

**Analysis of Urine Drug Testing  
Results from a Medical Review Officer  
(MRO) Data Source  
2006-2007**

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This presentation was modified from its original format for 508 compliancy.

# Background

- Drug testing indices which are based only on laboratory confirmed positive results may not accurately represent illicit drug use rates because they include:
  - Blind quality control samples
  - Results later reversed after Medical Review Officer (MRO) determination of valid medical explanations for the test results

# Objectives

- To evaluate the relationship between laboratory reported drug test results and MRO verified results reported to employers in federally regulated (FR) and non-regulated (NR) workplaces
- To specifically focus on NR synthetic opioid and benzodiazepine positive drug test results

# Methods I

- Records for 2.52 M urine specimens collected from January 2006 through December 2007 were obtained from a large MRO data source
- Specimens represented ~5,000 companies nationwide

# Methods II

- Virtually all specimens (99%) were analyzed by SAMHSA certified labs
- All blind QC samples were excluded from the analysis

# Methods III

- Each record contains 254 data elements including:
  - Donor demographics
  - Employer information
  - Collection site information
  - Lab results
  - MRO determinations
- HHS human subject protection criteria were followed

# Urine Data Summary

		<b>Records</b>	<b>Lab +</b>	<b>MRO Verified +</b>
<b>Federally Regulated</b>	<b>2006</b>	<b>223,053</b>	<b>1.38%</b>	<b>90.54%</b>
	<b>2007</b>	<b>199,966</b>	<b>1.43%</b>	<b>85.07%</b>
<b>Non- Regulated</b>	<b>2006</b>	<b>1,062,367</b>	<b>4.19%</b>	<b>79.95%</b>
	<b>2007</b>	<b>1,037,473</b>	<b>4.11%</b>	<b>72.80%</b>

- MRO Reversal Rates ranged from 0% (PCP) to 85.6% (Hydrocodone)

# % Total Verified +'s by Drug Class

- Regulated

Drug	2006	2007
Amphetamine	2.5%	5.0%
Methamphetamine	3.0%	5.0%
Cocaine	36.0%	27.0%
Marijuana	56.0%	59.0%
Opiates	2.5%	2.0%
PCP	<1.0%	<1.0%

- Non-regulated

Drug	2006	2007
Amphetamine	3.0%	3.0%
Methamphetamine	2.0%	2.5%
Cocaine	18.0%	15.0%
Marijuana	69.0%	72.0%
Opiates	4.5%	4.0%
PCP	<1.0%	<1.0%
Barbiturates	1.0%	1.0%
Benzodiazepines	2.5%	2.5%

# Federally Regulated Testing

Drug	% Laboratory Confirmed +		% MRO Verified +		% MRO Reversed	
	2006	2007	2006	2007	2006	2007
<b>Total All Drugs</b>	1.38	1.43	90.54	85.07	9.46	14.93
<b>Amphetamines</b>	0.14	0.19	62.26	41.35	37.74	58.65
<b>Cocaine</b>	0.45	0.37	99.40	99.86	0.60	0.14
<b>Marijuana</b>	0.70	0.79	99.11	99.55	0.89	0.45
<b>Phencyclidine</b>	<0.01	<0.01	100.00	100.00	0.00	0.00
<b>Opioids</b>	0.10	0.13	30.09	17.80	69.91	82.20

- Number of FR specimens = 223,053 in 2006 and 199,966 in 2007
- FR Opioid data includes codeine, morphine and 6-acetylmorphine

# Non-Regulated Testing (a)

Drug	% Laboratory Confirmed +		% MRO Verified +		% MRO Reversed	
	2006	2007	2006	2007	2006	2007
<i>Total All Drugs</i>	<b>4.19</b>	<b>4.11</b>	<b>75.94</b>	<b>72.80</b>	<b>24.06</b>	<b>27.72</b>
Amphetamines	0.33	0.39	43.08	31.09	<b>56.92</b>	<b>68.91</b>
Cocaine	0.58	0.47	99.75	99.92	0.25	0.08
Marijuana	2.11	2.17	99.54	99.50	0.46	0.50
Phencyclidine	0.01	0.01	99.17	100.00	0.83	0.00

- Number of NR specimens = 1,062,367 in 2006 and 1,037,473 in 2007

# Non-Regulated Testing (b)

Drug	% Laboratory Confirmed +		% MRO Verified +		% MRO Reversed	
	2006	2007	2006	2007	2006	2007
<b>Total Opioids*</b>	<b>0.51</b>	<b>0.55</b>	<b>26.91</b>	<b>23.20</b>	<b>73.09</b>	<b>76.80</b>
Hydrocodone	0.31	0.36	19.02	14.43	<b>80.98</b>	<b>85.57</b>
Hydromorphone	0.17	0.21	21.25	16.73	<b>78.75</b>	<b>83.27</b>
Oxycodone	0.27	0.34	34.93	26.61	<b>65.07</b>	<b>73.39</b>
Oxymorphone	0.30	0.46	34.42	32.41	<b>65.58</b>	<b>67.59</b>
<b>Barbiturates</b>	0.34	0.33	19.73	19.24	<b>80.27</b>	<b>80.76</b>
<b>Benzodiazepines</b>	0.58	0.67	29.55	27.51	<b>70.45</b>	<b>72.49</b>

- Denominator for NR Total Opiates = 1,062,367 in 2006 and 1,037,473 in 2007.
- \*Total Opioids include: codeine, morphine, 6-AM, hydrocodone, hydromorphone, oxycodone and oxymorphone

# Non-Regulated Testing (c)

Drug	% Laboratory Confirmed +		% MRO Verified +		% MRO Reversed	
	2006	2007	2006	2007	2006	2007
Hydrocodone	0.31	0.36	19.02	14.43	80.98	85.57
Hydromorphone	0.17	0.21	21.25	16.73	78.75	83.27
Oxycodone	0.27	0.34	34.93	26.61	65.07	73.39
Oxymorphone	0.30	0.46	34.42	32.41	65.58	67.59

# Detailed Analysis of Synthetic Opioids

<b>Oxycodones</b>	<b>Specimens Tested</b>	<b>Specimens Positive (+)</b>	<b>Specimens + Oxycodone</b>	<b>Specimens + Oxymorphone</b>	<b>Specimens + for Both</b>
<b>2006</b>	<b>214,916</b>	<b>774</b>	<b>129</b>	<b>190</b>	<b>455</b>
<b>2007</b>	<b>212,124</b>	<b>1,043*</b>	<b>63</b>	<b>312</b>	<b>666</b>

<b>Hydrocodones</b>	<b>Specimens Tested</b>	<b>Specimens Positive (+)</b>	<b>Specimens + Hydrocodone</b>	<b>Specimens + Hydromorphone</b>	<b>Specimens + for Both</b>
<b>2006</b>	<b>637,620</b>	<b>2,138</b>	<b>1,051</b>	<b>129</b>	<b>958</b>
<b>2007</b>	<b>649,469</b>	<b>2,478</b>	<b>1,244</b>	<b>143</b>	<b>1,091</b>

# MRO Reversal of d-Amphetamine

- D-amphetamine laboratory percent positives
  - All methamphetamine, MDMA, and MDA +'s deleted

<b>Year</b>	<b>% Non-regulated</b>	<b>% Regulated</b>
2003	50.75	24.74
2004	54.04	36.65
2005	56.20	45.62
2006	67.23	63.33
2007	73.57	66.06

# Summary I

- Lab positive rates appear consistent from 2006 to 2007 in both FR and NR testing
- MRO reversal rates increased from 2006 to 2007 in both FR and NR testing
  - The majority of reversals appeared to be due to prescription use of opiates and amphetamine in FR tests
  - Increased MRO reversals were associated with opioids, amphetamine, barbiturates, and benzodiazepines in NR tests
  - MRO reversals for amphetamine increased every year since 2003 in both FR and NR testing

# Summary II

## MRO reversals in NR Expanded Panels

- Synthetic opioids (hydrocodone, hydromorphone, oxycodone and oxymorphone) account for roughly half of the total NR opioid\* laboratory positive results
  - \*Opioids include: codeine, morphine, 6-AM, hydrocodone, hydromorphone, oxycodone and oxymorphone

# Summary III

## MRO reversals in NR Expanded Panels

- Lower MRO reversal rates were observed for oxycodone/oxymorphone (65+%) than for hydrocodone/hydromorphone (80+%)
- Barbiturate and benzodiazepine reversal rates remained consistent at approximately 80% and 70%, respectively