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Review Article

Analysis of drug abuse data reported by medical institutions in Taiwan from 2002 to 2011



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ABSTRACT

Drug abuse has become a global issue of concern. It affects not only individual users, but also their families and communities. Data were retrieved from the database of the Taiwan Surveillance System of Drug Abuse and Addiction Treatment (SSDAAT) from 2002 to 2011, and 147,660 cases reported by medical institutions in Taiwan were reviewed. This study showed that the top five reported abused drugs by medical institutions during the last decade were heroin, methamphetamine, benzodiazepines, ketamine, and zolpidem. Heroin and methamphetamine continued to be the first two abused drugs reported by medical institutions. Heroin abuse was significant, but has shown a downward trend. However, emerging abused drugs, such as ketamine and zolpidem, presented upward trends. 3,4-Methylenedioxy-*N*-methylamphetamine (MDMA) abuse seems to have re-emerged and has increased gradually since 2010. Injection without needle sharing has become the most common route of administration of abused drugs since 2002. The majority of causes for these reported drug abuses were drug dependence, followed by peer influence and stress relief. Hepatitis C was the most commonly reported infectious disease, followed by hepatitis B and AIDS in the drug abusers reported by medical institutions. It should be noted that access to drugs via the Internet increased year by year, and this is clearly an area needing constant monitoring.

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1. Introduction

Drugs can cure people of diseases, however their misuse can also generate crime, street violence, and other social problems that harm societies. Drug abuse affects not only individual users, but also their families and communities. In the USA, there were 5.1 million drug-related emergency department

(ED) visits in 2011; about a half (49%) were attributed to drug misuse or abuse with 45% attributed to adverse drug reactions. ED visits involving use of illicit drugs increased from 2009 (974,392 visits) to 2011 (1,252,500 visits); the rate of visits involving illicit stimulants increased by 68%. ED visits involving misuse or abuse of pharmaceuticals increased from 2004 (626,470 visits) through 2011 (1,428,145 visits); the most

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commonly involved drugs were anti-anxiety and insomnia medications and narcotic pain relievers (160.9 visits and 134.8 visits per 100,000 population, respectively) [1]. The United Nations Office on Drugs and Crime (UNODC) estimated in 2010 that 10–13% of drug users continued to be problem users with drug dependence and/or drug use disorders, the prevalence of human immunodeficiency virus (HIV), hepatitis C virus (HCV), and hepatitis B virus (HBV) among injecting drug users continuing to add to the global burden of disease, and approximately one in every 100 deaths among adults was attributed to illicit drug use [2].

According to the Atlas on Substance Use 2010 of the World Health Organization (WHO) [3], global prevalence rates of drug use disorders were estimated to range from 0% to 3%, with the highest prevalence rates found in the Eastern Mediterranean region. In the estimated annual prevalence of illicit drug use in 2010, cannabis remained the world's most widely used illicit substance, ranging from 2.6% to 5% of the adult population (119–224 million estimated users aged 15–64 years). Amphetamine-type stimulants (ATS) (excluding "ecstasy") remained second with an estimated prevalence of 0.3–1.2% (14.3–52.5 million users), and opioid (mainly heroin, morphine, and nonmedical use of prescription opioids) was placed third at 0.6–0.8% of the population aged 15–64 years (26.4–36 million opioid users) [2]. Besides, there were 99,000–253,000 deaths globally in 2010 as a result of illicit drug use, with drug-related deaths accounting for 0.5–1.3% of all-cause mortality among those aged 15–64 years, which was taken as 18.74 million [4]. Heroin, cocaine, and other drugs kill around 0.2 million people each year, shattering families and bringing misery to thousands of other people. Drug abuse not only undermines economic and social development, but also contributes to crime, instability, insecurity, spread of diseases, and considerable costs to health care services [2,5–8].

In Taiwan, approximately 1.43% of persons aged 12 years to 64 years (252 thousand people) abused drugs at least once in 2009 [9]. Our study was designed specifically to address the trend of drug abuse from 2002 through 2011 by analyzing the drug abuse data reported by medical institutions from the Surveillance System of Drug Abuse and Addiction Treatment (SSDAAT), which was established by the National Bureau of Controlled Drugs, Department of Health in 1995. The National Bureau of Controlled Drugs was mandated to merge into the Taiwan Food and Drug Administration, Department of Health in 2010. Drug abuse cases have been reported online since 2002 [10–12].

2. Methods

2.1. Data sources

The data for this study were derived from the SSDAAT. To date, there are a total of 598 medical institutions, which have enrolled SSDAAT as reporters, in Taiwan. The cases with drug abuse problems were reported by filling out the drug abuse case reporting sheet via the Internet. From 2002 to 2011, 147,660 cases reported by medical institutions on the SSDAAT were reviewed.

2.2. Measures

In order to know the real time information of drug abuse in Taiwan, the National Bureau of Controlled Drugs, psychiatric hospitals, and specialists in drug abuse-related fields in Taiwan codesigned the drug abuse case reporting sheet for medical institutions to report the cases that were diagnosed with drug abuse problems. The reporting sheet contained 20 questions with items on demographic characteristics, age of first drug use, reasons for seeing a doctor, motives for drug use, drug use history, the routes of administration, the places of drug abuse, and the types of drug used.

2.3. Statistical analysis

All analyses were performed in SPSS for Windows Version 17.0 (SPSS Inc., Chicago, IL, USA). For statistical analysis, either χ^2 or one sample t test was used for comparison, as appropriate, and a *p* value of 0.05 was used as the criterion of significance. Microsoft Office Excel 2010 (Microsoft Corporation, Redmond, WA, USA) was used in this study to construct the charts to present the changes of each variable for each year.

2.4. Study restrictions

The SSDAAT is a reporting system that, without the use of coercion, encourages medical institutions to voluntarily report drug abuse cases. Although 598 medical institutions (over a half) have enrolled in the SSDAAT as reporters in Taiwan, not all psychiatric institutions have been involved, therefore not every drug abuse case has been reported to the SSDAAT.

Considering patients' privacy, the willingness of medical institutions to report cases, and the Personal Data Protection Act, only basic demographic characteristics such as gender, age, education, marriage, reason for seeing doctors, and drug use history were queried in each case. Hence, it was difficult for the data in the SSDAAT to combine with other drug- and health-related research databases, such as the National Health Insurance and National Health Interview, for obtaining more information on drug abusers.

3. Results and discussion

3.1. Demographic data

On analyzing the data of 147,660 reported cases over the years, males outnumbered females by a factor of 6.1 in 2002, reduced to 4.9 in 2011, and then there was an upward trend in the number of female cases. Demographic data of reported records are shown in Table 1. While illicit drug use among males in general greatly exceeded that among females, the nonmedical use of tranquilizers and sedatives among females in South America, Central America, and Europe is a notable exception to the rule [2].

The highest estimated prevalence rates of drug use disorders among men ($\geq 1.6\%$) and women ($\geq 0.4\%$) were found in parts of the Americas. Selected countries in Africa, Eastern Mediterranean, Europe, and the Western Pacific were found to

Table 1 – Demographic data of the drug abuse cases reported by medical institutions during the period 2002–2011.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Gender**										
Male	86.0	86.0	84.3	84.1	82.6	83.4	83.2	83.1	83.3	83.0
Female	14.0	14.0	15.7	15.9	17.4	16.6	16.8	16.9	16.7	17.0
Male/female ratio	6.1	6.2	5.4	5.3	4.8	5.0	5.0	4.9	5.0	4.9
Age (y)**										
Under 20	3.0	1.7	1.1	0.8	0.4	0.3	0.3	0.4	0.3	1.2
20–29	43.1	39.4	37.2	32.3	26.7	23.3	18.2	15.0	12.4	13.2
30–39	37.6	39.5	40.8	42.4	41.3	43.9	45.7	45.8	45.1	41.9
40–49	13.7	16.8	17.1	19.7	24.7	25.2	27.3	29.5	31.9	31.0
>50	2.5	2.6	3.6	4.7	7.0	7.2	8.4	9.2	10.2	12.7
Mean age of first drug use (y)*	24.7	25.0	25.6	26.1	26.9	26.4	26.4	26.1	26.5	26.7
Education**										
Elementary school and below	6.6	6.1	6.0	6.7	6.9	7.5	7.6	7.6	8.0	8.5
Junior high school	47.8	48.1	46.4	46.3	44.6	46.8	47.9	47.8	47.8	49.4
Senior high/vocational school	40.6	41.8	42.9	42.6	44.1	41	39.9	39.6	39.3	37.0
College and above	4.2	2.9	3.1	3.4	3.5	3.8	4.0	4.0	4.1	4.2
Others	0.8	1.0	1.6	0.9	0.9	0.9	0.6	1.0	0.8	0.9
Marriage**										
Single	54.1	51.4	50.2	51.7	49.1	50.9	51.5	51.4	51.3	52.0
Married	33.1	35.1	36.9	35.7	35.6	30.6	27.8	28.0	26.5	26.6
Divorced	10	10.7	10.1	11.2	13.1	16.5	18.1	17.8	19.3	19.2
Widow/widower	0.6	1.0	1.2	0.5	0.9	0.6	0.5	0.5	0.7	0.6
Others	2.1	1.7	1.6	0.8	1.3	1.4	2.0	2.3	2.1	1.5
Reason for seeing doctor**										
Drug dependence	58.6	79.2	91.2	90.7	90.1	85.2	83.5	86.8	88.6	83.1
Mental illness	5.2	5.9	4.4	4.3	3.3	3.3	2.1	1.7	2.0	1.7
Drug overdose	10.1	1.1	1.4	1.1	2.0	2.5	2.4	2.1	1.9	2.9
Corrective	10.6	3.0	0.2	2.4	1.4	0.5	0.1	0.1	0.1	0.3
Others	15.5	10.8	2.4	1.5	3.2	8.4	11.9	9.4	7.3	12.0
Drug use history**										
<1 y	14.7	8.7	5.8	5.5	6.7	6.8	3.9	3.1	3.6	6.5
1–5 y	43.0	44.1	43.2	42.0	38.9	28.9	24.3	18.3	18.8	20.4
6–10 y	24.4	21.6	21.3	22.0	24.7	24.5	24.6	22.7	24.1	20.3
>10 y	17.9	25.6	29.7	30.5	29.7	39.8	47.1	55.9	53.5	52.8

Data are presented as percentages unless indicated otherwise.

* One sample t test: $p < 0.001$.

** χ^2 test: $p < 0.001$.

have high rates of drug use disorders among men and women [3]. The mean age of first drug use (ranging from 0 years to 70 years) on the SSDAAT from 2002 to 2011 was 24.7 years in 2002 and the peak was 26.9 years in 2006. In terms of age distribution, most were between 30 years and 39 years (37.6% in 2002 and 41.9% in 2011, the peak of 45.8% in 2009). The 20–29 year age group has declined and the 40–49 year age group has increased every year since 2002, except 2011. The percentage for the “50 years and over” age group has increased every year from 2002. Most of the reported cases fell within the age groups of 20–29 years, 30–39 years, and 40–49 years.

Regarding educational level, the majority were “junior high school” (47.8% in 2002 and 49.4% in 2011, the valley 44.6% in 2006) followed by “senior high/vocational school” (40.6% in 2002 and 37.0% in 2011, the peak 44.1% in 2006); however, “elementary school and below” and “college and above” have presented upward trends since 2004 and 2003, respectively, as shown in Table 1.

In terms of marriage, most of the reported cases (about a half) were single; the proportion of “married” cases increased from 33% in 2002 to 36.9% in 2004, but declined from 35.7% in 2005 to 26.6% in 2011. By contrast, the proportion of “divorced”

cases increased from 10% in 2002 to 19.2% in 2011. As for the reason for seeing a doctor, the major reason was drug dependence (79.2% in 2003, 83.1% in 2011, and the peak 91.4% in 2004), followed by drug overdose (1.1% in 2003 and 2.9% in 2011) and mental illness (5.9% in 2003 and 1.7% in 2011).

The findings of this study indicate that drug abuse among males greatly exceeded that among females. However, the differences were reduced and drug abuse cases among females have increased over the years. Although the data obtained from drug abuse cases reported by medical institutions may not reflect the real drug abuse situation, these are consistent with the results of the 2005 and 2009 National Health Interview and Drug Abuse Surveys [9,13].

3.2. Most commonly abused drugs

The most commonly abused drugs in the cases reported by medical institutions in Taiwan were heroin, methamphetamine, benzodiazepines, ketamine, zolpidem, and 3,4-methylenedioxy-N-methylamphetamine (MDMA). Heroin use increased in 2002 and 2003, the growth curve remained stagnant from 2004 to 2007 (93.8%), and then it declined (83.3%

in 2011). The curve of methamphetamine use saw a remarkable climb from 2003 onwards and then it fell in 2008. The use of benzodiazepines (5.4% in 2002 and 2.5% in 2011, the peak 7.3% in 2006) presented a downward trend. Both ketamine and zolpidem use have increased yearly since 2002 and showed upward trends as well. MDMA use decreased from 2002 (3.3%) to 2009 (0.3%) and then increased over consecutive years (1.7% in 2011), as shown in Fig. 1.

Heroin and methamphetamine have been categorized as Schedule I and II controlled drugs, respectively, in many countries including Taiwan [14,15] on consideration of their high addiction, abuse levels, tolerance, and harm to society. They are traditionally abused in Taiwan. To date, heroin and methamphetamine have continued to be the two commonly abused drugs reported by medical institutions in Taiwan. The abuse of these two drugs is still serious, but heroin use has shown a downward trend. By contrast, emerging drugs of abuse such as ketamine, zolpidem, and MDMA have presented upward trends (Fig. 1).

In Taiwan, methamphetamine is the second abused drug of concern and its appearance is mainly crystalline. In Southeast Asia, crystal methamphetamine is the most commonly used drug in Brunei Darussalam, Japan, Philippines, and the Republic of Korea. In China, opioids (mainly heroin) are the primary drug of concern, followed by ATS and tranquilizers [2]. More than half of the United Nations (UN) Member States have reported ATS-related manufacturing since 1990. In 2009, 10,598 ATS laboratories were dismantled—mostly methamphetamine (96%), followed by combined ATS (3%) [16].

Ketamine, a Schedule III controlled drug in Taiwan, is a derivative of phencyclidine that possesses anesthetic and analgesic effects. The control of ketamine is less tight than

those of Schedule I and II drugs such as heroin, methamphetamine, and MDMA. Therefore, it is sometimes mistaken that ketamine abuse may not undermine one's health. Due to its dissociative and paralytic effects, ease of availability, and low cost, ketamine has gained popularity among Taiwan's young people and has become the most commonly abused drug of choice for recreation in pubs. According to the statistics of drug abuse cases and laboratory testings, the amounts of yearly ketamine seizures by judicial systems increased from 9.5 kg in 2002 to 1371.9 kg in 2011 and have ranked the highest since 2006 [17].

Although ketamine has not been scheduled by the UN, the trend of ketamine abuse has been alarming worldwide. In Southeast Asia, the abuse trend of ketamine is on the rise. In China (including Hong Kong), Malaysia, and Vietnam, ketamine use was also perceived to increase in 2010 [2]. Ketamine not only causes long-term adverse health effects in recreational users, including tolerance, dependence, and bladder syndrome [18–21], but also a number of drug-related problems such as considerable costs to health care services.

In Taiwan, ketamine abuse is serious and its danger is noticed by the authorities. The incumbent agencies have started to revise the law to enhance the penalties of manufacturing and selling Schedule III drugs. However, the incumbent agencies have not reached a consensus to reschedule ketamine. It is recommended that the assessment system for drug scheduling should take not only the addiction potentials, but also the levels of abuse and facts on social harm into consideration. In addition, it is necessary to enforce drug abuse prevention and education. Incumbent agencies and nongovernmental organizations (NGOs) should work closely and campaign to enhance perception and alertness on the hazards of drug abuse among the public.

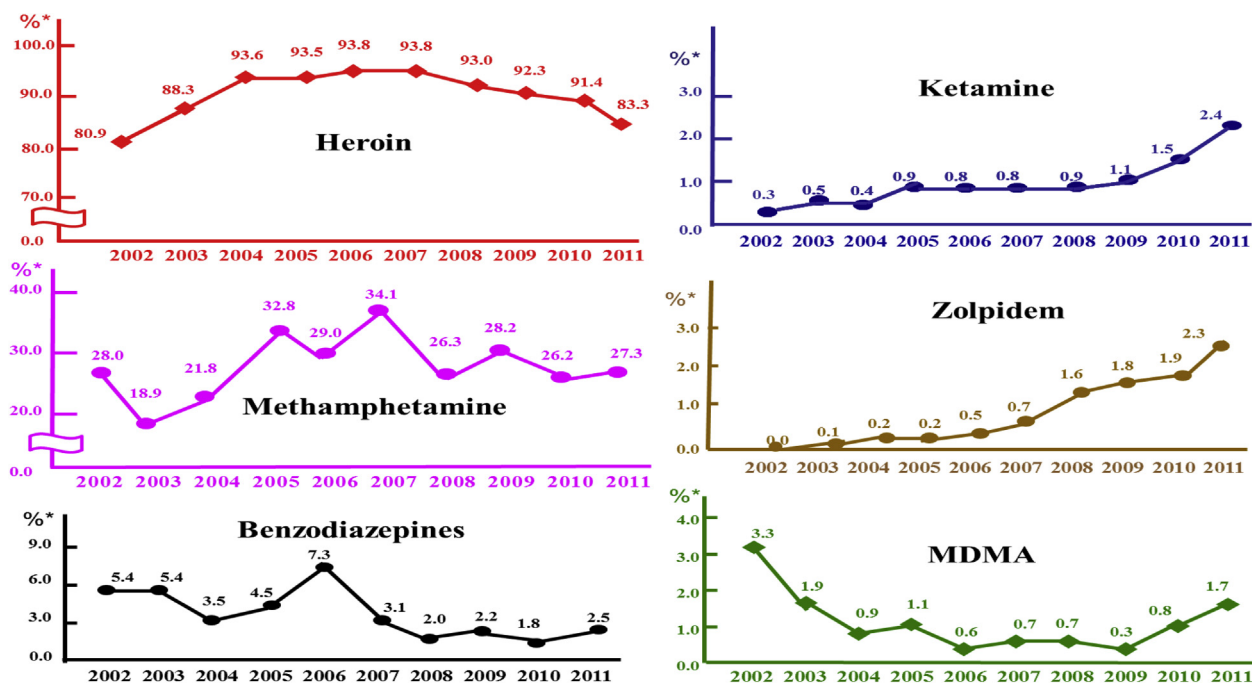


Fig. 1 – The trends for the most commonly abused drugs reported by medical institutions in Taiwan from 2002 to 2011. *% = the percentage of cases reported. MDMA = 3,4-methylenedioxy-N-methylamphetamine.

On further analysis of the data by age, flunitrazepam (FM2) was found to be the major abused drug of the benzodiazepine family; it was especially popular among persons aged 40 years and over and was ranked the third reported abused drug in this age group within the period 2002–2007. Zolpidem is one of the nonbenzodiazepine hypnotics (z-drugs), with effects similar to benzodiazepines, and it was also found to be popular among persons aged 40 years and over; it was ranked as the third reported abused drug in this age group since 2008. Benzodiazepines and z-drugs are psychoactive drugs and are useful in the treatment of insomnia and anxiety [22–24]. They are prescription drugs and categorized as Schedule IV controlled drugs by the International Narcotics Control Board (INCB), except for FM2, which is a Schedule III drug under the Convention on Psychotropic Substances [25]. The abuse of FM2 and zolpidem implies an existing and growing problem of abuse of prescription drugs for nonmedical purposes in Taiwan.

The nonmedical use of prescription drugs, including tranquilizers and sedatives, is reported to be significantly increased and poses a growing health problem in a number of developed and developing countries [2,26–28]. The report of the INCB for 2006 highlighted that prescription drugs have become the second most abused class of drugs after cannabis in the United States [26]. According to results from the 2010 National Survey on Drug Use and Health (NSDUH), an estimated 2.4 million Americans used prescription drugs non-medically for the first time within the past year. More than a half were females and about a third were aged 12–17 years [29]. In Australia, there was also a statistically significant increase in the use of pharmaceuticals for nonmedical purposes among persons aged 14 years and over [28].

MDMA, the best known member of the ‘ecstasy’ compounds [MDMA, 3,4-methylenedioxyamphetamine (MDA), methylenedioxyethylamphetamine (MDE), etc.] is making a comeback. An increase in the purity of ecstasy available in Europe was pointed out in the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) 2012 annual report [30]. European studies show higher prevalence of ecstasy use among club goers in comparison with such use among the general population [31,32]. In Australia, ecstasy among Australia’s regular drug users in pubs, clubs, and music festivals appears to resurge, and the number of ecstasy users taking synthetic drugs such as emerging psychoactive substances has increased [33]. The finding in this study also shows the percentage of MDMA use reported from medical institutions in Taiwan has obviously risen from 0.3% in 2009 to 1.7% in 2011. This indicates that the abuse of MDMA in Taiwan has synchronized with Europe, Australia, and the United States.

Illicit use of Schedule I and II drugs is an indictable criminal offense in Taiwan. It can cause liability in people who use drugs with low dependence without proactively seeking treatment. It is not sufficient to assess trends or situations of drug abuse by simply analyzing one database of a surveillance system. The drug abuse data in this study may not represent the real scenario in the whole drug abuse population in Taiwan. Therefore, in order to represent the drug abuse situation in Taiwan, it is necessary to compile information on other reporting systems such as the Analytic Laboratory Drug Abuse Report System (ALDARS), which gathers nationwide identification of cases including urine and nonurine samples, the reporting system of

illegal drugs seized from the Ministry of Justice, the reporting system of illegal drug-related charges from the Ministry of the Interior, the reporting subsystem of HIV/AIDS from the Center for Diseases Control, Ministry of Health and Welfare, and the National Household Survey on Drug Abuse in Taiwan [10–12,34].

3.3. The causes of drug abuse, common sources of abused drugs, and places of common access to drugs

The major causes of drug abuse were drug dependence (23.2% in 2002 and 47% in 2011, the peak 52% in 2009), followed by peer group influence (16.7% in 2011, the peak 28.3% in 2004) and stress relief (14.1% in 2011, the peak 21.6% in 2004) as shown in Fig. 2.

It was globally estimated that 153–300 million people aged 15–64 years (3.4–6.6% of the world’s population in that age group) have used an illicit substance at least once in 2010. Problem drug users are estimated to number approximately 15.5–38.6 million (almost 12% of illicit drug users), including those with drug dependence, and drug use disorders remain a particular concern [2].

In terms of common sources of abused drugs, the drugs were mostly sourced from drug dealers (58.3% in 2003 and 52.8% in 2011), followed by peers (35.6% in 2003 and 37.3% in 2011) and doctor/pharmacist (2.5% in 2003, 5.3% in 2011, with a peak of 6.7% in 2008), as shown in Fig. 3.

The top three common places of access to drugs were the shops for KARAOK singing which have air bands and television screens (KTV)/the shops for watching music videos and movie DVD/tapes (MTV)/Internet cafes, video arcades/game parlors, and disco pubs/night clubs/bars.

It should be noted that the percentage of access to drugs from the Internet has increased year by year (0.1% in 2003, the peak 0.7% in 2011). The National Drug and Alcohol Research Centre in Australia also identified the emergence of the Internet as a major retailer of illicit drugs and “legal highs” in creating a paradigm shift in drug use globally [35]. This is clearly an area that requires monitoring.

Risk factors for drug dependence may differ among countries. However, Degenhardt et al [36] pointed out a range of variables that were common to the development of illicit drug dependence among users: early onset of drug use, using more types of illicit drugs, and onset of externalizing (e.g., conduct disorder) or internalizing mental disorders (e.g., depression) before the age of 15 years [36].

3.4. The routes of administration

There are many routes of administration, including oral ingestion, injection–needle sharing, injection–non-needle sharing, smoking, snorting, sniffing, and inhaling. Injection without needle sharing (50.4% in 2002 and 65.2% in 2011, the peak 69.9% in 2010) has become the main route of administration reported since 2002. In comparison with the percentage of injection–needle sharing, which showed growth after 2002 but declined from 2005 to 2011, that of injection–non-needle sharing increased in the period 2005–2010 as shown in Fig. 4.

The major route of administration for heroin was injection–non-needle sharing, followed by smoking and injection–needle sharing. With regard to methamphetamine, the

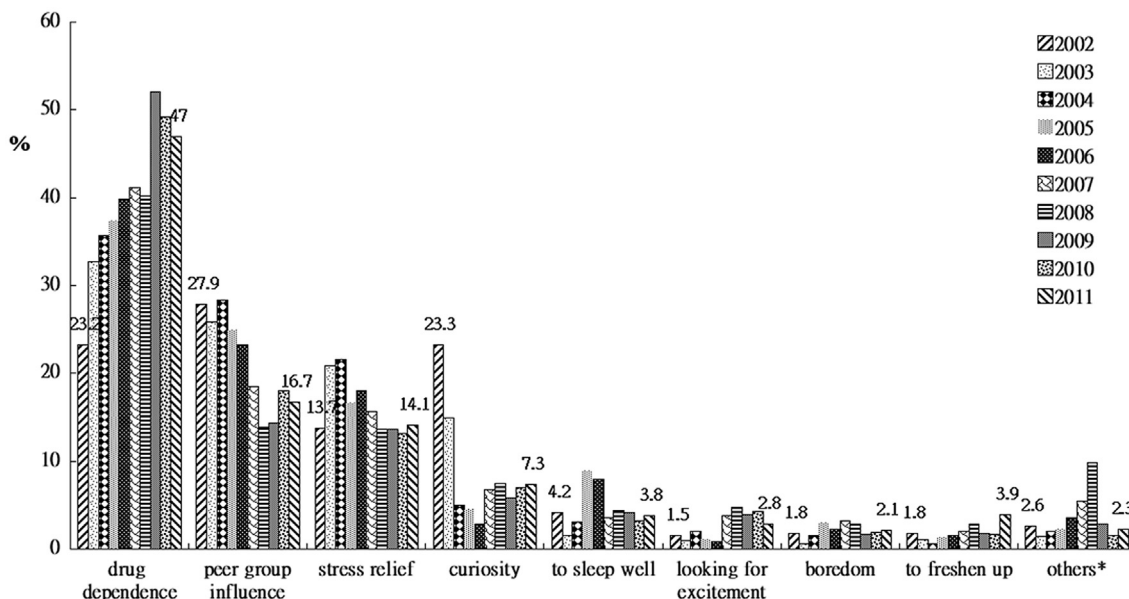


Fig. 2 – The trends for causes of drug abuse reported by medical institutions in Taiwan from 2002 to 2011.* Others include disease treatment, suicide, weight loss, and nonmentioned reasons.

majority of cases involved inhaling and the second most common route was injection—non-needle sharing. As for ketamine, snorting was the main route, oral was the second, and smoking was the third. Oral was the major route for both MDMA and benzodiazepines.

Drug use by injection is an extreme form of illicit drug use with serious health implications and costs for the individual and the community. Mathers et al [37] pointed out that injecting drug users account for about 7.5% of all drug users worldwide and there were approximately 15.9 million (range 11.0–21.2 million) injecting drug users in the world, with the largest numbers in China, the United States, and the Russian Federation.

In 2005, Taiwan introduced the national harm reduction program, which included the methadone maintenance

treatment program and the needle exchange program (NEP), to reduce the harm associated with using unsterile or contaminated injecting equipment and the spread of HIV among injecting drug users (IDUs). The findings of this study suggest that the percentage of cases of injection—needle sharing has been in decline since 2005 and indicates that HIV spread among IDUs has been effectively curbed; therefore, the NEP seems to have brought about positive effects.

3.5. Health problems of drug abusers

From these drug abuse data reported by the medical institutions in Taiwan, we found hepatitis C is the most commonly reported infectious disease, followed by hepatitis B

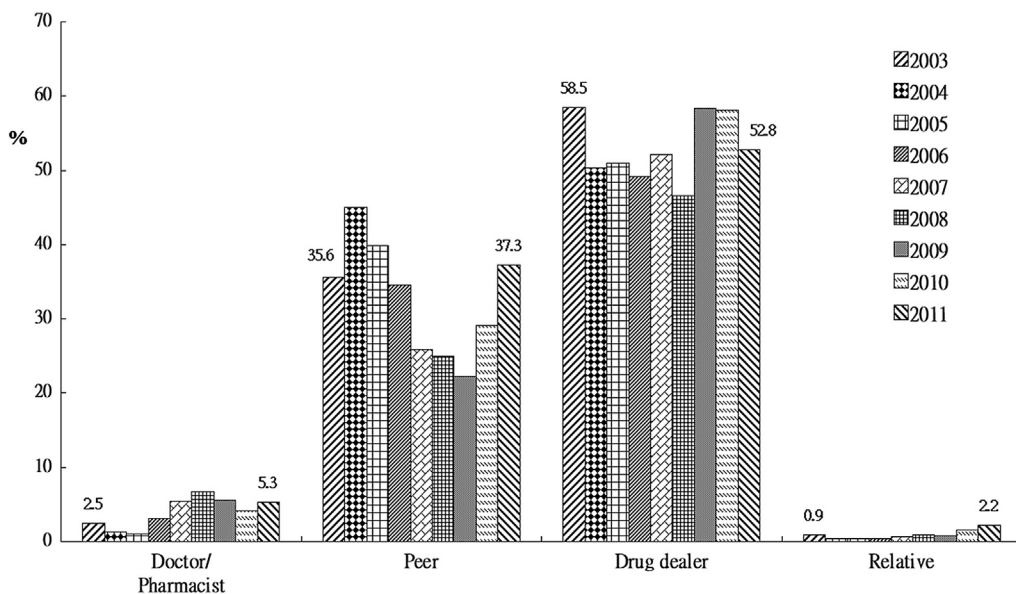


Fig. 3 – The trends for common sources of abused drugs reported by medical institutions in Taiwan from 2002 to 2011.

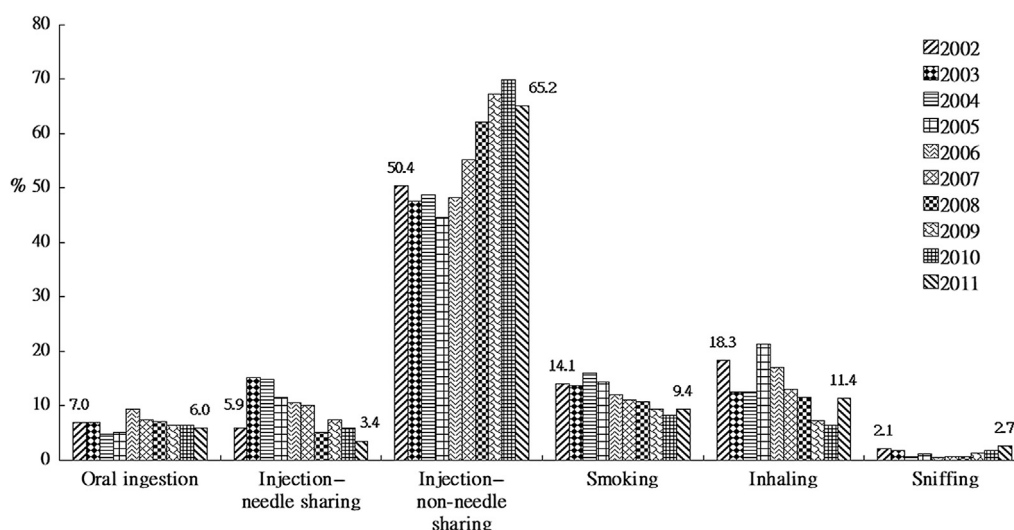


Fig. 4 – The trends for routes of administration in drug abuse reported by medical institutions in Taiwan from 2002 to 2011.

and AIDS. The curve of hepatitis B (4.5% in 2002 and 11.0% in 2011, the valley 4.3% in 2005) has been a remarkable climb from 2006 to 2008 and presented an upward trend. The reported AIDS cases (0% in 2002–2003 and 0.1% in 2004, the peak 10.1% in 2010) increased from 2004 to 2010 and the growth curve had a little decline in 2011 (8.7%). It needs to be noted that the percentage of syphilis increased in the period

2002–2011 (0% in 2002, the peak 0.8% in 2010 and 0.6% in 2011) as shown in Fig. 5.

Drug use by injection was significantly associated with the transmissions of HCV, HBV, and HIV, which was similar to many studies reported [38–40]. Research indicated that the prevalence of HCV among groups of IDUs ranged from 30% to 98% [38–40]. Despite the existing data having many limitations,

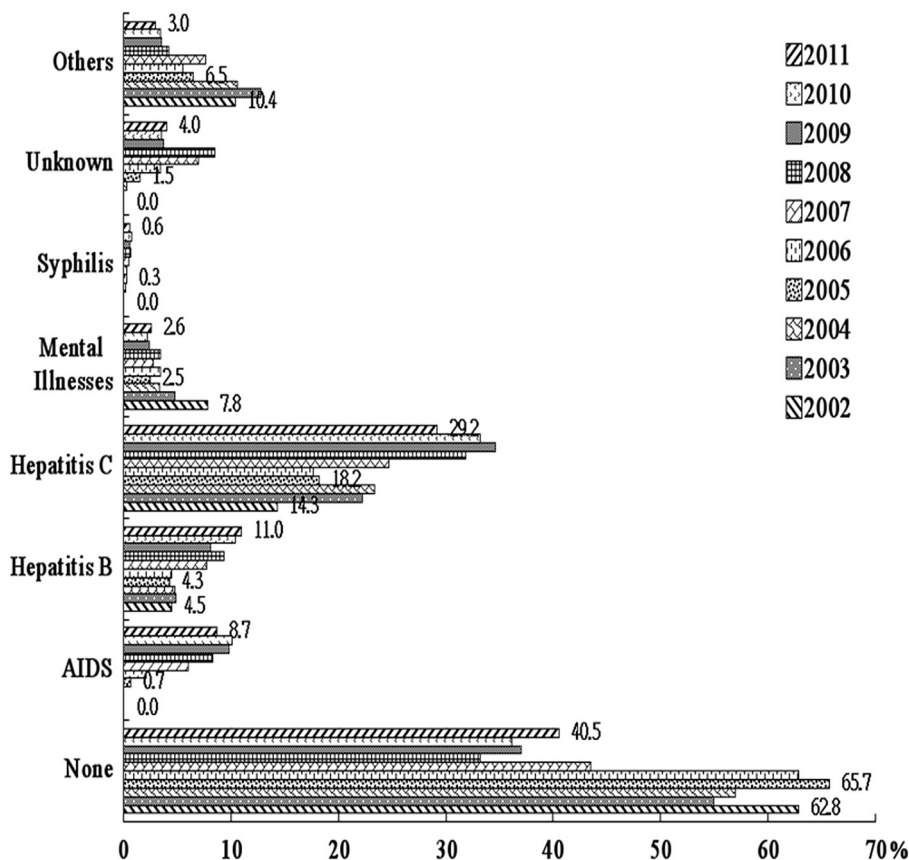


Fig. 5 – The trends for health problems in drug abusers reported by medical institutions in Taiwan from 2002 to 2011.

the results suggested that the transmission of blood-borne diseases remained one of the health consequences among drug abusers. Drug use by injection is an important cause of HIV transmission in most countries. Mathers et al [37] estimated that about 3.0 million (range 0.8–6.6 million) people worldwide who inject drugs might be HIV positive.

In Taiwan, the response to blood-borne virus transmission among IDUs has primarily focused on HIV. Maintaining and strengthening the response to HIV among IDUs remains crucial, however, the significance of viral hepatitis must receive greater recognition than it does at the present moment. Investment in and development of comprehensive and effective strategies to prevent the transmission of viral hepatitis, and reduce resultant morbidity and mortality among IDUs, are urgently required.

4. Conclusions

The drug abuse problem has been one of the toughest issues for governments around the world. Risky injecting and sexual behavior among drug users are major public health concerns because of the high risk for the transmission of blood-borne infections such as HIV, HCV, and HBV, especially among the marginalized and most at risk populations.

In Taiwan, traditionally abused drugs like heroin and methamphetamine continue to be the top two abused drugs reported by medical institutions. By contrast, users of emerging drugs such as ketamine have increased gradually over the years and the abuse of MDMA has seen a resurgence.

Conflicts of interest

All authors declare no conflicts of interest.

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