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Utility of Point of Care Urine Drug Tests in the Treatment of Primary Care Patients with Drug Use Disorders

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Abstract

Objectives—To determine if urine drug tests (UDTs) can detect underreporting of drug use (i.e., negative self-report, but positive UDT) and identify patient characteristics associated with underreporting when treating substance use disorders in primary care.

Methods—Self-reported use (last 30 days) and UDTs were gathered at baseline, 3, 6, 9, and 12 months from 829 primary care patients participating in a drug use intervention study. Rates of underreporting were calculated for all drugs, cannabis, stimulants, opioids, and sedatives. Logistic regressions were used to identify characteristics associated with underreporting.

Results—40% (n=331) of participants denied drug use in the prior 30 days despite a corresponding positive UDT during at least one assessment. Levels of underreporting during one or more assessments were 3% (n=22) for cannabis, 20% (n=167) for stimulants, 27% (n=226) opioids, and 13% (n=106) for sedatives. Older (OR=1.04), female (OR=1.66), or disabled (OR=1.42) individuals were more likely to underreport any drug use. Underreporting of stimulant use was also more likely in individuals with lower levels of educational attainment, previous arrests, and family and social problems. Underreporting of opioid use was more likely in those

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with other drug problems, but less likely in those with better physical health, more severe alcohol and psychiatric comorbidities, and African-Americans.

Conclusions—With the exception of cannabis, UDTs are important assessment tools when treating drug use disorders in primary care. UDTs might be particularly helpful when treating patients who are older, female, disabled, have legal and social problems, and have more severe drug problems.

INTRODUCTION

In outpatient addiction treatment clinics point of care urine drug tests (UDTs) are frequently used to objectively verify self-report drug use. UDTs are inexpensive, provide immediate results, and can detect illicit and addictive prescription drugs for two to five days following their use, with the exception of cannabis which can be detected for a week or more (Vandevenne *et al.* , 2000). Despite recommendations that UDTs be combined with self-report when assessing treatment outcomes (Donovan *et al.* , 2012, Nuckols *et al.* , 2014), few primary care providers routinely use UDTs. Most primary care providers rely on self-report measures to screen for and monitor drug use because of their feasibility and low cost (Lanier and Ko, 2008). However, patients may underreport drug use, particularly when there are negative social, legal, or other consequences for disclosing use (Babor *et al.* , 2000, Del Boca and Noll, 2000, Langenbucher and Merrill, 2001).

Primary care is an important setting for screening and treatment of substance use disorders, because of the large volume of patients seen in that setting (Saitz *et al.* , 2010). Indeed, only 11% of adults with substance use disorders receive care in specialty treatment clinics (SAMHSA, 2014). Due to increased implementation of screening and the availability of feasible pharmacological (e.g. buprenorphine), and psychosocial treatments (e.g., brief interventions) in primary care, as well as frequent misuse of prescription opioids (Atluri *et al.* , 2014), primary care providers are increasingly treating patients with substance use disorders. Little is known about the utility of UDTs as a tool for monitoring substance use treatment outcomes in this setting. When considering UDTs to assess drug use, primary care providers are faced with important questions, such as are UDTs necessary? What drugs should I be testing for? And with which patients are UDTs most likely to provide additional information, above and beyond self-report?

Research supports the notion that combining self-report and UDTs improves the accuracy of drug assessment (Chen *et al.* , 2006, Chermack *et al.* , 2000, Fendrich *et al.* , 2003, Hilario *et al.* , 2015, Myrick *et al.* , 2002, Schuler *et al.* , 2009, Vitale *et al.* , 2006). In an epidemiological survey of drug use, Fendrich and colleagues found that UDTs were more likely than self-report to detect cocaine (6% vs. 3%) and heroin use (1.6% vs. 0.3%), but not cannabis use (15% vs. 20%) in the previous 30 days (Fendrich *et al.*, 2003). When self-report and UDT screenings were implemented in an emergency department (ED), Chen and colleagues found that 74% of those who submitted drug-positive UDT, denied drug use (Chen *et al.*, 2006). In another ED-based study, UDTs identified over three times as many patients as having used drugs in the previous 24 hours (30%), relative to self-report (9%) (Vitale *et al.*, 2006).

Studies investigating agreement between self-report and UDTs in those receiving specialty addiction treatment typically find moderate to high levels of agreement, with rates varying by samples and methodologies (Chermack *et al.*, 2000, Digiusto *et al.* , 1996, Malbergier *et al.* , 2012, Schuler *et al.*, 2009, Yonkers *et al.* , 2011). The majority of these studies suggest that UDTs improve detection (Chermack *et al.*, 2000, Hilario *et al.*, 2015, Myrick *et al.*, 2002, Schuler *et al.*, 2009). For example, in methadone maintenance patients, UDTs were more likely than self-report to detect opioid (60% vs. 41%) and cocaine use (30% vs. 15%) (Chermack *et al.*, 2000). Among patients receiving treatment for prescription opioid dependence, 44% submitted at least one opioid-positive UDT, despite denying recent use (Hilario *et al.*, 2015). In a cocaine treatment study 58% of participants underreported use (Myrick *et al.*, 2002). Less is known about which patients are most likely to underreport drug use, with initial studies demonstrating that employed individuals and men are more likely to underreport drug use (Myrick *et al.*, 2002, Schuler *et al.*, 2009). Studies in the criminal justice system observed that those who were younger, African-American, arrested with a warrant, had multiple arrests, were interviewed by a race discordant interviewer, had never been treated for a substance use disorder, had higher incomes, and spent less money on drugs were more likely to underreport drug use (Peters *et al.* , 2015, Sloan *et al.* , 2004).

Although data from epidemiological, acute care, and addiction treatment settings support the use of UDTs as adjuncts to self-report, little is known about how helpful UDTs might be when assessing drug use disorder treatment outcomes in primary care. Therefore, the primary purpose of this study was to determine whether or not the addition of point of care UDTs improved detection of illicit and prescription drug use above and beyond self-report in 829 primary care patients participating in a randomized controlled trial of a brief intervention for drug use disorders. We calculated the number of individuals who denied substance use during one or more of the five study assessments, despite a corresponding positive UDT (i.e, underreported use). We also compared rates of underreporting across the following drug categories: cannabis, stimulants (i.e., amphetamines, methamphetamines, cocaine), opioids, and sedatives (i.e., benzodiazepines, barbiturates). Secondarily, we identified demographic, drug use, mental health, legal, and physical health characteristics associated with one or more cases of underreporting.

METHODS

Participants

Participants were recruited from 2009 to 2012 from 7 safety-net primary care clinics in King County, Washington using fliers and other study advertisements. Interested individuals contacted study staff and were screened for eligibility. Inclusion criteria were age 18 and over; self-reported illegal drug use or non-prescribed medication misuse at least once in the 90 days before screening (Smith *et al.* , 2010); English-speaking and able to read at a 6th grade level; and currently receiving and planning to continue care in the clinic. Exclusion criteria were attendance in formal substance use disorder treatment in the past month (excluding self-help groups); imminent high suicide risk; life-threatening medical illness; severe cognitive impairment; or active psychosis.

The sample was middle aged, mostly male (70%), non-white (51%), with limited education, and disabled (65%); approximately 30% were homeless at least one night in the past 90 days. In the year prior to enrollment, participants had substantial medical comorbidity (mean >6 medical conditions), with 34% being hospitalized and a mean of 2.5 +/− 4.1 emergency department visits in the last two years. Drug use was 13.82 +/− 11.00 days of use. Other demographic and clinical variables are described in Table 1. Participants gave written informed consent, and received compensation in gift cards for completion of study assessments.

Procedures

After a baseline assessment, participants were randomized in a 1:1 ratio to brief intervention or enhanced usual care using permuted blocks stratified by clinic and by drug use severity (Yudko *et al.* , 2007), comorbid mental illness (Alterman *et al.* , 1993), and readiness to change (Hall *et al.* , 1990).

Measures

At each study interview participants were reminded that their responses would be kept confidential and would not be shared with others. We did not specifically remind them that this included their treatment providers. The baseline interview assessed demographics, including self-reported race and ethnicity. The Drug Abuse Screening Test 10 (DAST-10), a 10-item measure of drug use, was collected (Yudko *et al.*, 2007). Drug use in the previous 30 days, as well as comorbid medical and mental illness, and social and legal outcomes were assessed with the Addiction Severity Index (ASI) (Cacciola *et al.* , 2007). The Thoughts about Abstinence assessment (Hall *et al.*, 1990), a measure that assessed an individual's motivation to achieve abstinence; the HIV Risk-taking Behaviour Scale (Darke *et al.* , 1991), a brief measure or sexual and injection drug use behavior; and the EQ-5D (Rabin and de Charro, 2001) which asks participants to rate their health across mobility, self-care, usual activities, pain/discomfort, and anxiety/depression were administered.

Urine samples were collected, but not directly observed by study staff. One Step Drug Screen Tests (Redwood Toxicology Laboratories, Santa Rosa, CA) dip cards were used to test for cannabis (11-nor-Δ^9THC-9 COOH 50 ng/mL), amphetamines (d-amphetamine 1,000 ng/mL), methamphetamine (d-methamphetamine 1,000 ng/mL), cocaine (benzoylecgonine 300 ng/mL), opioid (morphine 300 ng/mL), oxycodone (100 ng/mL), barbiturates (secobarbital 300 ng/mL), benzodiazepines (oxazepam 300 ng/mL). Other drugs were also assessed using UDTs, such as phencyclidine and ecstasy; however they were not included in this analysis due to infrequent use of these drugs.

Healthcare utilization data were gathered from Washington State administrative datasets, which included chemical dependency treatment records and felony and gross misdemeanor arrests. Emergency department (ED) visits and inpatient hospitalizations were also tracked using electronic medical record data from the safety-net medical center where the study took place. All measures except the demographics and DAST-10 were repeated at 3-, 6-, 9-, and 12-month follow-up assessments conducted by research assistants who were blind to

treatment group assignments. Self-reported drug use and UDTs were assessed contemporaneously at every follow-up assessment.

Interventions

Participants randomized to brief intervention received one 30-minute brief intervention. They were given feedback about their DAST-10 results, explored the pros and cons of drug use, increased participant confidence in being able to reduce use, and discuss options for reducing use. Participants were provided a list of substance use disorder treatment resources. A motivational interviewing approach was used to perform these tasks. The same interventionist attempted a follow-up telephone booster session within 2 weeks of the intervention. Motivational interviewing adherence was assessed using the Motivational Interviewing Treatment Integrity (MITI) coding system (Moyers *et al.* , 2005). Interventionists were recruited from social workers in participating clinics (n=11) and from those not already working in clinics (n=6). Participants in the enhanced usual care group received the same illustrated handout depicting their DAST-10 score and list of substance use disorder treatment resources. They received a quick introduction by the research assistant that resembled the “notification and referral” strategy that might be implemented in usual care. All contacts, with the exception of phone follow-ups occurred at primary care clinics.

Analysis

Self-reported drug use in the past 30 days, assessed by the ASI, was compared to corresponding UDT results across the baseline, 3-, 6-, 9-, and 12-month follow-up assessment. Individuals who denied using a specific drug (e.g., cocaine) during a study interview, but submitted a positive UDT for that drug at that interview were considered to have engaged in an underreporting. Individuals who engaged in one or more cases of underreporting across the 5 assessments, were compared to participants whose self-reported abstinence was verified by UDTs or who reported drug use, regardless of UDT results. The number and percentage of participants who engaged in underreporting were calculated for all drugs combined and separately for cannabis, stimulants, opioids, and sedatives. Stepwise logistic regression analyses were conducted to estimate the association of demographic, drug use severity, psychiatric severity, physical health, and health care utilization measures with underreporting on one or more study assessments. Significance was based on two-sided p-values <.05. Covariates were grouped for analysis and were dropped from regression models if the significance of all covariates in their group exceeded p=0.2. Groups were demographics, drug use severity, health and health behavior, mental health, arrests, and social status. All analyses were conducted using Stata version 13 (StataCorp).

RESULTS

Forty percent of participants (n=331) denied drug use but had a positive urine test, during one or more of the 5 assessments. Levels of underreporting on one or more assessments were 3% (n=22) for cannabis, 20% (n=167) for stimulants, 27% (n=226) opioids, and 13% (n=106) for sedatives. Amongst those who underreported at least once during the study, the

average percentage of assessments where underreporting occurred ranged from 35% (SD=29%) for marijuana to 43% (SD=27%) for opioids.

Table 1 describes group differences in across demographic and clinical variables of interest, while Table 2 describes results of the logistic regression analyses. Logistic regression analysis indicated that those who denied drug use, but submitted a drug-positive UDT for any drug were more likely to be older (OR = 1.04, CI: 1.02, 1.05) and female (OR = 1.66, CI: 1.18, 2.34), and report their employment status as disabled (OR = 1.43, CI: 1.01, 2.02) (see Table 2).

When drug categories were investigated separately those who denied stimulant use, but had a corresponding stimulant-positive UDT were more likely to be older (OR = 1.02, CI: 1.00, 1.04), be female (OR = 1.70, CI: 1.15, 2.52), did not attended college or technical school (OR = 1.57, CI: 1.07, 2.32), had a history of felony or gross misdemeanor arrest (OR = 2.14, CI: 1.31, 3.49), and had a higher ASI family and social composite score (indicating higher levels of family and social impairment) (OR = 2.55, CI:1.13, 5.77).

Individuals who denied opioid use, but submitted a corresponding opioid-positive UDT were more likely to be older (OR = 1.05, CI: 1.03, 2.85), be female (OR = 1.96, CI: 1.34, 2.85), and have higher ASI drug composite scores (OR = 1.97, CI: 1.33, 2.91). In contrast, African-Americans (OR = 0.65, CI: 0.42, 0.98), those who had lower alcohol (OR = 0.29, CI: 0.11, 0.79) and psychiatric status ASI composite scores (OR = 0.31, CI: 0.13, 0.73), as well as those with a lower EQ-5D score (indicating poorer health) (OR = 0.24, CI: 0.10, 0.60), were less likely to deny opioid use, despite submitting a positive opioid UDT. No variables were associated with under-reporting of barbiturate and benzodiazepine use.

DISCUSSION

In this sample of primary care patients participating in a randomized controlled trial of a brief intervention, 40% denied drug use despite a corresponding positive UDT at least once during the study. This finding suggests that UDTs may provide additional information, above and beyond self-report. This is consistent with previous studies in other settings observing relatively high rates of underreporting (Chen *et al.*, 2006, Hilario *et al.*, 2015, Myrick *et al.*, 2002).

As in previous studies, the usefulness of UDTs in this sample varied across illicit drugs (Fendrich *et al.*, 2003). Only 3% of individuals denied cannabis use despite submitting a cannabis-positive UDT. Therefore, even though the detection period of cannabis is one week or longer (Vandevenne *et al.*, 2000), drug testing for cannabis does not appear to improve detection of cannabis use in this population. Primary care patients who use cannabis may have felt more comfortable disclosing use for a number of reasons, including the increasing social and legal acceptance of cannabis use, particularly in Washington State where recreational use became legal near the end of data collection, as well as perceptions that cannabis is safer than other drugs (Okaneku *et al.* , 2015). Participants may have also been aware of the relatively lengthy detection period of cannabis UDTs and may have been more

honest as a result. We are only able to speculate about the cause of this finding, as we did not assess reasons for the low rate of cannabis underreporting.

For other drugs, UDTs detected underreporting in 13% (sedatives) to 27% (opioids) of study participants. Amongst these individuals repeated underreporting was also common, ranging from 36% (sedative) to 43% (opioids) of assessment periods indicating underreporting. Therefore, UDTs appear to be important tools for verifying self-reported abstinence.

A number of demographic and clinical variables were independently associated with underreporting. Older age and female gender were both associated with high rates of underreporting for any drug. The effect of age was relatively small, with the odds of representing increasing by 5% with each year increase in age. The effect of gender was particularly pronounced as women were 70% (stimulants) to 96% (opioids) more likely than men to engage in underreporting, suggesting that UDTs may be particularly helpful when treating women with substance use disorders.

A pattern of more severe drug, legal, and social problems, as well as lower academic attainment was also associated with underreporting of drug use. The relationship between health status and underreporting was more complex. Overall those who received disability benefits were 43% more likely to deny substance use, despite having a corresponding positive UDT. In contrast, those who reported poorer overall health were less likely to underreport opioid use. A one point increase in the EQ-5D resulted in a 76% decrease in underreporting.

Importantly, other illicit drug use, and not comorbid alcohol or psychiatric problems, appeared to be strongly associated with underreporting of opioid drug use. In contrast, those with comorbid alcohol use (71% reduction in underreporting for every one point increase in ASI Alcohol Composite score) and psychiatric problems (69% reduction in underreporting for every one point increase in ASI Psychiatric Composite score) were less likely to underreport opioid use when it occurred. Our finding of less underreporting by younger and African-American participants was inconsistent with previous studies in criminal justice populations (Peters *et al.*, 2015, Sloan *et al.*, 2004). These differences are likely a result of the different study settings and populations.

The current study has a variety of limitations. Individuals who were willing to participate in this treatment study might not represent all primary care patients with drug use disorders. Commercially available point of screening UDTs are subject to false positives due to cross contaminants. Therefore, it is possible that UDT-positive tests could be obtained despite not having used illicit drugs. The likelihood that this would occur in a sample of adults with drug use disorders is low and use of cross contaminates by a few study participants is unlikely to influence overall results, given the large sample size. We did not verify positive UDTs with mass spectrometry analyses. While verification of UDT results by mass spectrometry may be appropriate in some cases (e.g., forensic settings), laboratory based analyses were cost prohibitive and the agreement between point-of-care UDTs and mass spectrometry are over 90% (McDonell *et al.* , 2011). Point of care UDTs may not be able to detect some prescription opioids. Another limitation of this study was that self-report and

urine samples were collected by trained research assistants rather than by primary care clinicians or staff. Participants might have been more honest about their drug use with a research assistant, than they might have been with their providers (e.g., concerned about clinical consequences of their use), although rates of underreporting were not dissimilar from those observed in previous research.(Chermack *et al.*, 2000, Hilario *et al.*, 2015, Myrick *et al.*, 2002, Schuler *et al.*, 2009). Finally the period of assessment of self-report, 30 days, was longer than the detection period of most UDTs. Agreement might have been higher if participants were asked to report on their use in the last few days.

CONCLUSIONS

Study results support the use of UDTs when treating drug use disorders in primary care, as 40% of participants denied drug use, despite a corresponding positive UDT at least once during the study. UDTs do not appear to be helpful when assessing cannabis use, even in this population of adults with drug use disorders. They do appear to be helpful adjuncts to self-report when assessing stimulant and opioid use. They may be particularly helpful tools to confirm abstinence in women, older individuals, those receiving disability income, and individuals with legal and social troubles. Many primary care providers are faced with the challenge of managing opioid misuse in their patients. This study suggests that opioid UDTs might be particularly useful in verifying abstinence from opioid drugs in patients who have problems with other illicit drugs. Somewhat surprisingly, comorbid alcohol and mental health problems were associated with greater honesty regarding opioid use. When used in conjunction with brief self-report tools, UDTs are an inexpensive, rapid method for accurately assessing drug use in primary care.

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Table 1

Participant Characteristics

Characteristic		All participants Mean (standard deviation) Or Percent (n) n=829	Participants with >=1 instance of undisclosed drug use[1] n=393	Participants with no undisclosed drug use during study period n=436
Demographics				
Age		47.8 (10.8)	49.6 (10.0)	46.2 (11.2)
Female		30.4% (252)	34.9% (137)	26.4% (115)
Race	White	48.9% (401)	48.2% (188)	49.7% (213)
	Black	36.8% (302)	38.9% (152)	35.0% (150)
	Other	14.3% (117)	13.0% (51)	15.4% (66)
Hispanic		8.4% (69)	7.9% (31)	8.9% (38)
Education	Less than high school or high school only	48.6% (402)	50.9% (200)	46.4% (46.4)
Disabled and unable to work		64.5% (534)	72.3% (284)	57.5% (250)
Self-reported drug use severity				
DAST-10 score[2]		4.3 (2.5)	4.4 (2.5)	4.2 (2.5)
Thoughts about abstinence assessment score[3]		0.4 (0.5)	0.4 (0.5)	0.3 (0.5)
ASI drug use composite score[4]		0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
ASI alcohol use composite score[4]		0.2 (0.2)	0.1 (0.2)	0.2 (0.2)
Health and health behavior				
Emergency room visits[5]		2.5 (4.1)	2.8 (4.5)	2.3 (3.8)
Inpatient hospitalization[5]		34.0% (275)	39.1% (150)	29.3% (125)
Admission to chemical dependency treatment[5,6]		17.7% (143)	19.5% (75)	16.0% (68)
EQ-5D index score[7]		0.7 (0.2)	0.7 (0.2)	0.7 (0.2)
HIV risk-taking behavior score[8]		3.3 (4.1)	3.5 (4.1)	3.2 (4.1)
Mental Health				
ASI psychiatric composite score[4]		0.4 (0.2)	0.4 (0.2)	0.4 (0.2)
Any mental illness diagnosis[5]		64.6% (523)	69.3% (266)	60.3% (257)
Arrests				
Felony or gross misdemeanor arrest[5]		14.6% (118)	16.4% (63)	12.9% (55)
Social Status				
ASI family/social composite score[4]		0.2 (0.2)	0.2 (0.2)	0.2 (0.2)

[1] Includes stimulants, opioids, and sedatives

[2] From Drug Abuse Screening Test (Range 0-10, 10 indicating greatest severity)

[3] From Thoughts about Abstinence Assessment

[4] From Addiction Severity Index (Range 0-1, with 1 indicating greatest problem severity)

[5] From administrative records for the 2 years prior to baseline

[6] Excludes detox-only admissions

[7] From Euro-QoL

[8] From HIV Risk-Taking Behavior Scale

Table 2

Factors associated with underreporting of drug use: results from logistic regression*

		Odds ratio (95% CI)			
Characteristic		**All drugs (excludes cannabis) n=748**	**Stimulants n=748**	**Opioids n=745**	**Sedatives n=748**
Demographics					
Age		**1.04** (1.02, 1.05)	**1.02** (1.00, 1.04)	**1.05** (1.03, 1.07)	--
Female		**1.66** (1.18, 2.34)	**1.70** (1.15, 2.52)	**1.96** (1.34, 2.85)	--
Race	White	Ref	Ref	Ref	--
	Black	0.96 (0.67, 1.38)	1.50 (0.98, 2.29)	**0.64** (0.42, 0.98)	--
	Other	0.84 (0.52, 1.33)	0.74 (0.39, 1.40)	0.94 (0.55, 1.60)	--
Hispanic		1.02 (0.56, 1.85)	1.14 (0.55, 2.37)	1.22 (0.63, 2.38)	--
Education	Did not attend college	1.18 (0.86, 1.62)	**1.57** (1.07, 2.32)	0.89 (0.62, 1.29)	--
Disabled and unable to work		**1.43** (1.01, 2.02)	**1.68** (1.09, 2.59)	0.98 (0.66, 1.47)	--
Self-reported drug use severity					
DAST-10 score[2]		0.99 (0.91, 1.07)	--	1.04 (0.95, 1.14)	--
Thoughts about abstinence assessment score[3]		1.14 (0.80, 1.62)	--	1.09 (0.72, 1.63)	--
ASI drug use composite score[4] (dichotomized at median)		1.28 (0.90, 1.79)	--	**1.97** (1.33, 2.91)	--
ASI alcohol use composite score[4]		**0.40** (0.18, 0.91)	--	**0.29** (0.11, 0.79)	--
Health and health behavior					
Emergency room visits[5]		1.00 (0.96, 1.04)	--	0.96 (0.91, 1.01)	--
Inpatient hospitalization[5]		1.26 (0.90, 1.77)	--	1.15 (0.79, 1.69)	--
Admission to chemical dependency treatment[5,6]		1.53 (0.99, 2.36)	--	1.12 (0.68, 1.86)	--
EQ-5D index score[7]		0.56 (0.26, 1.20)	--	**0.24** (0.10, 0.60)	--
HIV risk- taking behavior score[8]		1.02 (0.98, 1.06)	--	1.03 (1.00, 1.08)	--
Mental Health					
ASI psychological composite score[4]		--	--	**0.31** (0.13, 0.73)	1.03 (0.39, 2.72)

	Odds ratio (95% CI)			
Characteristic	**All drugs (excludes cannabis) n=748**	**Stimulants n=748**	**Opioids n=745**	**Sedatives n=748**
Any mental illness diagnosis[5]	--	--	1.27 (0.85, 1.89)	1.60 (0.98, 2.60)
Arrests				
Felony or gross misdemeanor arrest[5]	--	**2.14** (1.31, 3.49)	--	--
Social Status				
ASI family/social composite score	--	**2.55** (1.13, 5.77)	--	2.11 (0.82, 5.44)

[*] Table includes regression coefficients for all variables retained by stepwise logistic regression model. Coefficients for characteristics with a statistically significant association with undisclosed drug use are in **bold**.

[1] Includes stimulants, opioids, and sedatives

[2] From Drug Abuse Screening Test (Range 0-10, 10 indicating greatest severity)

[3] From Thoughts about Abstinence Assessment

[4] From Addiction Severity Index (Range 0-1, with 1 indicating greatest problem severity)

[5] From administrative records for the 2 years prior to baseline

[6] Excludes detox-only admissions

[7] From Euro-QoL

[8] From HIV Risk-Taking Behavior Scale