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Drugnet: A Pilot Study of Adult Recreational Drug Use via the WWW

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This study was intended (1) to explore the potential of using the World Wide Web (WWW) of the Internet to sample hidden populations and (2) to collect exploratory data on the hidden population of nonabusive, recreational users of illicit drugs. The survey modules were designed to assess demographics and lifestyle, drug experiences (including absence of DSM-IV criteria for abuse or dependence), legal history (drug-related arrests, etc.), and mental health as measured by the General Well-Being Schedule (GWBS). The survey was completed by 276 persons, aged 18 to 62, with a mean age of 32.34. The sample was predominantly white (93%), male (78%), college educated (75%), and employed full-time (76%). The WWW is a useful tool for reaching hidden populations but is likely to impose a bias toward male, better educated, and more computer-involved samples on the respondents reached. This survey further documents the existence of a nonclinical population of drug users which is generally healthy, well-adjusted, and productive.

KEY WORDS: drug use; Internet; nonabusive drug use; successful adults; WWW.

INTRODUCTION

There is a large body of clinical research focusing on the attributes of drug abusers. In the course of clinical treatment for drug problems or drug-related health problems, a subgroup of abusers becomes accessible for study in treatment facilities. A second subpopulation becomes accessible to researchers as a result of their arrest for drug or drug-related offenses. These subpopulations are so well described that many Americans incorrectly believe they adequately represent all drug abusers and users.

Large-scale, population-based studies of individuals such as the National Household Survey on Drug Abuse (NHSDA) and The Monitoring the Future Study, however, reveal that there are millions more Americans who consume illicit drugs and never present themselves for treatment or become engaged with the

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criminal justice system (1,2). The clinical studies thus do not present a comprehensive picture of all consumers. When the National Institute of Mental Health's Epidemiologic Catchment Area Study, for instance, applied the formal diagnostic criteria for substance abuse disorders set by the American Psychiatric Association (1987) to representative samples of the populations of five metropolitan areas, they found that only 1 of every 5 users of illicit drugs met, or had ever met, the criteria for a diagnosis of substance abuse or dependence (3–5). Unfortunately, the Substance Abuse and Mental Health Services Administration (SAMHSA) and National Institute on Drug Abuse (NIDA) surveys make no clear distinction between use and abuse. SAMHSA's household survey, which offers no statistics on numbers of abusers, nevertheless reports its wealth of data on use under the title, National Household Survey on Drug Abuse. While the text of government reports increasingly uses the correct term "use" for these data, they are cited in the news media, political speeches, and much of the scientific/medical literature as reflecting abuse. Recent increases in use of marijuana were widely reported, for instance, as increases in marijuana abuse.

Describing Drug Users

There is a relatively small but growing body of research which distinguishes users from abusers and offers some description of the former. Lindesmith (1957) may have been the first to distinguish between what he called "joy poppers" and true heroin addicts. "A 'joy popper,'" he wrote, "is simply an individual who uses the drug intermittently and *who has never been hooked*" (6). Clearly, however, he believed that most would eventually succumb to addiction. Chein *et al.* (1964), likewise documented the existence of "long term nonaddicted users" of heroin, but concluded both that their numbers were insufficient to warrant study and that most would go on to become addicts eventually (7). The accepted view among drug researchers, as stated by Goode (1972), came to be one that, "the occasional (weekend) heroin user is probably a good deal more common than most of us realize, although an extraordinarily high percentage of those who "chippy" (experiment) with heroin eventually become addicted" (8).

Beneath the surface of this consensus, a contrary view persisted and grew. Scher (1961) described heroin users with "*what might be called a regulated or controlled habit*" (9). Observing similar subjects, Alksne *et al.* (1967) reported that, "although no research reports are available for this kind of user, our own observations indicate that some persist in occasional or limited use for an indefinite period of time without going on to more regular use" (10). The explosion in community-based treatment programs in the Seventies brought increasing reports of nonaddicted heroin users (11–13). Powell (1973), for instance, recruited occasional heroin users through advertisements in a counterculture ("underground") newspaper. He described a dozen subjects who had used heroin for three years or more without becoming addicted (14).

Best known is the work of Zinberg and colleagues, who recruited subjects through newspaper advertisements, community agency and professional contacts,

and by subject referral (15,16). Zinberg was able to identify 90 opiate users who had between 3 and 23 years experience using heroin without addiction. Follow-up interviews were conducted 6 months to a year later with 60 subjects and 2 years later with 25, thus confirming that they did not subsequently become addicted but leaving the status of the lost cases unknown. Zinberg and his associates had clearly proven that, contrary to popular opinion and clinician belief, a stable population of long-term nonaddicted heroin users existed, while neither their absolute nor relative numbers were known. Hunt and Chambers (1976) combined data from a number of sources to estimate that the current heroin-using population of the United States numbered between three and four million, with only 10% being addicted (17). Their figures seem to be generally consistent with the results of epidemiologic surveys (1,3,5).

Erickson and Alexander (1989) have reported findings about cocaine use similar to those reviewed above for heroin use (18). They reviewed research which studied users in the community, outside of treatment and prison, and concluded,

> Most social recreational [cocaine] users can maintain a fairly low use pattern and lengthy periods without escalation to addiction. Users appear to recognize the need to limit their use of cocaine, and most seem to be able to accomplish this without professional intervention.

Cohen (1989) applied "snowball sampling" techniques (in which known subjects nominate new subjects, who in turn nominate others) to identify 160 cocaine users in the city of Amsterdam who were demographically and economically similar to the profile of cocaine users developed through a general household survey (19,20). His data offered no evidence that any of the subjects had ever lost control of their cocaine use. Only 2% of the subjects currently used cocaine at what Cohen considered a heavy level (2.5 g per week or more) and only 20% had ever done so.

Waldorf *et al.* (1991) studied a snowball sample of 267 current or former heavy users of cocaine in California (21). Heavy use was defined as using at least 2 g per week for at least 6 months or have used some cocaine every day for a minimum of 1 year. The author's describe this sample as falling in the top 5% consumption rate of all of the millions of Americans who have tried cocaine. Results showed that about half of the users had some serious clinical problems, while the other half reported few, if any, such problems. These authors state, "Many of our respondents used cocaine for years in a controlled manner."

Sampling "Hidden" Populations

One of the major difficulties in drug abuse research is the fact that we are studying populations which are, for the most part, making a concerted effort to remain undetected (22). Our major opportunities to study drug abusers come about as a result of the abuser entering a treatment program, overdosing, or being arrested. Unfortunately, this gives rise to distorted samples of abusers, since many never seek treatment, overdose, or get arrested (23). Drug users are even harder to identify and they do not need treatment and are unlikely to overdose or be

arrested. Reaching this population is a real challenge for the researcher, and at present, as Wiebel (1990) points out, "Representative sampling, irrespective of scientific merit, is quite simply not possible in relation to the numerous varieties of phenomena at issue" (22).

The participant observer approach has had considerable use in the study of illicit drug users but seems more difficult to apply to such a potentially diverse population as is the target of the present study (24,25). Additional approaches to studying hidden populations include "snowball" (*viz.*, chain-referral) sampling and the use of privileged access interviewers (PAIs) (20,26). A serious drawback to these approaches is that one may acquire a sample which is entirely composed of one social network while excluding other networks which do not intersect with it.

Watters and Biernacki (1989) developed an approach called targeted sampling which identifies potential data-producing social networks which may then be sampled using any of the preceding techniques (27). While highly appropriate for studies of drug abuse, this approach has little to work on in the way of indicators of use in healthy, nonaddicted populations.

In NIDA's monograph, *Survey Measurements of Drug Use—Methodological Studies*, Turner *et al.* (1992) conclude after reviewing the experiences of NHSDA studies that utilization of self-administered questionnaires (SAQ's) and/or computer-assisted self-interviewing (CASI) technology can lead to increased reported drug use by respondents (28). A recent comparison of a computer-administered version of the Primary Care Evaluation of Mental Disorders (PRIME-MD) to clinician administration of the same instrument or a DSM interview, revealed that twice as many patients admitted symptoms of alcohol abuse on the computer-administered version (29). A further advantage to use of such methods is the anonymity a respondent can have while completing a survey of socially-deviant and very often illegal behavior. The Drugnet project is an attempt to utilize one of these new information technologies—the World Wide Web—to study the hidden population of occasional, recreational drug users.

METHOD

The purpose of this research was twofold: (1) to explore the potential of using the World Wide Web (WWW) of the Internet to sample hidden populations (such as drug users) and (2) to collect exploratory data documenting the existence and some of the characteristics of a hidden population of nonabusive, recreational users of illicit drugs. The identified population was to be described in terms of demographics, past legal history, health/behavioral indices, general mental health status, and drug-taking profile. The population reached by this survey would not necessarily be representative of all nonabusive users, nor would it offer any estimate of the numbers of such persons in the general population.

Given the widespread denial of the existence of healthy, successful, nonabusive drug users which has greeted the studies cited above and our own presentations of this study in progress, we feel justified in proposing our study as a test of the implicit and widely held hypothesis that there are no long-term, nonabusive users of illicit

drugs. The discovery of any substantial number of cases of such users, justifies rejection of the null hypothesis, much as the discovery of the first breeding colony of black swans disproved the hypothesis that all swans are white.

Procedure

Between October 12 and October 27, 1996, Internet users were solicited to participate in an anonymous on-line survey. The survey was located on the WWW and the home page for the Drugnet survey was registered with the major search engines such as Lycos and Alta Vista. Respondents were also actively solicited by electronic mailing lists (e.g., Drug-Policy@wku.edu) and announcements posted on USENET News Groups (e.g., the entire alt.drugs.* and rec.drugs.* hierarchies, as well as other interest groups). Announcements were initially posted to groups which were not drug-related as well as those which were, but objections to this practice of "spamming" led to minimization of such postings. The on-line announcement solicited happy, successful adults with stable home lives who occasionally used recreational drugs—this being the population whose existence we sought to demonstrate in the face of widespread popular and professional denial.

Users would then point their browsers to the web address (http://wku-webl.wku.edu/~drugnet) and be given an opportunity to complete the survey. In addition to the survey, this initial page included a short tutorial on how to complete the survey, a link to a service that would increase the anonymity of their responses (http://www.anonomyzer.com) and, also, a statement of informed consent. Respondents had to at least view the contents of the page before actually completing the survey. Only if they indicated their agreement with the purpose and procedures of the survey, would they be asked any questions with regard to their past history of drug usage.

The survey itself consisted of several smaller questionnaires about the seven drug categories. Respondents would only see the questionnaires dealing with drugs with which they had previous experience. In addition, all respondents also completed three more sections: past legal experiences and opinions, the General Well-Being Schedule, and demographics and lifestyle indices.

One major advantage of conducting surveys on the WWW is the ease with which data can be collected and coded. For the current research, a program was written in C computing language to handle the administration of the various surveys and also to code and store the data for analysis. This type of program is known as a Computer Graphics Interchange (CGI) and its actions are invisible to the respondent. Furthermore, since the CGI program runs continuously in the background, the data are coded as each response is submitted and available for analysis by the researcher as soon as subjects completed each section of the survey.

Instrument

The Drugnet questionnaire was composed of four components: (a) demographics and lifestyle indices, (i.e., age, gender, race, citizenship/residency, employment,

marital status, education, household income, and voting behavior); (b) drug experiences—questions relating to the usage of alcohol, cigarettes, cocaine, depressants, hallucinogens, marijuana, and stimulants; (c) legal history—record of previous felony convictions for drug possession/trafficking and violent offenses; and (d) General Well-Being Schedule (GWBS)—self-perception of well-being and distress. Item formats were varied and included multiple choice, multiple response, Likert scale, fill-in-the-blank, and short essay.

The GWBS was developed for the National Center for Health Statistics to fill the need for a brief, reliable and valid self-report measure of mental health for use in general population surveys and was initially used in the U.S. Health and Nutrition Examination Survey (HANES I). Scores can range from 0 to 110, with higher scores indicative of better well-being. Test–retest reliability has been reported as .85 (30).

RESULTS

Description of Study Sample

A total of 276 individuals completed part or all of the survey. Missing data proved to be a serious problem, with more than one-third of the sample failing to answer certain questions, primarily in the demographics component. As a result, we cannot accurately describe our entire sample, but only that self-selected subsample who completed the demographics component. The totals for drug-specific questions also vary, of course, since they were answered only by persons reporting a history of use of that drug.

The mean reported age of respondents was 32.34 (SD=9.45; range=18 to 62 years) (n=82 missing data). The breakdown by gender was 78.1% (n=153) male and 21.9% (n=43) female (n=80 missing data). The majority of respondents were white (n=182 or 93.3%), while 2.1% (n=4) were other, 1.5% (n=3) were Hispanic, 1.5% (n=3) were Asian, and 1.0% (n=2) were black, and 1 (0.5%) was Native American and 81 did not respond. The breakdown of the sample by marital status was as follows: (a) 39.8% (n=78) never married, (b) 38.3% (n=75) married, (c) 16.3% (n=32) living with someone, (d) 5.1% (n=10) divorced, and (e) 0.5% (n=1) widowed (n=80 missing data). One hundred forty-nine (76.8%) of the respondents were U.S. citizens/legal residents, while 45 (23.2%) were not (n=80 missing data). Most non-Americans came from predominantly English-speaking countries.

All respondents had at least a high school diploma or GED certificate. The breakdown of the sample by education was as follows: (a) HS/GED, 12% (n=22); (b) associate, 5.5% (n=10); (c) vocational, 4.4% (n=8); (d) baccalaureate, 48.6% (n=89); (e) master's, 19.7% (n=36); (f) law, 2.2% (n=4); (g) doctorate, 4.4% (n=8); and (h) postdoctoral, 3.3% (n=6) (n=108 missing data). One hundred forty-eight individuals (76.3%) were employed in full-time jobs, while 46 (23.7%) were unemployed (n=82 missing data). When self-identified full-time college students were excluded from the analysis, 88.7% (n=126) were employed fully, while 11.3% (n=16) were unemployed (n=81 missing data). Eighty-six individuals (67.2%) had

spouses who worked, while 42 (32.8%) did not (n=148 missing data or had no significant other). The breakdown of the sample by type of work is as follows: (a) 63.2% (n=117) white collar, (b) 23.8% (n=44) self-employed, (c) 6.5% (n=12) blue collar, and (d) 6.5% (n=12) unemployed (n=91 missing data). One hundred forty-nine individuals also reported their actual job title. The largest single area of employment was in a computer related occupation (e.g., computer engineer, programmer, technician, etc.). Other jobs covered the entire spectrum of employment areas (e.g., attorney, broker, CEO, business owner, electrician, erotic dancer, fisherman, homemaker, physician, nurse, scientist, salesperson, teacher, veterinarian, etc.). The median household income for the entire sample (n=190) (including college students) was between $50,000 to $69,999 ($n$=86 missing data). When asked if their household income was enough to satisfy their needs 84.3% (n=161) said yes, while 15.7% (n=30) replied no (n=85 missing cases).

Description of Drug Usage

Table I displays for each drug category the number of individuals who "ever used" and "used in the past year." Of the total sample, 235 (85.1%) reported having ever used at least one illicit drug in their lifetime. Alcohol, marijuana, and cigarettes were the drugs most often ever used. Within the past year alcohol and marijuana remained the preferred drugs. The percentages for the other drug categories (i.e., cocaine, depressants, hallucinogens, and stimulants) are notably lower. There is a drop in the percentage from "ever used" to "used in the last year" for cocaine, stimulants, and hallucinogens.

Table II displays the ages at which individuals reported first trying a drug and getting high on it. Consistent with previous research, alcohol and cigarettes were the drugs initially consumed, followed by marijuana. Initial usage and intoxication experiences for the drugs ranged from a mean of 13.3 years (having tried alcohol) to a mean of 20.7 (became intoxicated by cocaine).

Individuals were asked to estimate the level of intoxication they "typically" experience when using a particular drug; excluding cigarettes (Table III). Alcohol intoxication was the lowest (Mdn=2), while hallucinogens produced the greatest level of intoxication (Mdn=4). The median value for all other drug categories was 3. A majority of all people reported getting mildly high to moderately high. Only for hallucinogens was there a majority that reported getting extremely high in most instances.

Individuals were asked an identical series of questions for each drug category that attempted to measure potentially harmful behaviors. A substantial percentage of individuals (*viz.*, 24.1% for depressants up to 67.4% for marijuana) have used at least one of these drugs under dangerous circumstances, however, this behavior is not frequent. For depressants, cocaine, stimulants, and hallucinogens, at least 70% of respondents who reported using these drugs dangerously say this occurs less than once a year.

At least 85% of users for each category answered no to the question of whether or not use of a drug had ever caused a failure in education, work, or family life.

Table I. Drug Usage[a,b]

Category	Past year		Ever used	
	%	*n*	%	*n*
Alcohol	89.1	228	92.8	256
Cigarettes	—	—	70.3	194
Marijuana	86.3	196	83.3	230
Depressants	36.5	30	32.2	89
Cocaine	20.7	23	42.0	116
Stimulants	33.0	35	41.3	114
Hallucinogens	55.0	89	60.5	167

[a]Dashes indicate that data were not gathered for this category.
[b]Past year and lifetime prevalence calculated from different questions resulting in different denominators for each time period and drug.

Table II. Age of First Drug Use and First Intoxication[a]

Drug category	Age first used			Age first intoxication		
	n	$\bar{X}$	*SD*	*n*	$\bar{X}$	*SD*
Alcohol	253	13.3	4.0	250	15.2	3.2
Cigarettes	194	13.9	3.2	—	—	—
Marijuana	230	17.0	4.3	227	17.3	4.4
Depressants	89	18.8	4.7	87	18.8	4.7
Cocaine	116	20.9	4.6	115	20.5	5.2
Stimulants	114	18.4	3.8	109	18.2	4.2
Hallucinogens	167	19.3	5.1	165	19.3	5.3

[a]Dashes indicate that data were not gathered for this category.

Table III. Level of Altered Consciousness Usually Experienced

Drug category	*n*	Median	Level of altered consciousness (%)[a]				
			1	2	3	4	5
Alcohol	255	2	36.1	43.5	17.6	2.0	0.8
Cigarettes	152	1	67.1	27.6	2.0	2.6	0.7
Marijuana	224	3	1.3	19.2	56.3	20.1	3.1
Depressants	80	3	6.3	32.5	37.5	18.8	5.0
Cocaine	99	3	5.1	28.3	32.3	30.3	4.0
Stimulants	95	3	3.2	27.4	33.7	28.4	7.4
Hallucinogens	158	4	0.0	3.2	25.9	40.5	30.4

[a]Level interpretations are (1) not at all high, (2) mildly high, (3) moderately high, (4) very high, and (5) extremely high.

Individuals were asked if getting drug(s) occupied a large part of their time. Excluding cigarettes, at least 90% of respondents said that it did not occupy large parts of their time. Individuals were next asked if they ever wanted to stop using a drug but had trouble doing so. Again, excluding tobacco, at least 87% of those who reported ever using a particular drug stated they did not have trouble stopping

when they wanted to. The last two questions which probed for potentially harmful behaviors were: (a) Have you ever experienced withdrawal illness (e.g., shakes, nausea, trouble sleeping) when you stopped taking this drug? and (b) Have you ever experienced health or psychological problems as a result of your use of this drug. Strong majorities (from 72.4 to 95.7%) answered "no" to both questions for each drug category.

Mental Well-Being

The samples (n=199) mean score on the GWBS was 80.82 (SD=13.93; range = 68 to 108). This is equivalent to the mean reported for a representative sample (n=6931) of American adults as measured in the Health and Nutrition Examination Survey ($\bar{X}$=80.3; SD=17.7) (31). Broken down into stress categories, the Drugnet's sample scores were as follows: (a) positive well-being (73–110), 74.5% (b) moderate stress (61–72), 16%; and (c) severe distress (<60) 9.6%. In terms of overall mental well-being, as measured by the GWBS, this sample appears to be no different than the general population of noninstitutionalized, American adults.

Health and Behavioral Indices

These items were designed to probe for the respondents self-perception's of their health status and measure behaviors generally accepted as normal or appropriate for nondeviant, functional, social individuals. Two questions related to religion were asked for descriptive purposes only.

Respondents were asked to rate their own physical health status. Responses were as follows: (a) excellent, 31.1%; (b) good, 46.9%; (c) average, 14.8%; (d) fair, 5.1%; (e) poor, 1%; and (f) very poor, 1%. Thus, over 90% of the sample felt their physical health status was average to excellent. One question on the GWBS asks, How concerned or worried about your health have you been (in the last month). Response options are a Likert scale ranging from 0 (very concerned) to 10 (not at all concerned). The subjects median score on this item was 8.0 (SD=2.24; range=0 to 10), indicating a positive physical health self-perception. The responses to this item appear to validate the previous question on self-perceived physical health status.

Of those individuals responding to the question—Do you vote regularly?—a strong majority (83.6%) responded yes. This is notably above the voting level in U.S. National Elections which ranges from 33% to 62% (31). One hundred eighty-seven (95.4%) of respondents said they regularly engage in non-drug-related recreational activities. Forty-three percent said they regularly get involved with community organizations such as the PTO, Elk's Lodge, etc. When subjects were asked if they were happy with their marital status, 90.2% of the respondents said yes. These responses appear to be indicative of positive social functioning. Finally, respondents were asked their current overall college GPA or their final GPA if they have already graduated from college. The mean reported GPA was 3.34 (SD=.83; range = 1 to 4), which represents A/B performance. This is indicative

of very good academic accomplishment. The survey included two purely descriptive questions related to religion. The first asked whether respondents regularly attended church services, to which a strong majority of 91.1% responded "no." This is substantially lower than the proportion of the U.S. national population which attends church services regularly (31). Respondents were also asked a Likert scale question on how important religious beliefs were to their lives with a response range of 0 (no importance) to 10 (central focus of life). The median response was 3.0, with a range from 0 to 10, indicating that while most had a minimal religious orientation, a broad spectrum of commitment levels was represented. The responses to these two questions are consistent and appear to indicate that this sample is less religious than the general population as a whole. Of note, however, were several short essay responses and separate e-mail messages concerning these items. A number of individuals reported having difficulty responding to them. Some viewed themselves as very "spiritual" but not "religious" in the sense of formalized, traditional, religious structures such as a church affiliation.

Legal History and Attitudes

Individuals were asked several questions regarding any previous drug or violence-related encounters with the judicial system. Twenty-three percent of respondents reported having legal problems related to their drug use, while 76.8% did not have these problems. When asked if they had ever been convicted of a drug-related (i.e., possession or trafficking) felony offense, 6.5% said they had, while 93.5% said they had not. Following this, individuals were asked if they had ever been convicted of a nondrug related felony. One person (.5%) said they had, while 195 (99.5%) said they had not. One hundred ninety-eight or 100% of the respondents reported they had never been convicted of a violent felony offense. Finally, the survey asked, "Would you support major drug reform which included strategies such as legalization and/or decriminalization of currently illegal drugs?" A strong majority of 92.8% (n=198) said they would support such reform, while only 7.2% (n=14) said they would not. Respondents were also allowed to write essay responses detailing their legal experience and attitudes to U.S. drug policy. These responses will be reported in later reports.

DISCUSSION

These results demonstrate support for the first purpose of this project. A substantial number of individuals were willing to complete part or all of an on-line survey of recreational drug use within a 2-week period. A majority of individuals responding to the survey felt secure enough to answer questions of a very personal nature, many of which were related to illegal drug consumption.

These results also provide preliminary data on a broad demographic and behavioral profile of this target population, heretofore, reported in only a few small studies in the scientific literature. Based on our results, and within the limitations

of this study, several conclusions can be drawn about this sample. Overall, these respondents appear to be what was sought—a normal, healthy group of individuals who occasionally or socially use illicit drugs. Generally, they are well-educated, employed, active in social activities, comfortable with their physical health and possess normal mental well-being as a group. Their recreational drug use does not appear to be the central focus of their lives. This clearly distinguishes them from drug abusers. Their drug consumption is generally low to medium in frequency and appears to be well-controlled (i.e., consumed within nonharmful, self-defined parameters).

Generalization of these findings to the entire population of nonabusive drug users must be tempered by an awareness of the characteristics of the total population using the Internet. Marketing surveys indicate that Internet users are (a) more likely to be college-educated than the general public, (b) possess median household incomes of approximately $60,000 (i.e., notably above the $42,000 median for all U.S. households in 1994), and (c) number between 15 and 30 million and are rapidly increasing both in and outside of the United States (32,33). 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.

These data provide evidence, from a sample both larger and more diverse than those we have previously cited (13–21), that substantial numbers of individuals are able to use a variety of illicit recreational drugs in safe or minimally hazardous ways. This is an important counter to the widely held view that drug abuse is the inevitable outcome of drug usage which proceeds at all beyond experimentation.

As a pilot effort this project also contains notable limitations and many lessons were learned which are being applied to a revised larger Drugnet survey. Of major concern was the roughly 30% nonresponse rate for many of the items, particularly in the demographic and behavioral components of the survey. Initial pilot testing prior to going on-line indicated that people could complete the entire survey in 15 to 30 min, depending on their drug history and familiarity with computers. It is possible that the survey was too long for some people and they lost interest in it. The demographic questions were at the end of the survey, which is typical of formats for many paper-and-pencil tests. If people find these items least interesting to spend time on, it may be advisable to place these items at the beginning of on-line surveys.

This rearrangement of survey sections is being implemented in the full-scale study. A number of other changes are also being performed. Cigarettes are being dropped as a category since they are generally not considered "recreational" drugs and a category on opiates is being added. Questions with high levels of nonresponse were analyzed and response patterns were studied. This revealed numerous opportunities to write clearer questions that hopefully will provide better information and clarity. This was especially an issue with questions that involved branching. Logical sequencing of questions and branches were enhanced and simplified.

In contrast to these problems and limitations several positive methodological factors occurred. Most respondents were willing to write long essay responses to the open-ended attitude questions not reviewed here. These comments were often

powerfully emotional and thus indicate this subsample of the population has strong needs to be heard. If given enough safety and security, they appear willing to tell their stories. Numerous respondents sent us mail and e-mail which included information of a sensitive nature. This bodes well for future research efforts of this type. Analysis of the range of responses to questions and response patterns also seem to indicate that the responses provided were honest and possibly more frank than what people will say face-to-face with an interviewer or with a researcher in the room. For research of this type, this may be a solution to some forms of subject–response bias.

These researchers believe that these preliminary Drugnet results and experiences provide encouragement for the development and refinement of further online surveys of the general population who have access to these technologies. In the years to come this should be a steadily increasing proportion of the population similar to the increase in home phone ownership in the latter part of the 20th century. For studying so-called "hidden" populations such as recreational, illicit drug users this medium appears to be potentially valuable.

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