

The spread of drug abuse in rapidly urbanizing communities in Vientiane, Lao People's Democratic Republic

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SUMMARY

To determine the prevalence of drug abuse in city neighborhoods in a developing country undergoing rapid urbanization, we performed a household survey on the spread of drug abuse in Vientiane, Lao People's Democratic Republic. A total of 1497 households from 17 villages were selected by the stratified random sampling method from urban districts in the city of Vientiane. Participatory style research was employed to increase both the sensitivity of detection and the reliability of information gathered. Local key players shared in the participatory process in this study. We worked with national and city officers and community leaders, as well as with neighborhood leaders who had received previous training for this survey, and conducted household surveys using face-to-face interviews. We inquired about the spread of drug abuse by asking if the families interviewed recognized drug abuse problems in their community. To examine the extent of urbanization of individual villages, the urban index was calculated by

principle component analysis from the following eight indicators: income, occupation, parents' educational histories, diffusion of telephones, ownership of livestock, diffusion of plumbing for running water and distance from the Vientiane city center to the village. Distance was calculated by the Geographic Information System. Among the 17 villages included in the study, the average percentage of recognition of drug abuse in the community was 63.2%. The relationship between recognition of cases of drug abuse in the community and the urban index showed a significant correlation, with a Spearman coefficient of 0.650 ($p < 0.01$). The high reliability of participatory style surveys is also discussed. In conclusion, city neighborhoods in a developing country undergoing rapid urbanization showed evidence of the spread of drug abuse, which was associated with the urban index. Participatory style research activity was recommended to help raise awareness of community participation in anti-drug-abuse activities.

Key words: drug abuse; urbanization; participatory style research

INTRODUCTION

Over the last several decades, developing countries have become part of the increasing globalization of illicit drug markets. An estimated 5 million people worldwide inject illicit drugs, which is a high risk factor for infection, including hepatitis B, hepatitis C and HIV [World Health Organisation (WHO), 2001]. It was reported that 4.2% of people aged 15 years and above used drugs in the late 1990s (United

Nations Office for Drug Control and Crime Prevention, 2000), and the illegal market for drugs was estimated to be between US\$100 billion and US\$500 billion (Reuter, 1996).

Despite the seriousness of the emerging global problem of drug abuse, there have been relatively few reports regarding the actual status of its prevalence, especially in developing countries (Senay, 1991; WHO, 2000). The statistics of the

drug problem are generally reported based on the level of production, trafficking and consumption, and the number of cases of drug-related crimes (United Nations Office for Drug Control and Crime Prevention, 2000) as it is difficult to measure the size of the hidden population of illicit drug abusers in the general population (Bobashev and Anthony, 1998; Dunn and Ferri, 1999). Even a decrease in the reported number of arrested drug abusers does not necessarily mean a decrease in the number of non-apprehended drug abusers if the level of drug trafficking is increasing (Compliance and Narcotics Division, Pharmaceutical and Food Safety Bureau, Ministry of Health, Labor, and Welfare, 2001). Morbidity and mortality statistics related to drug dependence were shown to be informative (Jablensky *et al.*, 2000; Paykel, 2000; Vega *et al.*, 2002). However, the prevalence of drug abuse in a community cannot be determined directly. Studies on school children have revealed a high prevalence of narcotic-related substances (Suwanwela and Poshyachinda, 1986; Sanders, 2000; Piko and Fitzpatrick, 2002), leading to speculation that drug abuse may be increasing in the community, although this has not been demonstrated directly.

Vientiane Municipality and the Ministry of Health of Lao People's Democratic Republic (PDR) have made dedicated efforts to tackle the problem of drug abuse and have made remarkable achievements despite a surge in global prevalence of drug abuse. To create further effective countermeasures against drug abuse, it is necessary to establish baseline evidence regarding its prevalence. However, members of the general community may be hesitant to answer questions about their drug abuse history truthfully. It is known that recognition of violence occurring in the neighborhood is useful as an indicator of the prevalence of neighborhood violence (Sampson *et al.*, 1997). Thus, it was considered useful to conduct interviews about the recognition of drug abuse in the community as an indicator of the spread of drug abuse.

Therefore, it is worthwhile conducting a community-based survey on drug abuse based on reliable information. The utility and versatility of the community-based participatory research approach have been reported previously (Israel *et al.*, 1997; Macaulay *et al.*, 1999). It should be noted that the community-based approach could improve the quality of research identifying the social determinants of drug use (Donna and

Meltler, 2001). Moreover, we feel that such activity would be useful in both raising awareness and in facilitating community activities to prevent drug abuse, as it is known that information concerning drug prevalence measured by household surveys as a community variable enables effective intervention (Van Etten *et al.*, 1997; Delva *et al.*, 2001).

The factors involved in the increase in incidence of drug abuse are complicated, and although there is no clear, solid evidence, urbanization is thought to be a driving force in developing countries (United Nation International Drug Control Programme, 1998; United Nations Office for Drug Control and Crime Prevention, 2000; United Nations Center for Human Settlements, 2001). Several cities in Lao PDR are undergoing rapid urbanization, particularly the capital city, Vientiane (National Statistical Center, 2001; Buala, 2002).

The present study was performed to obtain a highly reliable measure of the spread of drug abusers in the community by employing a participatory-style household survey, and to examine the relationship between drug abuse and urbanization.

METHODS

Study households

Study households were selected by the stratified random sampling method from the two districts in Vientiane Municipality, Lao PDR. First, each village was selected at random from among the 17 administrative zones in two districts. Then, 1497 households were selected as representative study households by one-third random sampling from among the 17 selected villages.

Household survey

We conducted a household interview survey using participatory-style research in which the entire process from planning to implementation was shared with local partners. The research team was composed of a member of the National Healthy Cities Team from the Ministry of Health, Lao PDR, the Healthy City Team of Vientiane Municipality, and the Division of Public Health of Tokyo Medical and Dental University. This team developed a consensus on the objectives of the survey together with local governors and village leaders. The interview survey questionnaire was designed based on both academic and local

viewpoints. This survey was designed to obtain information reflecting the actual situations in villages and real recognition by villagers. A total of 70 interviewers were selected from among the neighborhood leaders. The questionnaire was tested first on the neighborhood leaders, and they were therefore trained to conduct interview surveys in workshops held by the research team. Interviewers visited selected households over a period of 7 days, including nights and weekends, until the interviews had been accomplished. Before starting the questionnaire, the interviewers explained the purpose of the study and informed consent was obtained from the respondents. The respondents of this survey were the mother, father or other family members, including grandparents or relatives, over 18 years old. Questionnaires included information regarding the following: recognition of drug abuse cases in the community, household characteristics and demographic characteristics of the respondents.

Village variables: spread of drug abuse

To develop village variables to indicate the spread of drug abusers, we calculated the percentage of households in each village that recognized drug abuse cases in their community. We define drugs as illicit drug, including amphetamine-type stimulants, cannabis, opiates or cocaine, but excluding alcohol or tobacco. Drug abuse is defined as the use of illicit drugs outside of a medical context in a manner that is harmful to both the user and others. This definition covers a wide spectrum of drug abuse, ranging from recreational or experimental use to persistent use or dependence.

Village variables: urban index

The 42 village indicators were developed by aggregating household data from the following 10 groups: monthly household income; father's occupation; parents' educational histories; participation in community health educational programs; health information source; ownership of electrical appliances; ownership of means of transport; ownership of livestock; access to running tap water; and family lifestyle.

The distance from the center of Vientiane city to the village center by the shortest route was calculated using Arcview 3.0a (Geographic Information System Analysis). The center of the city of Vientiane was defined as the intersection

of Luangpabang Street (LS) and Route 13, two major streets in Vientiane. The shortest distance was calculated by arithmetic summation of the distance on LS route between the center of Vientiane to a point on LS nearest to each village center, and the direct distance between each village center and point on LS nearest to each village center. This distance of each village was added to the village indicators.

Principal component analysis was performed to extract the urban index of each village indicating the stage of urbanization from eight indicators reflecting urban status in the surveyed area: the percentage of households with an average monthly income of at least 200 000 Kip (1 USD = approximately 9000 Kip); percentage of fathers working in a private office; percentage of mothers who had completed primary school or higher education; percentage of fathers who had completed primary school or higher education; percentage of households with a telephone; percentage of households with cattle; percentage of households with running water in their home; and the shortest distance from the city center to the village center.

Statistical analysis

The differences in respondents (mother, father, others) regarding recognition of drug abuse cases in the community were examined by *t*-test.

Spearman's correlation analysis was calculated to determine the association of drug abuse recognition in the community with the urban index and with 43 individual village indicators, respectively. Correlation coefficients were further calculated by respondents (mother, father, others).

To observe the differences in recognition of drug abuse cases in the community by respondents, correlation coefficients between percentages of households recognizing drug abuse cases in their community by the mother and father or other respondents, or father and other respondents were also examined by Spearman's correlation analysis.

RESULTS

Interviews of all 1497 subject households were completed and information was compiled for the analysis. The numbers of households responding by mother, father and others were 849, 397 and

Table 1: Results of principal component analysis of eight urban indicators

Indicators	Factor loading for principal component analysis
Percentage of households with an average income of at least 200,000 Kip*	0.728
Percentage of fathers working in a private office	0.862
Percentage of mothers who had completed primary school or higher education	0.905
Percentage of fathers who had completed primary school or higher education	0.940
Percentage of households with a telephone	0.854
Percentage of households with cattle	-0.877
Percentage of households with running water in their home	0.831
Shortest distance from the city center to the village center	-0.959

*1USD was equal to around 9000 Kip.

Only one factor was extracted by principal component analysis. The proportion of variation by the factors are 0.760.

Table 2: Spearman correlation coefficients between recognition of drug abuse case in their own communities by respondents and the urban index or eight indicators

	Percentage of respondents who recognized existence of drug abuse cases in their communities							
	All households interviewed (n = 1497)		Households respondent mother (n = 849)		Households respondent father (n = 397)		Households respondent others [†] (n = 251)	
	r	p	r	p	r	p	r	p
The urban index*	0.650	0.005	0.633	0.006	0.663	0.004	0.612	0.012
Percentage of households with an average income of at least 200,000 Kip*	0.466	0.060	0.487	0.047	0.477	0.053	0.347	0.187
Percentage of fathers working in a private office	0.717	0.001	0.724	0.001	0.732	0.001	0.675	0.004
Percentage of mothers who had completed primary school or higher education	0.546	0.023	0.534	0.027	0.548	0.023	0.436	0.091
Percentage of fathers who had completed primary school or higher education	0.515	0.034	0.485	0.048	0.534	0.027	0.447	0.083
Percentage of households with a telephone	0.469	0.057	0.438	0.078	0.490	0.046	0.548	0.028
Percentage of households with cattle	-0.598	0.011	-0.561	0.019	-0.625	0.007	-0.586	0.017
Percentage of households with running water in their home	0.318	0.214	0.315	0.218	0.323	0.206	0.348	0.186
Shortest distance from the city center to the village center	-0.601	0.011	-0.593	0.012	-0.603	0.010	-0.561	0.024

r: Spearman correlation coefficients; p: probability value; bold letters represent statistical significance ($p < 0.05$).

*The urban index was calculated by principal component analysis from eight urban indicators (the percentage of households with an average income of at least 200,000 Kip (1USD = around 9000 Kip), percentage of fathers working in a private office, percentage of mothers who had completed primary school or higher education, percentage of fathers who had completed primary school or higher education, percentage of households with a telephone, percentage of households with cattle, percentage of households with running water in their home, and the shortest distance from the city center to the village center).

†Others include grand parents or relatives living in visited household.

251, respectively. The average number of family members was 5.6 (SD = 2.2).

The arithmetic mean, median, quartile and third quartile of the percentage of recognition of drug abuse cases in each community among the 1497 households in 17 villages were 63.2, 66.7, 31.9 and 100%, respectively. Values of more than 80% were obtained in eight villages.

The percentages of respondents' recognition of drug abuse cases in their community were 62.0, 65.7 and 59.8% for mothers, fathers and others, respectively. These values were not statistically significant by *t*-test ($p > 0.1$).

The average and range of eight indicators were: percentage of households with an average monthly income of at least 200 000 Kip, 90.2% (53.3–100%); percentage of fathers working in a private office, 8.5% (0–18.8%); percentage of mothers who had completed primary school or higher education, 66.9% (0–96.7%); percentage of fathers who had completed primary school or higher education, 85.3 (62.0–100%); percentage of households with a telephone, 25.4% (0–69.8%); percentage of households with cattle, 13.7% (0–49.2%); percentage of households with running water in their home, 53.8% (0–100%); the shortest distance from the city center to the village center, 13.8 km (1.54–36.4 km) [mean, (range)].

Among the several means of transport, the percentage of household owning a *tuktuk* showed a tendency toward a positive relation with recognition of drug abuse even though the association was not statistically significant. Two villages in which 15.6 and 13.6% of the households owned a *tuktuk*, respectively, had a higher than average percentage of recognition of drug abuse cases in their communities.

Table 1 shows the results of principal component analysis of eight indicators to obtain the urban index. Only one factor was extracted from eight indicators that had an eigenvalue of 6.08 and that explained 76.0% of the variance.

Table 2 shows Spearman correlation coefficients between recognition of drug abuse cases in the respondents' community and the urban index or eight indicators. The urban index was significantly related to recognition of drug abuse cases in the community by all households interviewed with a Spearman correlation coefficient of 0.650 ($p < 0.01$). Among the eight indicators, the percentage of fathers working in a private office was strongly correlated with the recognition of drug abuse cases in the community ($p < 0.01$).

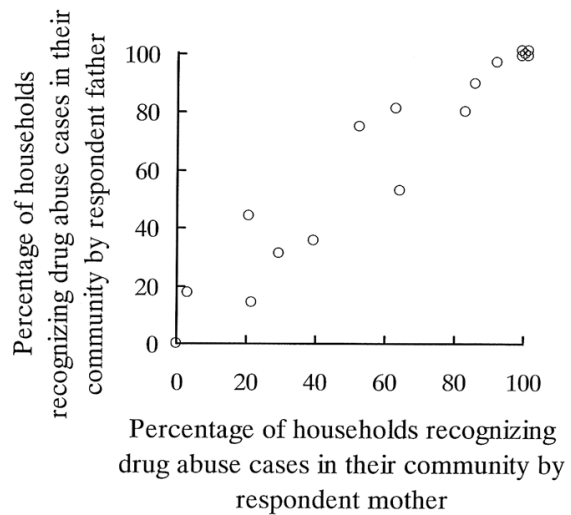


Fig. 1: Scatter plot between 'percentage of households recognizing drug abuse cases in their community by respondent mother' and 'percentage of households recognizing drug abuse cases in their community by respondent father'. Correlation coefficient was 0.972 (Spearman, $p < 0.001$).

Parents' educational histories, possession of cattle, and distance between the city and the village center were also significantly correlated with drug abuse recognition ($p < 0.05$). Even if households were divided by demographic characteristics of respondents, the degree of recognition of drug abuse was significantly related to the urban index with Spearman correlation coefficients of 0.633, 0.633 and 0.612, respectively ($p < 0.05$).

Figure 1 shows the relationship between the percentage of households recognizing drug abuse cases in their community by mother and father as the respondent. The calculated Spearman correlation coefficient was 0.967, which was statistically significant ($p < 0.001$). The associations between recognition of drug abuse by other respondents and the mother or father were also significantly correlated with Spearman correlation coefficients of 0.914 and 0.932, respectively ($p < 0.001$).

DISCUSSION

The results of the present study indicated the spread of drug abuse in Vientiane, Lao PDR, which is currently undergoing rapid urbanization. The recognition of drug abuse in the community

was significantly and positively associated with the urban index of the community, with those living in more urbanized communities showing a greater tendency to recognize drug abusers.

Regardless of whether the respondent was the mother, father or some other family member, the percentages of recognition of drug abuse cases in the community were similar for all over the age of 18. This consistency demonstrated the reliability of this survey inquiring about the spread of drug abuse. Interviewers were adequately trained before visiting the households to share their understanding with the respondents on what constitutes drug abuse cases in the community. It is difficult to obtain information about drug abuse in the general population. However, the involvement of community members in a community survey (Israel *et al.*, 1998; Donna and Meltler, 2001) and appropriate training of interviewers (Schulz *et al.*, 1997) are viewed as increasing the quality of information obtained by such studies. Use of a participatory style in this study with adequate training of interviewers resulted in reliable information concerning drug abuse in the community.

The present survey design did not address the prevalence of drug abuse by aggregating individual drug abusers, but by measuring recognition of drug abuse as an indicator of community-level spread of drug abuse. A similar survey research strategy was employed in examination of the actual prevalence of violence in communities to deal with the collective efficacy issue (Sampson *et al.*, 1997). Due to the difficulty in evaluating the actual number of drug abusers in a community (Bobashev and Anthony, 1998; Dunn and Ferri, 1999), it is necessary to develop various methods to assess the prevalence of drug abuse problems. We consider the present survey method to provide new possibilities for elucidating the prevalence of drug abuse problems at the community level.

While a large average percentage, i.e. more than 60% of households, recognized drug abuse in their communities, it is noteworthy that there was a wide range of variation of the percentage among villages, as shown by the large quartile range. More than 80% of respondents in eight of the 17 villages recognized drug abusers in their communities. This suggested that there were focal villages where drug abuse is more prevalent rather than an equal distribution of the problem among all of the villages.

Urbanization has various aspects related to health issues (United Nations, 1996). In the

present study, we devised an urban index using eight indicators from several aspects of the situation of urbanization in Vientiane, although each individual indicator might not always solely reflect urbanization in other settings. There was a close correlation between recognition of drug abuse and the stage of urbanization of villages represented by the urban index. Some indicators showed significant correlations with the percentage of drug abuse in the community: percentage of workers in private business, distance from city center to village, cattle ownership and parents' educational histories. These correlations support the positive relationship between the prevalence of drug abuse cases and the stage of urbanization.

The results of this participatory-style study indicated that more than 60% of the households were aware of the existence of drug abuse in their neighborhoods. People recognized the seriousness of the spread of drug abuse in the urban area of the city, which indicated that action is required to reduce its spread. Health professionals developed an educational program to communicate the health risks associated with drug abuse, and members of the community were encouraged to participate in the program. It is widely recognized that community-based research facilitates awareness about the issue within the community and supports the development of effective countermeasures (Israel *et al.*, 1998). In addition, community participation research itself is regarded as a health-promoting activity through enhancing ownership of the research and its results (Macaulay *et al.*, 1999). The process, including questionnaire development, training of community leaders, survey implementation, data collection and feedback, performed together with local partners required a considerable amount of time (Israel *et al.*, 1998). However, the amount of time invested in this approach was rewarded by the reliability of information obtained and the enhanced awareness obtained by participatory style research. The involvement of members of the community in the process of this research was regarded as having a positive influence on the development of programs to prevent drug abuse.

The findings of the present study suggested that there is a need for anti-drug abuse health promotion activities targeted toward communities in urbanizing areas. Dissemination of knowledge about the health risks associated with drug abuse in health promotion programs is recommended. The involvement of members of

the community in the development of drug abuse prevention programs is considered effective, as this process would raise awareness of drug abuse problems in the community.

In conclusion, the spread of drug abuse revealed by recognition in the community was found among city neighborhoods in a developing country undergoing rapid urbanization, and it was shown to be significantly and positively associated with the urban index. Participatory-style research activity helps raise awareness of the problems associated with drug abuse within the community and thus facilitates participation in anti-drug-abuse activities.

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