



BULLETIN ON NARCOTICS

1 and 2, 1989

ue on drug abuse assessment

UNITED NATIONS

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DIVISION OF NARCOTIC DRUGS
Vienna

BULLETIN ON NARCOTICS

Volume XLI, Nos. 1 and 2, 1989

Double issue on drug abuse assessment

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119834

U.S. Department of Justice
National Institute of Justice

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UNITED NATIONS
New York, 1989

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Development and application of a system for monitoring drug abuse: the Malaysian experience

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ABSTRACT

Monitoring systems are useful epidemiological instruments for assessing the problem of drug abuse. The rapid growth of the drug dependence problem in Malaysia led to increased awareness of the need for a system for continuous monitoring of the situation. Preliminary work on the design of an appropriate monitoring system was initiated in 1976. A fully integrated national reporting system was established in 1978, linking all public services and agencies coming into contact with drug-dependent persons, including law enforcement agencies, drug abuse treatment and rehabilitation centres, and social and welfare institutions. The information system included a mechanism for systematic gathering, processing, analysing and presenting essential data on the prevention, control and management of drug abuse problems. It also included reporting on drug-related events, such as hospitalizations and arrests, as well as data on known drug-dependent persons and new cases of dependence. The system has been used for routine monitoring of the extent, trends, patterns and other characteristics of drug abuse problems in Malaysia, providing basic information for policy-making and programme planning. On the basis of data generated by the system, it was estimated that the prevalence rate of drug-dependent persons per 100,000 population increased from 84.3 in 1976 to 754.6 in 1986. It was estimated that there were 119,001 drug-dependent persons in Malaysia in 1986.

Introduction

Assessment of the drug abuse situation is crucial for the evaluation and development of national policies and programmes for drug abuse prevention and control. Drug abuse management requires information on the extent, nature and distribution of the problem. Such information also aids policy makers and programme planners in deciding on the extent of the effort required to deal with drug-related problems and in establishing priorities. Thus, it is essential to develop reliable methods for obtaining early, rapid and accurate information on changes in the extent, distribution and types of drug-related problems at the community, provincial and national levels.

Several epidemiological methods have been developed to attain these goals. Systematic monitoring of the drug abuse situation can be achieved

through the development of a drug abuse reporting system. A reporting system may be defined as "an information system based on reports submitted to a central body using systematic reporting procedures" [1]. It compiles and provides core information on the extent and nature of the drug problem, as well as trends in use over time.

There are three major types of systems: event-reporting systems, case-reporting systems and case registers. An event-reporting system records only the number of drug-related events, such as hospitalizations, arrests and seizures of reporting institutions, without counting the actual number of individuals. With a case-reporting system, however, identification of individuals within the same institution is possible. A case register is capable of linking events that occur to the same individual in different settings. An individual who is reported separately by several institutions can be identified as one case rather than several cases. Hence, each of the systems has its own advantages and limitations, which have been described in detail elsewhere [1].

Development of a monitoring system in Malaysia

The drug abuse problem in Malaysia began to escalate in the early 1970s, thus making even more urgent the need to develop a systematic method for assessing drug abuse. This led to the conceptualization and initiation of work on the establishment of a national drug abuse reporting system in 1974 [2].

As an initial step towards developing such a system, the Drug Abuse Research Group at the University of Science in Malaysia developed an experimental state drug profile monitoring system and the State of Selangor was selected to test the feasibility and validity of the system. All agencies that were most likely to come into contact with drug-dependent persons were identified and urged to participate. These included all governmental and private hospitals and clinics, the departments of education, welfare, culture, youth and sports and all law enforcement agencies in the state.

The agencies were requested to provide monthly information on the drug-dependent persons who had come to their attention. This represented an aggregated case-reporting system whereby all individuals in contact with the same institution were identified and reported. The system proved to be capable of providing the total number of drug addicts identified by each agency in Selangor, a general profile of the known addicted persons, and any broad changes in the drug abuse pattern within the state. The system, which was operated at low cost, maintained a high level of confidentiality regarding the cases reported.

Aggregated reporting, however, was found to have inherent limitations. The primary limitation was the inability to identify repeated reporting of individuals. As a result, the total number of cases reported by all agencies became unreliable because of the problem of double-counting. It also did not allow the linking of cases between agencies or case follow-up. Aggregated data could only provide a generalized picture of the drug abuse situation and had much less analytical capability and flexibility compared with individualized data.

Realizing the problems and limitations of aggregated reporting, a decision was made to develop an individual case register with a monitoring system linking all detection and detoxification centres in government hospitals to the system. This proved to be successful and, in 1977, the Cabinet Committee of the Government decided to expand the system to include all major public authorities in Malaysia that were most likely to come into contact with drug-dependent persons. By 1978, the police, the Ministry of Health, the Ministry of Welfare Services and private medical practitioners formed a network of reporting sources of known drug-dependent persons. Under this system, all police stations, general and district hospitals, social welfare centres and general medical practitioners within each state became reporting sources. In 1981, the prisons and Customs departments were also linked to the system.

Type of system and its goals

The National Drug Abuse Monitoring System is an integrated system that provides event-reporting and case-reporting and also functions as a case register. The system is based on reports of "events" or contacts with drug-dependent persons made by the various reporting agencies. Events refer to hospital admissions, arrests or seizures occurring during a given period. The system allows the linking of different events for the same individual in the same reporting institution. For example, two hospitalizations of the same individual within a given reporting agency represent only one case. The system enables multiple events involving the same person in the same institution to be identified as a single case. Since the system also functions as a case register, it is capable of linking events that occur in different settings but involve the same individual. Therefore, reports of a person who is arrested and hospitalized are analysed as the related experiences of one individual in contact with different reporting agencies. In other words, an individual who is reported separately by several institutions will be identified as one case rather than many cases.

The National Drug Abuse Monitoring System is a drug information system with a mechanism for gathering, processing, analysing and presenting information required for planning and implementing services relating to the control, prevention, treatment and rehabilitation of drug-dependent persons. It serves as an effective epidemiological tool and an essential information source for drug abuse management in Malaysia. Its goals are:

- (a) To provide current epidemiological information on drug abuse in the country and to update such information;
- (b) To identify trends in the nature of drug abuse over time and variations between geographical locations;
- (c) To provide relevant information for effective planning, evaluation and management of drug abuse programmes.

Reporting agencies and reported drug abusers

Linked to the monitoring system are three law enforcement agencies (police, prisons and Customs), treatment centres (all hospitals, private doctors

and rehabilitation centres), and all drug rehabilitation centres under the Ministry of Home Affairs and a non-governmental agency, the National Association for the Prevention of Drug Abuse.

Each agency provides information on a different population of addicts. Drug addicts identified by the criminal justice system consist of three groups: arrested individuals who are suspected addicts and whose addiction is later confirmed through self-confession and a positive urine test; individuals who are arrested for possession or sale of drugs or possession with intent to traffic and are confirmed drug users; and criminals arrested for non-drug-related offences and found to be drug abusers.

Reports on drug-dependent persons produced by the treatment centres are on persons who were referred to a treatment programme by the criminal justice system and volunteers for treatment and rehabilitation. Drug-dependent persons reported by treatment centres also include all cases referred by families, school systems, employers and social welfare agencies.

It should be kept in mind that each of these special categories of drug abusers are representative of subgroups that may or may not reflect completely the epidemiological profile of the drug-using segment of the general population. They are, however, individuals about whom extensive data can be obtained.

Types of information collected

A standardized instrument was developed for collecting data. Core information included:

- (a) Administrative details (reporting agency, identification card number of each individual);
- (b) Background characteristics of each individual (including ethnic affiliation, sex, age, marital status, date of birth, educational level attained, occupation and monthly income);
- (c) Pattern and history of drug use (age of initiation, types of drugs used in the past and at present, duration of use, daily expenditure, source of drugs, reasons for use and discontinuing use);
- (d) Treatment experience;
- (e) Criminal history (past arrests, convictions and imprisonment);
- (f) Drug-related crimes (type of drug and amount seized, type of crime committed and criminal status of the addict).

Data collection procedures

Officials within the agencies are responsible for the collection of information on confirmed drug abusers (confirmation through a positive urine test and/or a confession). There is a continuous flow of information to the central co-ordinating agency, the Centre for Drug Research. Each reporting agency submits, on a monthly basis, all individual records.

Each report is checked manually at the Centre for Drug Research. Complete reports are processed and incomplete ones are returned to the reporting agency.

Data processing

Information from all individual record forms is manually edited and entered into the computer. All items are checked for errors. The monitoring system represents a central case register where information concerning identified drug addicts obtained from the various agencies are computerized and stored.

Duplication checks are done by scanning identity card numbers to see if the cases were, in fact, reported for the first time. The system is able to distinguish, for example, between one addict reported five times and five addicts each reported once. Thus, all multiple counting of the same individual is avoided and a case file of each reported individual is established through record linkage.

The monitoring system functions as a data bank where information on known drug addicts is readily available. The epidemiological data on the drug abuse situation in the country are updated by the constant flow of incoming information. The data are then analysed and monthly statistical reports are produced. Such reports provide relevant information on incidence, prevalence, distribution and other indicators of the drug abuse situation in Malaysia.

Examples of applications of information generated by the system

Data from the system are useful for epidemiological research and for the planning of drug abuse prevention, control, treatment and rehabilitation. Information from the system is used for assessing the extent, distribution and pattern of the drug abuse problem in Malaysia. Data on the socio-demographic characteristics of drug-dependent persons, the type and pattern of drug abuse, the severity of the drug problem and variations in drug abuse activities between regions, together with other relevant data, have been found to facilitate programme planning and policy-making in the field of drug abuse control.

The system provides data over a period of time on cases and their reported contacts with law enforcement, treatment and other agencies.

Information from the monitoring system facilitates the assessment of changes in the reported incidence and prevalence of the drug abuse problem. The number of known addicts is an indicator of the total number of addicts, including those unknown. Changes in the former usually reflect changes in the latter. This has been supported by other studies [3]. Based on certain assumptions, case registers are also used to estimate the incidence and prevalence of drug abusers in the population.

Since the establishment of the integrated system in 1978, the Centre for Drug Research has been producing monthly statistical reports that present and

update of the status of the problem so that it can be monitored on a regular basis.

Some results of the analyses of data [4, 5] are discussed here to demonstrate applications of information collected by the system.

Trend analysis of the extent of the problem

Routine and systematic collection of information on reported drug-dependent persons enables the monitoring of incidence and prevalence of the problem over time. Figure I presents the reported incidence of drug dependence in Malaysia.

In 1970, a total of 711 drug-dependent individuals were identified and, by 1975, the number of identified persons had increased to 5,078. In 1976, there were twice as many new cases as in 1975, and the figure remained high in the late 1970s. The number of new cases of drug dependence reached its peak in 1982, when 14,334 were reported. Since 1983, however, there has been a downward trend. In 1986, only 7,329 new cases of drug dependence were recorded.

In 1970, the reported incidence of drug dependence was 6.8 per 100,000 population (see figure II).

The rate increased to 22.4 per 100,000 in 1974, 43.5 in 1975 and 84.3 in 1976. There were substantial fluctuations in the annual rate from 1977 to 1981. These may have been associated with the availability of drugs. In the period 1978-1979, the opium crop in the Golden Triangle, the area where Burma, the Lao People's Democratic Republic and Thailand meet, was badly hit by drought and disease, resulting in a severe drug shortage. This was followed by a decline in the incidence of new cases in 1979 and 1980. Bumper harvests coincided with a rise in incidence from 1981 to 1983.

The incidence rate declined from 82.8 per 100,000 in 1983 to 66.5 in 1984 and finally reached a low point of 46.5 per 100,000 in 1986. Two key factors contributed to this decline:

(a) The increase in community and individual awareness of the consequences of drug dependence, resulting in a lower number of persons experimenting with drugs;

(b) The effective joint application of law enforcement activities and judicial measures.

In 1986, there were approximately 119,000 known drug addicts in Malaysia (see figure III). The reported prevalence rate of drug-dependent persons, which had increased gradually from 1970 to 1975, had risen from 6.8 per 100,000 population in 1970 to 754.6 per 100,000 population in 1986, or 111-fold.

From the foregoing, it is clear that the monitoring system can be used as a barometer for measuring the drug dependence problem, based on the assumption that the number of drug-dependent persons in the population is a constant function of the number of cases identified by the system.

Figure I
Trends in reported incidence of drug-dependent persons, 1970-1986

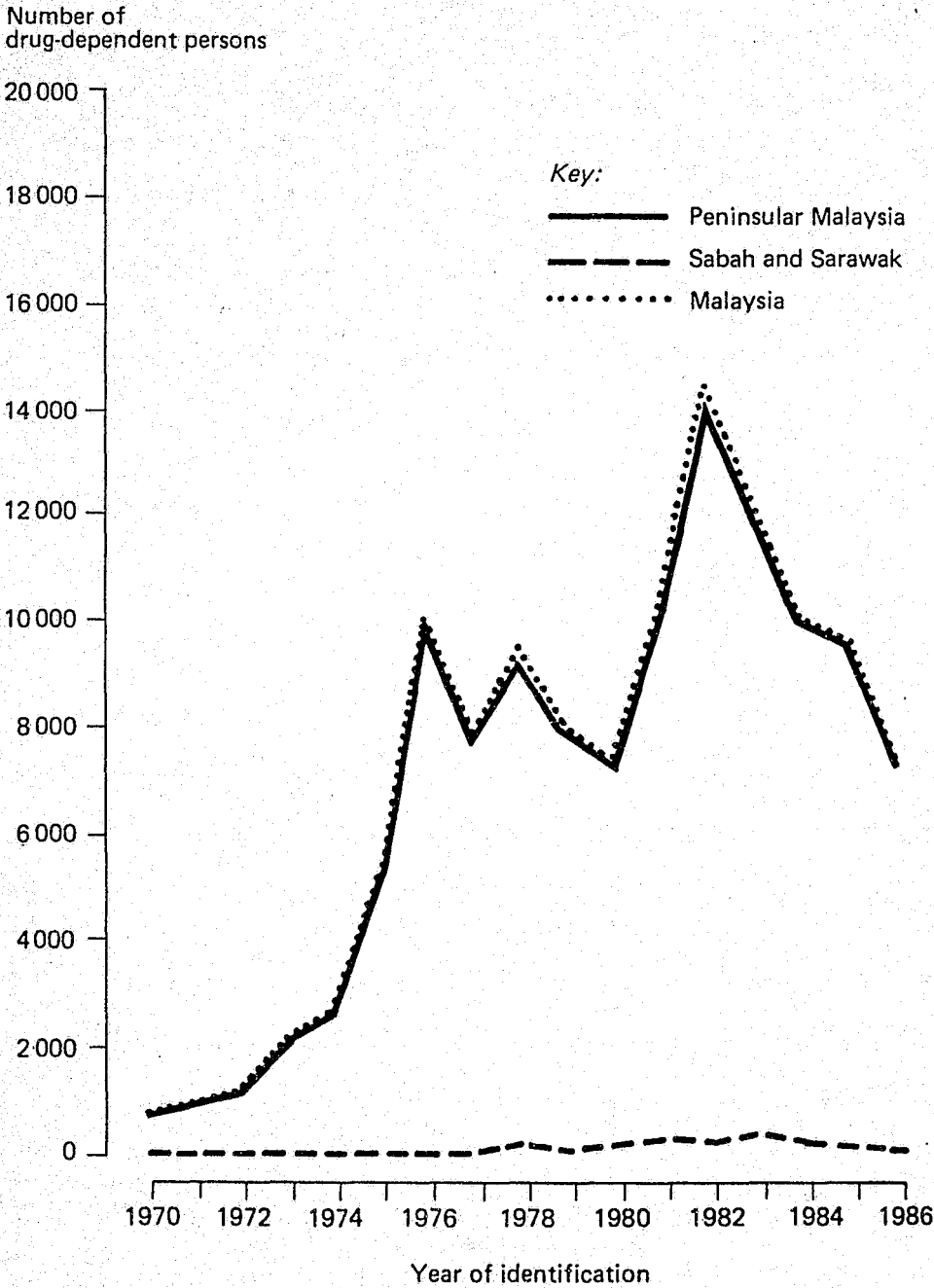


Figure II

Trends in reported incidence of drug-dependent persons, 1970-1986

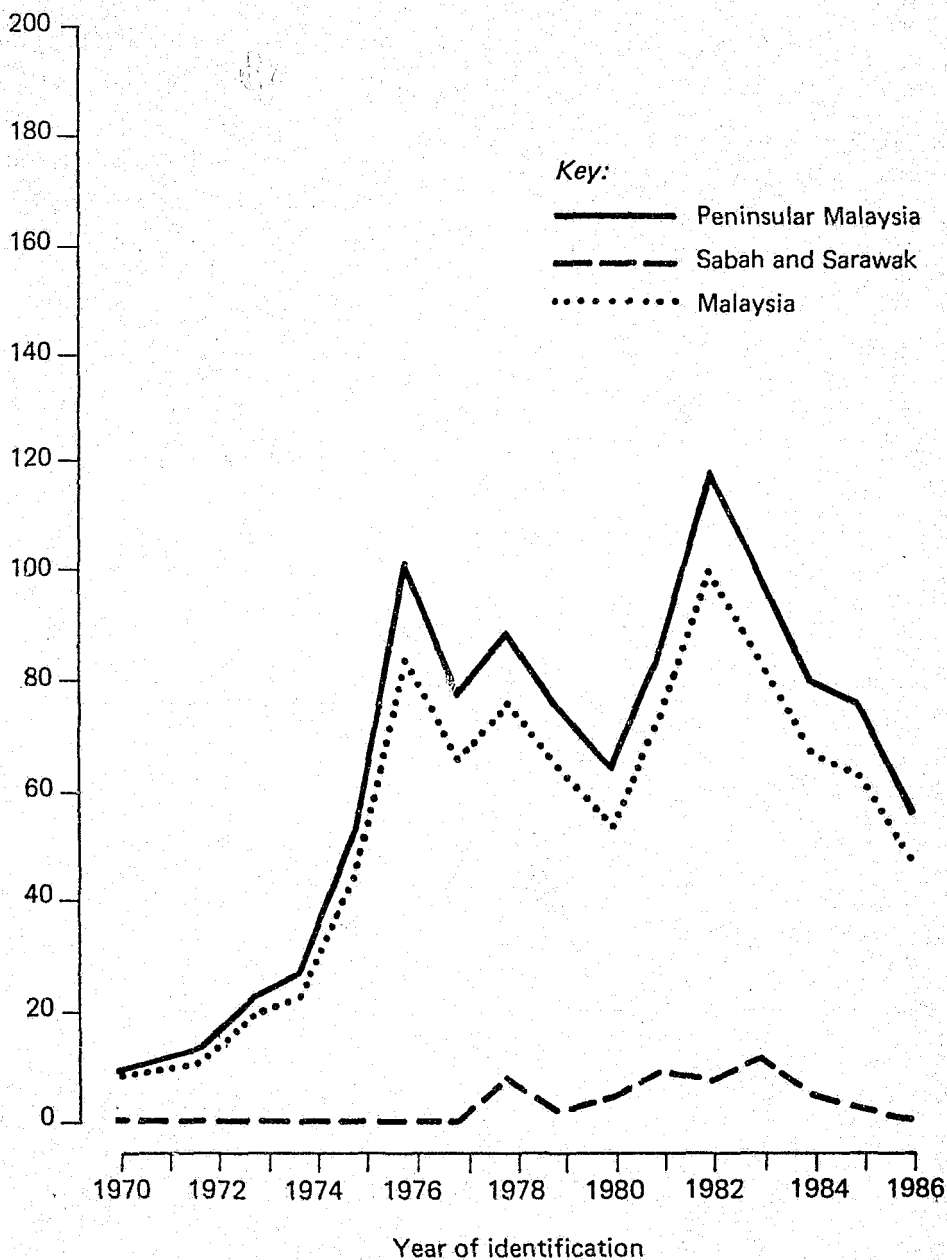
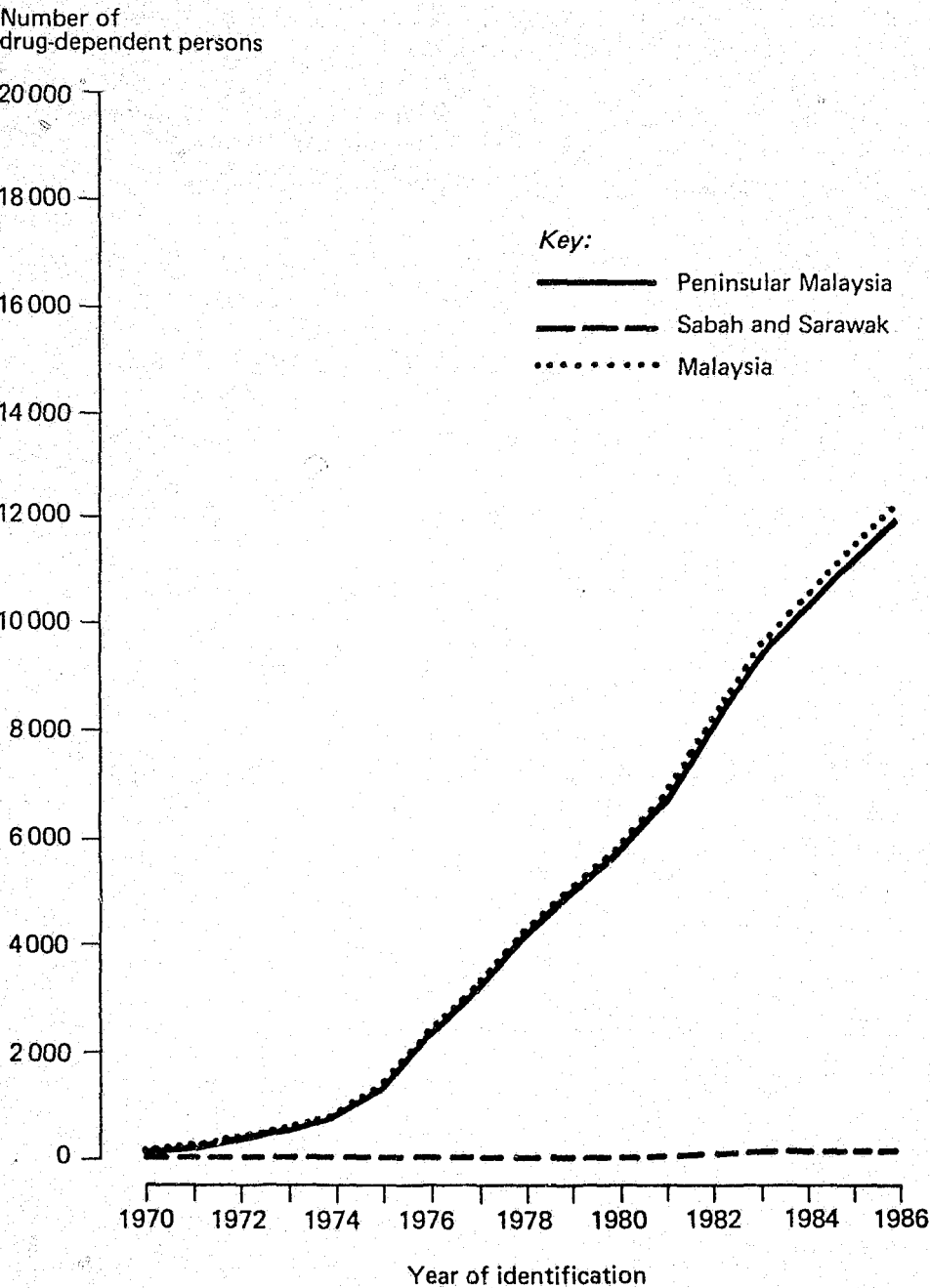
Rate per
hundred thousand of population

Figure III
Trends in reported prevalence of drug-dependent persons, 1970-1986



Based on systematic and complete reporting of drug-dependent persons identified over time, the indicator dilution formula described by Woodward [6] was applied to estimate the prevalence of drug dependence in Malaysia. To illustrate this, the overall prevalence of drug dependence at the end of 1984 was determined using this method of estimation [4].

The number of cases detected in 1979 and 1980 serve as the baseline in the explanation of the method of calculation. The prevalence of drug-dependent persons in Malaysia at the end of 1984 was calculated as follows:

Sample 1 = cases contacted in 1979 and 1980

Sample 2 = cases contacted in 1981 and 1982

Sample 3 = cases contacted in 1983 and 1984

Let N_{1984} = Number of drug-dependent persons in Malaysia at the end of 1984

N = Sum of total drug-dependent persons contacted by all the reporting agencies from 1979 to 1984 = 43,487

f_{111} = Number of drug-dependent persons seen in samples 1, 2 and 3 = 1,426

f_{221} = Number of drug-dependent persons seen in sample 3 only = 15,167

f_{122} = Number of drug-dependent persons seen in sample 1 only = 5,927

f_{212} = Number of drug-dependent persons seen in sample 2 only = 12,875

f_{121} = Number of drug-dependent persons seen in samples 1 and 3 = 1,371

f_{211} = Number of drug-dependent persons seen in samples 2 and 3 = 4,858

f_{112} = Number of drug-dependent persons seen in samples 1 and 2 = 1,863

Estimation of the total population of drug-dependent persons:

$$\begin{aligned}
 N_{1984} &= N + \frac{f_{111} \times f_{221} \times f_{122} \times f_{212}}{f_{121} \times f_{211} \times f_{112}} \\
 &= 43,487 + \frac{1,426 \times 15,167 \times 5,927 \times 12,875}{1,371 \times 4,858 \times 1,863} \\
 &= 43,487 + 133,101 \\
 &= 176,588
 \end{aligned}$$

For the period from 1979 to 1984, computations were based on agency claims that the number of cases were underreported by about 31 per cent. This resulted in an adjusted estimate:

$$(N) = 1.449 \times 176,588 = 255,876$$

It should be mentioned that the estimated population refers to active regular drug-dependent persons. Drug experimenters and irregular users are not accounted for in this estimate.

An individual's name is deleted from the case register when he or she has not been reported for a duration of five years after completion of treatment. Deaths are also registered by the system.

Characteristics of reported drug users

The development of effective intervention programmes requires accurate and relevant information about the characteristics of drug-dependent persons. The monitoring system collects core information that enables authorities to plan and implement appropriate and effective intervention measures.

An analysis of the profile of all persons reported for drug dependence for the first time each year from 1975 to 1986 shows that an overwhelming majority (63.5 per cent) of the drug-dependent persons reported were in their twenties. More than 95 per cent of them were males. There were no significant ethnic variations among them. Drug dependence is a predominant problem among unmarried individuals. Almost three out of four (72.4 per cent) drug-dependent persons identified were single.

About half (44 per cent) of the reported drug-dependent persons were employed as labourers while one in four was unemployed. White-collar workers accounted for a small proportion (3.2 per cent) of the total and less than 2 per cent were students. More than half (58.1 per cent) of the employed drug-dependent persons earned below 351 ringgit a month and one in three earned between \$M 351 and \$M 600 a month. The reported drug-dependent persons were also found to have a history of criminal involvement. About 40 per cent had previous arrest records. One in three had been previously convicted and incarcerated. Possession of drugs was the most common crime committed.

Trend analyses indicated that the characteristics of known drug-dependent persons remained generally stable during the period 1975-1986. The majority of the known drug-dependent individuals identified each year were unmarried males in their twenties who were either unemployed or were employed as labourers.

Pattern of drug dependence

In addition to identifying high-risk groups involved in drug dependence, the monitoring system also keeps abreast of the current pattern of drug abuse and changes over time.

Of the drug-dependent persons identified between 1975 and 1986, the majority (66.8 per cent) had initiated drug use between the ages of 15 and 24. The trend in the age of initial drug use is towards an older age. Prior to 1979, the majority had initiated drug use in their teens. Since 1979, however, the

majority have reported initially using drugs in their twenties. This finding must be interpreted cautiously since changes in the socio-legal environment within Malaysia have made the reporting of drug use more discriminate. Since 1979, the year of initiation to addictive drug use has been reported; up until then, initiation had included experimental use.

Heroin was the primary drug abused by the overwhelming majority (over 80 per cent) of drug-dependent persons at the time of contact. Nicotine (cigarettes) was the next most frequently used substance, while cannabis was used to a much lesser extent. The use of psychotropic substances, such as tranquilizers, barbiturates, amphetamines and lysergic acid diethylamide (LSD), was very uncommon. The pattern of drug abuse has been fairly stable over the past 12 years, with heroin remaining the most frequently abused drug.

Almost 90 per cent of the drug-dependent persons reported each year were users of a single drug. There has been an upward trend in the number of multiple drug users in recent years.

Peer-group influence was the major reason (53 per cent) for initial drug use. The proportion of those who initially used drugs for reasons of deriving pleasure has increased in recent years (19 per cent in 1975; 55 per cent in 1984). There has also been an upward trend in the proportion of those initiating drug use as a result of curiosity.

The majority (73.2 per cent) of reported drug-dependent persons had used drugs for four years or less. Drug pushers who were also abusers were the most common suppliers of drugs (approximately 70 per cent). Friends of the abusers represented another major source of drugs.

The findings presented here and elaborated upon in more detail in other reports [4, 5, 7] are particularly useful for developing policies and programmes for drug abuse control. They provide programme planners and policy makers with valuable information regarding the scope of drug-related problems and the groups most often affected. Trends provide clues to future drug-related problems.

Data limitations

Limitations of the monitoring system, such as the presence of systematic reporting biases resulting from changes in reporting and/or treatment practices, should be considered when interpreting the data. For example, in recent years, law enforcement agencies have expanded their activities in relation to trafficking and controlling drug distribution networks. Therefore, changes over time may reflect changes in reporting and activities rather than real changes in the extent of the problem.

Although the system updates the register on a monthly basis, another limitation is underreporting or the delay in reporting cases to the central agency as a result of practical and administrative problems. This should be taken into consideration when determining the extent of the problem.

Concluding remarks

The National Drug Abuse Monitoring System is a massive and complex network. In order for it to be an accurate, comprehensive and effective information source, a substantial commitment from all co-ordinating institutions is required in reporting all cases of known drug-dependent persons.

All sources of data, including surveys and observational studies, have limitations. In spite of the interpretational difficulties resulting from these limitations, the system is useful for epidemiological purposes. The strengths of the National Drug Abuse Monitoring System are that it draws information from all possible sources in Malaysia that come into contact with drug abusers. The reporting from these sources is uniform, highly reliable and almost comprehensive, and the tabulations are up to date. The system differentiates between events, new cases and established cases. Thus, it is currently the most comprehensive source of information about drug-dependent persons in Malaysia.

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