

## **An ethno-epidemiological approach for the multi-site study of emerging drug abuse trends: the spread of methamphetamine in the United States of America\***

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### **ABSTRACT**

*In the present article, the authors describe a multi-site, ethno-epidemiological study of methamphetamine use in five cities in the United States of America. They present techniques and strategies used to develop and link short-term, focused qualitative studies. Both local variations and comparable issues germane to methamphetamine use and its public health consequences were examined in the studies. The article contains a description of the methods utilized to identify and access various subgroups of drug users, collect sensitive information on drug use and risky sexual and drug use behaviour and establish links between the study sites. In the study, data collection was tailored to fit the local contexts of methamphetamine use and involved the use of a shared protocol and reporting format. Collaborative participation in developmental meetings and regular communication by Internet facilitated the collection of comparable data. The diverse and socially embedded nature of methamphetamine use indicated: (a) a wide array of user groups and patterns of methamphetamine use; (b) multiple health and social consequences of methamphetamine use; and (c) the need for ongoing qualitative and quantitative monitoring of trends in methamphetamine use. The approach followed in the study suggests methods for enhancing the collection of information in current surveillance networks.*

*Keywords:* methamphetamine; ethnography; emerging drug trends.

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## **Multi-site study of methamphetamine use**

Amphetamine-related stimulants have become the most widely used illicit synthetic drugs in the United States of America and in much of the world [1]. In the United States, there was an explosive rise in methamphetamine use in the 1990s, especially in parts of California, Washington and the Midwest [2, 3]. The total number of treatment admissions for methamphetamine expanded by fourfold in the period 1992-1997 [4]. The level of methamphetamine use eclipsed that of other illicit substances in a number of settings [5], and the rate of human immunodeficiency virus (HIV) infection grew exponentially among methamphetamine users in certain subpopulations such as homosexual and bisexual men [6, 7]. Furthermore, methamphetamine use was associated with an increase in new and younger users [8]. Accompanying those trends was an expansion in small local laboratories used to manufacture methamphetamine and the involvement of Mexican criminal organizations in trafficking and distributing methamphetamine throughout the United States [9]. Ethnographic and media reports indicated that methamphetamine use was growing in popularity among user groups in a number of cities on the eastern coast of the United States, such as Atlanta, New York and Washington, D.C. [2]. Methamphetamine thus presented a serious drug abuse problem with significant public health consequences, and it emerged in the 1990s as a major concern of national drug policy makers [9].

There was much uncertainty about how to deal with the growing problem of methamphetamine use. That was related in part to the dearth of studies on the characteristics of methamphetamine users and the patterns of its use [10]. The few intensive studies that existed [11-13] indicated an enormous diversity of user groups. Those groups included homosexual and bisexual men, college students, white-collar businessmen, young adults and youth in the rave or club culture and living on the street and longtime user groups such as outlaw motorcycle gangs. Within those groups there was much variation by class, ethnicity, rural/urban residence and social identity, many social groups presenting different patterns of drug use and health risks [14-16]. Methamphetamine use identified in the initial studies ranged from occasional use to bingeing and chronic use, which varied depending on the user subgroup [17, 18].

Thus, there was a need to document patterns of methamphetamine use among diverse subpopulations of users and to identify the associated health risks. The widely varying patterns of use and user subgroups necessitated responsive methods of data collection. Given the time constraints of survey research, it was decided that a short-term, highly focused ethnographic study implemented in multiple sites could rapidly access diverse, hard-to-reach populations and collect comparable information.

With support from the National Institute on Drug Abuse of the United States, the authors launched a short-term, exploratory ethnographic study with researchers in five metropolitan areas in the United States from 1997 to 1998; the study was expanded to include two other sites in 1999. In the present article, the authors examine the strategies and challenges involved in designing an

ethnographic project in multiple sites in an effort to explore newly emerging drug abuse trends in methamphetamine use. The article includes a description of the conceptual and methodological framework of the study, its sampling of “hidden” populations, its approach to collecting sensitive information and the strategies that supported comparative linkages in data collection and analysis between the sites. The study has contributed to the growing area of “ethno-epidemiology”, in which risk behaviours are examined in relation to the user population and the social contexts in which risky behaviours occur, in order to improve the content and delivery of public health preventive services and interventions [19-21].

## **Methamphetamine**

In the United States, amphetamine-type substances vary in their effects and composition. Popularly known as “speed”, “crystal”, “crack” or “ice”, such substances are swallowed, snorted, smoked or injected. Gradations in the quality of methamphetamine relate to the precursor chemicals involved, the manufacturing techniques used and the channels used for trafficking and distributing the substance [9]. For instance, the red phosphorus method produces high-quality methamphetamine, which is distributed from the south-western part of the United States and California and is believed to be trafficked by Mexican drug trafficking organizations. Lower-quality methamphetamine (such as that manufactured using the 1-phenyl-2-propanone (P-2-P)) method is distributed by motorcycle gangs and small laboratory manufacturers in various areas. The wide range of sources and forms of methamphetamine spread throughout much of the United States in the 1990s [22].

The use of methamphetamine affects neural transmitters and receptors, producing euphoria and increased energy and mental activity. However, long-term use of the substance can produce psychosis, depression and drug dependency and may lead to death [23]. Studies have shown that many of the compounds and by-products of methamphetamine manufacture contain lead and heavy metals [24]. Those substances may be associated with neurological damage that has been documented by a number of studies of long-term or high-volume methamphetamine use [25, 26]. Chronic methamphetamine use may also lead to significant health and social problems such as job loss, interpersonal problems, infection with sexually transmitted diseases and HIV infection [6, 12, 27-29]. However, patterns of methamphetamine use vary greatly, depending on age, gender, sexual preference, occupation and social group; that applies to both highly addictive and more intermittent and recreational patterns of use [30, 31].

## **Methodological background**

The multi-site methamphetamine study included geographical locations across the United States with populations at high risk for methamphetamine use. The initial study sites included Atlanta, Denver, New York, Sacramento and Seattle;

subsequently, San Jose, California and south-western Missouri were added. The sites were selected to provide a broad sampling of methamphetamine contexts with the intent of gaining insight into a variety of geographical, demographic and cultural drug ecologies while making the best use of the limited time and resources available. Each site targeted a different combination of high-risk populations. The study was to take six months to complete, from beginning to end. The aim of the study was to collect information on characteristics of users, patterns of methamphetamine use and health risks associated with methamphetamine use.

There were a number of advantages to using ethnographic methods. Short-term ethnographic studies provided the means to delineate various social categories of methamphetamine users and emerging issues concerning the continued and increasing use of methamphetamine. In the framework of an ethnopidemiological approach [20], the ethnographers worked at the community level to identify categories of users and contexts of use by integrating data gathered through multiple qualitative methods and from secondary sources of data on methamphetamine use, including problem indicator data (for example, arrest and treatment data) and media reports. The use of qualitative methods allowed the ethnographers to grasp the meanings, motivations and consequences of methamphetamine use from the perspective of users, as well as from the perspective of substance abuse professionals. Those perspectives placed methamphetamine use in meaningful sociocultural and public health contexts.

The study design consisted of four components: (a) a semi-structured guide that would be used with a sample of at least 20 methamphetamine users; (b) unobtrusive observations in sites where users congregated; (c) interviews with professionals and lay individuals knowledgeable about methamphetamine use; and (d) the collection of problem indicator data and reports on methamphetamine use. The completion of data collection in six months was facilitated by the nature of the study design, which focused on particular issues, a limited sample of respondents and ready access to professional and street contacts knowledgeable about or involved in drug scenes in certain communities [32].

At least two "scenes" of methamphetamine users were described at each site. Scenes were defined by the social characteristics of users and their identifying sexual, interaction and expressive practices (for example, sexual preferences, music, clothing or occupational attributes). Those features influenced subgroup norms and behaviours that shaped their patterns of methamphetamine use (such as the frequency and mode of ingestion) and the contexts in which they used methamphetamine (such as in clubs or on the street) [19, 33].

In accessing various groups of drug users and collecting information, it was essential that the ethnographers develop rapport with the users in order to collect credible data in a limited amount of time. That was only possible because all of the ethnographers had pre-established knowledge of local drug scenes and contacts with drug users within their communities. In addition, the ethnographers regularly interacted with local drug surveillance, treatment and prevention organizations. Thus, their local knowledge of drug use and established contacts with professionals and drug users from various drug scenes were essential aspects of the

short-term projects. Issues of access to various user subpopulations were thus related to the depth and credibility of the information that the ethnographers were able to collect. Those issues are discussed in the sections below.

## **Project linkages**

User subpopulations and patterns of drug use specific to the contexts of each setting were identified. Among other user groups, the study focused on rural and female users in Atlanta [34], a comparison of heroin and cocaine injectors with methamphetamine injectors and the identification of long-time users of methamphetamine in Denver [35], polydrug users and minority female users of methamphetamine in Sacramento [36], homosexual and bisexual male and young adult and female heterosexual users in Seattle [14, 31, 37], and street youth and homosexual and bisexual men in New York who visited clubs and used methamphetamine [18]. In California, ethnographers investigated the diffusion of methamphetamine use in tandem with drug use in clubs (for example, methylenedioxymethamphetamine (MDMA, commonly known as “Ecstasy”), *gamma*-hydroxybutyric acid (GHB)) among homosexual and bisexual men in the San Francisco Bay area and central California [38]. The wide range of drug users and contexts of use necessitated flexibility in the approach used to access each subpopulation and to collect the data. However, there was also a need to produce comparative information on relationships between patterns of use and the distribution of health and social consequences. Therefore, the project initiated a number of processes that linked forms of data collection and analysis. These efforts extended throughout the study and involved utilizing a shared protocol, having a number of planning, site visit and presentation meetings and using the Internet. Those activities generated shared frameworks for data collection and analysis.

### **1. Project design and protocol**

The projects shared a study design that drew on rapid assessment [38] and community identification procedures [39]. Those approaches utilized a complementary blend of methods for identifying poorly understood health and social problems. The identification and recruitment of small samples of methamphetamine users and the emergent and “hidden” nature of their drug use necessitated the use of multiple data sources. Those sources included informal, open-ended and semi-structured interviews and participant observations with users, exploratory interviews with methamphetamine specialists and problem indicator data (police reports, emergency department mentions, drug treatment data and media reports).

The interview protocol was designed by the authors to examine drug use patterns and health risks. It was collaboratively expanded and adapted to the contexts of each project in order to identify connections between drug use and its health and social consequences. It included questions on drug use behaviour (patterns and frequencies of use), social aspects of drug use (characteristics of users,

purposes of use (dance, sex, work)), forms of drug distribution (procurement and the substances used) and HIV risk behaviour and other health and social consequences of methamphetamine use.

## **2. Meetings**

A number of meetings were held to promote the development of a shared framework for data collection and analysis [40]. The authors initially met with staff at the National Institute on Drug Abuse to identify issues of concern regarding methamphetamine use and its public health consequences. The ethnographers also discussed those issues and their approach to examining methamphetamine use. Following that meeting, the ethnographers met among themselves to decide on the project design and the topics to be examined.

In the course of the project, project coordinators visited sites to observe their research settings and gain a sense of the information being collected at each site. During those visits, they also shared a series of issues that reflected the public health concerns of the National Institute on Drug Abuse with regard to methamphetamine use. The on-site discussions, together with follow-up communication by means of electronic mail (e-mail), produced a reporting format that guided the ethnographers' analyses and reports.

Following data collection, there was a series of meetings in which the researchers met among themselves and with staff of the National Institute on Drug Abuse. The ethnographers first shared among themselves key findings and emerging conceptual issues and implications. In the discussion, the shared and distinct drug-use patterns and health risks of the sites were identified. That meeting was followed by presentations in which the ethnographers discussed their preliminary findings with staff of the National Institute on Drug Abuse and then jointly participated in a discussion on the insights and implications of their research. Following those meetings, the ethnographers completed their analyses and reports.

All of the meetings and discussions led to an agreement on the issues to be examined, analysed and presented in final reports. Regular communication played an essential role in that process. It allowed the ethnographers to agree on their approach to the research and to share perspectives and concepts that emerged in their analyses. Regular communication using the Internet was a key factor in that process.

## **3. Use of the Internet**

Regular communication using the Internet facilitated project development in a number of ways. It provided a means of immediately sharing information (such as references and initial findings), supported collaborative planning (regarding site visits, schedules and deadlines) and facilitated the project's conceptual development through ongoing discussions of emerging issues, analytical categories and substantive findings. Through monthly communication, the Internet served as a

forum for discussing concepts and strategies of data collection and analysis. The discussions included comments on the interview guide, the nature of user groups and social aspects related to drug use [41].

Such communication generated a number of conceptual perspectives. Two useful concepts were the multifunctional uses of methamphetamine and the “scenes”, or configurations, of social contexts and groups of methamphetamine users. The concept of multifunctional uses of methamphetamine was especially useful given the wide range of forms, functions and effects of methamphetamine use among user groups [17]. For example, methamphetamine use was found to enhance recreational dancing, work performance, sexual encounters, social interactions and everyday functioning. The various purposes and perceptions of methamphetamine use were related to its initiation, continued use and variability in its patterns of use. Those diverse associations were found to be related to particular health and social consequences.

The notion of “scenes” of methamphetamine users acted as a unifying methodological and analytical concept. Drawing on theories of cultural production [42] and the expression of subcultural identities [43], the ethnographers identified “scenes” of drug users by the social characteristics of the users (age, gender, sexual preference, occupation) and their social, occupational and expressive practices. The concept of scenes of methamphetamine use and users provided a framework for identifying social categories of users and related contexts and practices of methamphetamine use that were meaningful from “insider” social and analytical perspectives. Identification of these contexts and practices provided insight into configurations of situations and norms that led to risky health and social behaviours.

## **Methods**

### **1. Identifying and recruiting methamphetamine users**

The initial challenge for each site was to identify meaningful social categories of users in order to identify patterns of methamphetamine use and the distribution of health risks among representatives of those categories [44]. Methamphetamine users do not make up a visible or readily identifiable population, and a random sample cannot be drawn from an unknown universe of users. In order to develop a baseline of relevant types of methamphetamine users, the projects utilized a series of approaches that had been developed in applied ethnographic research with undersampled and hard-to-reach subpopulations. In approaches that combined targeted sampling [45] and community identification processes [18, 39], project ethnographers consulted available research reports, the “internal” knowledge of their outreach staff and community contacts knowledgeable about methamphetamine use, including current users. They also observed the settings that users frequented. Information from those sources enabled the ethnographers to begin to identify distinctions in types of users in their communities.

Those efforts entailed convenience, snowball and modified targeted sampling activities. For instance, a convenience sample of prior research contacts with methamphetamine users led to initial interviews with such users. The initial interviews and other sources of information began to indicate distinct groups of methamphetamine users and provided contacts for other interviews with users. As information accumulated, the nature of categories and “scenes” of users were increasingly delineated and revised in an evolving process. The attributes of users and their patterns of behaviour were thus revealed in a process in which further interviews confirmed categories or suggested other categories of users [44, 46].

Various approaches were used to access and recruit individuals from the various “scenes” of methamphetamine users, such as members of club or street cultures. For instance, some users could be recruited directly through a chain referral process that stemmed from previously established contacts. Other categories of users had to be recruited on a one-to-one basis more gradually from contacts developed at congregation sites or through other social intermediaries, such as bartenders. To recruit individuals from other groups, it was necessary to rely on the reputation and status of a staff member who had strong ties to often wary and hidden user groups. Initial locating and recruiting activities also involved the use of various public media, such as advertisements in local newspapers and trade newsletters that certain groups (for example, homosexual and bisexual men) were known to read. Referrals from public health, social service and community-based organizations and other professional agencies such as substance abuse treatment programmes or HIV outreach and support programmes were also used to recruit individuals.

The various forms of recruitment were necessary for identifying and accessing important at-risk groups and networks of users. However, some user groups (such as truck drivers, motorcyclists and upper middle-class users) were especially difficult to recruit in the time allotted because of sociocultural barriers. Again, the development of rapport and trust among community contacts was critical to the efforts to recruit and interview methamphetamine users at the sites.

## **2. Data collection**

Ethnographic data collection began in February and March 1998 and continued until the end of September 1998 at the initial sites and until the end of 1999 at the additional sites. Over 200 interviews were conducted at the five sites with active or recent users of methamphetamine who were over the age of 18. The interviews lasted between one and two hours and respondents were reimbursed for their time. The exigencies of interviews during participant observation sessions varied in their length and degree of formality, as did interviews with knowledgeable community professional and lay contacts in the community.

Ethnographic data collection occurred initially as part of the process of identifying and recruiting users. It evolved from interviews aimed at identifying categories of methamphetamine users and locales where such users congregated to interviews focused more on particular aspects of methamphetamine use and users.

In the same manner, exploratory participant observation in bars and clubs evolved to become observation in particular clubs or on the street and, over time, in more long-standing projects, in users' homes. Just as sampling categories were scrutinized and revised throughout the study, questions on methamphetamine use were supplemented and respondents' answers were probed as issues arose throughout the data collection process [47].

The multi-site protocol contained both closed and open-ended questions and respondents were encouraged to speak at length about any subject that they thought was relevant to their own use of methamphetamine, and to their perceptions of methamphetamine users in their community [48]. Socio-demographic data and information on HIV risk behaviours were collected through closed-ended questions, while statements containing information on current and past methamphetamine use and other drug use were elicited through semi-structured questions. Accounts of incidents of methamphetamine use or sexual episodes associated with methamphetamine use were gathered in an open-ended, conversational format. Respondents were encouraged to elaborate on issues of interest to them throughout the interview; that approach yielded information that was unexpected and that indicated their perspectives on methamphetamine. Many of the interviews were audiotaped and transcribed. Listening to audiotaped interviews provided non-verbal information on voice tone, pauses in discussions and other communicative information not available in hard copies of transcripts. In addition to the interviews, the ethnographers collected field notes that provided information about where an interview or observation occurred, the physical appearance and behavioural nuances of the respondents and other impressions and experiences of the ethnographers in user settings.

Given the sensitive nature of the information, research relationships and the setting of the interviews influenced the type of information collected [49]. For example, interviews that occurred informally during participant observation at clubs or bars with users who had just been contacted could cover only a limited range of topics. In collecting sensitive information, some ethnographers, at the beginning of the interview, initiated open-ended discussions with respondents about their life history and about methamphetamine users in their community; towards the end of the interview, more specific personal questions (such as HIV and drug risk behaviours) were covered. Where possible, some ethnographers would utilize open-ended and conversational formats throughout the initial interview and then interview respondents a second time on topics that had not been covered or that had emerged during the first interview.

The above-mentioned approaches to data collection elicited responses on topics that were less threatening, allowed rapport to develop during the interview process and led to the collection of unexpected information as users shared their views on methamphetamine use. The various formats and developmental approaches to collecting information also allowed researchers to frame questions and allowed the respondents to consider issues from varying perspectives, thus providing the ethnographers with a means to cross-check sensitive or complex information, such as HIV or drug risk behaviour.

## **Summary of findings**

The ethnographic, multi-site approach of the study demonstrated that methamphetamine use had become entrenched and that methamphetamine was becoming an increasingly popular drug among a number of categories of users in diverse areas of the United States. Methamphetamine use was related to perceptions that it enhanced sexual, social and occupational performance; thus, it was often integrated into the social fabric and identities of users' lives. The use of methamphetamine was found to be less stigmatized and often cheaper than the use of other drugs. Methamphetamine was readily available, it was usually obtained through private distribution channels rather than on illicit drug markets on the street. Those features made methamphetamine a less visible drug in public contexts and made it more difficult for institutional sources of information and law enforcement to reach methamphetamine users.

There was considerable variation in user groups, user settings and patterns of use. The configurations of drug use characteristics and social contexts underpinned users' involvement in behaviours that posed various health and social risks. The preliminary findings of the study are presented below.

### **1. Variation in patterns of use and user groups**

The user groups and associated patterns of use varied according to age, gender, sexual preference, ethnicity, occupation and residence. The sampling techniques used did not produce a representative sample of the user population, but did reflect much of the diversity in user groups and patterns of use. For example, although two thirds of the users studied were male, in some sites (such as Atlanta and Denver), rates of female users rivalled those of male users. Furthermore, the study showed that growing numbers of youth were becoming involved in methamphetamine use: one quarter of the study population was below the age of 24, most of them having used the drug for less than five years. Youth and young adult users displayed patterns characterized by both a rapid progression to daily use and more recreational, intermittent use, depending on the social context of use. That trend is particularly serious because many long-term users become involved in methamphetamine use in their youth, suggesting that initiation to methamphetamine use during youth may lead to lifetime use of the drug.

Methamphetamine was predominantly used by Whites (67 per cent), although there was an increase in methamphetamine use among Blacks and Hispanics. Those trends appear to reflect, in part, a shifting in the traffickers and distributors of methamphetamine, from largely White motorcycle gangs to local producers and small-scale distributors, and the involvement of Mexican criminal organizations and gangs in trafficking and distributing the drug.

There was also much variety in the user subgroups. For example, homosexual and heterosexual men at some sites (such as New York [18]) were generally young, educated and employed and rarely injected methamphetamine, while at other sites (such as Seattle [28]), they were older and unemployed and usually

injected methamphetamine and used it in sexual encounters; or, if the users were HIV-positive, they would use methamphetamine to help them in their daily functioning. Thus, some users were involved in chronic and highly addictive patterns of use, while others preferred intermittent and seemingly more controlled drug use.

The study showed that the aetiology and patterns of methamphetamine use are not equivalent in all categories of users or determined simply by the biochemical properties of the drug. Because of the impact of social contexts, biography and meaning in the use of the drug, especially among new and intermittent users [17], it is important that further research be carried out to examine specific categories of methamphetamine users in particular settings and related to particular practices of drug use. Such knowledge is critical to understanding variations in risk behaviour and to designing relevant and effective intervention programmes.

## **2. Health and social consequences of methamphetamine use**

The multi-site study indicated that methamphetamine use presents serious public health concerns, including increased risk of: the transmission of HIV, hepatitis B and hepatitis C; reproductive problems for women; psychiatric comorbidity; and violence. It also has a number of consequences for the social and educational development of youth and the occupational and social functioning of chronic users. Furthermore, a number of subpopulations, such as heterosexual youth and young and HIV-positive homosexual and bisexual men, are especially vulnerable to initiating use of the drug. Health risks associated with the use of methamphetamine include the following:

(a) Intravenous use of methamphetamine is widespread and increasing in various social categories of users and areas in the United States. The multi-site study indicated that methamphetamine users engage in direct and indirect sharing of drug paraphernalia, and that the rate of syringe-sharing is often higher among methamphetamine injectors than among heroin injectors. Observations in the studies showed that methamphetamine injectors may inject the drug over long periods of time and in groups in which there is often inadvertent sharing of used syringes. Many users also have incomplete or inaccurate knowledge of modes of HIV transmission and lack strategies for risk reduction;

(b) For almost all categories of drug users, homosexual and bisexual males, heterosexual males and females and youths, methamphetamine is associated with unsafe sexual behaviour in the form of unprotected sex, sex with multiple partners and with strangers, commercial sex and experimental and prolonged sexual encounters. Those practices were distributed across the sites but also varied by social group. For example, methamphetamine use within sexual encounters was more common among homosexual and bisexual males than among females. Nonetheless, the frequency of sexual encounters and involvement with multiple partners was shown to be higher among methamphetamine injectors than among heroin injectors, and users of most other drugs. Moreover, alcohol use was com-

bined with drug use in sexual liaisons more frequently among methamphetamine users than among users of other drugs; that further heightened involvement in risky behaviour and the potential for transmitting and contracting blood-borne infections;

(c) The social groups that use methamphetamine are involved in contexts in which various subpopulations interact with one another during drug and sexual behaviours. Those subpopulations and mixing patterns vary by mode of administration— injection drug users using drugs with non-injection drug users; they also vary in drug-use interactions among younger and older cohorts of users, rural and urban users, homosexual and bisexual subpopulations and heterosexual subpopulations, and HIV-positive and HIV-negative individuals. Those social, drug and sexual mixing patterns, combined with frequent changes of sexual and drug partners, together with the synergistic effects of injection drug use and unsafe sex, were shown to be facilitated by the use of methamphetamine. The interaction of those behaviours and relationships placed those groups at higher risk of contracting blood-borne infections, regardless of the subpopulations and area involved;

(d) There appears to be an association between methamphetamine abuse and mental health problems. Methamphetamine users have reported using the drug to relieve depression, anxiety and personality disorders. They also use it to relieve symptoms of acquired immunodeficiency syndrome (AIDS). Methamphetamine use is considered to exacerbate predispositions to emotional and cognitive problems. That is a complex area that deserves rigorous, clinical and epidemiological assessment. However, sleep deprivation from continued methamphetamine use and the depressing effects of the process of withdrawal, or “coming down”, from such use put a strain on the emotional and cognitive states of most users. Moreover, many chronic, long-term and high-volume methamphetamine users were found to be unemployed and to lack intimate relationships, indicating that, over time, the drug has deteriorating effects on the users’ psychosocial adjustment and that the use of methamphetamine, like the use of other drugs, may lead to increased social isolation;

(e) Methamphetamine use has been associated with domestic violence between couples and within families and with organizational forms of violence related to its distribution. At some of the sites, there were reports in the media associating murders and violent subgroups (such as White supremacists) with methamphetamine use. However, studies focusing on the relationship between violence and methamphetamine have yet to be conducted. Nevertheless, as Mexican criminal organizations and gangs have expanded their involvement in methamphetamine trafficking and distribution, the level of violence associated with its distribution has increased;

(f) Female methamphetamine users are becoming increasingly common; in a number of areas, the proportion of female users is comparable to that of male users. Initial findings at two of the sites indicated that female users tend to suffer from reproductive problems, such as disturbed menstruation cycles and miscarriages, and experience problems in parenting. They were also found to be the

victims of domestic violence and to have proportionally more blood-borne infections. Those who become pregnant risk transmitting infections such as HIV to their children.

The above-mentioned health and social risks are closely related to particular forms and frequencies of methamphetamine use (such as chronic, high-volume and injection drug use) and the social contexts in which the drug is used and risk behaviours occur. Those factors are critical in planning and evaluating interventions for methamphetamine users.

### **3. Surveillance**

The prevalence of methamphetamine is not adequately reported or monitored by local and national drug surveillance systems. Variations in the scale of manufacture of methamphetamine, its distribution through private channels and friendship networks and its association with social activities make it less publicly visible than other drugs. Since indicator surveillance systems operate in public spaces, innovative approaches are needed to track changes in the use of methamphetamine. In the multi-site study, it was possible to access various user subpopulations, to collect data through the use of qualitative methods and to use those sources to gain access to established community contacts. Mixed methods of qualitative contextual and quantitative monitoring in particular communities and with groups with whom researchers have ongoing relationships are necessary to be able to track the hidden and changing subpopulations of users and shifting trends in methamphetamine use. Since methamphetamine is not a typical “street” drug, new approaches are needed to gain access to users by expanding on established forms of street outreach and harm-reduction activities [50].

## **Conclusion**

The multi-site study has used a strategy for linking intensive, qualitative studies, while allowing for the flexibility needed to access diverse user groups and collect meaningful social and public health information within particular settings. As the study suggests, the use of an ethno-epidemiological approach is well suited to identifying and monitoring emerging drug trends. The findings of the study also show that approach to be capable of providing crucial information for designing public health interventions for subpopulations within local and wider social and geographical settings.

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