	0
	Urine	3	0	0	1	0	0
		<b>20</b>	<b>17</b>	<b>5</b>	<b>4</b>	<b>1</b>	<b>0</b>
Minnesota	Hair	20	19	9	6	0	0
	Urine	3	1	0	0	0	0
		<b>17</b>	<b>18</b>	<b>9</b>	<b>6</b>	<b>0</b>	<b>0</b>
Missouri	Hair	20	19	9	6	0	0
	Urine	3	1	0	0	0	0
		<b>17</b>	<b>18</b>	<b>9</b>	<b>6</b>	<b>0</b>	<b>0</b>



# Testing by State



State	Type of Test	Marijuana	Cocaine	Amphetamines/ Methamphetamines	Opioids	MDMA (Ecstasy)	PCP
Mississippi	Hair	23	8	3	11	0	0
	Urine	1	0	0	0	0	0
		<b>22</b>	<b>8</b>	<b>3</b>	<b>11</b>	<b>0</b>	<b>0</b>
Montana	Hair	1	0	1	1	0	0
	Urine	0	0	1	0	0	0
		<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
North Carolina	Hair	20	34	3	9	0	0
	Urine	3	0	0	0	0	0
		<b>17</b>	<b>34</b>	<b>3</b>	<b>9</b>	<b>0</b>	<b>0</b>
North Dakota	Hair	0	0	0	0	0	0
	Urine	0	0	0	0	0	0
		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Nebraska	Hair	5	1	1	0	0	0
	Urine	2	0	0	0	0	0
		<b>3</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
New Hampshire	Hair	0	0	0	1	0	0
	Urine	0	0	0	0	0	0
		<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
New Jersey	Hair	8	10	0	4	0	0
	Urine	1	1	0	0	0	0
		<b>7</b>	<b>9</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>

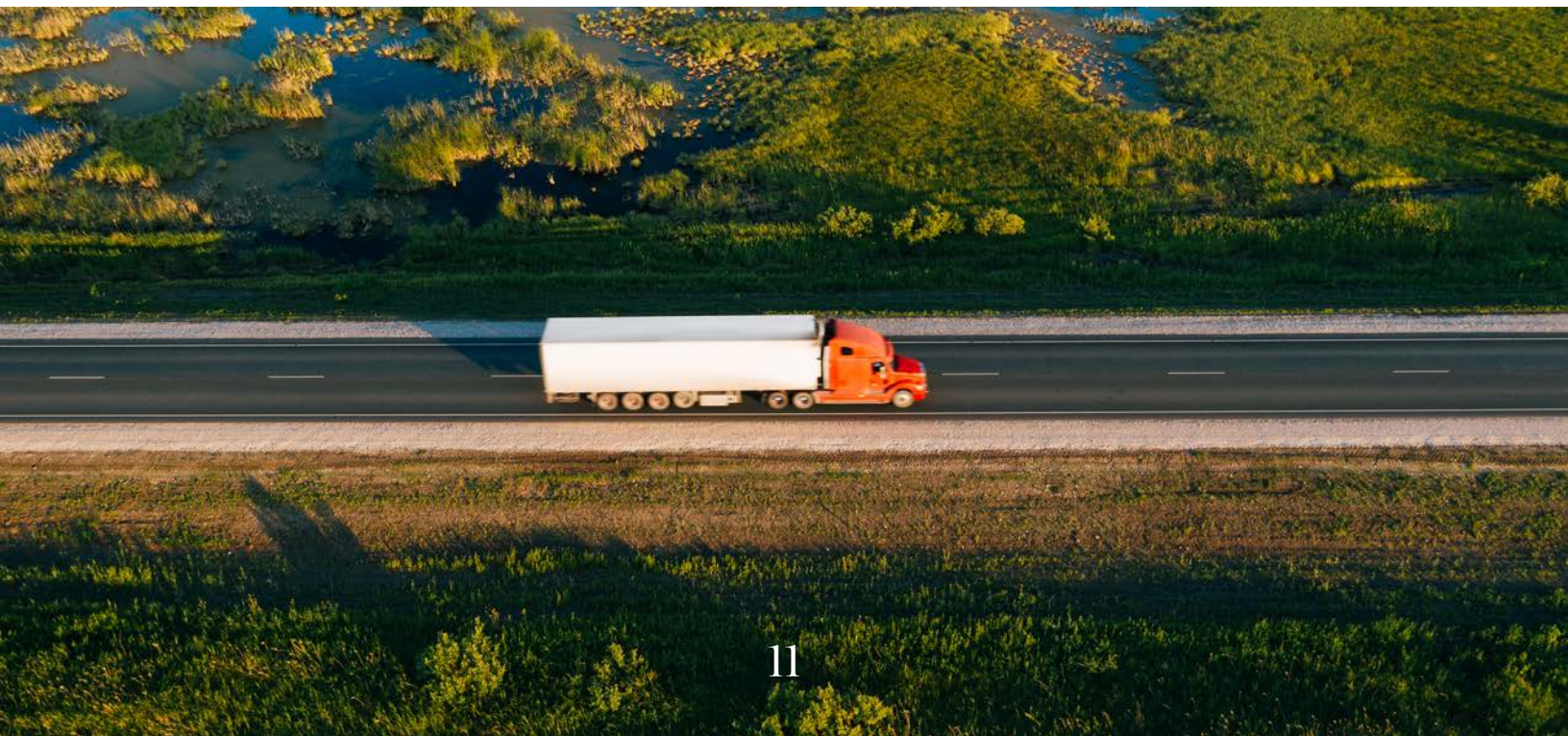
# Testing by State

Table 5: Drug Use by State, continued

State	Type of Test	Marijuana	Cocaine	Amphetamines/ Methamphetamines	Opioids	MDMA (Ecstasy)	PCP
New Mexico	Hair	0	2	1	0	0	0
	Urine	0	0	0	0	0	0
		<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
Nevada	Hair	11	31	12	4	0	0
	Urine	6	2	0	1	0	0
		<b>5</b>	<b>29</b>	<b>12</b>	<b>3</b>	<b>0</b>	<b>0</b>
New York	Hair	11	5	0	1	0	0
	Urine	5	0	0	0	0	0
		<b>6</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
Ohio	Hair	30	22	6	8	1	1
	Urine	2	1	0	1	0	0
		<b>28</b>	<b>21</b>	<b>6</b>	<b>7</b>	<b>1</b>	<b>1</b>
Oklahoma	Hair	5	5	2	5	0	0
	Urine	0	0	0	0	0	0
		<b>5</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>0</b>
Oregon	Hair	5	1	4	0	0	0
	Urine	0	0	0	0	0	0
		<b>5</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>
Pennsylvania	Hair	11	25	5	7	0	0
	Urine	3	1	1	0	0	0
		<b>8</b>	<b>24</b>	<b>4</b>	<b>7</b>	<b>0</b>	<b>0</b>
Rhode Island	Hair	1	3	0	0	0	0
	Urine	0	0	0	0	0	0
		<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
South Carolina	Hair	24	19	1	5	0	0
	Urine	5	0	0	0	0	0
		<b>19</b>	<b>19</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>0</b>
South Dakota	Hair	0	0	0	0	0	0
	Urine	0	0	0	0	0	0
		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Tennessee	Hair	20	14	2	10	1	0
	Urine	1	0	0	0	0	0
		<b>19</b>	<b>14</b>	<b>2</b>	<b>10</b>	<b>1</b>	<b>0</b>
Texas	Hair	63	61	27	23	0	1
	Urine	3	1	1	1	0	0
		<b>60</b>	<b>60</b>	<b>26</b>	<b>22</b>	<b>0</b>	<b>1</b>

# Testing by State

State	Type of Test	Marijuana	Cocaine	Amphetamines/ Methamphetamines	Opioids	MDMA (Ecstasy)	PCP
Utah	Hair	1	6	3	2	0	0
	Urine	0	0	0	0	0	0
		<b>1</b>	<b>6</b>	<b>3</b>	<b>11</b>	<b>0</b>	<b>0</b>
Virginia	Hair	7	11	1	2	0	0
	Urine	0	0	0	0	0	0
		<b>7</b>	<b>11</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>
Vermont	Hair	0	0	0	0	0	0
	Urine	0	0	0	0	0	0
		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Washington	Hair	12	2	8	5	0	0
	Urine	1	0	0	0	0	0
		<b>11</b>	<b>2</b>	<b>8</b>	<b>5</b>	<b>0</b>	<b>0</b>
Wisconsin	Hair	16	14	1	0	0	0
	Urine	2	0	1	0	0	0
		<b>14</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
West Virginia	Hair	1	0	1	0	0	0
	Urine	0	0	0	0	0	0
		<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
Wyoming	Hair	0	0	0	0	0	0
	Urine	0	0	0	0	0	0
		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>





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**The Alliance for Driver Safety & Security**

Cargo Transporters  
Dupre' Logistics  
J.B. Hunt  
KLLM Transport Services  
Knight Transportation  
Maverick Transportation  
May Trucking Company  
Schneider  
Swift  
U.S. Express