

17. A DEMOGRAPHIC PROFILE OF EMPLOYED USERS OF ILLICIT DRUGS

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Human resource professionals in all industries have been made increasingly responsible for compliance with federally mandated workplace drug policies. In addition, concerns related to drug use and worker productivity, absenteeism, and accidents have prompted new strategies to deal with these issues. In the context of the U.S. War on Drugs (WOD) of the last three decades, workplace drug testing has achieved a prominent role in these strategies. However there is little or contradictory evidence regarding the effectiveness of drug testing. Therefore, this paper fills an important gap in the literature by reviewing the current state of knowledge regarding the efficacy of drug testing at the work site and further, describes a sample of successful, employed, users of illicit drugs.

Recently, Guth (2000) indicated that "the battle between government and industry about [drug testing] is over with and a certain calm has settled" (p. 22). However, since the passage of the Anti-Drug Abuse Act of 1988 research has been mounting questioning the efficacy of using workplace drug testing to create a 'drug free' workforce. Indeed, some research has even suggested that the opposite has occurred and significant costs have resulted to industry from misguided social and economic policies.

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A major argument in support of workplace drug testing has been that recreational drug users are generally less employable than non-drug using adults. Higher accident rates, absenteeism, and turnover are among the purported outcomes of workers (and presumably managers) who use drugs. However, very little is actually known about the outcomes of drug testing programs and even less is known about workers who use drugs recreationally. DRUGNET is a longitudinal, panel survey of adults who occasionally use recreational drugs. Thus, it is possible to examine a subset of these adults and demonstrate that they are in fact desirable employees who lead normal healthy lives.

Any discussion of recreational drug use and success in North America must be tied to the largely unsuccessful 'War on Drugs' and the civilian enforcement mechanism—workplace drug screening. In 1986, President Ronald Reagan issued Executive Order 12564 for federal agencies to implement urine testing programs in the hope of creating drug-free federal workplaces. The U.S. Drug-Free Workplace Act, 1988 also increased testing in various parts of the private sector (Harrison & Simpler, 1989; O'Malley & Mugford, 1991). A survey of Fortune 500 companies indicated that 18% had drug testing programs in 1985, increasing to 40% by 1991 (Ackerman, 1991). Also, in 1991, 48% of Fortune 1000 companies engaged in some type of drug testing (Guthrie & Olian, 1991). Annual surveys performed by the American Management Association (AMA) indicate that companies with drug testing programs increased from 22% in 1986 to 81% in 1997 (American Management Association [AMA], 1997). Results from the National Household Survey on Drug Abuse (NHSDA) indicated that 49% of full-time workers between the ages of 18 and 49 were at work sites that had some form of drug testing program (Substance Abuse and Mental Health Services Administration [SAMHSA], 1999). In addition, 13% of full-time workers in the United States had actually taken a mandatory workplace drug test (SAMHSA, 1996).

Large companies are more likely to have testing programs than small ones (Bureau of Labor Statistics, 1989; Hartwell, Steele, French, & Rodman, 1996) and that prevalence varies by type of industry and region of the country (Hartwell et. al., 1996). Concomitant with increased testing has been rising direct financial outlays to provide these services. Texas Instruments, for example, spent \$1 million to test 10,000 employees (Rothstein, 1991). The federal government spends tens of millions of dollars each year on its many programs (Wick, 1992; American Civil Liberties Union [ACLU], 1999). Total private sector costs have been estimated to range from \$300 million to \$1 billion per year (Shepard & Clifton, 1998; Blumner, 2000).

Workplace drug testing programs exist in several formats. The major types are: (a) random drug testing of employees (RDT); (b) pre-employment screening

of applicants; and (c) for-cause screening of employees. This paper will focus on the most frequent and controversial programs—RDT and pre-employment screening. Have these programs been effective in increasing efficiency and productivity (e.g., lower accident and absenteeism rates) as is claimed by the drug testing industry and the federal government? Have they reduced the burden of drug abuse in America?

Surprisingly, considering the time and expenditures involved, little research has been performed to answer these questions. The AMA's 1996 annual survey found that only 8% of companies involved with testing had done any cost-benefit analysis (AMA, 1996). Within the small body of published literature that is available, results are inconclusive. Some studies have even shown that drug testing itself reduces productivity or that drug users are more productive than non-users (Shepard & Clifton, 1998; Morris, 1991; MacDonald & Pudney, 1998). Shepard and Clifton (1998) argue that drug testing has the potential to lower productivity due to: (a) the time and expense of programs, (b) testing may hurt worker morale and loyalty, and (c) very productive workers, who sometimes use drugs, may be fired or not hired. Hoffman and Larison (1998) analyzed data from the 1994 NHSDA to see if drug users were more likely to have work-related accidents than other workers. These authors' conclusion is, "The answer to this question is a uniform no" (p. 4). The ACLU's 1999 review of the literature found no evidence to substantiate higher rates of turnover or termination for users as compared to non-users. Shepard and Clifton (1998) state "Most of the evidence cited in favor of drug testing is anecdotal or based on case studies that may not reflect the larger population. Some of the claims about large productivity losses from drug use by workers is based on research that would not pass the rigorous review process of most respected journals in the social sciences" (pp. 2-3). In summation, the Institute of Medicine (1994) in its comprehensive report on drugs in the work force concluded that commonly cited cost estimates of the effects of alcohol and drug use on worker productivity in the United States are grounded in questionable assumptions and weak measurements.

Workplace drug testing's lack of demonstrated effectiveness, after so many years of activity and billions of dollars in expenditures, is further compounded by the actual and potential negative effects of testing. Given the lack of scientific evidence linking drug use during private time off the job to worker performance, testing programs may be screening out many good workers and deterring valuable job applicants (ACLU, 1999; Nadelmann, 1999; Blumner, 2000). The existence of false positives (i.e., people who test positive but have not actually used an illicit drug) means that many non-users will also be fired or never hired (Campbell & Campbell, 1987; Nadelmann, 1999; Association of Flight

Attendants [AFA], 2000). The Institute of Medicine also notes that little is known about what happens to applicants for jobs who are refused employment or currently employed individuals who are fired as a result of a positive drug test. It is known, however, that many employers have incurred significant legal expenses defending their programs against wrongful dismissal claims by workers (ACLU, 1999).

Pre-employment and RDT programs also raise concerns over privacy. Many individuals believe these tests are an unjustified intrusion into their bodies and private lives (ACLU, 1999; Join Together Online, 2000). Since these tests are not based on any 'cause,' the individual is therefore being asked to prove his/her innocence. O'Malley and Mugford (1991) state: "rather than hinging on 'proof beyond a reasonable doubt,' the application is probabilistic—those 'at risk' are assumed to be probable offenders until tests show otherwise. This of course, creates a limited reversal of the criminal law assumption of 'innocent until proven guilty'" (p. 123). And, in discussing supply-side war on drugs strategies, they further note: "In a liberal democracy with strong constitutional defenses to intrusion on privacy, this can be hard to achieve through direct law enforcement. A large majority of Americans, however, are wage or salaried employees or are dependent on such employees. If one can link drug surveillance to employment . . . one can shift enforcement from the criminal domain (whose standards of proof are exacting and defendants have the right not to testify against themselves) to a civil arena, where standards of proof are lower" (p. 137).

Urine tests can reveal legal prescription and over the counter (OTC) drugs that a person might prefer to keep private (Kelly, 1996). Such drugs include, but are not limited to, narcotic pain relievers, tranquilizers, anti-depressants and other treatments for psychiatric disorders. The IOM (1994) report states: "Drug testing results may reveal drugs taken legally for medical treatment that do not seriously affect an employee's job performance. These drugs may, however, be associated with conditions that the employee for good reasons wishes to keep private" (p. 10).

Drug testing programs also provide employers with a false sense of confidence. Most do not check for alcohol, the most widely used recreational drug and the largest potential threat to employee accidents and productivity (IOM, 1994). A tractor-trailer driver would be foolish to smoke marijuana, days or weeks before a mandatory urine test. However, a hangover from pre-work consumption or on the job drinking would go undetected. Put succinctly, pre-employment and RDT are not performance-based tests that measure 'impairment' on the job. These tests assess what a worker may have consumed days or weeks ago by measuring drug metabolite by-products that are excreted

in the urine. According to Nadelmann (1999), "One can understand employers wanting to identify those who are impaired in the workplace, and thus potentially a danger to themselves and others. But most drug testing reveals much more about what one consumed last night or over the weekend and little about whether one is impaired at work" (p. 2). It also takes some length of time, possibly several hours, for these drug metabolites to appear in urine. A person can use drugs while on the job and not be detected with these procedures. Additionally, for on the job users that are detected, the lag time for most RDT technologies is days or weeks before results are supplied to managers. An incapacitated employee would not be revealed until long after the event (O'Malley & Mugford, 1991). The ACLU (1999) concludes, "Thus, if drug-related impairment on the job is an employer's primary concern, drug testing is both an over-inclusive and an under-inconclusive strategy" (p. 9). As a more effective strategy the Institute of Medicine (1994) recommends, "If an organization's goal is to avoid work decrement (e.g., accidents, injuries, performance level) due to impairment, then research should be conducted on the utility of performance tests prior to starting work as an alternative" (p. 10).

Work site drug strategies, which include all forms of testing and employee assistance programs (EAPs), need to be based on the current body of scientific evidence on drug consumption in order to be effective. When all psychoactive drugs are taken into account (viz., alcohol, tobacco, caffeine, nicotine, many OTC and prescription medicines, the predominantly illicit drugs, etc.), it is clear that most, if not all Americans, are drug consumers (Duncan & Gold, 1982). An estimated two-thirds of American adults drink alcohol and the lifetime prevalence of illicit drug consumption is 35.8% (SAMHSA, 1999). This consumption can be classified as drug use, abuse, or dependence. Drug use is controlled consumption of a drug, in terms of frequency and quantity, where the persons sought-for effects are experienced without significant toxic, adverse physical or psychological consequences. Drug abuse is a maladaptive pattern of consumption that greatly increases the danger or impairs the ability of the individual to adequately function or cope with their life circumstances (Irwin, 1974; Glantz, 1992; IOM, 1994). Dependence (i.e., physiological) occurs with the regular use of certain drugs, where abrupt cessation leads to withdrawal syndrome. This may or may not imply abuse or dependence in the behavioral sense (IOM, 1994). The U.S. National Institute of Mental Health's Epidemiologic Catchment Area Study, using criteria set by the American Psychiatric Association, found that only one out of every five persons who used illicit drugs had ever met a diagnostic criteria for drug abuse or dependence (Robins & Regier, 1991). Thus, the majority of illicit drug consumers are users rather than abusers or drug-dependent (Duncan & Gold, 1982; Robins & Regier,

1991; IOM, 1994; SAMHSA, 1999). The overwhelming majority of these users never consume drugs at work. Actual drug abusers are much more likely to not be working at all. Given these realities, the potential for workplace testing programs to substantially reduce drug abuse problems is remote (Campbell & Campbell, 1987; IOM, 1994; ACLU, 1999).

We therefore ask the question, what do occasional users of recreational drugs "look" like? The purpose of this paper is to document the existence of employed users of illicit drugs and provide a broad demographic profile of this hidden population. The research question is what are the demographic and lifestyle indices, past legal history and attitudes about drugs, mental well-being status, and experience with alcohol and other illicit drugs of healthy, employed, adults who occasionally use these substances. Additionally, Bayes theorem will be applied to U.S. government population estimates of adult drug users to determine the potential number of Americans falsely accused or suspected of using illicit substances to illustrate a fundamental flaw in the use of workplace testing. A flaw which has devastating personal consequences for many individuals.

METHOD

Measurement

The survey had four subdivisions: (a) demographic and lifestyle indices (i.e., age, citizenship/residency, community participation, education, employment, gender, household income, marital status, physical health, race, recreational activities (i.e., non-drug), religiosity, spirituality and voting behavior); (b) experiences with drugs—questions regarding their use (if any) of alcohol, cocaine, depressants, hallucinogens, marijuana, opiates and stimulants; (c) past legal history and attitudes about drug issues; and (d) General Well-being Schedule (GWBS)—self-perception of well-being and distress. The GWBS is a brief, reliable (i.e., $r = .85$ test-retest), and valid self-report measure of mental well-being for use in population surveys. The GWBS was developed and used by the National Center for Health Statistic's U.S. Health and Nutrition Examination Survey (HANES I). The instrument's first 18 questions contribute to an individual's total score. The first 14 items have 6 structured response options and the next 4 questions have 0 to 10 rating bars. Each item response is given an ordinal score from 0 to 10 or 0 to 5 with the high value (10 or 5) representing a high level of well being and the low values (0) representing high distress. Scores range from 0 to 110, with higher scores indicating better well-being. Fazio (1977) describes the validation and development of the scale more fully.

Data Collection

Self-described happy, successful adults were solicited to participate in the study by completing an anonymous on-line survey between March, 1997 and July, 1998. Respondents were solicited by sending e-mail messages to mailing lists (e.g., Drug.Policy@wku.edu), posting the same message in UseNet news group postings (e.g., the entire alt.drugs hierarchy), and through an article appearing in Wired, an online magazine serving the WWW community (see <http://www.wired.com/news/news/culture/story/7055.html> for the full text of the article).

Respondents would point their browsers to the study's web address (<http://www.accessky.net/illicit-drugs>). The web site included identifying information about the researchers, a brief tutorial on using web forms (e.g., radio buttons and free text fields), and the survey itself. To participate in the survey, respondents were first presented with information about the purpose of the study, a warning about the security of their responses along with an accompanying link to an anonymizer service (<http://www.anonymizer.com>), and finally a statement about informed consent. Respondents were advised that by clicking on the link to the survey they were providing the researchers permission to use their comments and answers.

The survey itself was an HTML 2.0 compliant document. Coding of responses was transparent to subjects and was handled by Cold Fusion (<http://www.alaire.com>), a product that takes HTML forms output and translates it into an existing database file by handling SQL queries and actions. Consequently, responses were available for analysis as subjects completed the survey.

The choice to use the Internet and the World Wide Web (WWW) to reach and survey this population was made for three reasons. First, it allowed the authors to reach a diverse, nationwide and even international population at minimal expense. Second, the population using the WWW is largely characterizable as well-educated and successful and the authors were trying to reach persons whose success had not been limited or impaired by their choice to use drugs. Third, evidence indicates that people are more truthful and willing to admit to illicit drug use and symptoms of mental disorder when interviewed via computer than when interviewed by a human (Nicholson, White & Duncan, 1999)

Analysis

Given that the purpose of this paper is taxonomic (viz. describing employed illicit drug users) frequency counts and descriptive statistics (means and standard

deviations) will be used to describe respondent demographics. Where appropriate, comparisons to published national norms will be made to illustrate similarities to the U.S. general population. Lastly, Bayes theorem will be applied to federal estimates of the drug using population to estimate the potentially large numbers of individuals who could be seriously harmed by the utilization of workplace drug testing programs.

ANALYSIS OF RESULTS

Demographic Profile

A total of 1,583 individuals completed the survey during the study period. Of this group, those who reported being U.S. citizens and were employed either full time ($n = 875$), part time ($n = 193$), or reported being self-employed ($n = 137$) were included in this analysis. Respondents who were not U.S. citizens ($n = 313$), reported being unemployed ($n = 49$), or whose employment information was missing ($n = 16$) were excluded from this analysis. All further analysis were conducted on this subsample of employed, U.S. respondents for an usable sample size of 1,205.¹ Job titles of subjects ranged from entry level (e.g., receptionist) to CEO/Owner of the business. Industries included health care/hospitals, computer/electronics, chemical, hotel/hospitality, government, etc.

Respondents were middle-aged with a mean of 31.41 ($SD = 9.03$, $n = 1,176$) years old. The sample was predominately white (91.6%, $n = 1,104$) and male (83.5%, $n = 1,006$). Education ranged from less than high school (0.8%, $n = 10$) to Post-Doctorate (1.2%, $n = 14$), with the majority of respondents having had at least four years of college (59.5%, $n = 710$). This compares to the 24.4% of the U.S. population that has completed four years or more of college (U.S. Census Bureau, 2000, see Table 263). Further, respondents reported an average GPA of 3.36 ($SD = 0.54$, $n = 1,094$), ranging from a low of one to a high of four. Annual household income for this sample ranged from less than \$10,999 per year (7.0%, $n = 83$) to over \$110,000 (13.3%, $n = 158$), with the median income for the sample reported in the range of \$50,000—69,999 (20.1%, $n = 239$). This far exceeds the 1997 median household income of \$37,005 (U.S. Census Bureau, 2000, see Table 743). Clearly, this sample does not match the commonly held stereotype that recreational drug users are unemployed or unemployable.

The majority of respondents were either single (42.2%, $n = 506$) or married (35.1%, $n = 421$) and reported being happy with their marital situation (91.4%, $n = 913$). Among respondents with a partner, the majority reported a working spouse (84.2%, $n = 581$), but no children (71.7%, $n = 787$).

The majority of respondents have non-drug related hobbies (96.4%, $n = 1,161$), although these activities are not often shared with the community at large. Only 40.2% ($n = 481$) reported being active in their local community, which is similar to the rate of 43% to 48% reported in the general United States population (U.S. Census Bureau, 2000, see tables 448 and 643, respectively). Another measure of community involvement, political activity, scored much higher with the vast majority reporting that they voted in the last general election (79.4%, $n = 950$). This is much higher than the national reported average of 54.2% (U.S. Census Bureau, 2000, see Table 488).

While these previous measures suggest typical or higher rates of participation in socially desirable behaviors, respondents reported far lower participation rates in organized religious activities. Only 10.7% ($n = 128$) of the sample attended church regularly compared to a national average of 40% (U.S. Census Bureau, 2000, see Table 89). Respondents were also asked to rate the importance of their religious beliefs and values, as well as the importance of spirituality on an 11 point Likert-type question with a zero indicating no importance and a ten indicating that the statement represented a central focus of life. The median value for religion ($n = 1,199$) was four and a slightly higher score of five for spirituality ($n = 1,202$). Thus, it would appear that this sample has a lower religiosity than the general population of the United States.

A single six point Likert-type item asked respondents to rate their overall health with the anchors excellent (6) and very poor (1). The median response was a five—good ($n = 1,202$). Additionally, the GWBS scores were calculated for each respondent. DRUGNET respondents mean GWBS score was 78.35 ($SD = 14.49$; $n = 1,205$). This is equivalent to the national mean of 80.3 reported in the HANES study ($SD = 17.3$; $n = 6,931$) (Fazio, 1977). Thus, the overall level of mental well-being for this sample of users is equivalent to the level of well-being of non-institutionalized adults in the U.S.

In sum, this sample of drug using adults is employed, earns more than the average household income of the general U.S. population, is well educated, and is happy with their marital status. They are comparable in terms of their volunteerism, and vote at higher rates than the general population. However, they are far less religious, as measured by attendance in some recognized church, than the general population. This suggests a healthy, well educated, highly paid, secular sample.

Recreational Drug Use

Table 1 presents the percentage of current recreational drug use by drug category. As can be seen, the most frequent drugs reported are alcohol and

Table 1. Current Drug Use

Drug Category	(%)	Current Use <i>n</i> *
Alcohol	194.7	1149
Marijuana	86.5	1141
Hallucinogens	48.5	948
Stimulants	32.1	483
Cocaine	31.2	661
Depressants	38.5	374
Opiates	37.9	346

* Counts reflect missing values which indicate any of two possibilities, either the respondent has never taken the drug or that the question was not answered.

marijuana. Alcohol is the most frequently used drug, and of course, is not commonly tested for in RTD or pre-employment screenings. Marijuana is the second most frequently cited drug with the other five categories less frequently used.

However, as with drug testing, current use tells us little about frequency or when this use occurs. Table 2 presents information about self-reported frequency of drug usage by category of drug. As can be seen from the table, alcohol and marijuana again dominate frequency of use with hallucinogens, cocaine, stimulants, depressants, and opiates tending to be used once a month or less. For example, 43.9% of respondents who use alcohol or the 51.5% who use marijuana use these drugs at least once a week. Contrast this with the over 50%

Table 2. Typical Frequency of Drug Use

Drug Category	Once a: <i>n</i> *	Daily (%)	Week (%)	Month (%)	Less than once	
					Year (%)	a Year (%)
Alcohol	1148	5.9	38.0	29.6	17.2	9.3
Marijuana	860	14.3	37.2	17.5	15.6	15.4
Hallucinogens	723	0.2	6.1	28.7	43.2	21.8
Cocaine	626	3.3	16.9	21.4	27.8	30.6
Stimulants	455	6.6	20.2	22.0	26.8	24.4
Depressants	274	2.0	16.6	29.7	27.3	24.4
Opiates	243	4.0	22.7	33.7	27.6	12.0

*Counts reflect missing values which indicate any of two possibilities, either the respondent has never taken the drug or that the question was not answered.

of persons who consume hallucinogens, cocaine, stimulants, and depressants once a year or less. Opiates are consumed slightly more frequently, with 61.3% consuming them somewhere between once a month or once a year.

The aforementioned questions tell us nothing about when (or why) a drug was consumed. They also tell us little about the effect of the drug on the person. Table 3 presents self-reported levels of intoxication by drug category. Alcohol has the lowest levels of effect, with 76.1% of users reporting mild or no effects. Over 78% of marijuana users report mild to moderate levels of intoxication. Approximately half of the users of cocaine, stimulants, depressants, and opiates report reaching this mild to moderate stage, with approximately 20% of respondents becoming very intoxicated. Hallucinogen users report much higher levels of intoxication, with 73.4% reporting very or extreme levels of intoxication when using this category of drugs. And yet, despite these relatively high levels of intoxication, these individuals remain productive members of society.

Bayes Theorem Application

Let us now consider the number of persons that could be falsely accused of taking illicit drugs. Bayes theorem (Hogg & Tanis, 1977) tells us the proportion of false positives that can be expected given a drug screen's specificity and sensitivity. Bayes theorem is as follows (Campbell & Campbell, 1987):

$$P(B_2|A) = \frac{P(A|B_2) * P(B_2)}{P(A|B_1) * P(B_1) + P(A|B_2) * P(B_2)}$$

where:

$P(B_1)$ = probability person does take drugs

$P(B_2)$ = probability person does not take drugs (1 - $P(B_1)$)

$P(A|B_1)$ = probability test is positive given person takes drugs

$P(A|B_2)$ = probability test is positive given person does not take drugs (false positive)

$P(B_2|A)$ = probability person does not take drugs given that they have a positive test result

Using data from the 1998 National Household Survey on Drug Abuse, an annual survey of a representative sample of U.S. population aged 12 and older, 6.5% of persons employed full time have used an illicit drug in the past month. The Epidemiologic Catchment Area Study and other epidemiologic studies have suggested that approximately one out of every five current drug users will meet the criteria for a diagnosis of substance abuse currently, or has done so in the

Table 3. Typical Level of Intoxication Experienced

Drug Category	n*	Not at all (%)	Mildly (%)	Moderate (%)	Very (%)	Extremely (%)
Alcohol	1148	31.7	44.4	19.0	3.7	1.2
Marijuana	1136	1.6	30.5	48.1	16.1	3.7
Hallucinogens	935	0.5	3.7	22.4	42.9	30.5
Cocaine	626	5.0	26.5	38.5	22.7	7.3
Stimulants	326	4.0	22.7	33.7	27.6	12.0
Depressants	341	6.2	29.6	37.0	21.1	6.2
Opiates	457	7.4	24.5	35.4	22.3	10.3

* Counts reflect missing values which indicate any of two possibilities, either the respondent has never taken the drug or that the question was not answered.

past (Anthony & Helzer, 1991). Applying this one in five rule to the SAMHSA figure above yields an estimated 1.3% of employed adults who could be considered drug abusers. Given the association between drug abuse and unemployment along with the fact that some of these were past and not present abusers, this estimate of a 1.3% rate of drug abuse among employed persons might be regarded as an upper limit.

Using the 6.5% illicit drug use rate [$P(B_1)$] and the nationwide specificity and sensitivity standards recommended by NIDA of 0.95 [$P(A|B_1)$] and 0.996 [$P(A|B_2)$], respectively, yields the following:

$$P(B_2|A) = \frac{0.004 * 0.935}{0.95 * 0.065 + 0.004 * 0.935}$$

or

$$P(B_2|A) = 0.0571$$

Using the 1.3% drug abuse rate yields:

$$P(B_2|A) = \frac{0.004 * 0.987}{0.95 * 0.013 + 0.004 * 0.987}$$

or

$$P(B_2|A) = 0.2422$$

According to SAMSHA (1996) estimates, approximately 13% of the employed U.S. adults have undergone a drug screen. The Department of Labor (1999)

has estimated that there are 133,488,000 employed adults. Using the 6.5% estimate there would then be 991,019 individuals accused of taking illicit drugs, when in fact they had not taken these drugs (13% of employed adults times the false positive test results of 0.0571). This of course would hold if the policy is designed to catch people using drugs on their own time. Most illicit drug use occurs during an individuals off work time. Hence the term, 'recreational drug use.' It would seem far more important to identify abusers of illicit drugs, or those persons most likely to consume drugs on the job. If the abuse rate is used in this calculation, then the number of persons falsely accused of taking drugs on the job rises to 4,203, 668 (or 13% of employed adults times the false positive test results of 0.2422). Thus, it would appear that almost one million or as high as four million Americans will be falsely accused of taking illicit drugs. This of course also ignores the concerns raised by the IOM (1994) and ACLU (1999) reports about the other issues surrounding drug testing.

DISCUSSION

Implications for Management

Guth (2000) has suggested that drug testing of employees is simply part of being a 'good corporate citizen.' We challenge this assertion. First, drug testing appears to be poor business. As noted in the IOM (1994) report there is no evidence to indicate that workplace drug testing increases worker productivity or produces a healthier work site. Further, RDT introduces potentially significant opportunity costs such as lowered productivity, and loss of valuable, skilled, employees. Second, as a direct result of this ineffective and unjustifiable—enforcement activity, businesses are exposed to potentially expensive lawsuits and wasted efforts promoting a flawed system. Third, by allowing government to transfer the burden of proof from the criminal justice system to a subsidized form of enforcement in the civil sector, corporate America has in essence lowered the rights enjoyed by their workers and managers.

Rather than continuing to follow this failed strategy, we suggest that industries concentrate on the more effective and efficient methods proposed in the IOM (1994) report. Namely, researching performance tests that could detect impairment prior to starting work, which would be a far more logical strategy. For example, in health care, fatigue is a common source of medical errors. One performance criteria could be that individuals appear well rested for their shift, rather than concerns about what employees might have consumed twenty-four hours earlier.

The overwhelming majority of U.S. workers do not use illicit drugs. Of the very small percentage that do, drug use on the job is very rare. Current RDT programs are therefore ill-conceived strategies to increase worker productivity and reduce drug abuse in society. Drug abuse is indeed a significant public health problem. These authors suggest focusing resources on the prevention and treatment of drug abuse based on sound scientific principles and a respect for the freedom and dignity of the individual.

Future Directions for Research

As noted previously, numerous articles have questioned the efficacy of utilizing drug testing to improve worker efficiency. Given that fewer than eight percent of businesses have actually conducted a cost-effectiveness analysis (AMA, 1996) this would seem to be a fertile area of research. However, research is complicated by the difficulty of identifying an appropriate sample. To truly evaluate these programs, a comparison of employees who pass screens should be compared to employees who fail screens—but obtain employment elsewhere. This would allow an examination of whether productive employees are being lost or turned away. Unfortunately, individuals who fail these screens when seeking employment are not documented, representing a hidden population, making such a comparison difficult, if not impossible.

A second line of research would be to repeat studies such as those conducted by Shepard and Clifton (1998) or McDonald and Pudney (1998), only with diverse samples drawn from more than a single business or industry. Further, many countries other than the United States utilize different strategies in the workplace. To date, there has been no comparative study of business practices with regards to drug policies across various nations. Even those nations most closely allied with the American policy of the War on Drugs have very different approaches to the use of licit and illicit drugs in the workplace.

Lastly, research similar to the DRUGNET study presented here could be conducted on a national level. The literature on illicit drug use among successful, normal, healthy adults is miniscule when compared to the studies conducted on those populations that have documented drug problems (e.g., the American prison population or individuals in treatment).

Limitations of the Study

Clearly, this sample is not representative of the United States general population. Only persons with access to the internet could participate, and further, only

those individuals that utilized UseNet news groups, subscribed to a mailing list that received an advertisement, or subscribe to Wired online would have had an opportunity to participate. However, our sample is roughly representative of the Internet at the time the survey was conducted. While an ever increasing proportion of Americans in all walks of life seem to be going online, marketing surveys indicate that Internet users are more likely than the general population to be college graduates and earn median household incomes of \$60,000 compared to the \$42,000 median for all U.S. households (Tedesco, 1996). Naturally, a population of drug users identified via the Internet is likely to share many of these characteristics if it is true that their drug use has not impaired their educational or career progress.

As with all survey research, the honesty of respondents when answering questions about highly personal and in many instances, illegal, activities is of primary concern. However, no research exists suggesting that persons responding on the Internet are any more or less truthful than individuals responding to surveys via phone or "anonymous" surveys sent through postal mail. It may be that the perceived anonymity of the Internet allows people to be more frank in responding to items.

The unique aspect of the DRUGNET survey is its use of an online survey form to access a hidden population and acquire sensitive information. Contrast this to the methods used in the SAMHSA (1999) National Household Survey on Drug Abuse, in which government contracted workers visit individuals at their home, assures them that although the surveyor represents a government agency, all the individual's responses are confidential, and proceeds to ask them whether they consume a variety of drugs which are illegal under federal law, and records their responses on a paper and pencil coding sheet. Despite the level of confidence we may have in the honesty of DRUGNET respondents, until research demonstrates whether systematic differences exist between the use of this methodology to administer surveys or other, more traditional methods, readers are cautioned against generalizing these results to the general population, or to persons who utilize the internet as a whole. In addition, when comparing data collected in different ways (e.g., online vs. in person interviews) there is always the possibility of a threat to construct validity from "mono-method bias" (Cook & Campbell, 1979). In the DRUGNET survey an unknown amount of variance within respondent's answers is due to the nature of online test taking. This variance might be quite different from what occurs in the SAMHSA household surveys. It has been suggested that the SAMHSA methodology results in systematic underestimates of drug-taking behavior while the use of online surveys results in unknown variation.

CONCLUSION

These results confirm that the popular image of drug users as unemployed or unemployable is simply false. Users (i.e., not abusers) of illicit drugs come from all walks of life, work in all types of business, at many levels, and maintain healthy, successful lives, regardless of their illicit use. This sample earned more than the average American, is better educated, and is generally happy with their life and health. Further, their illicit drug use does not, in and of itself, make them irresponsible members of our society. These individuals report volunteering and voting at approximately the same or higher rates as the U.S. general population. Additionally, these individuals are far more secular than the rest of the community. We therefore must ask whether it is cost effective to spend hundreds of millions of dollars a year to identify and punish people who are otherwise healthy and productive members of our society.

NOTE

1. Reported sample sizes may differ from 1,205 due to missing data. Actual counts of legitimate responses for each variable are reported in parentheses throughout the text.

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