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The "Black Box" of Prescription Drug Diversion

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Abstract

A variety of surveys and studies are examined in an effort to better understand the scope of prescription drug diversion and to determine if there are consistent patterns of diversion among various populations of prescription drug abusers. Data are drawn from the RADARS® System, the National Survey of Drug Use and Health (NSDUH), the Delaware School Survey, and a series of quantitative and qualitative studies conducted in Miami, Florida. The data suggest that the major sources of diversion include drug dealers, friends and relatives, smugglers, pain patients, and the elderly, but these vary by the population being targeted. In all of the studies examined, the use of the Internet as a source for prescription drugs is insignificant. Little is known about where drug dealers are obtaining their supplies, and as such, prescription drug diversion is a "black box" requiring concentrated systematic study.

Keywords

prescription drugs; diversion; oxycodone; hydrocodone; club drugs

The non-medical use of pharmaceutical opioids has been an enduring problem in the United States. There has been some speculation that the trend began early in the eighteenth century with Thomas Dover, a student of British physician Thomas Sydenham [1]. Known as the "English Hippocrates" and the father of clinical medicine, Sydenham had been a strong advocate of the use of opium for the treatment of disease. Following the path of his mentor, Dover developed a form of medicinal opium known as *Dover's Powder*, which contained one ounce each of opium, ipecac, and licorice, combined with saltpeter, tartar, and wine [2]. It was introduced in England in 1709, but quickly made its way to the American colonies and remained one of the most widely used opium preparations for almost two centuries. The attraction of Dover's Powder was in the euphoric and anesthetic properties of opium, and its introduction apparently started a trend. By the latter part of the eighteenth century, patent medicines containing opium were readily available throughout urban and rural America, and by the closing years of the nineteenth century the abuse of these drugs had become widespread [1, 3, 4, 5].

The abuse of opioids continued throughout the twentieth century. The first general population survey of drug abuse undertaken in the U.S. was conducted in New York State in 1970 [6]-- one year before the first National Household Survey on Drug Abuse (NHSDA). The New York survey found the abuse of prescription drugs to be commonplace. Subsequent surveys as well as focused research studies documented the continuing abuse of prescription drugs [7, 8, 9, 10,

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[11]. Moreover, from the 1970s through the 1990s, several prescription drugs cycled in and out of the American drug scene – pentazocine (T's & blues) and propoxyphene (Darvon) in particular – while others, such as hydromorphone (Dilaudid) and hydrocodone (Vicodin), maintained a steady presence [10, 12, 13, 14, 15]. By the close of the 1990s, it had become clear from data gathered through the Drug Abuse Warning Network (DAWN), the National Institute on Drug Abuse's (NIDA) Community Epidemiology Work Group (CEWG), the Monitoring the Future (MTF) surveys, and the National Survey on Drug Use and Health (NSDUH) that prescription drug abuse – including opioids, benzodiazepines, stimulants -- was on the upswing [16, 17, 18, 19, 20, 21, 22, 23].

Concomitant with the widespread abuse of prescription drugs, since the beginning of the twenty first century increased attention has focused on *diversion* – the transfer of a prescription drug from a lawful to an unlawful channel of distribution or use [24]. Diversion, furthermore, can occur in many ways, including: the illegal sale of prescriptions by physicians and what are referred to on the street as “loose” pharmacists; “doctor shopping” by individuals who visit numerous physicians to obtain multiple prescriptions; theft, forgery, or alteration of prescriptions by health care workers and patients; robberies and thefts from manufacturers, distributors, and pharmacies; and thefts of institutional drug supplies [25, 26, 27]. Moreover, there is growing evidence that the diversion of significant amounts of prescription opioids and benzodiazepines occurs through residential burglaries as well as cross-border smuggling at both retail and wholesale levels [24, 28, 29]. In addition, anecdotal reports suggest that diversion occurs through such other channels as: “shorting“ (undercounting) and pilferage by pharmacists and pharmacy employees; recycling of medications by pharmacists and pharmacy employees; medicine cabinet thefts by cleaning and repair personnel in residential settings; theft of guests' medications by hotel repair and housekeeping staff; and Medicare, Medicaid, and other insurance fraud by patients, pharmacists, and street dealers [24, 30, 31]. Furthermore, it would appear that pill abusing middle and high school students are obtaining their drugs through medicine cabinet thefts, medication trading at school, and thefts and robberies of medications from other students. Finally, some observers consider the Internet to be a significant source for illegal purchases of prescription drugs [32, 33, 34].

Although a list of the mechanisms of diversion is easily compiled, little is known as to the magnitude of the primary ways that prescription drugs are making their way to the streets and who the major diverters are. In fact, the answers to these questions vary depending upon whom you ask. Officials in regulatory agencies suggest that the major diverters are pharmacists, physicians, and other health care workers, and regulatory officials come to this conclusion because these are the populations that their agencies focus on. Physicians and pharmacists suggest that the diverters are doctor shoppers and prescription forgers. This is not surprising either, given that these individuals are the clients and customers of physicians and pharmacists. Diversion investigators in police agencies consider the major diverters to be all of the above -- pharmacists, physicians, other health care workers, doctor shoppers and prescription forgers, because these are the types of diverters referred to the police by regulatory agencies, physicians, and pharmacists. However, what about all the other types of diversion, and who are the other players in the diversion paradigm? This is the essence of the “black box.”

Within this context, this paper examines a variety of surveys and studies in an effort to better understand the scope of diversion and to determine if there are consistent patterns of diversion among various populations of prescription drug abusers.

Risk Management and Prescription Drug Diversion

Currently, a comprehensive risk management program is being conducted by Denver Health and Hospital Authority, a public, not-for-profit health care system serving the Denver MSA

and the Rocky Mountain region of Colorado. Known as the RADARS® (Researched Abuse Diversion and Addiction-Related Surveillance) System, the Denver Health initiative is a broad series of studies designed to proactively collect timely and geographically specific data on the abuse and diversion of a number of prescription stimulants and opioid analgesics. These data represent a scientific foundation for developing prevention and intervention efforts to address abuse and diversion. Subscribers to the RADARS System initiative include a number of pharmaceutical companies that are marketing prescription drugs having a significant potential for abuse. Four different surveillance efforts, or "signal detection systems," make up the RADARS System program – a poison center system, an opioid treatment program system, a key informant network, and a drug diversion system.

The poison center system consists of 48 poison centers nationwide, serving a population of more than 239 million people. Weekly data involving cases of drug abuse and misuse are sent to the RADARS System and are compiled for quarterly reports for the pharmaceutical industry subscribers. The data provided by this system allows the RADARS program to recognize and track trends in prescription drug abuse on a weekly basis. However, no diversion data are routinely collected in this particular signal system.

The opioid treatment program system includes 75 treatment programs. On a quarterly basis, patients admitted to these treatment programs are asked to complete an anonymous questionnaire, which inquires about the their drug use in the past month, lifetime drug abuse, the age when first drug use occurred, and the primary source of the abused drug (diversion).

The key informant network consists of "key informants" across the nation who report on prescription drug abuse in their areas. This network includes professionals in the field of drug abuse, such as clinicians, epidemiologists, treatment counselors, and others who are in positions to recognize and report on drug problems. Diversion data are not routinely collected as part of the key informant system. However, supplemental data on diversion are obtained on a periodic basis.

One of the more expansive RADARS System components is a diversion study with a survey sample of 300 diversion investigators, from all 50 states, the District of Columbia, and Puerto Rico, including rural, suburban, and urban areas. The primary purposes of the survey are to determine the extent of the diversion of selected prescription drugs in a sample of police, other law enforcement, and regulatory jurisdictions, and to identify diversion "signal sites" for specific drugs.

Information from the four signal systems is compiled and analyzed, and forwarded to sponsoring pharmaceutical companies for the purpose of developing interventions to reduce abuse and diversion, if appropriate. The opioid drugs currently monitored by the RADARS System include buprenorphine, fentanyl, hydrocodone, hydromorphone, methadone, morphine, oxymorphone, oxycodone, and tramadol. The stimulant drugs currently monitored include amphetamine and methylphenidate.

RADARS System Diversion Data

In the drug diversion signal system, the participating police and regulatory agencies are sent a brief questionnaire on a quarterly basis that elicits an enumeration of the total number of *new* cases of diversion reported to and/or investigated by the diversion unit or regulatory board during the previous three months. For each of the drugs mentioned, the following information is requested: the total number of diversion cases logged in, the number of cases in which the targeted drugs were mentioned, and the dosage form (tablet, liquid, patch, powder, wafer, suppository, or other). For the next 10 most diverted drugs in their jurisdictions, over and above the targeted drugs, reporters are asked to provide the number of cases in which they occur, as

well as the dosage form. This procedure provides a comprehensive distribution of the types and numbers of diversion cases in a given jurisdiction. During the period January 1, 2002 through December 31, 2007, a total of 80,328 diversion cases were reported, and this figure brings us back to the issue of the "black box." That is, how are these 80,328 cases, and other cases of diversion elsewhere in the United States, actually occurring? Where are the drugs coming from? Who are the suppliers? How are the drugs reaching the street? Who are the diverters?

Although information on the sources of diversion is not available for collection as part of the RADARS System drug diversion system, a brief survey was conducted with the diversion investigators in the 300 police and regulatory agencies participating in this nationwide surveillance program [24]. As illustrated in Figure 1, almost three-fourths of the survey participants considered drug abusers posing as patients to be the major source of diversion (through doctor shopping and prescription theft/forgery). Only small proportions of the surveyed participants viewed other sources of diversion as particularly significant. No doubt these considerations were based on the kinds of cases the diversion investigators were coming into contact with.

As noted above, the RADARS System opioid treatment program system includes 75 treatment programs, and measures of substance abuse and sources of prescription drugs are routinely collected. Participation in this study by methadone maintenance patients is voluntary, and the project protocols for the protection of clients against research risks were reviewed and approved by the National Development and Research Institutes, Inc. Institutional Review Board. As illustrated in Table 1, during the 4th quarter of 2007, 62.2% (n = 346) of program enrollees reported a prescription opioid, particularly sustained release oxycodone and hydrocodone, as their primary drug of abuse. Of these 346 individuals, there appeared to be three major sources for obtaining prescription opioids: 75% reported obtaining opioids from drug dealers, 39% from friends or relatives, and 20% from a doctor's prescription (see Table 2). These data would appear to be quite different from the perceptions of the police and regulatory agency representatives who reported doctor shopping and prescription theft/forgery as the major sources of diversion. This raises the question of where the dealers, friends, and relatives are obtaining the drugs.

In the RADARS System key informant network, 94 treatment specialists were asked to recruit as many of their patients as possible during the period January 1, 2005 through December 31, 2007, who had a diagnosis of prescription opioid abuse or dependence using the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). Criteria for participation included meeting DSM-IV criteria for substance abuse/dependence with a prescription opioid as the primary drug, and the use of prescription opioids to get high at least once in the past 30 days. Participation in all phases of the study was voluntary, and the project protocols for the protection of clients against research risks were reviewed and approved by the Washington University Institutional Review Board (IRB).

Overall, 85% of the patients (n = 1,472) approached by the treatment specialists completed surveys, covering: demographics; licit and illicit patterns of drug use; sources of supply; diagnostic criteria for alcohol and opioid abuse or dependence; and, whether they were currently being treated for a psychiatric condition. Completed survey instruments were identified solely by a unique case number and were sent directly to Washington University School of Medicine. The treatment specialists did not see the detailed responses of their patients/clients.

As illustrated in Table 3, the primary prescription opioids of abuse within this population included extended-release oxycodone (29.4%), followed by hydrocodone (29.2%), immediate-

release oxycodone (15.2%), and methadone (12.8%). Table 4 suggests that the major sources of these drugs were dealers (65%), friends and relatives (64%), a doctor's prescription (59%), emergency rooms (22%), and forged prescriptions (21%). In several ways, the sources of diversion among the individuals accessed through the key informant network were not unlike those of the methadone maintenance patients.

Large Scale Surveys

Going beyond the RADARS System, data from two large scale surveys – the National Survey of Drug Use and Health (NSDUH) and the Delaware School Survey -- examine the sources of diversion within a far broader framework.

National Survey of Drug Use and Health offers a national perspective on the sources of prescription drug diversion as well as annual data on drug use in the United States. The NSDUH is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), an agency of the U.S. Public Health Service and a part of the Department of Health and Human Services (DHHS). This general population survey provides yearly national and state level estimates of alcohol, tobacco, illicit drug, and non-medical prescription drug use. In addition, data are collected on the methods of obtaining prescription opioids for non-medical use.

As illustrated in Table 5, lifetime non-medical use of prescription opioids appeared to be considerable [67]. Hydrocodone ranked first in this regard, with an estimated 21,335,000 persons reporting lifetime non-medical use, followed by propoxyphene and codeine products (n = 20,461,000) and oxycodone (n = 13,055). The majority of these lifetime users, furthermore, were in the 26 or older age group [35]. As illustrated in Figure 2, two-thirds of these abusers reported friends or relatives (either for free or purchased) as their major source of supply, followed by prescriptions from a physician. In contrast to other populations noted above, few obtained their prescription opioids from drug dealers.

The Delaware School Survey

School surveys have been carried out annually in Delaware since 1989 to provide estimates of student alcohol, tobacco, and other drug abuse incidence and prevalence for state assessment and planning purposes. The 2008 survey was conducted as an anonymous classroom endeavor in the Spring, using a self-administered form that could be completed in no more than one class period. To help ensure anonymity, the survey was directed by University of Delaware personnel. Survey participants were essentially a census of all 11th grade public school students who agreed to participate, were not in a classroom randomly selected to be in the Center for Disease Control and Prevention's (CDC) Youth Tobacco Survey, and whose parents did not object to their child's participation. The final sample of 5,621 represented 80% of the state's 11th graders.

Twenty percent of the sample reported using prescription drugs “to get high” in the past year. Figure 3 illustrates the reported sources of prescription drugs for those 11th graders who reported any use of prescription drugs to get high in the past year. Since students may report getting drugs from more than one source, the percentages total to more than 100%. Most of those who used prescription drugs illegally reported getting them from friends (58%) with the next most prevalent source being dealers under age 21 (43%). It is worth noting that peer-aged drug dealers were more likely to be the source of drugs for these high school students than older drug dealers, although older dealers were the third most mentioned source (27%). Parents, either knowingly or unknowingly, were also a meaningful source for students' prescription drugs. Getting drugs at parties or clubs was less common (12%), and the least notable source was the Internet (2%).

Miami Street Studies

Miami, Florida, has long since been a major tourist destination, and for more than three decades it has been a national center for cocaine importation, distribution, and use [36, 37, 38]. Moreover, Miami has been designated by the Drug Enforcement Administration as a destination where large amounts of prescription drugs are regularly being channeled into the illegal marketplace [68]. As such, this locale is an excellent place to study both the abuse and diversion of prescription drug medications. To this end, the authors of this paper have been involved in a number of projects which focus on these topics – particularly with drug-involved, women street sex workers and members of Miami's vast club culture.

Street Sex Workers

In the first Miami study, designed as an HIV outreach and intervention program for drug-involved, street-based women sex workers, a total of 588 women were interviewed extensively about their drug use [39]. Participation in all phases of the study was voluntary, and the project protocols for the protection of clients against research risks were reviewed and approved by the University of Delaware's IRB.

The drug use histories of the sex workers were quite extensive. The participants were typically poly-drug users, and reports of past month activity indicated that alcohol and crack-cocaine were the substances most widely used (80.4% and 68.2%, respectively), followed by marijuana (62.7%), powder cocaine (50.0%), and heroin (16.3%). Although smoking and snorting were the most common routes of administration, nearly 11% had injected drugs in the month prior to interview. In terms of prescription drug abuse, 12.2% of the sample (n = 72) reported using at least one opioid analgesic in the past 90 days without having a legitimate prescription, with extended release oxycodone and other oxycodone products as the most frequently abused opioids (data not shown). As illustrated in Figure 4, these women sex workers reported obtaining prescription opioids through a variety of mechanisms: 30.6% reported acquisition through street buys, 68.1% from friends and/or relatives, 12.1% from clients and other sex workers, 4.2% from “script doctors,” and 1.4% from theft. None of the women reported accessing prescription opioids through prescription thefts, prescription forgery, doctor shopping, or the Internet.

The Club Culture

In addition to its reputation as one of the cocaine capitals of the Americas, Miami is also a major player in the U.S. club drug scene. In fact, with the restoration of Miami's art deco districts and the large and continuously expanding South Beach area, Miami has become a national and international destination for partying, sexual tourism, and club drug use. And to a great extent, South Beach has also become an East Coast center for the club culture – setting trends that are emulated and replicated elsewhere in the United States, Western Europe, and Latin America [40, 41, 42, 43, 44, 45, 46, 47, 48]. Or as one club promoter recently put it: “Every night is like New Year's Eve on South Beach, and drugs and sex are all part of it” [49]. And a recent trend in this regard has been a significant incursion of prescription drugs into the club culture [23, 50], with the concomitant health consequences associated with their abuse [51]. Because of the young age of the vast majority of club drug users and their tendency to mix numerous drugs during their typical drug binges, club drug users tend to be a highly vulnerable population [23, 52, 53, 54, 55, 56, 57, 58]. Within this context, a recent NIH funded study is examining the patterns of drug use and health consequences of prescription drug abuse within this population. For all of the interviews, informed consent procedures were approved by the University of Delaware's Institutional Review Board (IRB), and were rigorously followed.

Among 515 club drug users interviewed in this quantitative study, all were current (past 90 days) users of alcohol and marijuana, 90% were current users of cocaine, and 82% were current users of ecstasy (data not shown). All of these individuals reported using prescription drugs for recreational purposes during the past 90 days, and as illustrated in Figure 5, the drug most commonly used was alprazolam, followed by oxycodone and hydrocodone. All of these club drug users had multiple sources for obtaining prescription drugs, but as indicated in Table 6, almost three-fourths used local drug dealers, more than half shared or traded prescription drugs with friends, and almost a fourth obtained drugs from family members [51].

Qualitative Studies

In addition to the quantitative studies described above, a qualitative research program was developed by the authors to further investigate sources of prescription drugs. Two qualitative studies are described here – the first focused on the Miami club culture, and the second was a rapid assessment study conducted in Wilmington, Delaware.

Prescription Drug Users in the Club Scene

Four focus groups of prescription drug abusers in the Miami club culture were conducted, and included 27 ethnically-diverse men and women ages 18 to 36. Three in-depth interviews with particularly heavy users of both opioids and benzodiazepines were also conducted. In addition, 8 prescription drug dealers connected to the club scene were interviewed. All interviews and focus groups were tape recorded and transcribed. Informed consent procedures were approved by the University of Delaware's IRB. Coding categories were established to capture response patterns in the topics covered by the interview and focus group guides.

A common theme in the focus groups was Medicare and Medicaid fraud as a mechanism for obtaining prescription drugs. One of the focus group participants stated:

> Somebody who is on Medicaid and welfare and who gets × amount of prescriptions per month, and they'll get like maybe 100 Xanax or 100 Percocets due to various ailments. But they have a habit for crack or heroin, so they sell their prescription at a little bit less than street market value, knowing that they'll get rid of them fast and in bulk. They'll say “Oh, you can give me 60 bucks for the 100 Xanax.” And they'll use the money to buy their drug of choice.

Another reported:

> A dealer will take an old man to a doctor who's a little bit crooked. He's got a broken arm or a bad hip; he complains of pain. Doctor knows what's going on; he gets kickbacks from patients coming in through Medicaid. The old man gets prescribed OxyContin. After that he goes right to a pharmacy and gets the prescription filled, and the dealer pays him $200 for the pills. Its all because a lot of old people don't have any money on the 20th of the month when their social security checks are gone; they don't want the pills, they want the money.

And a third individual stated:

> The *dogs* [drug dealers] were in our neighborhood one night asking for people with the red, white and blue card, which is the Medicare/Medicaid card. And if you do, they'll sign you up right there. They paid $50 for signing up right there on there spot. They paid the $80 for the doctor's visit, and they paid $200 for the pills. They paid one person $500 for the prescription he got for a wheel chair, and they paid $150 for receiving an oxygen tank and nebulizer. And he had a prescription for Percocet. They bought those off of him for 2 bucks a piece.

The 8 dealers interviewed provided especially interesting information about diverse modes of drug diversion. For example, one dealer reportedly specialized in the diversion of alprazolam -- averaging 10,000 pills per month, which are smuggled into South Florida by a “go-fast” boat from Mexico. The dealer's customer base consists of college students, and this business provides the dealer with a monthly net income of about $10,000. Moreover:

> I go to the West Coast of Florida, to Tampa Bay and meet in a hotel. This guy comes from Mexico by boat. He's got the pills, I have the money and we switch camera bags. It's the same bag. No one can tell the difference.

A second dealer reportedly restricted his diversion to oxycodone, averaging 1,000 pills per month. His supplies were obtained from a larger dealer in Atlanta; the dealer's customers were described as “professional people” who pick up their purchases at the dealer's home. Several other dealers reported obtaining prescription drugs from people who hijacked delivery trucks. And finally, inner-city crack houses were identified as useful sources for obtaining prescription drugs. For example:

> I know at the crack house that they get them from street people, like the homeless, that have prescriptions. Because usually the people in the street have a variety of ailments, so when they get prescribed anti-depressants, muscle relaxants, pain killers, and they don't really want to use them, they want to be smoking crack or whatever. So they'll make a deal with the house: “Look, I'll give you my whole bottle of pills, just give me three [crack] rocks.”

Rapid Assessment – Wilmington, Delaware

The World Health Organization defines rapid assessment as a series of strategies for ascertaining, understanding, and characterizing the nature and extent of health and social problems in a particular locale, and for suggesting ways in which those situations can be improved [59]. Rapid assessment investigations speed up the usual process of behavioral science and epidemiologic research, reducing the time needed to less than a year or even perhaps just a few months of investigation, surveys, and interviews, and then linking assessments with action. An important characteristic of rapid assessment is that it aims to prioritize realistic outcomes over scientific ones. Rapid assessment embraces several different research methods, including such techniques as surveys, key informant interviewing, direct observation, focus groups, or even intercept interviewing. In addition, quantitative methods in epidemiology and behavioral science are sometimes utilized, particularly risk factor approaches and prevalence estimation.

A rapid assessment was carried out in Wilmington, Delaware, during December 2006. Wilmington, the largest city in Delaware and having a population of almost 73,000 in 2006, was chosen for this investigation for two reasons. First, several authors of this paper were familiar with the area and already had a number of key informant contacts in the prescription drug abusing community. Second, throughout 2006 media reports repeatedly noted the problems of prescription opioid abuse and diversion throughout the state, and particularly in Wilmington [60, 61, 62].

As part of this rapid assessment, six focus groups were conducted with 32 patients in two residential programs [63]. Each of the focus groups was recorded, and lasted approximately 90 minutes. The focus group areas of inquiry included perceptions of the prescription drug problem in Delaware, the more popular prescription medications and their prices on the street, how the participants started using prescription drugs for non-medical purposes, and how the drugs were obtained.

Dealers were recruited from the same treatment facility sources. However, because pill brokers were not active substance users, and hence, not in treatment, they were referred for interviewing by dealers known to one of team members who has substantial experience conducting street-based recruitment in drug-using communities.

In-depth interviews with three prescription drug "dealers" and two prescription "pill brokers" were conducted and focused on understanding the sources of access to prescription drugs. According to the focus group participants, "dealers" are typically drug abusers who hustle prescription medications and other drugs whenever and however they can, to help support their own drug habits. By contrast, "pill brokers" tend to be more organized than dealers, and most are not abusers. Many pill brokers specialize in only one or two drugs, while others buy and sell any type of prescription medication. Moreover, pill brokers regularly work with a consistent crew of people – such as a given set of "doctor shoppers," pain patients, pharmacists, or even physicians.

A consistent theme among the focus group participants was that many members of the elderly population in Wilmington were in the business of duping their physicians – because they could complain of pain (whether they were in pain or not) and get prescriptions they wanted. Some of these elderly individuals were reportedly abusing their drugs, but the overwhelming majority was diverting medications for economic reasons. Some sold their prescriptions on their own initiative, while others would work in conjunction with a dealer or pill broker.

Another prominent theme among the focus group participants, dealers, and pill brokers was that many patients who were suffering from serious pain would use part of their medications and sell the rest because of a need for cash. Some were dependent on street drugs, and would sell/exchange prescription drugs for heroin or crack. Several patients would reportedly ask for additional prescriptions from their pain management specialists, which they would fill and sell to an abuser, a drug dealer, or a pill broker. Also common in this group was selling supplies of unused medications.

In addition to these two major sources of diversion, pill brokers, dealers, and sellers of often congregate in open air drug markets – typically strip mall and pharmacy parking lots, and outside methadone clinics -- to buy, sell and trade prescription drugs. Sometimes prescription drugs are traded for crack, heroin, or just cash. Pill brokers also purchase used fentanyl patches from nurses who have stolen them from pain patients or from disposal containers in hospitals. Some individuals frequenting the drug markets barter their oxycodone for other opioids or benzodiazepines, typically alprazolam. Less common sources of diversion identified in this rapid assessment study included doctor shopping, "script docs," and friends and family members.

Discussion

Earlier in this paper it was stated that identifying the primary sources of prescription drug diversion depended on whom you asked, and the studies and surveys summarized above support this contention to a great extent. At the same time, however, some similarities are apparent across a number of populations. One of the difficulties with comparing these populations, however, is the fact that different survey instruments were used for each, and hence, categories of diversion sources tend to vary. Nevertheless, a number of commonalities exist.

One of the most frequently mentioned sources of prescription medications are drug dealers. For example, as illustrated in Figure 6, the majority of the methadone maintenance patients, as well as patients accessed through the RADARS System key informant network and members of the Miami club culture obtained their drugs from street dealers. In addition, 70% of the

Delaware 11th graders and 31% of the sex workers interviewed purchased prescription drugs from street dealers. This is not an unexpected finding given these individuals involvement with, or proximity to, street drug cultures. One might find it surprising, however, that so many of the Delaware 11th graders have access to street dealers, but other studies of these students have demonstrated that 11th graders who abuse prescription drugs are also abusers of other substances, including street drugs [64].

The large proportions of the drug using populations obtaining prescription drugs from dealers should be contrasted with that of the general population (the NSDUH survey) in which only 4% reported obtaining prescription drugs from dealers. This raises a question for the so-called "black box --"where are the dealers obtaining their supplies? The qualitative studies in Miami, Florida, and Wilmington, Delaware, suggest that a number of pain patients and some members of the elderly population work with dealers and pill brokers, and no doubt this phenomenon is occurring elsewhere. However, this likely explains only a small part of the supplies that dealers are selling. In addition, it is probable that a portion of the prescription medications that are diverted through robberies, burglaries, and thefts make their way to street dealers, but little is known about this aspect of the illicit market. There is also the matter of traffickers smuggling prescription drugs into the United States, but the only information on this practice is limited.

A second major source of prescription drugs is friends and/or relatives. This seemed to be common among methadone maintenance patients (39%), those individuals identified through the key informant network (64%), sex workers (68%), Delaware 11th graders (58%), and members of the general population (65%). In addition, 22% of the members of the club culture reported obtaining prescription drugs from friends/relatives, and an additional 59% indicated that their drugs came from a related mechanism of trading and sharing. Again, where are the friends, relatives, and traders obtaining their supplies? In all likelihood, some of these drugs are coming from family medicine cabinets, but little is known about the magnitude of the problem in this regard. However, it is likely widespread, given the tendency of many patients to hold on to medications after they no longer need them. For example, on August 1, 2008, the St. Lucie County, Florida, Sheriff's Department initiated its Operation Safe Medicine Cabinet program, which gave community residents the opportunity to properly dispose of unwanted or unused prescription medications [65]. In exchange, gift cards to local stores were provided. In all, 500 people responded, turning in more than 100,000 pills, with some of the prescriptions dating as many as 30 years.

Doctor shopping would appear to occupy a minor position in the diversion activities of the populations studied. Although diversion investigators in police and regulatory agencies come into contact with many doctor shoppers, only 3% of the members of the club culture reported this activity, and none of the users in any of the other populations claimed to participate in doctor shopping. Similarly, "script docs" seemed to play a minor role in the scheme of diversion activities. Physicians' prescriptions, on the other hand, were a significant source of drugs for those identified through the RADARS System key informant network.

Internet sales have been identified as a major source of diversion by some observers. In fact, on May 16, 2007, Joseph A. Califano, Jr., president of Columbia University's Center on Addiction and Substance Abuse (CASA) and former Secretary of Health, Education and Welfare, testified before the Senate Judiciary Committee about the availability of drugs on the Internet. Mr. Califano suggested that the easy availability of addictive drugs has, for many children, made the Internet a greater threat than street drug dealers. He went on to state that "the Internet has become a pharmaceutical candy store stocked with addictive drugs, available at the click of a mouse to any kid with a credit card number"[66].

Mr. Califano's comments were based on several studies by CASA [34], but it would appear that a reality check is in order (see Figure 7). Without question, drugs can be purchased on the Internet. However, survey data suggest that this is not where abusers, including Internet-wise youths, typically go to find prescription drugs. As illustrated earlier in Figure 6, for example, only 1% of methadone maintenance patients and members of the club culture, 6% of patients accessed through the key informant network, 2% of Delaware 11th graders, only 1% of the general population studied in the National Survey of Drug Use and Health, and none of the street sex workers reported the Internet as a source of prescription medications. In fact, the Internet appears to be one of the least likely places that drug seekers go to find prescription medications to get high.

The Internet is indeed a source for prescription drugs, but the overwhelming volume of purchases is likely at the wholesale level, since few end users report accessing the Internet for drugs. The members of the club culture described earlier reported deliberately avoiding the Internet for three reasons: 1) prescription drugs can be purchased more cheaply on the street, 2) they are wary of “rip-offs,” and 3) “big brother may be watching” [51]. The large volume of drugs purchased via the Internet presumably end up in the hands of dealers, and not with “any kid with a credit card number” as Mr. Califano argued [66]. But if not the Internet, then where? For those abusers who report getting prescription medications from friends, relatives, and dealers, where are these latter individuals obtaining them? In the final analysis, no one really knows for sure. In many ways, prescription drug diversion continues to be a “black box” requiring concentrated systematic study. Future research should be both quantitative and qualitative, focusing on all of the populations involved in the abuse and/or diversion, with a special emphasis on prescription drug dealers, pill brokers, smugglers, and other traffickers.

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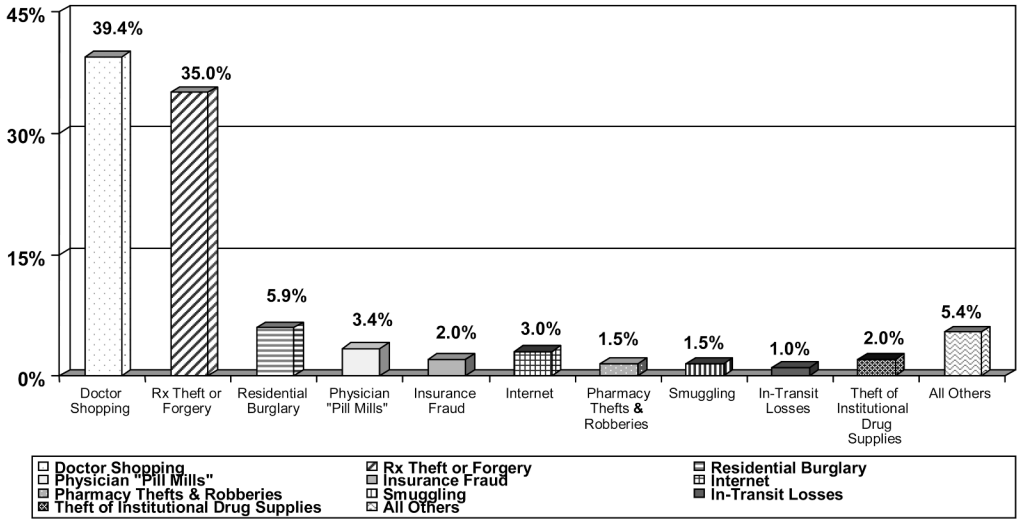

Figure 1. Police and Regulatory Agency Perceptions of the Primary Sources of Prescription Drug Diversion

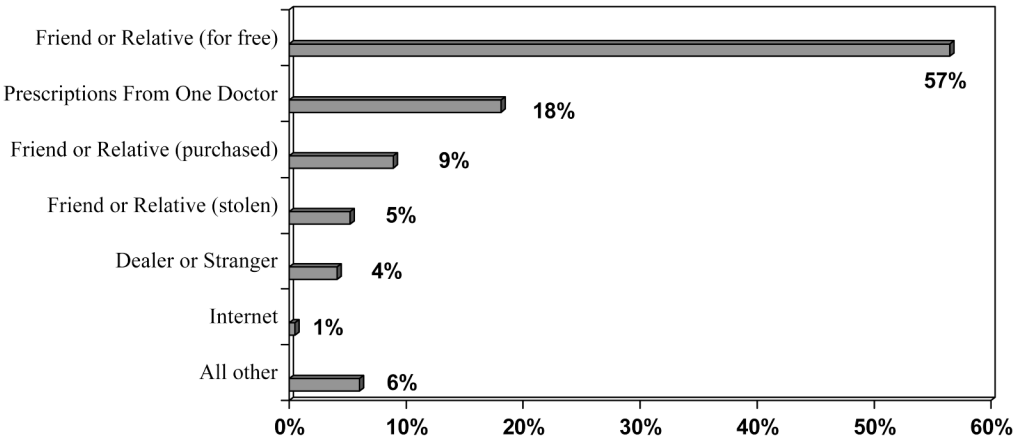

Figure 2. Primary Method of Obtaining Prescription Opioids for Nonmedical Use in the Past 12 Months among Persons Aged 12 and Older: 2007, NSDUH

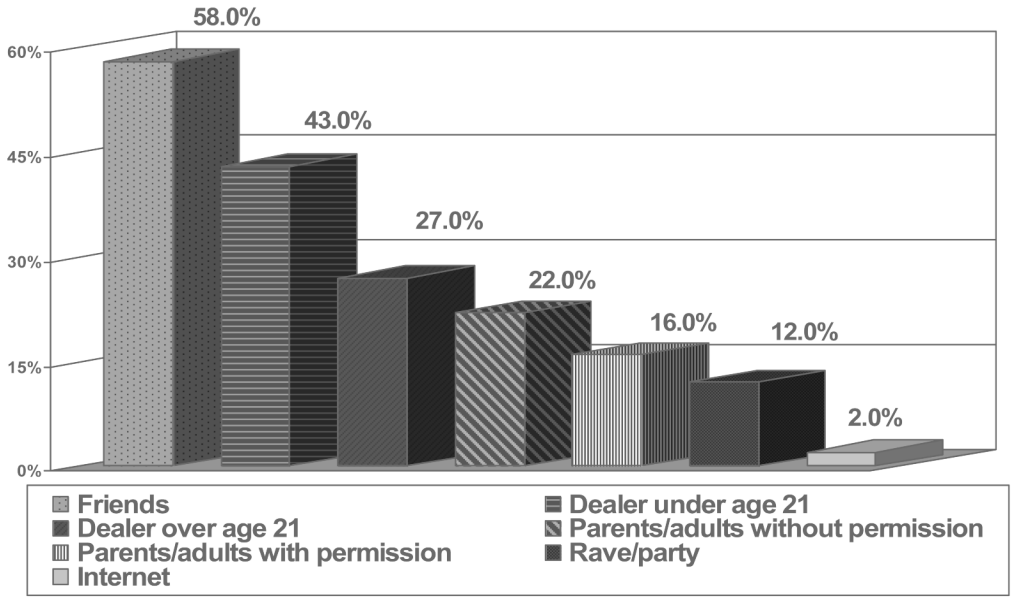

Figure 3. Sources of Prescription Drugs Used to "Get High" among Delaware 11th Graders who Reported Illegal Use of Prescription Drugs, 2008

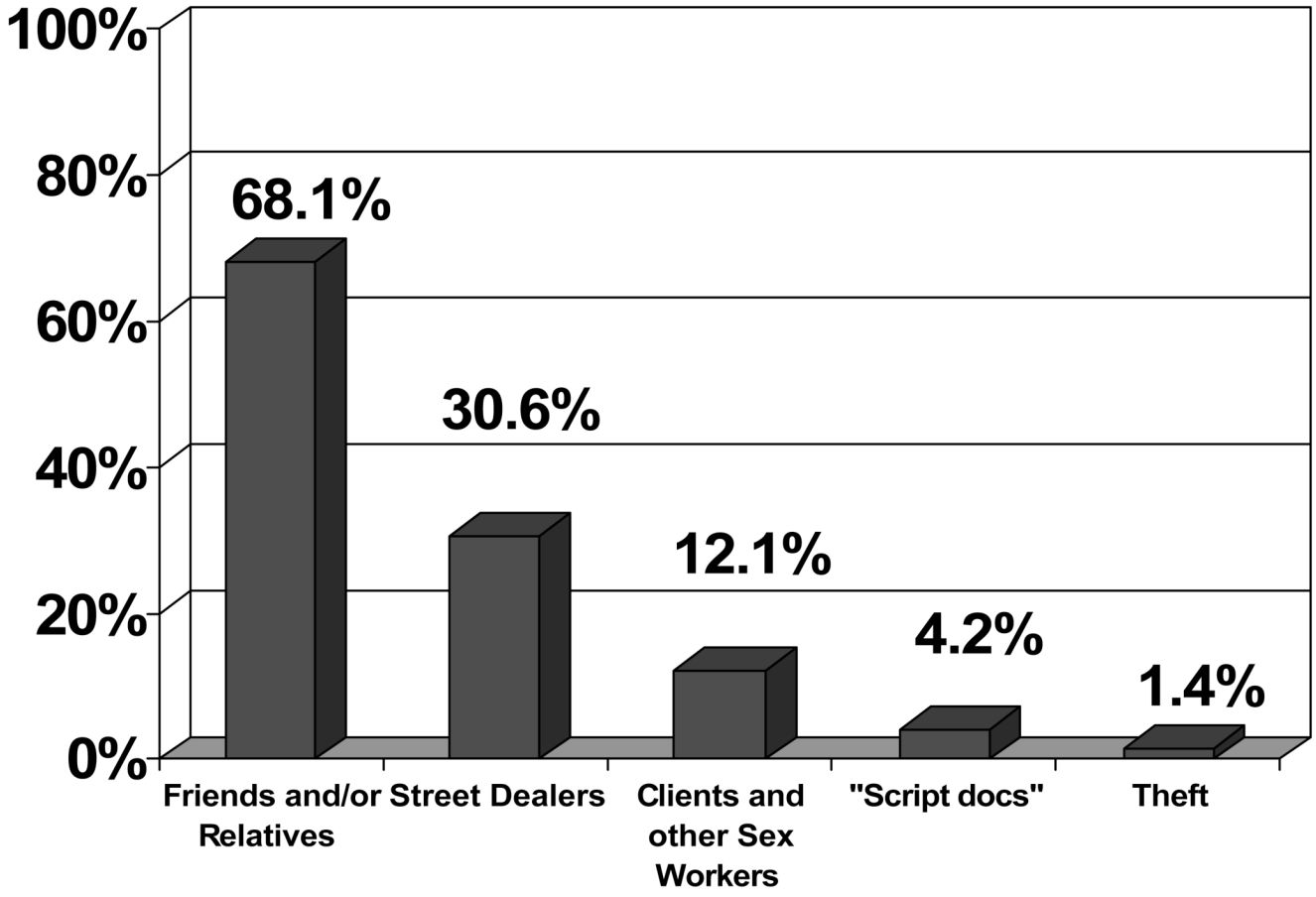

Figure 4. Sources of Prescription Drugs among 72 Drug-Involved Women Street Sex Workers, Miami, FL

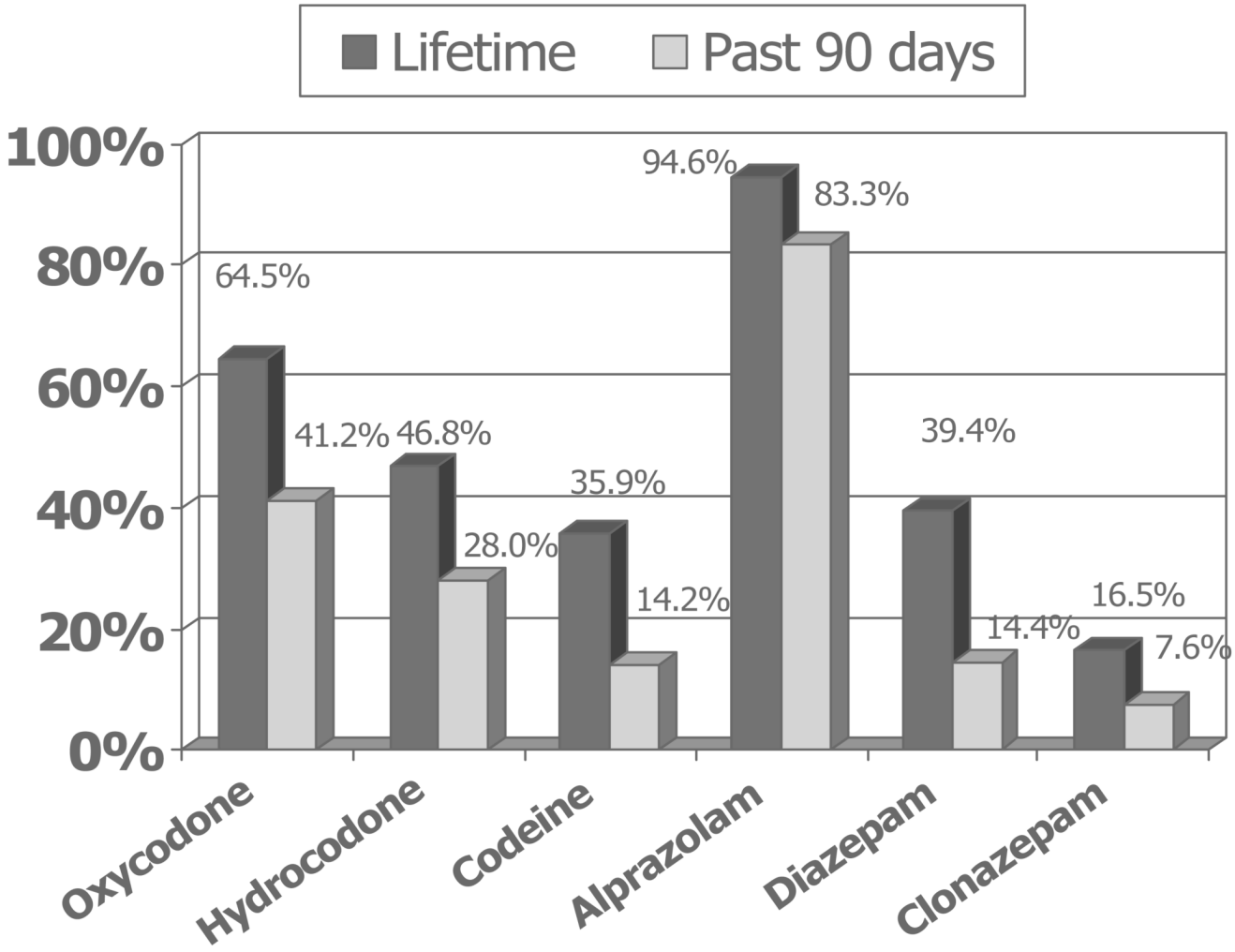

Figure 5. Baseline Drug Use Data among Miami Club Drug Users, Lifetime and Past 90 Days (N = 515) Prescription Opioids and Benzodiazepines

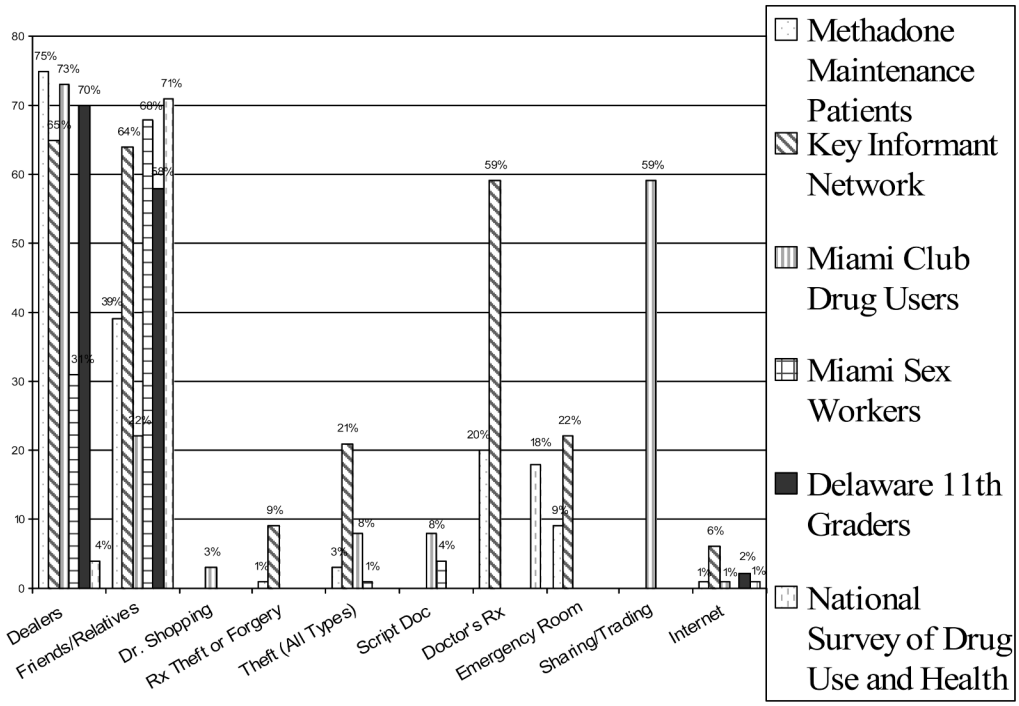

Figure 6. Sources of Prescription Drugs Among Various Populations

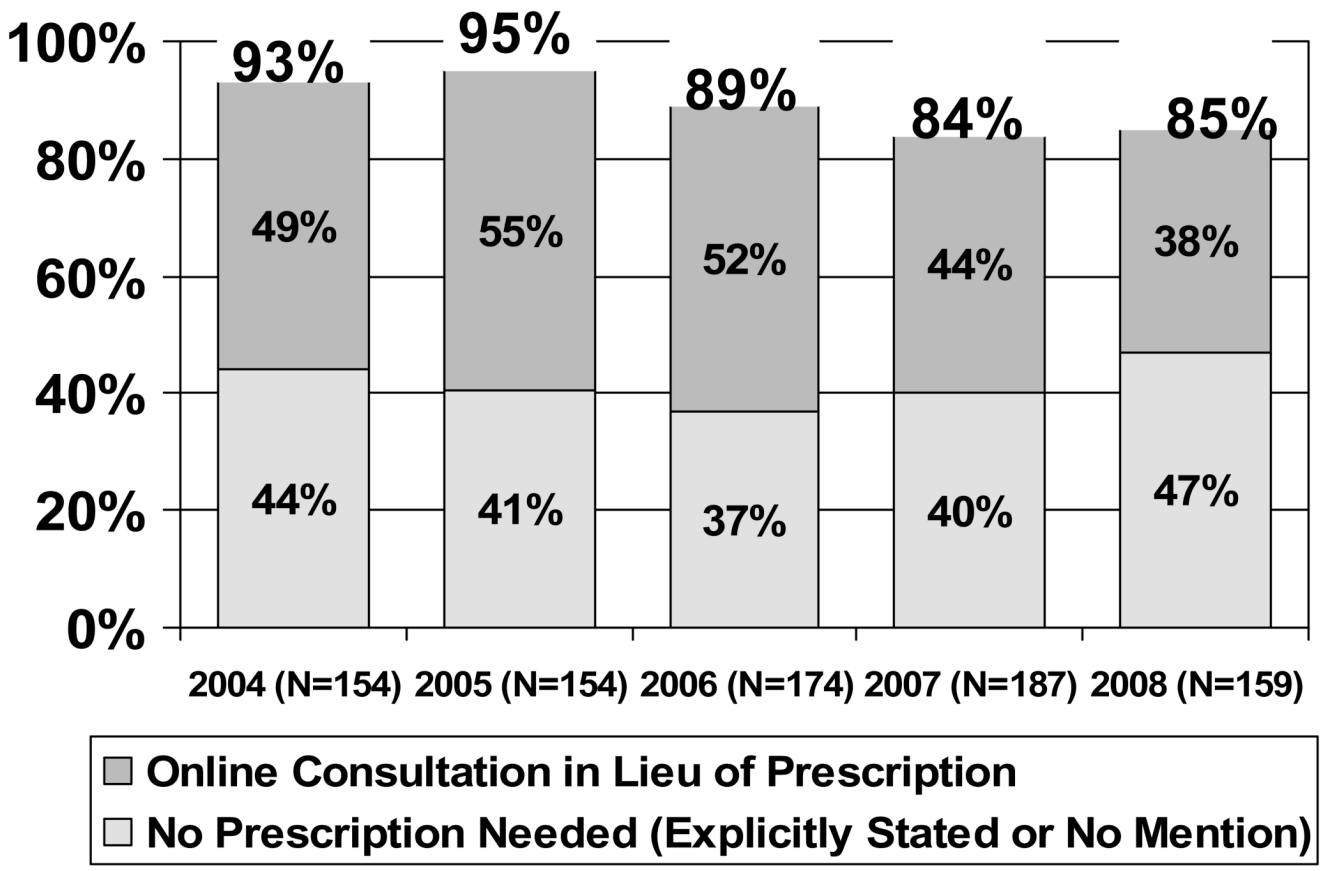

Figure 7. Percentage of Web Sites Selling Prescription Drugs without Requiring a Prescription, CASA, 2004 – 8

Table 1

Primary Drug among Methadone Maintenance Treatment Program Enrollees, 4th Quarter 2007 (N=557)[a,b]

Heroin	38.1%
Sustained-release oxycodone	28.0%
Hydrocodone	10.6%
Non-Prescribed Methadone	9.5%
Immediate-release oxycodone	7.0%
Morphine	3.9%
Hydromorphone	1.4%
Fentanyl	0.7%
Tramadol	0.4%
Buprenorphine	0.0%
Other Opioid	0.7%

[a] Includes respondents who reported using a prescription opioid in the past 30 days.

[b] Respondents who did not report a primary drug (n=15) or who reported more than 1 primary drug (n=86) are excluded.

Table 2

Sources of Primary Prescription Opioid among Methadone Maintenance Treatment Program Enrollees, 4th Quarter 2007 (N=346)*

Dealer	75%
Friends or relatives	39%
Doctor's prescription	20%
Emergency room	9%
Theft	3%
Forged prescription	1%
Internet	1%
Other ways	4%

*Includes participants who reported using a prescription opioid as their primary drug in the past 30 days

Table 3

Primary Drugs among Prescription Opiate Abusers Recruited by RADARS® Key Informants (N=1,472)

Extended-release oxycodone	29.4%
Hydrocodone	29.2%
Immediate-release oxycodone	15.2%
Methadone	12.8%
Hydromorphone	3.7%
Morphine	3.2%
Fentanyl	2.9%
Buprenorphine	2.4%
Tramadol	1.1%
Other opioid drug	0.1%

Table 4

Sources of Primary Prescription Opioids among Prescription Opiate Abusers Recruited by RADARS® Key Informants (N=1,472)

Dealer	65%
Friends or relatives	64%
Doctor's prescription	59%
Emergency room	22%
Theft	21%
Forged prescription	9%
Internet	6%

Table 5

Non-Medical Use of Specific Prescription Opioids in Lifetime, by Age Group, in Thousands, NSDUH, 2007

	Age Group			
	Total	**12 to 17**	**18 to 25**	**26 or Older**
Pain Reliever				
Propoxyphene or Codeine Products [1,2]	20,461	1,320	4,287	14,854
Oxycodone Products [1,3]	13,055	638	3,538	8,879
Hydrocodone Products [1,4]	21,335	1,297	6,251	13,787
Tramadol Products [1,5]	1,559	92	Data not available	
Fioricet and Fiorinal	728	38	100	591
Methadone	1,611	128	605	878
Morphine	2,351	214	885	1,253
Talwin	356	13	38	304
Demerol	2,446	91	537	1,818
Dilaudid	1,011	15	148	849

[1] Includes other drugs that are not asked about explicitly in the opioid module but fall into this category.

[2] Includes Darvocet®, Darvon® or Tylenol® with Codeine, codeine, Phenaphen® with codeine, propoxyphene, and SK-65®.

[3] Includes Percocet®, Percodan® or Tylox®, and OxyContin®.

[4] Includes Vicodin®, Lortab®, or Lorcet®, and other hydrocodone.

[5] Includes Ultram® and other tramadol.

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 2006.

Table 6
Sources of Prescription Drugs among Club Drug Users, Past 90 Days (N = 515)

	Past 90 Days
Dealer (street/ club buy)	73%
Sharing/ trading meds	59%
Family members	22%
“Script Doctor”	8%
Theft	8%
“Doctor Shopping”	3%
Brought from outside the U.S.	2%
Internet	1%