A Comparison of Drug Abuse Situation in Hong Kong with Selected Countries

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EXECUTIVE SUMMARY

1. This study attempted to compile drug statistics of Hong Kong and eight other selected countries, and to compare the situation of drug abuse between Hong Kong and these countries.

2. Relevant literature and data of drug abuse were identified by computerised search of databases. Relevant departments or offices of selected countries were also liaised in order to obtain raw data of drug statistics. The data were cleaned, triangulated, and summarised in graphical format (Appendix).

3. The situation of drug abuse of Hong Kong was milder than the western countries (i.e., USA, UK, Australia) selected in the study. However, many drug abuse indicators of Hong Kong were slightly worse than Singapore and Malaysia. The situations of drug abuse of Hong Kong, China, and Taiwan were similar.

4. Cannabis was the commonest substance of abuse in USA, UK, and Australia whilst heroin and opium were the commonest substance of abuse in most Asian countries selected in the study. The epidemic potential of cocaine and amphetamine was discussed. Polydrug abuse was relatively rare in Hong Kong, compared with other countries.

5. Multivariate analysis of 26 socio-economic factors showed that divorce rate and tourism (as measured by receipts from visitors) contributed to a linear regression model of prevalence of drug abuse. The higher the divorce rate and earning from tourism, the higher the prevalence rate of drug abuse. The implications and the limitations of this modeling were discussed.

6. Eight recommendations were made. Hong Kong should strengthen her liaison with China and Taiwan in terms of mutual exchange of drug statistics and intelligence. Apart from heightened vigilance of drug abuse situation of the neighbourhood, Hong Kong could conduct regular household surveys and more frequent school surveys.

A comparison of drug abuse
situation in Hong Kong with selected countries

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1. INTRODUCTION

1.1 It is generally recognised that drug abuse is a complex condition, involving socio-cultural, psychological and biological factors. The extent and pattern of drug abuse, however, vary across different cultures and societies. Yet despite the fact that most countries compile drug statistics and carry out drug-related researches for their own reference, an up-to-date comparison of the drug scene around the world is conspicuously lacking.

1.2 A comparison of drug abuse situation between Hong Kong and other countries will promote the understanding of Hong Kong drug problem in a global perspective. It will help us to understand how serious is drug abuse situation of Hong Kong in comparison with other countries. A comparative study will also reveal hidden relationships between drug abuse situation of Hong Kong and her neighbour. Besides, the analysis of the drug data will disclose the similarities and differences between Hong Kong and other countries in terms of the extent and pattern of drug use and abuse. These will allow us to determine if certain historical, cultural, and socioeconomic factors are associated with the pattern and extent of drug use in a society. Eventually it is hoped that the research will establish an aetiological model of drug abuse at cross-national level.

1.3 In view of a rising tide of drug abuse in Hong Kong, a research of this nature is clearly of extreme relevance and importance. For not only will it help us to identify those varying socio-cultural and psychological factors associating with drug abuse in our society, thereby advancing our knowledge and understanding of the drug problem, it may also enable us to develop more appropriate and effective strategies to combat against the drug problems in Hong Kong.

2. CONCEPTUAL ISSUES

2.1 A major obstacle of cross-national research in drug abuse is the lack of uniformed definition in drug abuse terminology. A term may mean different things to researchers or government officials of different countries. Besides, researchers from different countries may modify the measuring parameters and methods, rendering comparison difficult, if not impossible. Therefore, it is important to begin the report with a brief glossary of commonly used concepts and epidemiologic constructs.

2.2 Incidence & Prevalence

2.2.1 The frequency of a phenomenon, e.g. drug abuse, within a population can be measured and expressed by several different parameters. Each of these parameters conveys specific information on the "commonness" of the phenomenon. To obtain the complete picture on the severity of a phenomenon, a combination of constructs may be required.

2.2.2 ***Incidence*** is a measure of the "force of morbidity or mortality". It is the number of *new* events occurring over time among members of the population who are candidates for such events. The parameter is usually expressed by incidence rate or incidence density, which is the number of new events occurring per unit of population per unit time. The incidence density can be assessed for an instantaneous time point by the slope of a curve measuring change in disease-free population over time, i.e. the rate of changes of new events. This instantaneous rate of change is often referred to as the hazard rate or the force of morbidity.

2.2.3 Incidence is generally measured by prospective cohort study. The population is first defined, and individuals who have already had the outcome of interest will be excluded. The population is then followed up over a period of time and individuals who developed the outcome of interest are identified. Although the design appears to be simple, prospective cohort study is very expensive and time consuming to run, particularly if the outcome of interest is an uncommon condition (e.g. incidence rate less than 10%). Therefore, few countries can afford to conduct prospective cohort study on drug abuse.

2.2.4 Although the measurement of incidence rate is expensive, the incidence of drug abuse can still be measured by other parameters, like hazard rate. As the hazard rate measures the rate of change of new cases, no prospective cohort study is required. Instead, notification figures of central registry can be used. Assuming the proportion of drug abusers being notified remains stable across time, the rate of change of newly reported persons will be an approximation of the hazard rate or the force of morbidity.

2.2.5 ***Prevalence*** or prevalence rate is the proportion of a population who have a particular condition at a point or over a period in time (e.g. one month prevalence). The prevalence can also be expressed by lifetime prevalence rate, which is the proportion of a population who will develop the condition of interest during the course of their lives.

2.2.6 Both newly onset cases and cases that begin before the study period contribute to prevalence. In a community where the rates of birth, death, migration are balanced and the disease rates are stable, prevalence is proportional to the incidence rate multiplied by the average duration of the condition.

2.2.7 Prevalence rate is measured by cross section study. A population is first defined, and all individuals within the population are examined to ascertain the presence or absence of the conditions of interest. The study population will not be followed up, and when the condition of interest is uncommon, the prevalence rate is measured for population subgroups, where the condition of interests is known to be more common.

2.2.8 In drug abuse research, prevalence rate is generally measured by school surveys as household surveys are expensive to conduct. However, most psychiatric epidemiologic studies measure the prevalence of drug abuse, in addition to other psychiatric disorders. These studies often adopt standardized research design and protocol, and structured interviews are used to obtain reliable diagnosis. They are therefore idea for the purpose of cross-national comparison of drug abuse epidemiology.

2.3 Case Definition

2.3.1 The issue of case definition in drug addiction research is a confusing area and is beyond the discussion of this report. However, the comparison of drug statistics will be difficult unless different definitions of drug addiction are understood. For this purpose, these definitions are presented as follows.

2.3.2 Drug use refers to the use of any drug without proper medical indications, irrespective of the frequency or consequence. In general, when the drug use leads to physical, psychological and social harm, it becomes drug misuse/ abuse. When drug use becomes habitual (including psychological craving) and the absence of drug will produce withdrawal reaction, drug dependence has developed. While different drug workers may have slightly different definitions of drug misuse, drug abuse, and drug dependence, these definitions do not vary significantly from the above concepts.

2.3.3 Another criterion commonly used to define caseness is the frequency of drug use. The proportion of population who has **ever used** drug before reflects the population that has been exposed to drug, which in turn, is related to the availability of drug within the community. While a substantial proportion of the population has ever used drugs at some point of their life, only a small percentage of them proceeds to regular use. The severity of regular drug use is further categorised by whether drug has been taken **over past one month** or **twelve months**.

3. DRUG STATISTICS

3.1 There is no single measurement that can fully and accurately reflect the size of drug problem within a community. Instead, different statistics provide information on different facets of drug problem. To obtain a full picture of the situation of drug abuse, an intelligent use of the drug statistics available and a good grasp of the advantages and shortcomings of different measurements are required.

3.2 Treatment Figure

3.2.1 In some countries, legislation requires medical practitioners or drug workers (e.g. social workers) to notify a confidential central registry the personal particulars of individuals under treatment. Informed consent may be required in certain countries, e.g. Hong Kong, and the Security Branch is usually responsible for the upkeeping of the registry. The treatment figure provides a rough estimate of prevalence rate, based on the number of persons who have sought treatment for their drug dependence over past one year. This figure therefore reflects the severity of drug abuse problem as well as the needs of the treatment service within a community.

3.2.2 However, there is no universal standard in the reporting of treatment figures. The range of reporting treatment agents varies from government-run clinics to private hospitals, and centres run by non-government organizations. Some governments only provide partial treatment figures (i.e. a sample of the government-run treatment centres). Besides, the surveillance is limited by the range of substances that is notifiable and is usually limited to only a few classes of drugs. Solvents and new substances of abuse are often absent from the reporting system. Besides, the case definition is usually not clearly described. The notifiable persons range from irregular users who sought counseling to individuals with long term and severe dependence.

3.2.3 Those abusers who are notified to the central registry is probably only a small proportion of the whole drug users population. Some abusers will not have sought medical treatment or will be waiting for treatment and will not have been notified.

Thus, there may be a significant increase in the abuse of a drug without being immediately reflected in the treatment figures. The figures are also influenced by the conscientiousness of drug workers in their notifications. Researchers in UK have demonstrated that there are considerable local variations in the extent to which the number of notified addicts under-estimates the number of regular users of notifiable drugs. Surveys also show that only a fifth of regular opiate users in London is recorded in these statistics. Nonetheless, despite these limitations, the statistics do provide an indication of the trends of drug abuse within a society.

3.3 Arrest/ Conviction Figure

3.3.1 Many governments base the estimate of the number of drug abusers on the number of arrest during the course of a year. Drug abusers may be arrested for drug use, possession of illicit drugs or drug trafficking. Some countries may not include arrests of drug trafficking in the annual estimate of drug abusers. There is also variation as to which drugs of abuse are included in the annual figures.

3.3.2 The absolute figures of treatment or arrest are gross under-representation of the number who actually abuse drugs in one year. Extrapolation of these absolute figures is essential in the estimation of the actual number of drug abusers in a given year. It is important to note that arrest/conviction figures are affected by changes in legal definition, as well as the efficiency of the law enforcement agents.

3.4 National Survey

3.4.1 In theory, repeated epidemiologic surveys of the whole population should provide the best assessment of the extent and pattern of drug problems. Unfortunately, few countries could afford such practice as this method is costly and time-consuming. The proportion with serious substance use problems in most populations is so small that surveys find it inefficient to ask about problems in any detail.

3.4.2 Besides, all national surveys tend to underestimate the number of drug abusers because of the circumstances in which the interviews take place and because many drug abusers do not live in a place that is recorded in national register. For example drop-outs and truants may be missed in school surveys.

3.4.3 The concern that subjects would falsely deny use, which was previously believed to be a major impediment to getting accurate survey results, has been fairly well laid to rest. It has been shown that privacy, guarantees of confidentiality, and a non-judgmental deportment on the part of the interviewer were sufficient to insure willingness to disclose substance use and abuse. However, these studies were conducted in Western countries at a time when illicit drug use was commonplace; we cannot assume that the same would hold true in other societies or other times.

3.4.4 To reduce the cost and the time involved in national survey, one can reduce the sampling frame to a smaller but more specific sample, e.g. one locality or one class of schoolchildren. On the other hand, the smaller and more closely targeted is the sampling frame, the more difficult to generalise the results to the rest of the population.

3.5 Cross Sectional Psychiatric Epidemiologic Surveys

3.5.1 A classic example of study of this sort is the Epidemiological Catchment Area Study (ECA study) of America. The ECA study was a multi-site epidemiological and health services research study that assessed mental disorder prevalence, incidence, and service use rates in about 20,000 community and institutional residents. The survey used a structured diagnostic interview (Diagnostic Interview Schedule) as an assessment instrument, which allows a life time diagnosis of various mental disorders, including drug abuse/dependence.

3.5.2 This study has been replicated in many other countries, allowing cross-national comparison of epidemiology of mental disorders. As standardised methodology,

instruments and case definition were used, these were the only drug statistics that were entirely suitable for cross-national comparison.

3.5.3 However, ECA studies were not without shortcomings. Most of them were conducted in the 1980s and thus could not reflect the latest extend and pattern of drug problem. Besides, the studies used DSM-III classification for the purpose of diagnosis. DSM-III classification has been criticised for its inadequacy in covering the full spectrum of substances of abuse, notably cocaine.

3.6 Seizure figure

3.6.1 The quantity of drugs seized by the Customs provides an index of availability, but it reflects only imported drugs (i.e. excluding those manufactured within the country) and trends over time may reflect changes in Customs' practices and efficiency as much as drug trafficking. Besides, the data only reflect controlled drugs and other substances of concern, e.g. solvents, over-the-counter medicines are not included.

3.7 Mortality figure

3.7.1 This provides a useful reflection of the size of the population involved in serious drug problems. However, the validity of the data is much influenced by the accuracy of diagnosis and reported drug use. The time-lag between initiation of drug misuse and death makes them tardy indicators that change has occurred.

3.8 Triangulation

Triangulation of data is the combination of the results of several studies. Data from as many sources already existing are collected and compared, such as treatment data, arrest data and seizure data. The opinions of those who might be directly in touch with drug takers are also sought. Small-scales studies can then be undertaken in

specific areas. The data from various sources can then be compared to see if a coherent pattern emerges. This is the methodology of rapid assessment promoted by the United Nation International Drug Control Programme (UNDCP). It is often possible to assess the approximate scale of a problem but virtually impossible to estimate the exact extent.

4. STUDY OBJECTIVES

1. To compile statistics of drug abuse in Hong Kong and selected countries.
2. To define the characteristics of drug abuse situation in Hong Kong and selected countries.
3. To assess the severity of drug abuse problem in Hong Kong in relation to selected countries.
4. To compare the similarities and differences of drug abuse epidemiology between Hong Kong and selected countries.
5. To identify socioeconomic factors that may account for the *different-ness* of drug abuse in different societies. To formulate theory that may help to explain the similarities and differences in the extent of drug use in selected countries.
6. To formulate and recommend appropriate strategy that may help to curb the rising tide of drug abuse in Hong Kong.

5. METHODOLOGY

5.1 Research Design

5.1.1 To achieve the stated objectives, we adopted three different research strategies. First, we reviewed relevant drug abuse literature of the selected countries. This was then combined with a retrospective analysis of drug statistics of the selected countries. The trend, pattern and the prevalence of drug abuse of selected countries were then compared. Finally, within the constrain of the validity of the data, we conducted multivariate analysis of socio-economic factors that might be relevant to the problem of drug abuse. Analysis of psychological factors was proposed in the original protocol but was dropped because there were no valid and reliable variables that quantified psychology at "macro" or societal level.

5.2 Sampling

5.2.1 To allow meaningful comparison and statistical analysis, we propose to cover a heterogeneous sample of countries with different life styles, economic development, legal system, and varying degree of drug problem. Besides, as stated before, we would like to understand the situation of drug abuse in our neighbouring countries. Finally, the selected countries must have adequate amount of drug statistics that were available to the study. With all these, we proposed to cover the following groups of countries: 1. The western developed countries: specifically, the United States of America, United Kingdom, and Australia; 2. The Asian developing countries, i.e. Singapore, Malaysia, South Korean; 3. People's Republic of China, Taiwan, and Hong Kong.

5.3 Collection of data on situation of drug abuse

5.3.1 We began the study by conducting a computerized search of literature databases on medicine, social science and economics[1]. Using different combinations of key words, we attempted to identify as many articles as possible from the existing literature. More than 5,000 relevant articles were earmarked by this method, which was subsequently trimmed down to about 200. We retrieved these articles through the interlibrary loan service of the university library. These articles provided excellent review of the situation of drug abuse in various countries. We also made use of the bibliography of these articles to further identify articles that were not listed in the databases.

5.3.2 Although these articles protraited the situation of drug abuse in selected countries, most of them did not contain raw data to allow in depth analysis. We therefore decided to establish contact with the relevant departmental bodies of selected countries. We visited the Home Office of United Kingdom and Australia, and obtained raw data on drug statistics from China, Taiwan and Singapore via mail. We also used our academic connections with medical and drug abuse researchers of China (National Institute of Drug Dependence), Taiwan (Executive Yuen), and South Korea (Yonsei University College of Medicine) to obtain first hand information concerning the situation of drug abuse in their countries.

5.3.3 Apart from computerized data bases search and direct contact with overseas drug offices, we also screened the documents of ACAN library and identified useful materials and data for the study. Besides, we also made use of the data and reports collected by the Unit of Psychiatric Epidemiology Research of the Department of Psychiatry, the Chinese University of Hong Kong.

5.3.4 Last but not the least, we conducted systematic search of the Internet and identified various web sites that publish statistics of drug abuse in America.

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[1] Medline, PsychLit, EMBASE, social sciences citation index, social work abstracts, EconLit, current contents.

5.4 Distillation of the retrieved data

5.4.1 The above mentioned data gathering process gave us a huge amount of data, which could not be totally included in this report. We therefore selected several drug abuse statistic indicators (see DRUG STATISTICS) as a framework to capture the retrieved data on drug abuse. In the process of data collection, particular attention was paid to the following data sources:

1. central registry
2. national household survey
3. psychiatric epidemiologic survey
4. school survey
5. arrest figures
6. seizure statistics

5.4.2 Triangulation was used and the validity of each data point was checked against the figures obtained from different approaches. To allow cross-national comparison, the data of the year 1994 were used as far as possible.

5.5 Socio-economic statistics of the selected countries

5.5.1 We identified 26 socio-economic factors for the purpose of multivariate analysis. These factors were selected on the basis that they had been commonly quoted in studies of similar objectives and design. The relevant data were then obtained from the Britannaica Encyclopaedia and other official publications. We also contacted various departments of Hong Kong Government to obtain the relevant and updated data on the selected socio-economic variables. These data were then cleaned and adjusted as different countries measured the variables in slightly different manners.

5.5.2 Socio-economic factors selected

- Population - total population size
- Population density - persons per sq. mid, persons per sq. km
- Urban-rural - percentage of urban & rural area within the country

- Sex distribution (in %) - male, female
- Age breakdown (in %) - under 15, 15-29, 30-44, 45-59, 60 & over
- Religious affiliation (in %) - percentage of people have religious affiliation among total population
- Birth rate per 1,000 population
- Death rate per 1,000 population
- Natural increase rate per 1,000 population
- Total fertility rate (average births per childbearing woman)
- Marriage rate per 1,000 population
- Divorce rate per 1,000 population
- Life expectancy at birth (age) - male, female
- Death per 100,000 population caused by accidents, homicide & over other violence
- Average household size
- Annual income per household (in US $)
- Gross national product per capita (in US $)
- Population economically active (number of people): activity rate of total population (in %), participation rate of those aged 15-64 (in %), participation rate of female (in %)
- Unemployment (in %)
- Tourism (in US $) - receipts from visitors
- Radio, Television, Telephone - 1 per ? persons
- Education (in %) - no formal schooling, primary education, secondary, post-secondary
- Literacy (in %) - total population age 15 and over
- Physicians (1 per ? persons)
- Hospital beds (1 per ? persons)
- Infant mortality rate per 1,000 live births

5.6 Comparison of drug abuse pattern and trends of selected countries

5.6.1 Based on the data set obtained from the afore-mentioned process, we conducted qualitative comparison of drug abuse pattern of selected countries. The purpose of this part of the study was to highlight the similarities and different-ness of drug abuse pattern among the selected countries.

5.6.2 Apart from a cross-sectional profile of drug abuse situation in selected countries, we also attempted to depict a longitudinal trend of drug abuse situation over past one to two decades, as far as the available data allowed. Different countries used different indicators for monitoring of the longitudinal trend of drug abuse. To allow comparison, we used a standardised construct called "index of drug abuse", which defined the 1990 figures as "one". The drug abuse indicators might differ in different countries, but the index of drug abuse measured the percentage change instead of the absolute size of drug abusers population. In this way, time series of drug abuse indicators of different countries can be potted on the same graph, allowing observation on the trends of drug abuse of different countries changed over time.

5.7 Multivariate analysis

5.7.1 As mentioned before, drug abuse indicators or statistics are very heterogeneous. There is no international standard and different countries use different ways to measure and monitor the pattern and trend of drug abuse. This is the major hurdle for multivariate analysis. Nevertheless, we felt that this analysis was worthwhile and thus decided to proceed with multiple linear regression using prevalence indicators as dependent variables. We, however, like to emphasised that the results of this part of the study should be treated with caution. Since we have only less than 10 countries to form a data set, we limited the number of variables to 26.

5.7.2 The multivariate analysis was conducted in two stages. First, we used cluster analysis to group the socio-economic variables into major groups. We then subjected the variables in each major group to multiple linear regression using prevalence indicators as dependent variables. Variables that contributed significantly to the regression equations were then selected and the other variables were discarded as covariates. After we had completed the regression analysis of each major group, we subjected the significant variables into the final analysis. By this method, we hoped that we could eliminate the confounding variables, and condense relevant variables into the final regression equation. As we found that the results of cluster analysis by statistical package were rather unmeaningful, we repeated the process of clustering

using expert judgment. The significant variables of each cluster were then combined together for a final multiple regression as in the previous instance.

5.7.3 There is no single drug abuse indicator that has been used by all of the selected countries. In view of this, we used drug abuse indicators obtained by different methods and concepts within the same regression analysis. While this is far from satisfactory, there was, as yet, no satisfactory way to adjust these data obtained from different sources. In fact, we conducted triangulation[2] and found that these different drug abuse indicators probably recorded more or less the same proportion of drug abusers in each country. In view of this, and in the absence of valid method of adjustment, we believe that our method is the best one can achieve.

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[2] Countries who had ECA-type epidemiologic study were included in the triangulation. It is assumed that the results of these studies were comparable because the same protocol, diagnostic instrument and criterior had been used. Besides, it is *assumed* that their findings were the 'gold standard', i.e. they identified all drug abusers within the sampling frame. The various drug statistics of indiviudal countries were then compared against this standard. Extrapolation were made as most ECA studies were conducted in the 1980's and the drug statistics for multivariate analysis were of 1994-95. We found that most drug statistics that we had adopted for the multivariate analysis were as effective as ECA statistics in indentifying drug abusers in the sampling frame. In most circumstances, the extrapolated figures of the chosen drug statistics were +/-100% of the ECA figures.

6. RESULTS

6.1 Compilation of statistics of drug abuse in Hong Kong and selected countries

6.1.1 The following table summarised the types of drug statistics of the selected countries that were available for our study.

	central registry	national household survey	psychiatric epidemiologic study	school survey	arrest figures	seizure figures
USA	no	regular	ECA, NCS	regular	yes	yes
UK	compulsory notification	no	NHS	no	yes	yes
Australia	no	yes	no	no	yes	yes
Singapore	govt central record	no	no	no	yes	yes
Malaysia	voluntary	no	no	no	yes	yes
S. Korea	no	no	ECA	no	no	no
China	govt central record	no	12 regions study	no	yes	yes
Taiwan	no	no	ECA	yes	yes	yes
H.K.	voluntary	no	ECA	yes	yes	yes

6.1.2 The study yielded a vast amount of data concerning the situation of drug abuse of selected countries. These statistics are summarised into sets of graphs under the following themes:

- longitudinal trend of drug abuse
- pattern of drugs of abuse

- age distribution of drug abusers
- educational background of drug abusers
- employment status of drug abusers
- arrest figures
- seizure figures

These graphs are grouped under Appendix.

7. COMPARISON OF DRUG ABUSE SITUATION

7.1 Source of data

7.1.1 Since no single drug statistic can capture the situation of drug abuse of all selected countries, comparison can only be made by using different drug statistics. The following listed the predominant data source of each selected country for the purpose of cross-national comparison.

7.1.2

Countries	*Data Source*
HK, UK, Malaysia	central registry
Taiwan, Singapore	arrest/ conviction figures
China	figures from Academy of Social Science
USA, UK	national household survey
S. Korea, Taiwan	psychiatric epidemiologic study

7.1.3 Different data source might use different methodology, e.g. case definition, sampling, and therefore making comparison among these data sources may be objectionable to demanding researchers. However, it is important to bear in mind that this is an intrinsic difficulty of cross-national comparative studies, and it is essential to allow for these discrepancies in methodology if comparison is to be made.

7.2 Prevalence of drug abuse

7.2.1 Central Registry of Drug Abuse (CRDA) recorded 20326 abusers in 1994, which was equivalent to 0.3% of the Hong Kong population. When compared with other countries, this prevalence is relatively low. Hong Kong ranked sixth among the nine countries selected.

7.2.2 It can also be seen that Western countries tended to have higher prevalence of drug abuse and all Asian countries selected in this study had prevalence rate of less than 1%.

Rank	*Countries*	*Estimated Prevalence (%)*
1	USA	6.10
2	UK	2.20
3	Australia	1.71
4	S. Korea	0.78
5	Taiwan	0.75
6	Hong Kong	0.34
7	Singapore	0.21
8	Malaysia	0.15
9	China	0.03

7.2.3 Four of the selected countries had conducted ECA-type psychiatric epidemiologic survey. These studies used the same protocol and case definition and were therefore ideal sources of data for comparison. Unfortunately, all of them were carried out in the 1980s and thus could not reflect the recent trend of drug abuse. Among the four countries, Hong Kong had the lowest lifetime prevalence of drug abuse/dependence.

Rank	*Country*	*lifetime prevalence according to ECA studies (%)*
1	USA	6.0
2	Korea	0.78
3	Taiwan	0.75
4	Hong Kong	0.24

7.3 Incidence of drug abuse

7.3.1 Incidence figures were available from five countries. The relative ranking using incidence rate is similar to that of prevalence.

Rank	*Country*	*Incidence Rate (%)*
1	USA	2.15
2	UK	0.87
3	HK	0.08
4	Malaysia	0.05
4	Singapore	0.05

7.4 Gender ratio of drug abuse

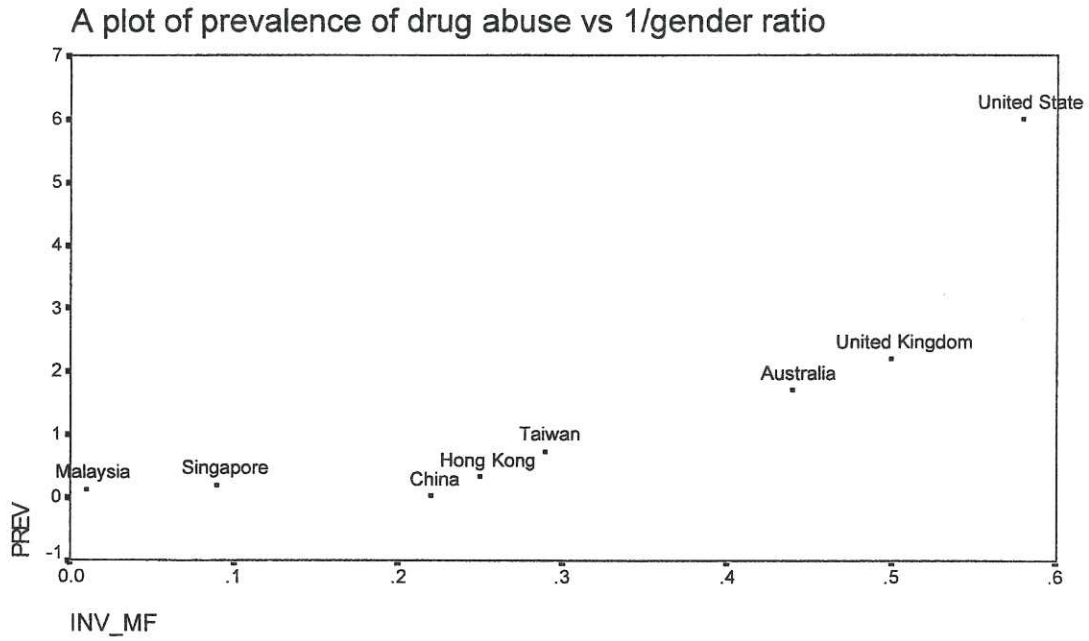
7.4.1 Only 20% of drug abusers reported to CRDA(HK) in 1994 were female. This gender ratio compared favourably with those of USA, UK, and Australia. Hong Kong, China and Taiwan had relatively similar gender ratio. In Singapore and Malaysia, drug abuse was predominantly a masculine activity.

Rank	*Countries*	*Gender Ratio*
1	USA	1.7
2	UK	2.0
3	Australia	2.3
4	Taiwan	3.4
5	Hong Kong	4.0
6	China	4.5
7	Singapore	11
8	Malaysia	82

*Gender ratio not available from S. Korea.

7.4.2 When the prevalence rate of drug abuse was plotted against the inversed gender ration (i.e. female to male ratio), it showed that the greater the proportion of abusers being female, the higher the prevalence of drug abuse in a country (fig. 7.1). It is uncertain which factor is the cause and which is the effect. One possibility is that when drug abuse becomes rampant in a country, it infiltrates into sub-populations (e.g. female) that are previously less susceptible. This would lead to a decrease of gender ratio. Certainly, there are other plausible hypotheses and further investigations are needed to clarify the causal relationship between prevalence of abuse and gender ratio.

fig. 7.1



7.4.3 It is noteworthy that over the past five to six years, whilst the prevalence of drug abuse in Hong Kong has shown a rising trend, so has the gender ratio. There was a significant rise in the proportion of female drug abusers from 10.1% in 1981, to 13% in 1986, and further to 20% in 1994.

7.5 Drug abuse among youth

7.5.1 Six of the selected countries divided age group by comparable categories and were therefore available for comparison.

rank	*country*	*proportion of drug abuse population of <20/21 yrs*
1	US	24%
2	HK	21%
3	Malaysia	20%
4	UK	19%
5	China*	10-40%
6	Singapore	8%

* Figures are obtained from high risk areas in China

7.5.2 According to 1994 CRDA figures, about one fifth of reported drug abusers is below 21 years of age. This proportion is comparable to the figures of US, UK, and Malaysia and certain high risk areas of China. Singapore had the lowest rate of 8%. The proportion of youth drug abusers population is not proportional to the rate of drug abuse in a society.

7.5.3 Although HK has a much lower prevalence of drug abuse than US and UK, our youth is as much affected as those of US and UK. However, it is also important to bear in mind that youth addiction problem affected five of the six selected countries where data were available for analysis.

7.6 Education level of drug abusers

7.6.1 Only US, China, Taiwan and HK data were available for comparison. In general, drug abuse is more common among individuals with primary or lower secondary education (see appendix 1.6, 7.6, 8.6, 9.6).

7.7 Employment status of drug abusers

7.7.1 Data of China, Taiwan, HK, Malaysia and US were available for comparison. No specific pattern appeared in the comparison. (see Appendix 1.7, 5.7, 7.7, 8.7, 9.7)

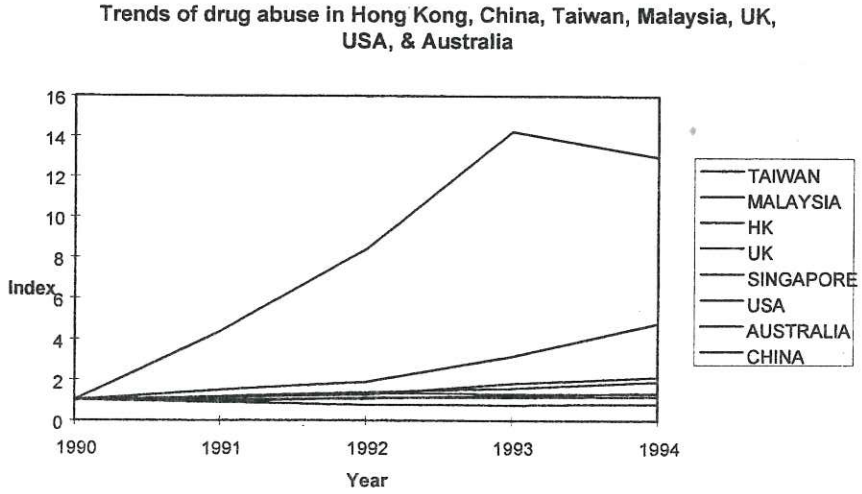
7.7.2 Hong Kong, China, and Taiwan had similar rate of unemployment (40-45%) among drug abusers.

7.8 Trends of drug abuse

7.8.1 A plot of the number of persons reported to the CRDA over the past 15 years (appendix 9.1) showed that the size of drug abuse population in Hong Kong has been relatively contained until recently. Between 1990 and 1994, the annual number of newly reported persons doubled. Although this rising trend is worrying, this is not as steep as those of Taiwan and China (see 7.8.2).

7.8.2 Using the prevalence rate of 1990 as the baseline, the trends of prevalence rate of selected countries over time were plotted on the following graph (fig. 7.2 or appendix 10.1). It can be seen that Taiwan was hit by an amphetamine epidemic during 1991-93. The prevalence of drug abuse doubles every two years in China. Hong Kong and United Kingdom showed steady increase in the prevalence rate while the rest of the selected countries showed relatively stable trend over the past five years.

fig. 7.2



7.8.3 Among the studied countries, USA experienced a cocaine epidemic in late 1970s and early 1980s, and Taiwan experienced an amphetamine epidemic in early 1990s. The American cocaine epidemic occurred amongst the background of a general decline of drug abuse. However, there was an initial ignorance about the addictive nature of cocaine and authoritative researchers reported that cocaine is not different from peanuts or potato chips as a source of enjoyment. The amphetamine epidemic in Taiwan was preceded by a period when drug abuse prevalence increased substantively. The two epidemics have several characteristics in common: both being caused by stimulants, both were followed by Government actions to curb the bloom and a subsequent fall of the epidemics.

7.9 Substances of abuse

7.9.1 Heroin is the commonest and predominant substance of abuse in Hong Kong, China, Singapore, and Malaysia. All four countries are closed to the Golden Triangle and have significant Chinese populations. Opium abuse, which was subsequently evolved into heroin abuse, was initially introduced to Singapore and Malaysia by immigrants from China. The history of opium abuse in China and Hong Kong dated to Qing Dynasty, which is beyond the scope of this report.

7.9.2 Cannabis is the predominant substance of abuse in Australia and is the commonest substance of abuse in USA and UK. This may be due to the availability of, and a more accepting attitude towards cannabis in these countries. It is interesting to note that these three countries also have the highest prevalence of drug abuse.

Country	*Substance of abuse (three commonest)*
USA	cannabis > cocaine > heroin
UK	cannabis > amphetamine > heroin
Australia	cannabis >>

7.9.3 Taiwan is the only country where amphetamine is the commonest substance of abuse. Before the amphetamine epidemic, heroin and opium were the predominant substance.

7.9.4 The pattern of substance abuse in S. Korea remains to be clarified.

7.9.5 *Cannabis* The drug abuse data reported to the United Nations showed that cannabis abuse in most countries remained relatively stable over a long period of time. Our study confirmed this impression. Among the selected countries, the trends of cannabis abuse are fairly stable over years.

7.9.6 *Amphetamine and Cocaine* Amphetamine and cocaine are both stimulants and are common substance of abuse among the selected countries. They often come after heroin or cannabis as the second commonest drug of abuse. Their epidemic potential is well illustrated by the amphetamine epidemic in Taiwan and the cocaine epidemic in the States.

7.10 Polydrug abuse

7.10.1 Only five countries reported the prevalence of polydrug abuse. About one in five to one in four abusers in UK, US and Australia abused more than one kind of substance. A study on 998 drug abusers of treatment centres in Gansu and Guizhou, China showed that over 90% addicts had polydrug abused. Report of polydrug use in other sites was rare. Polydrug abuse is uncommon in non-rampant areas of China. According to 1994 CRDA report, only 4.8% of reported persons were polydrug users. This figure compared favourably with the figures of the western countries in this study.

country	*polydrug abusers among addicts population*
Australia	25%
USA	20%
UK	20%

China (high risk areas)	variable, as high as 90%
China (low risk areas)	very rare
HK	5%

7.11 Multivariate analysis

7.11.1 The 26 selected social-economic variables were submitted for cluster analysis with SPSS statistical package. Six clusters were generated and they were summarized below.

Cluster 1

Tourism, divorce rate, gross national product

Cluster 2

Proportion of population with age below 15, household size

Cluster 3

Economic activity rate, number of persons sharing one television, **number of persons sharing one telephone**

Cluster 4

Proportion of population being female, unemployment rate, death rate, proportion of population between 45-59, proportion of population with age more than 60, proportion of population with middle education

Cluster 5

Life expectancy of male, life expectancy of female, proportion of population in urban city, population density, proportion of population with age between 30 to 45

Cluster 6

Marriage rate, activity rate, economic activity rate of those aged above 15, economic activity rate of female

Cluster 7

Proportion of population with no education, fertility rate, number of doctors per thousand population

7.11.2 The variables in each cluster were then subjected to multiple linear regression using prevalence rates of drug abuse as dependent variable. The bolded items were those who remained significant in the analysis. These significant variables were grouped together and subjected to another stepwise multiple linear regression. Only tourism and divorce rate remained to be significant and the results are summarized below.

Variable	B	SE B	Beta	T	Sig T
tourism	4.57851E-11	8.8665E-12	.566992	5.164	.0021
divorce	.630050	.147040	.470485	4.285	.0052
(constant)	-.347447	.213427		-1.628	.1547
	Beta In	Partial	Min Toler	T	Sig T
household	.149870	.367073	.071719	.882	.4180
activity rate	-.037466	-.227381	.315352	-.522	.6239
telephone	-.037445	-.220069	.302926	-.504	.6354
age <15	.150405	.656314	.175576	1.945	.1094

7.11.3 Since the cluster analysis by statistical package yielded rather unmeaningful clusters, we conducted another clustering using expert judgment. The clustering is summarized as follows:

Cluster 1

Natural growth rate, proportion of population below 15, **divorced rate**, household size

Cluster 2

Tourism, number of persons sharing one radio, number of persons sharing one television, number of television sharing one phone, average income, gross national product

Cluster 3

Proportion of population with primary education, with no education, with middle education, with post-middle education

Cluster 4

Hospital bed per thousand population, proportion of population with age 45-59, proportion of population age more than 60, death rate, proportion of population being female

Cluster 5

Density of population, proportion of population in rural area, proportion of population in urban area

Cluster 6

Life expectancy of male, life expectancy of female, population size.

The bolded items are those who remained significant after multiple regressions by clusters. Since only two items remained significant, they were not subjected to further regression analysis.

7.11.4 It is interesting to know that irrespective of method used to divide the cluster, divorce rate and tourism stand out to be factors that are significantly associated with the prevalence rate of drug abuse. This means that among the 26 socio-economic variables selected, they are the only ones that contribute significantly to a statistical model that explains the variation of drug abuse prevalence across selected countries. According to the results of the analysis, the simplest statistical model to summarized the prevalence of drug abuse in selected countries is

Prevalence = -0.347447 + (4.57851E-11 x tourism) + (0.630050 x divorce rate)

7.11.5 This equation means that the prevalence of drug abuse in a country is proportional to the divorce rate and the annual earning from tourism. A plot of

prevalence of drug abuse against these two factors illustrated the relationship (fig. 7.3, 7.4).

fig. 7.3

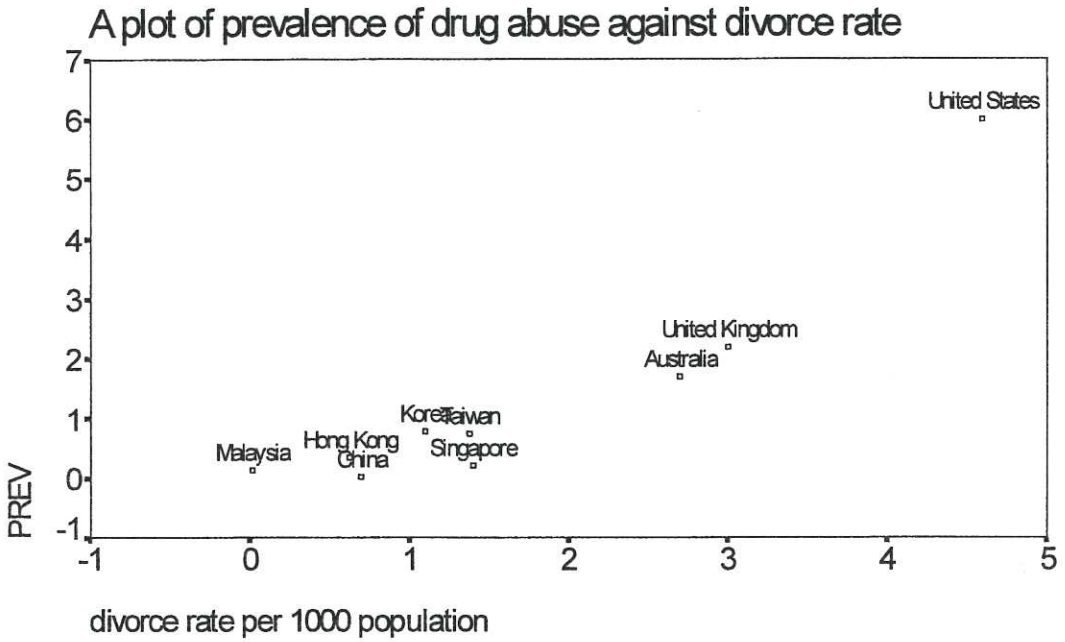
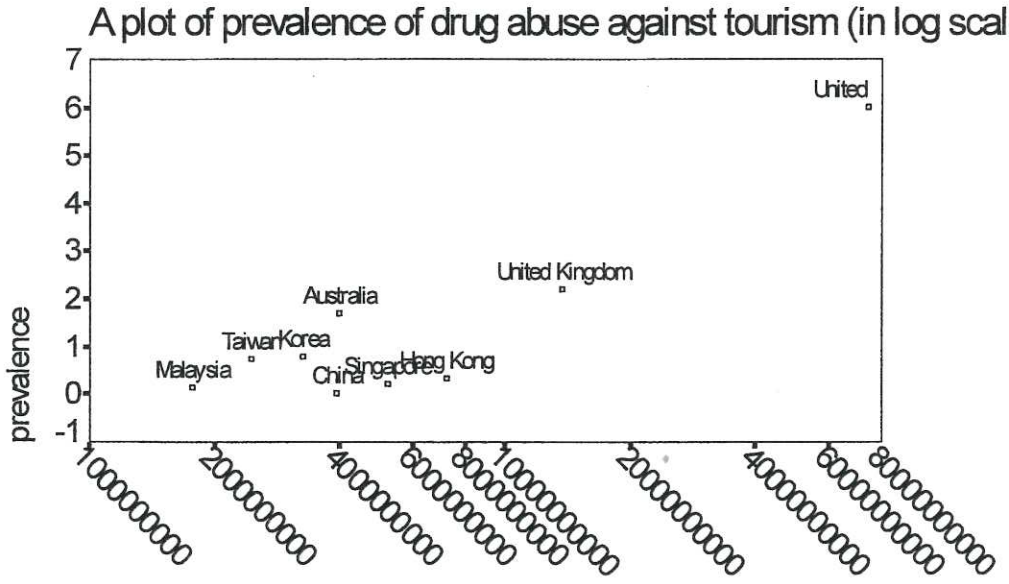


fig. 7.4



7.12 Divorce rate, tourism and prevalence of drug abuse

7.12.1 It is important to bear in mind that the multivariate analysis was conducted under not the most ideal circumstances. In particular, there were data from only ten countries for statistical analysis and 26 variables were fed into the regression equations. The drug statistics of individual countries were measured by different methods, and sometimes, even different units. Besides, only linear equations were tested as explanatory model. The results of the analysis should therefore be taken as a preliminary attempt to address the issue mathematically and the interpretations be viewed with caution.

7.12.2 Nonetheless, the results of the multivariate analysis substantiated the empirical experience of many drug workers. Higher divorce rate means more broken families within the society. Divorce inflicts emotional trauma to the every member of the family and particular the children. Besides, in a divorce family, the single parent is less able to exert proper parental control. This, in combination with the lack of the affection and emotional impact of parental separation is known to be associated with emotional and/or conduct disorders in children. It has been established by anecdotal and clinical research that teenagers and young adults use drugs to cope with overwhelming emotions. Thus, the higher the divorce rate, the greater the proportion of emotionally disturbed children in a society, and the higher the rate of drug abuse. Interestingly, over the past few years, there has been a steady rise of divorce rate in Hong Kong, paralleled the surge in prevalence of drug abuse in the society.

7.12.3 Although drug abuse is often construed as the price of modernization and economic success, indicators of economic success are not found to be significantly associated with the prevalence of drug abuse in this multivariate analysis. While this may be due to small sample size and inadequate statistical power of the analysis, we believe that the lack of association is a genuine finding. To quote China as an example, the areas that are most affected by drug abuse are the rural areas, which happened to be closed to golden triangle. This illustrates that the degree of economic success is not necessarily associated with the severity of drug problem.

7.12.4 In fact, the severity of drug abuse is very much dependent on the availability of drug through trafficking. Before the open door policy, China has almost extinguished

the problem of drug abuse within the country. After the open door policy, drug trafficking resumed and drug became available to areas closed to the golden triangle. The economic backward-ness of these areas does not "protect" them from drug problem.

7.12.5 Tourism is a good reflection of the accessibility of a country by foreigners, including drug traffickers. Drug traffickers often disguise themselves as tourists and the greater the number of tourist passes through a country, the more difficult it would be for the customs to identify those who traffic drugs. These countries, therefore, are likely become part of the drug trafficking routes and at the same time affecting by drug abuse problem.

7.12.6 The social economic variables that we have selected are by no means exhaustive. They were selected because they were commonly quoted in the existing literature. There are many more variables remained to be explored and further research using multivariate method may yield more insightful findings.

8. RECOMMENDATIONS

8.1 The results of this study show that Hong Kong, China and Taiwan have very similar extend and pattern of drug abuse. The prevalence rate, gender ratio, trends, and substances of abuse of these three societies formed a distinct group, amongst various countries selected in this study. Nowadays, the interaction and liaison among these three societies are so intense that drug abuse situation (e.g. new substance of abuse) in one society can easily affect that of others. In the past, drug abuse statistics of China and Taiwan were not readily available in Hong Kong. We may consider strengthening the liaison with the National Institute of Drug Dependence of China as well as the Executive Yuen of Taiwan, and ensure that we are informed of their latest trend and pattern of drug abuse. These data can be included in the future CRDA reports for reference.

8.2 Although Hong Kong ranked sixth amongst other countries in the extend of drug abuse problem, we are facing a new tide of drug abuse over the past five to six years. The rate of this rise is rather mild, when compared with the rise of drug abuse in China and Taiwan during the same period. Nevertheless, Hong Kong should not be complacent of her achievement in containing the extend of drug problem in the past 15 years. Indeed, more work should be done in understanding why Hong Kong experienced this new tide of drug problem. Unfortunately, this study was not designed to answer this question and further studies are needed.

8.3 The epidemic potential of stimulants deserves special attention of policy maker. Taiwan and United States were hit by amphetamine and cocaine epidemic, without any obvious signs or warnings beforehand. Although cocaine is still rare in HK, there are increasing concerns that amphetamine is becoming fashionable among local youth population. Most of our youth was not vaccinated against the potential addictive effects of stimulants as previous anti-drug messages emphasized on heroin, cannabis and psychotropics. This vulnerable and novelty-seeking population, when combined with the ready supply of amphetamine from the Southern coast of China, is a recipe for "disaster". It is difficult, if not impossible, to predict whether amphetamine epidemic, as what occurred in Taiwan, may happen in Hong Kong. However, the

importance of a close surveillance of the trend and pattern of drug abuse, especially among the youth population, cannot be over-emphasized.

8.4 At present, drug workers and policy makers in Hong Kong rely heavily on the CRDA to monitor the trend of drug abuse. While CRDA is probably the best of its type in Asia, it has its own limitations. For instance, it does not measure the actual size of the drug abuse population, which is essential in health services planning. It may also underestimate sub-populations that do not come into contact with the law-enforcing and treatment agents. Therefore, the Government should consider conducting or sponsoring regular household surveys to measure the extend and pattern of drug problem. This cross-sectional approach, when combined with the longitudinal approach of CRDA, will enrich the data that are available to drug workers and policy makers, and will equip the latter with better grasp of drug abuse situation within the territories.

8.5 It is a worrying trend that the youth population is becoming increasingly involved in drug abuse. Besides, the pattern of drug abuse among the youth population may change rapidly as this is the group that is most sensitive to trend and fashion. Like Taiwan and United States, Hong Kong may consider increasing the frequency of school survey to annually. This will heighten the sensitivity of the current surveillance system towards changes in pattern of drug abuse, especially among the youth population.

8.6 The multivariate analysis showed that the *different-ness* in the extent of drug abuse among the selected countries can be explained by divorce rate and earning from tourism, using a model of linear multiple regression. This finding deserves further validation on local drug statistics, particularly to see if these two factors also explained the trend of drug abuse in Hong Kong. While it may be difficult to intervene the divorce rate or tourism to reduce drug abuse, a sound mathematical model of drug abuse can contribute to the understanding and forecasting of the future trend of drug abuse in Hong Kong. It is possible that other factors that are susceptible to intervention may be identified in the future.

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Appendix: Graphical summaries of drug statistics of selected countries

1. United States of America
2. United Kingdom
3. Australia
4. Singapore
5. Malaysia
6. South Korea
7. China
8. Taiwan
9. Hong Kong

x.1 Longitudinal trend of drug abuse across time

x.2 Pattern of drugs of abuse

x.3 Trend of drug abuse of different age groups

x.4 Arrest figures

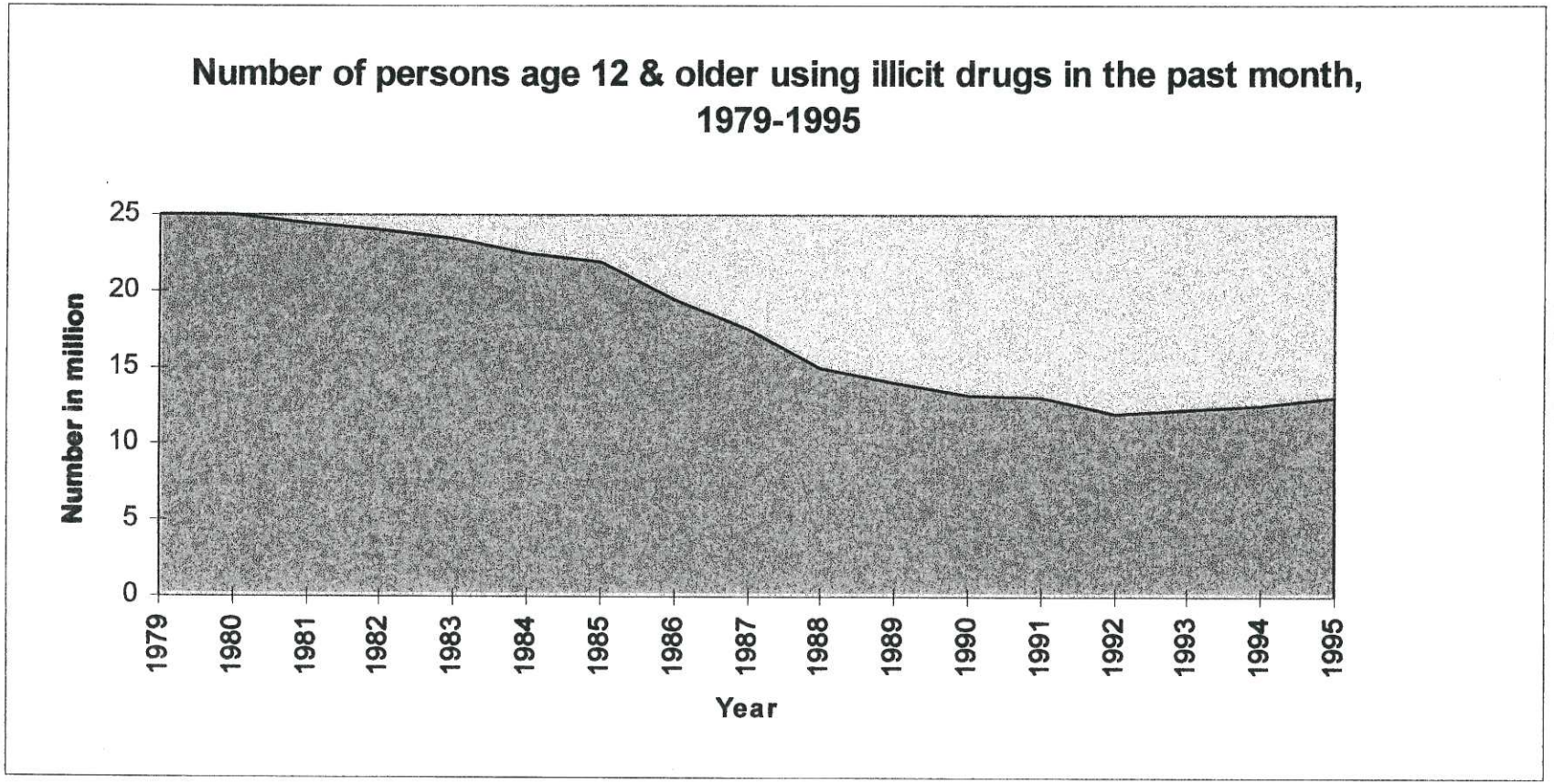
x.5 Seizure figures

x.6 Drug abuse by education

x.7 Drug abuse by employment

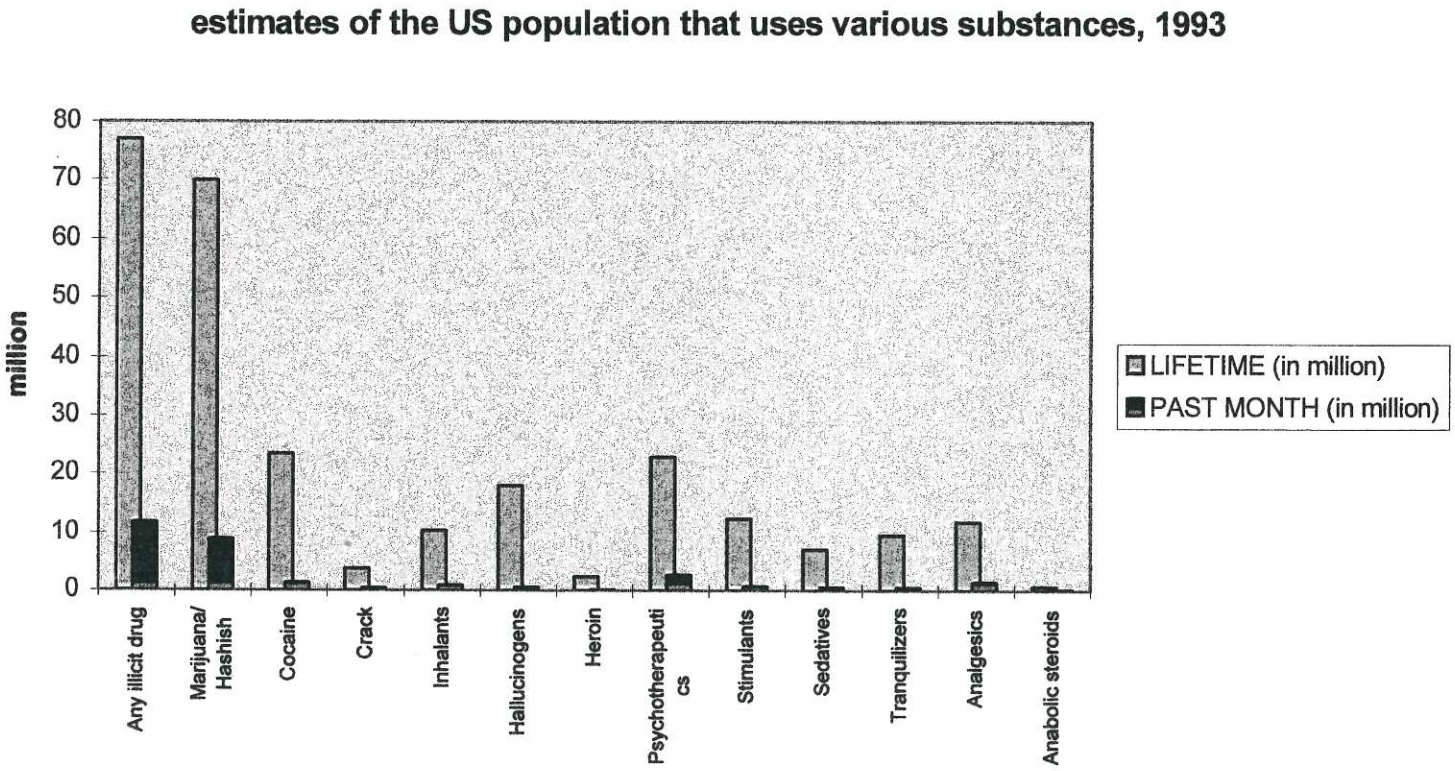
1. USA

1.1 Longitudinal trend of drug abuse across time



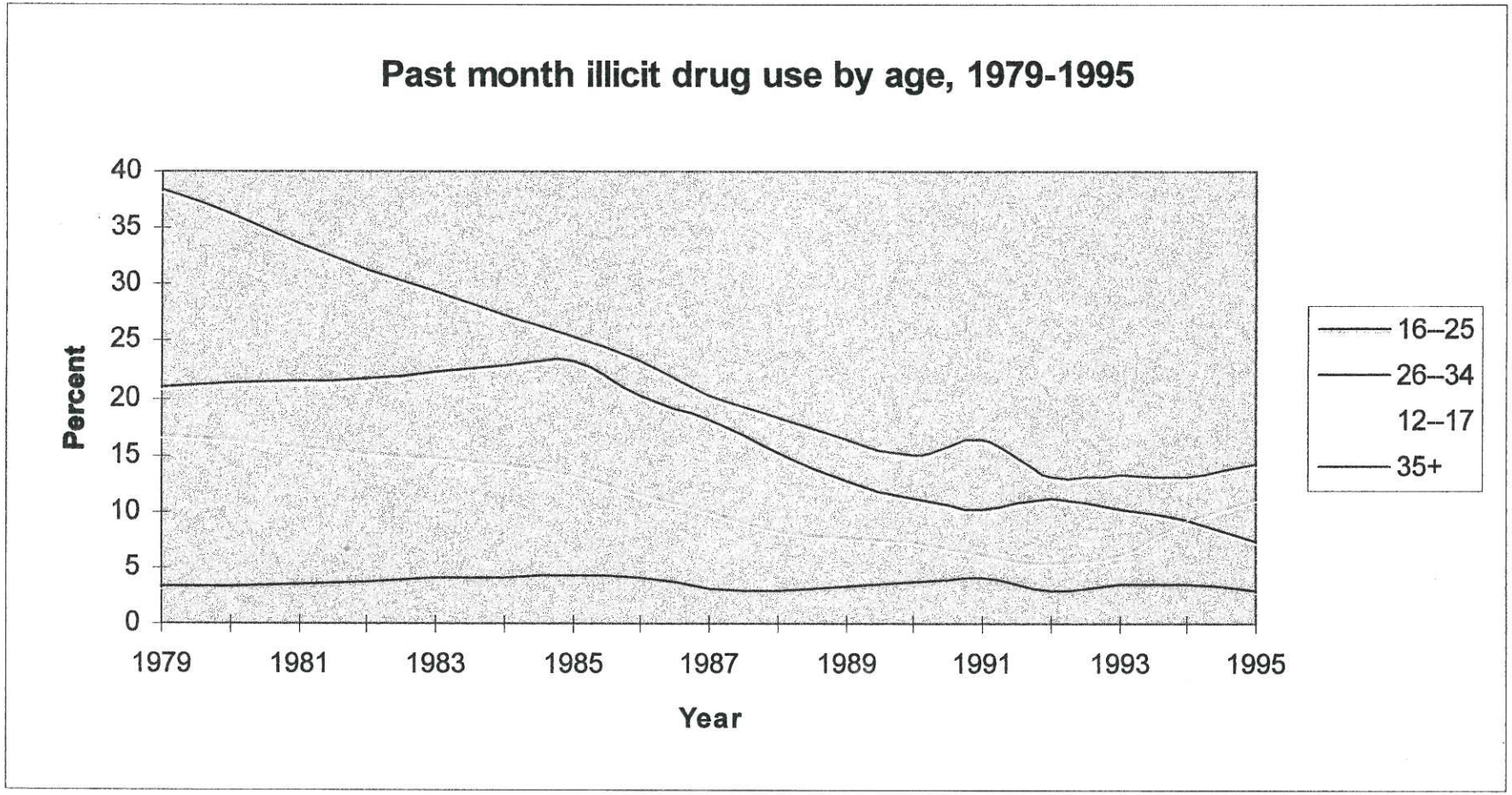
(source: http:\\www.health.org/pubs/95hhs/any.htm)

1.2 Pattern of drugs of abuse



(source: National Household Survey of Drug Abuse, 1993)

1.3 Trend of drug abuse of different age groups



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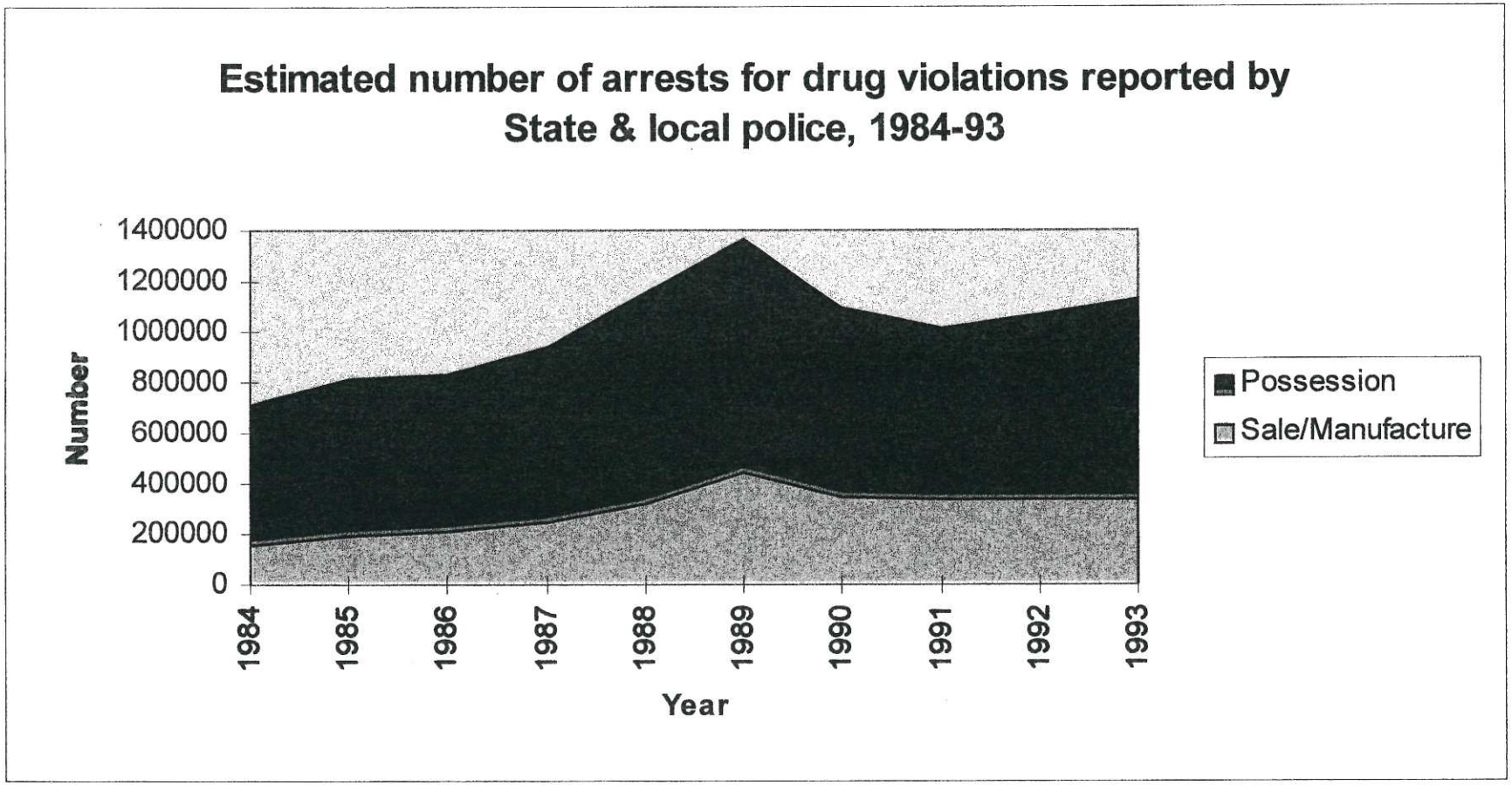
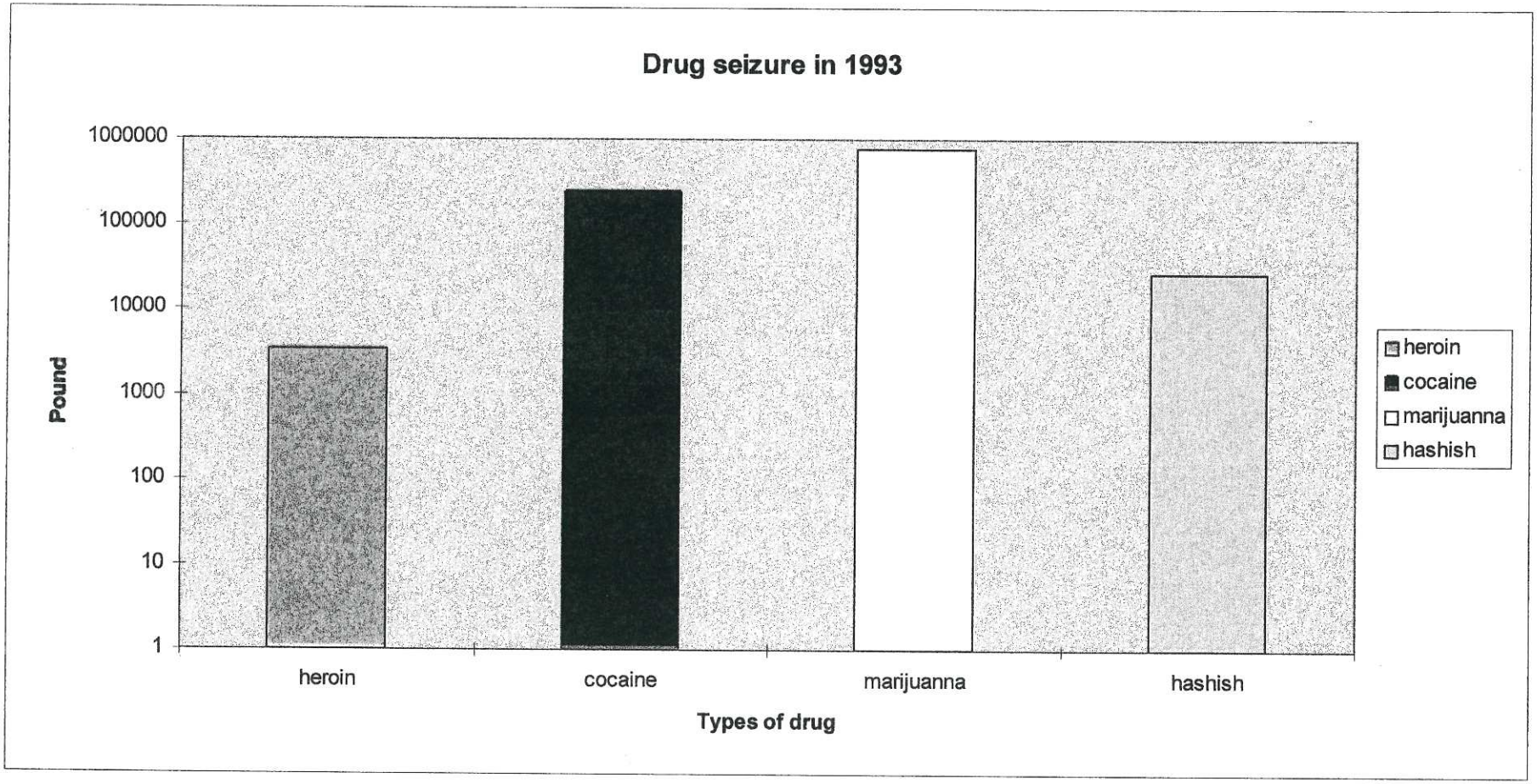
1.4 Arrest Figures



(source: httm://www.ojp.usdoj.gov/bjs/abstract/dcfacts.htm)

1.5 Seizure figures



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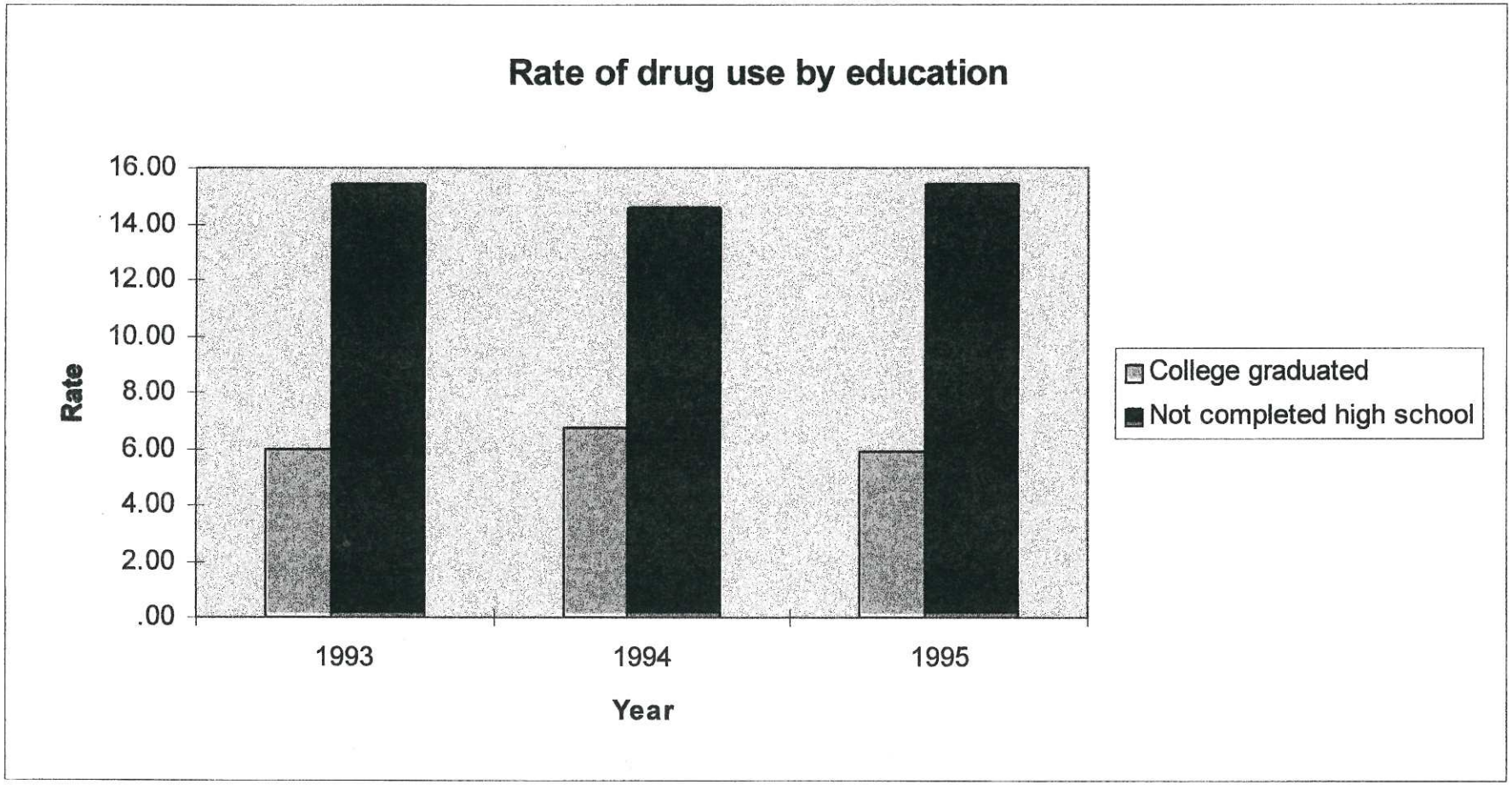
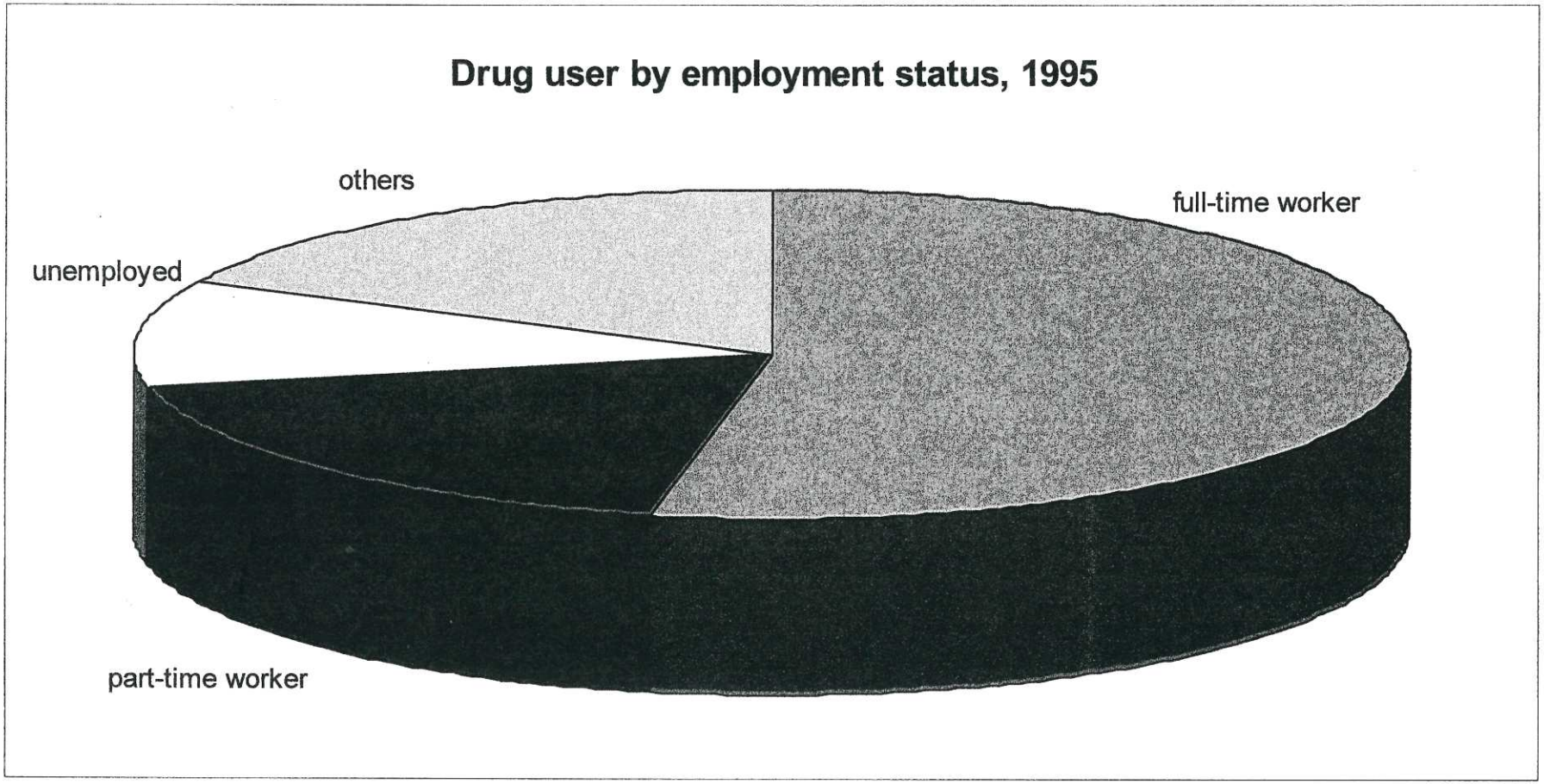
1.6 Drug abuse by Education



(source: http:\\www.health.org/pubs/95hhs/any.htm)

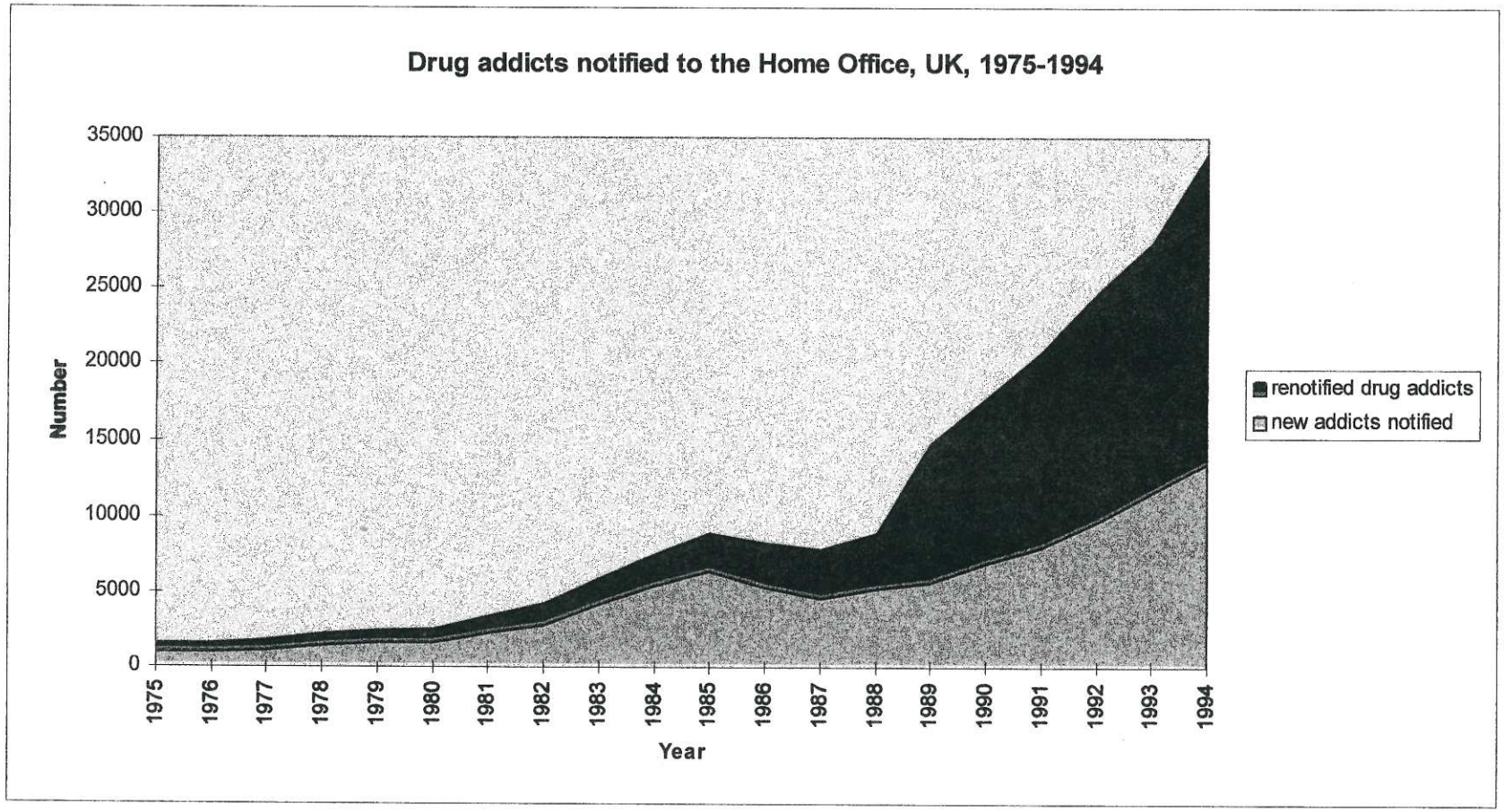
1.7 Drug abuse by Employment



(source: http:\\www.health.org/pubs/95hhs/any.htm)

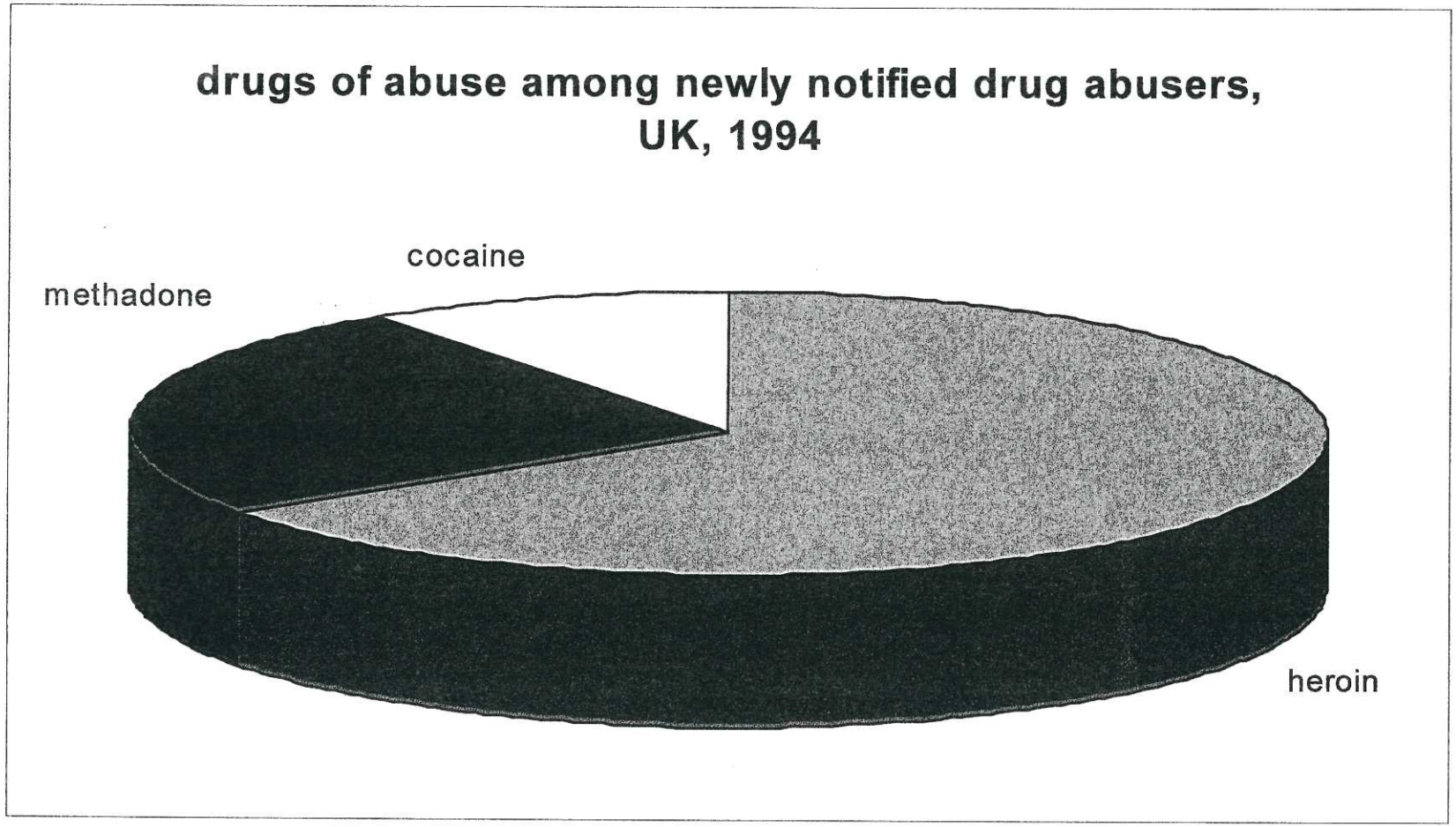
2. UK

2.1 Longitudinal trend of drug abuse across time



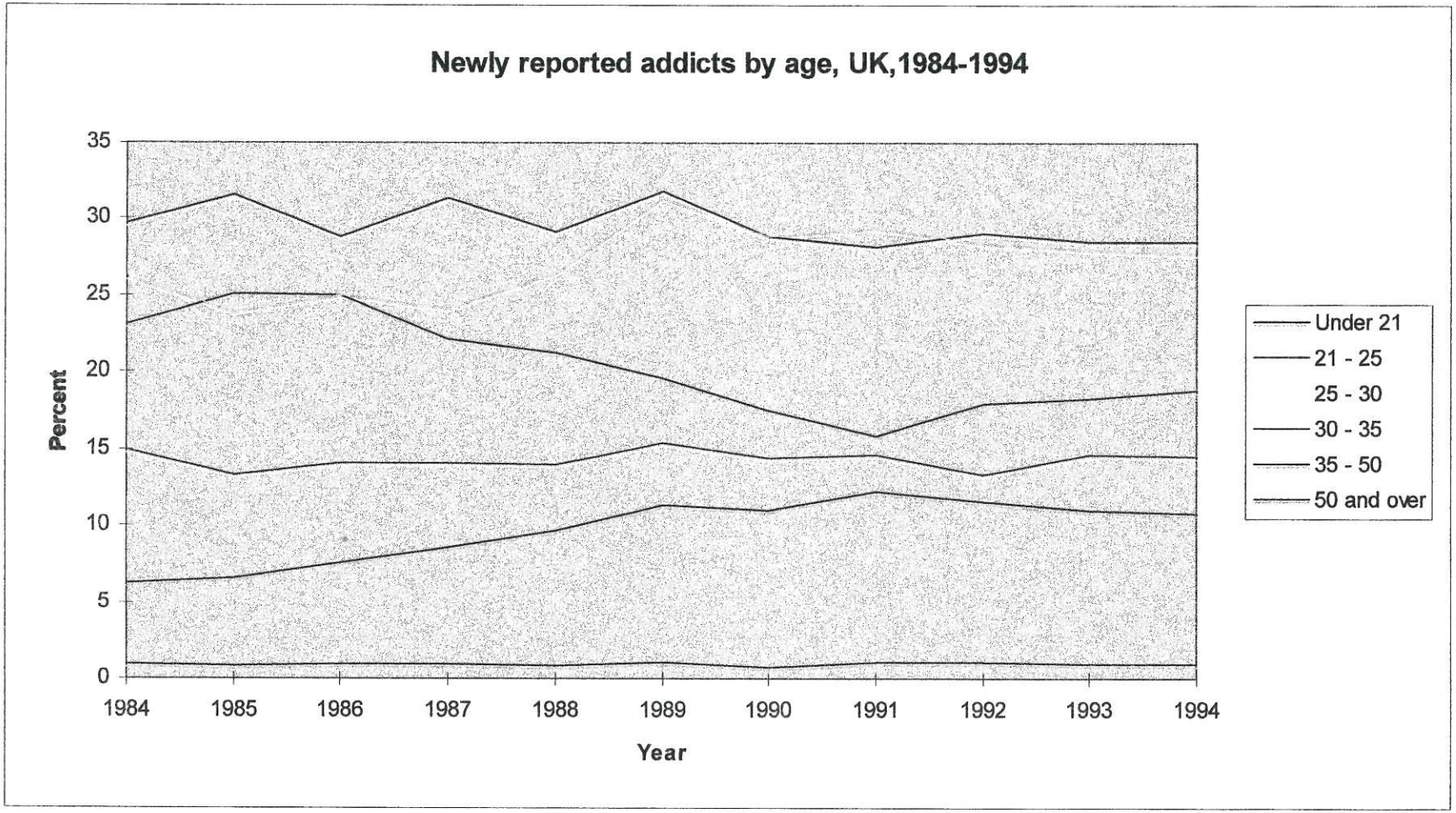
(source: Home Office Statistical Bulletin 1975-1994, Research & Statistics Department, UK)

2.2 Pattern of drugs of abuse



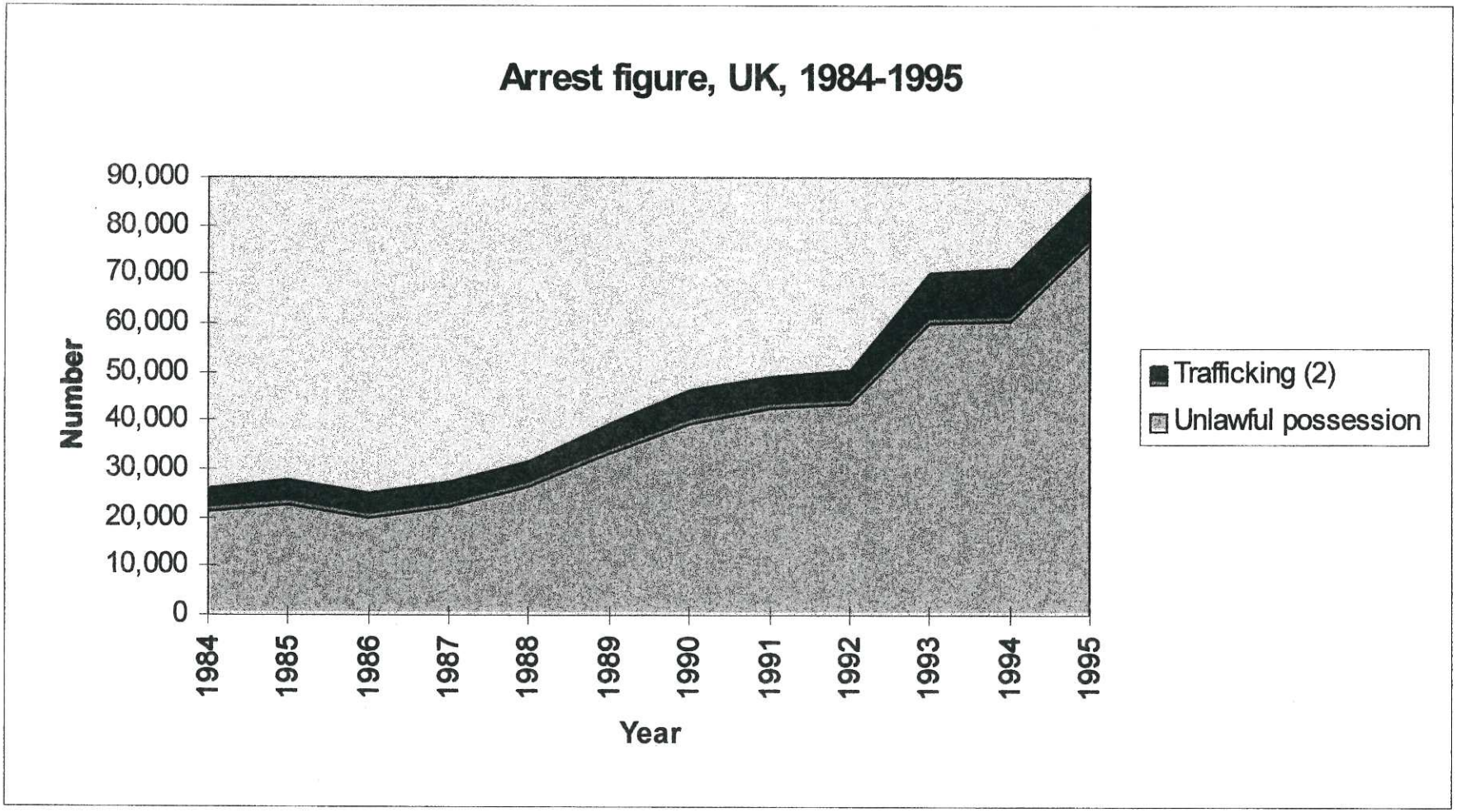
(source: Home Office Statistical Bulletin 1994, Research & Statistics Department, UK)

2.3 Trend of drug abuse of different age groups



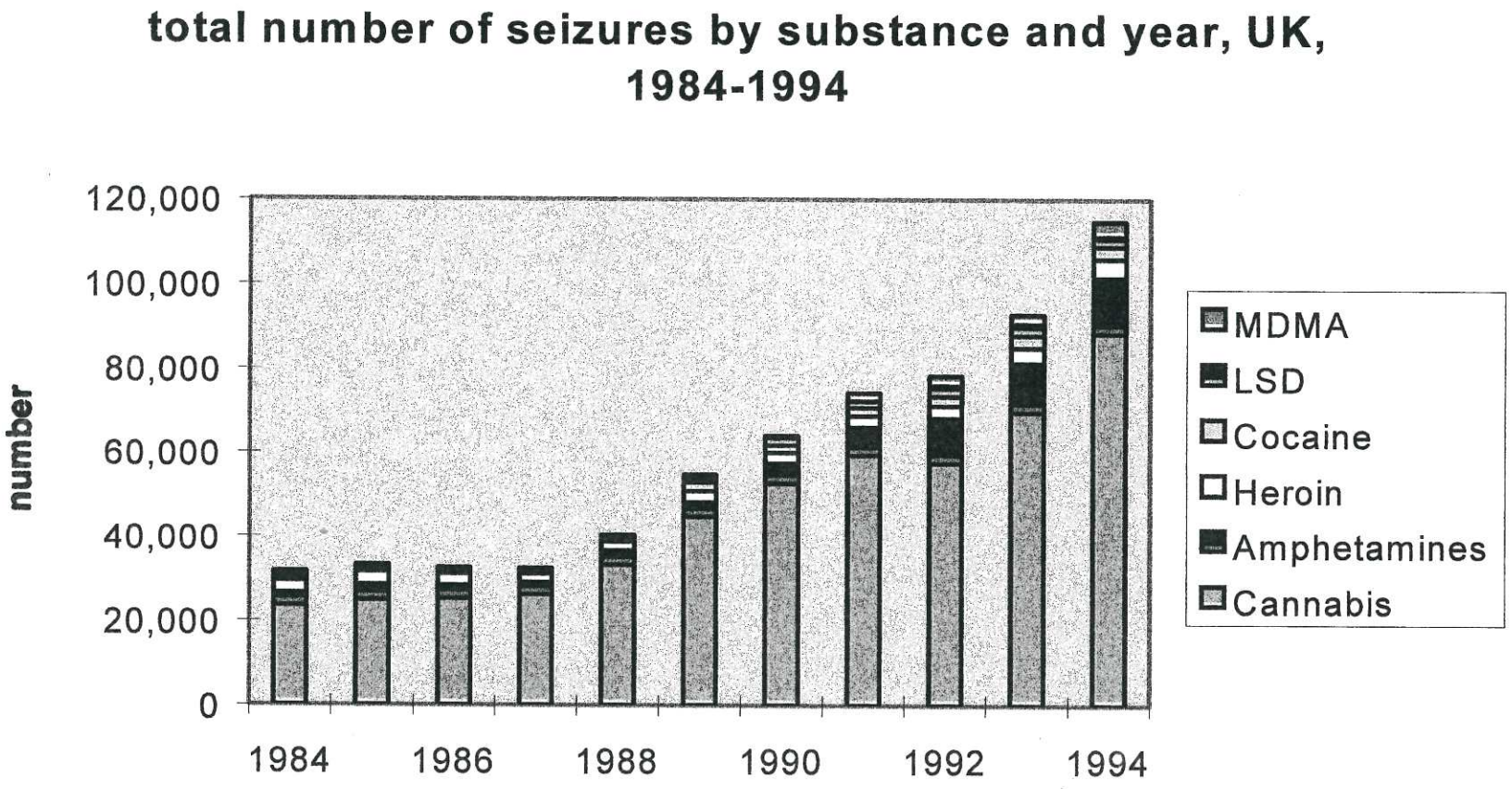
(source: Home Office Statistical Bulletin 1984-1994, Research & Statistics Department, UK)

2.4 Arrest figures



(source: Home Office Statistical Bulletin 1984-1994, Research & Statistics Department, UK)

2.5 Seizure figures



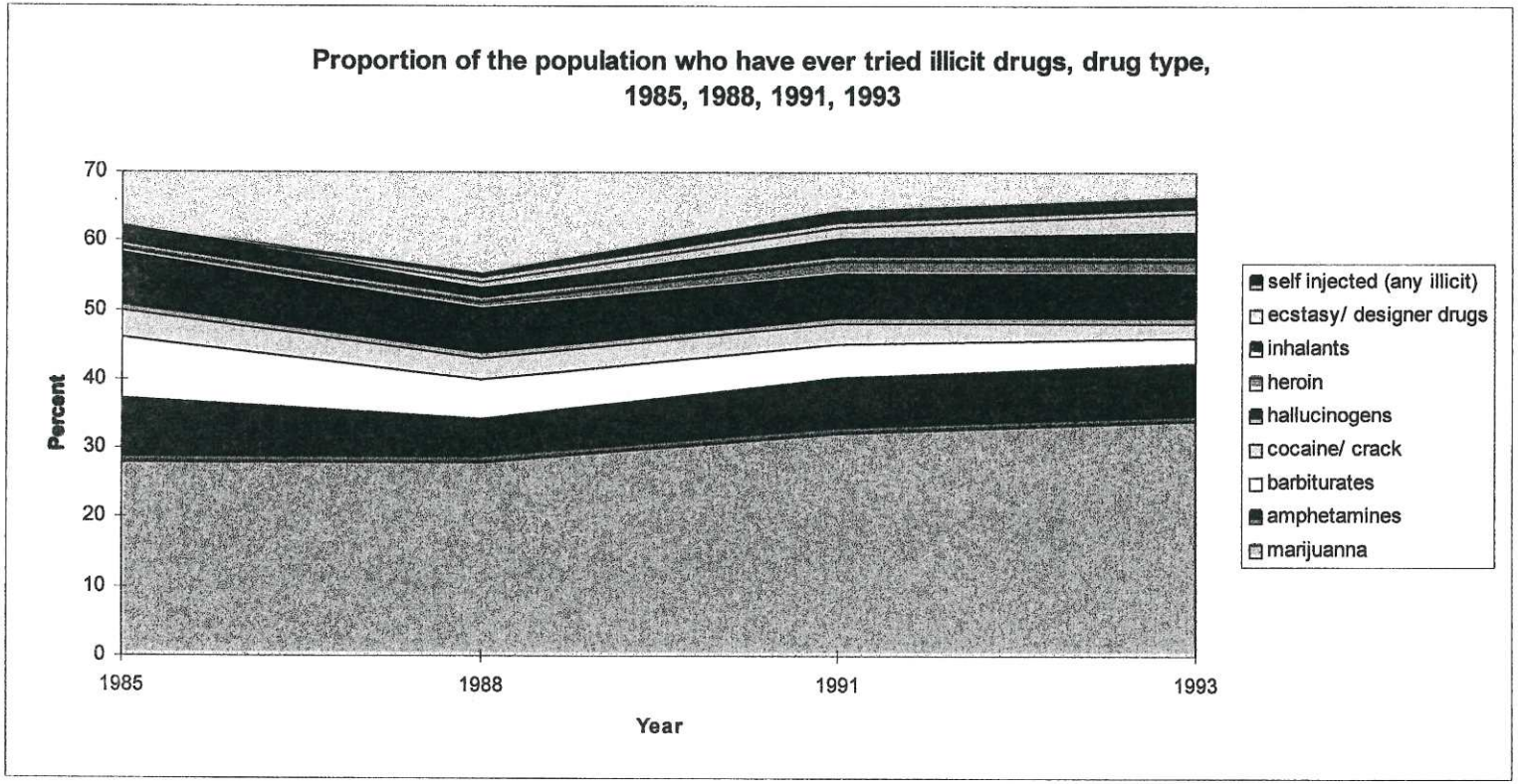
(source: Home Office Statistical Bulletin 1984-1994, Research & Statistics Department, UK)

2.6 Drug abuse by Education
(data not available)

2.7 Drug abuse by Employment
(data not available)

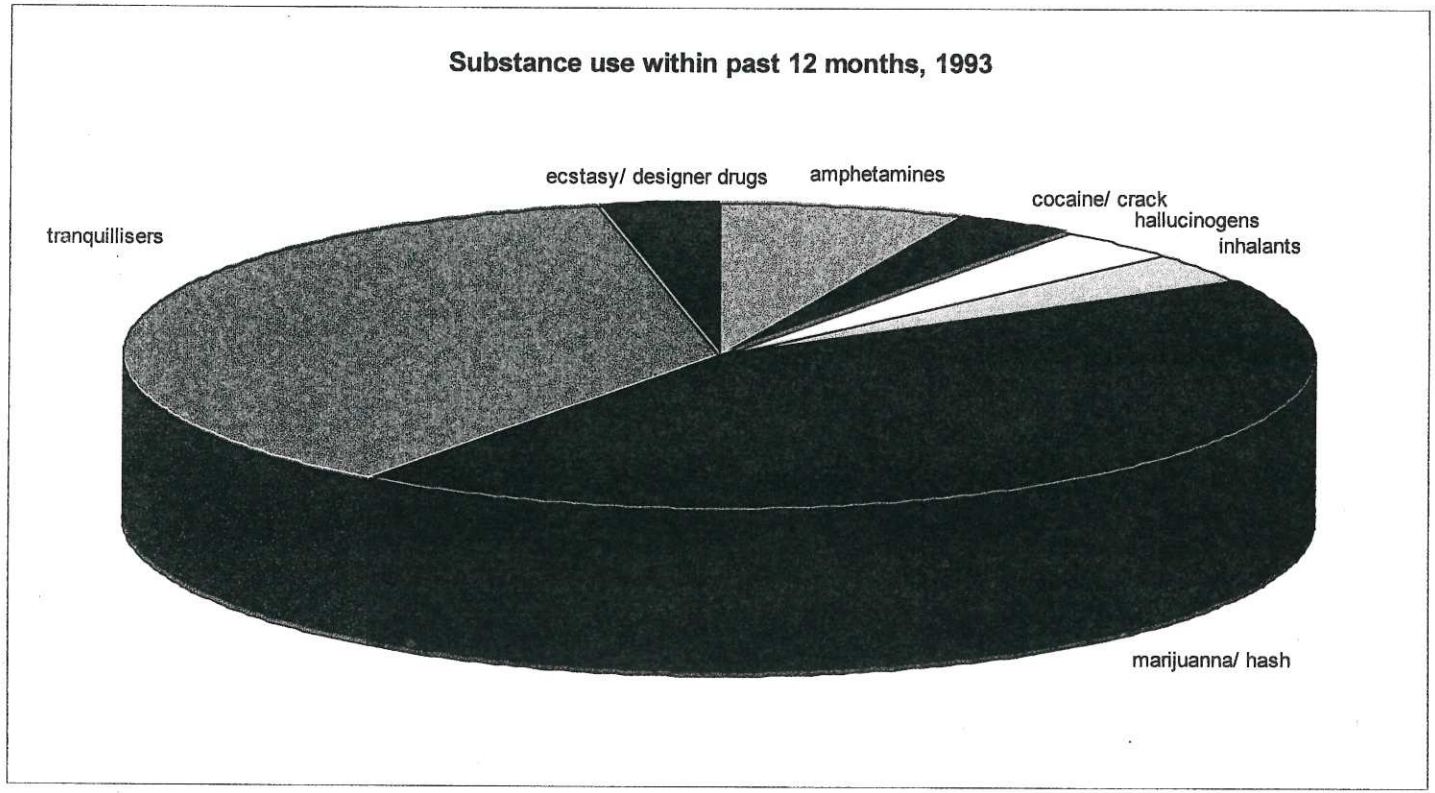
3. Australia

3.1 Longitudinal trend of drug abuse across time



(source: Statistics on drug abuse in Australia 1994, Commonwealth Department of Human Services and Health, Australian Government Publishing Service)

3.2 Pattern of drugs of abuse

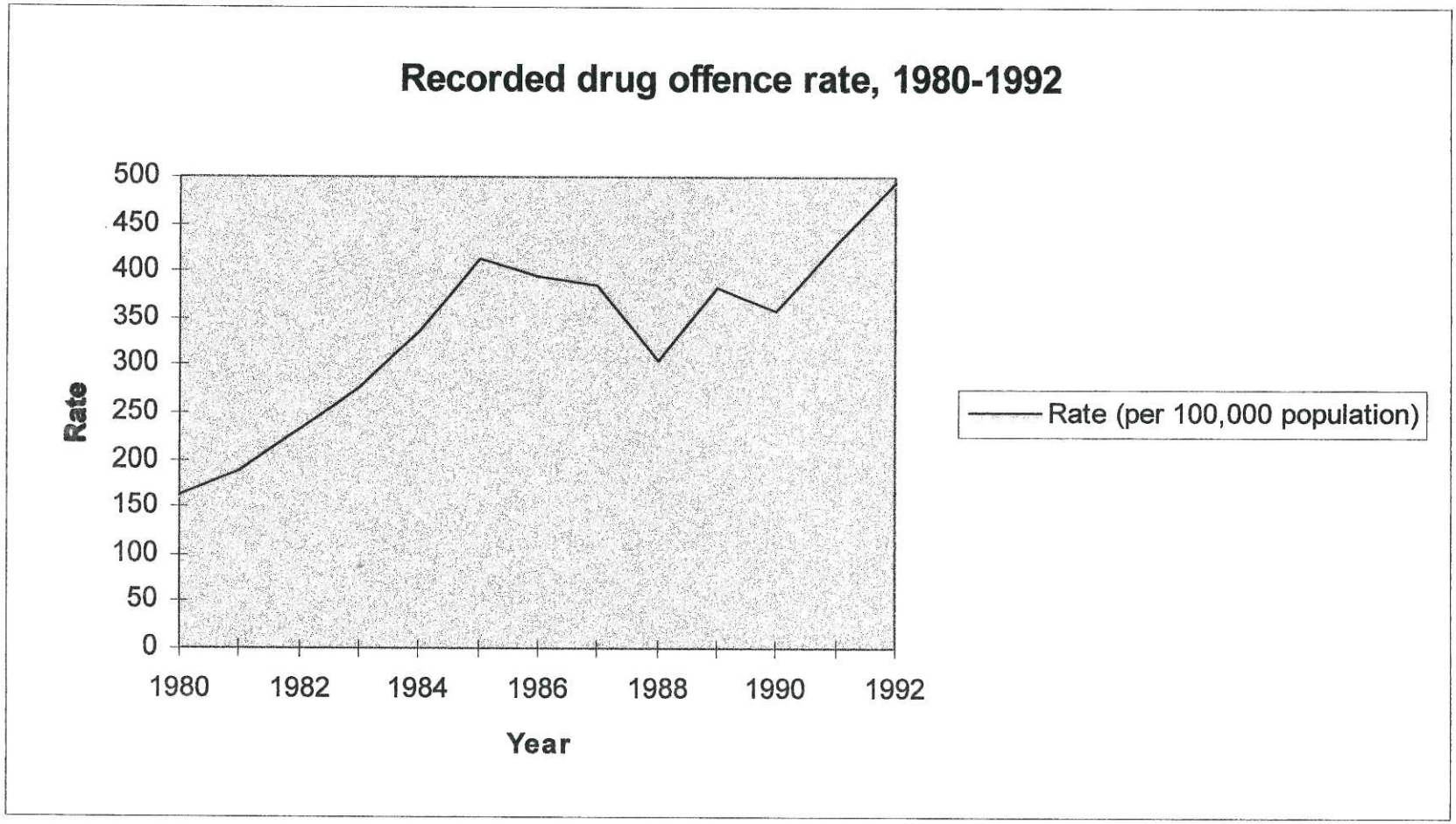


(source: Statistics on drug abuse in Australia 1994, Commonwealth Department of Human Services and Health, Australian Government Publishing Service)

3.3 Trend of drug abuse of different age groups

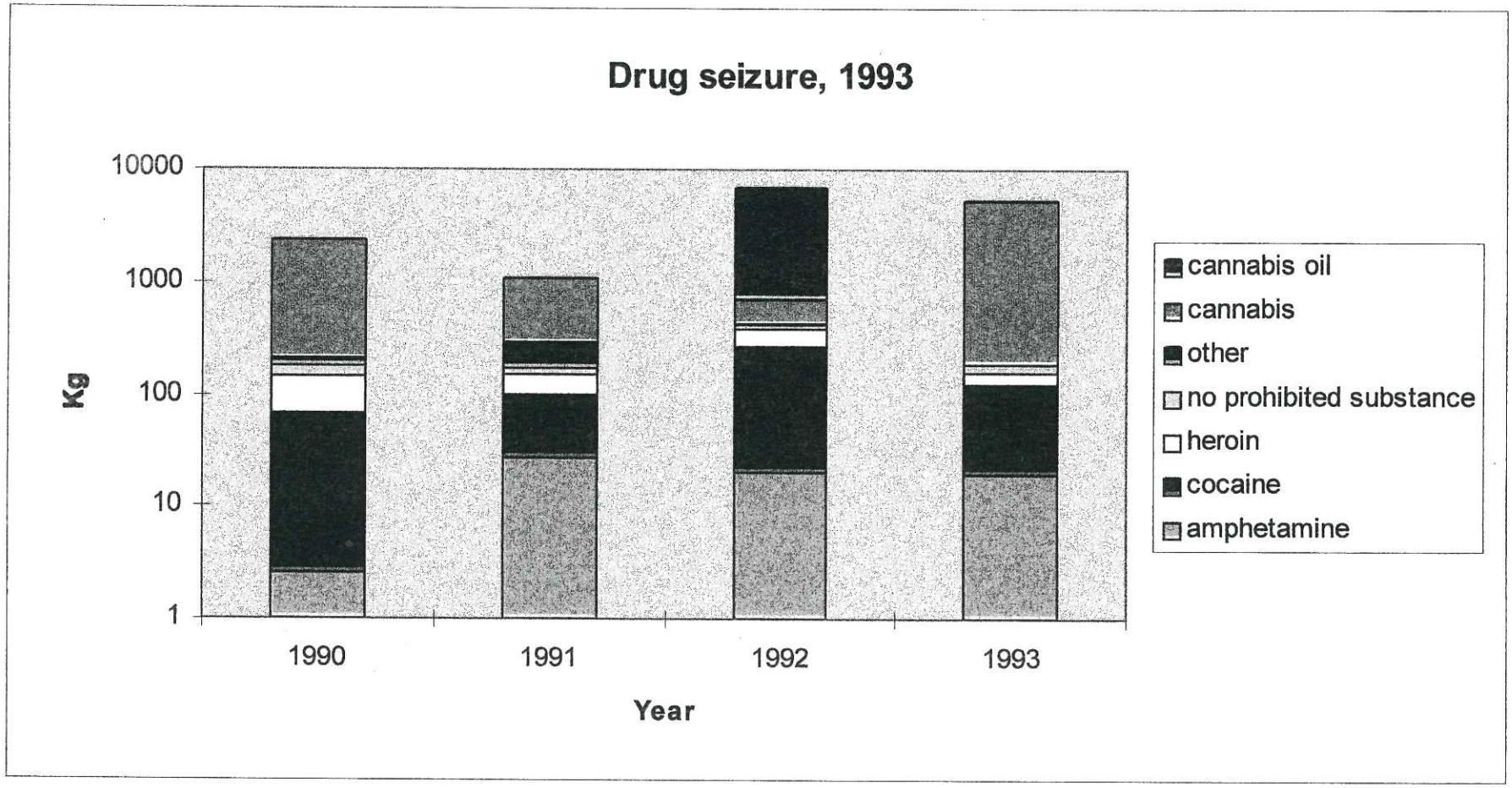
(data not available)

3.4 Arrest figure



(source: Statistics on drug abuse in Australia 1994, Commonwealth Department of Human Services and Health, Australian Government Publishing Service)

3.5 Drug Seizure



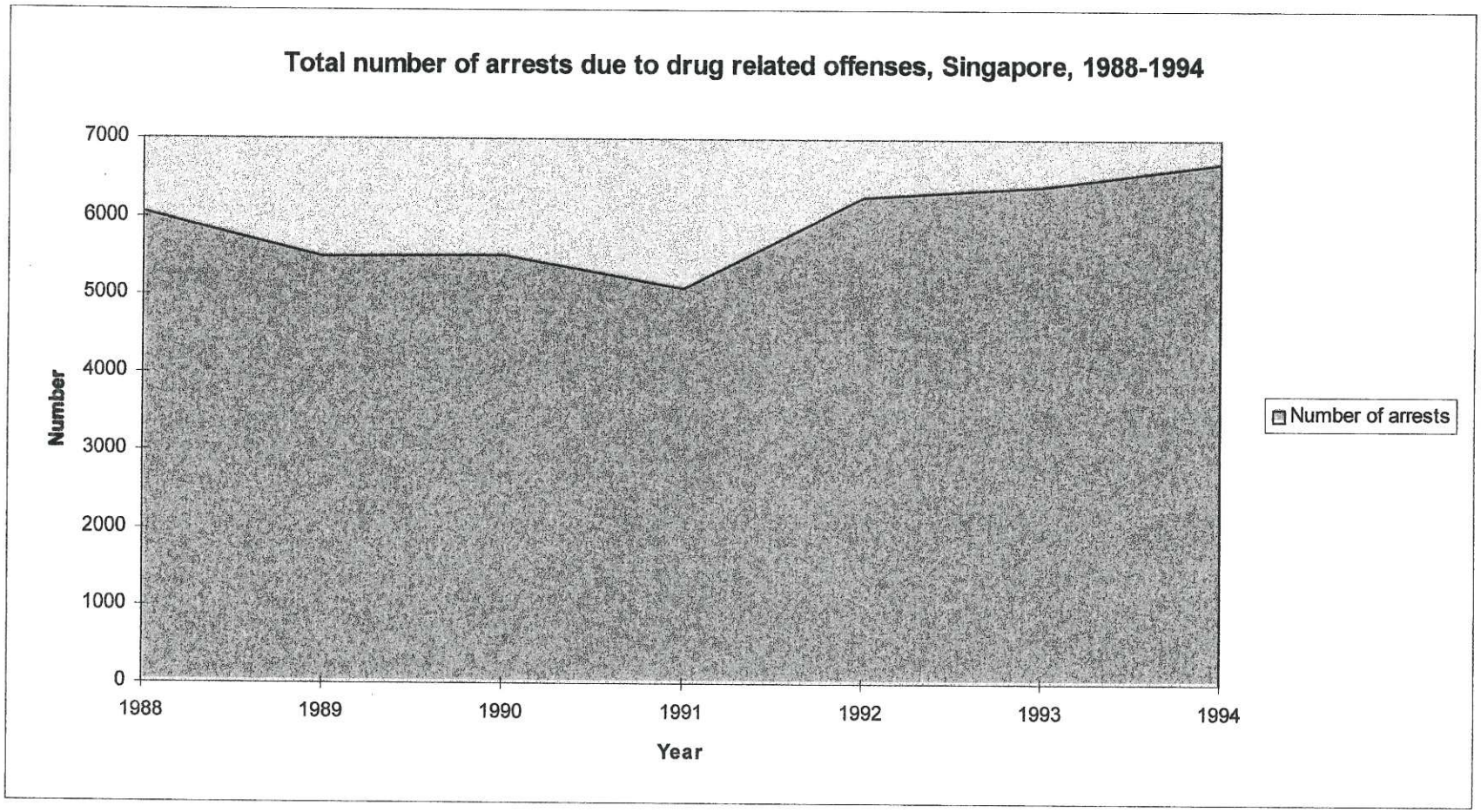
(source: Statistics on drug abuse in Australia 1994, Commonwealth Department of Human Services and Health, Australian Government Publishing Service)

3.6 Drug abuse by Education
(data not available)

3.7 Drug abuse by Employment
(data not available)

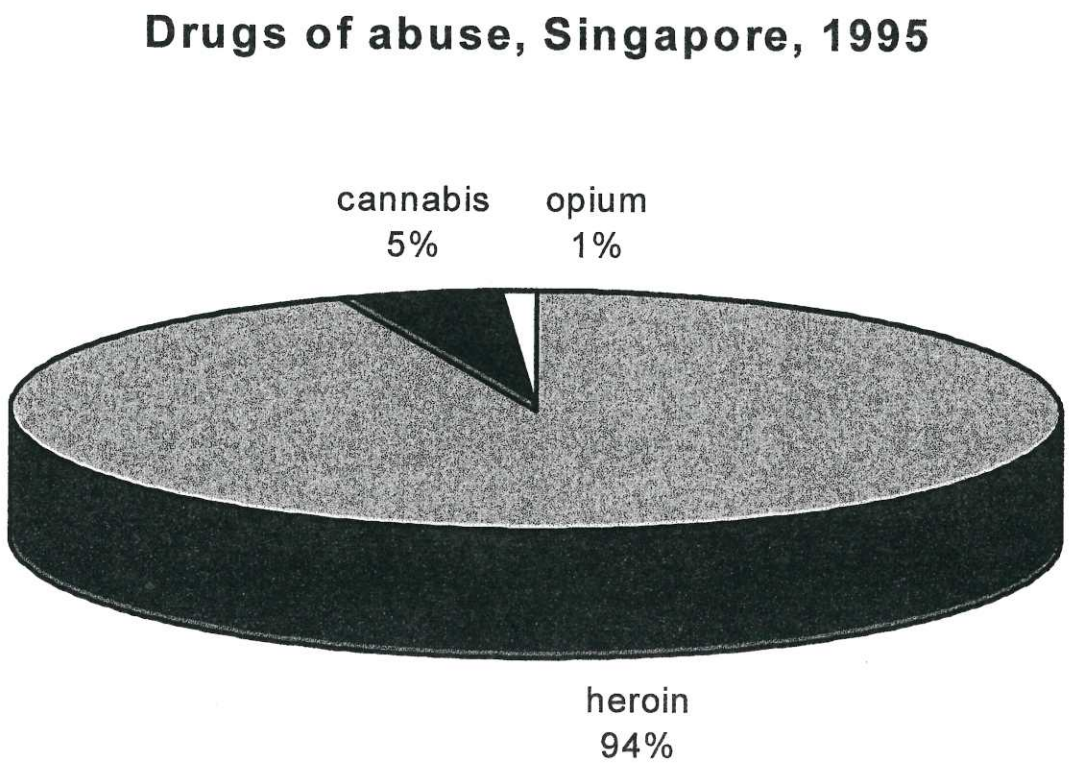
4. Singapore

4.1 Longitudinal trend of drug abuse across time



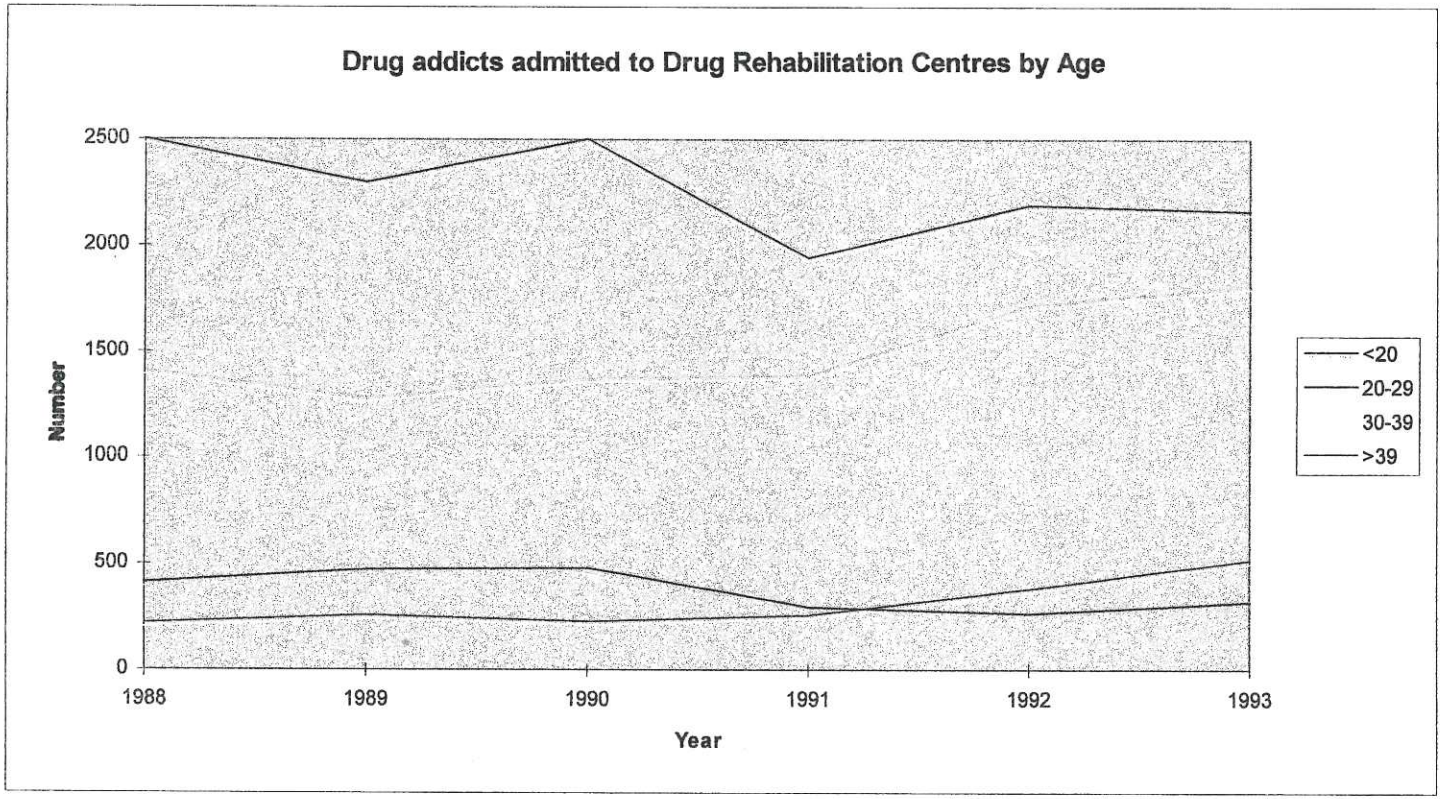
(source: Central Narcotics Bureau Bulletin 1992-1994, Central Narcotics Bureau, Singapore)

4.2 Pattern of drugs of abuse



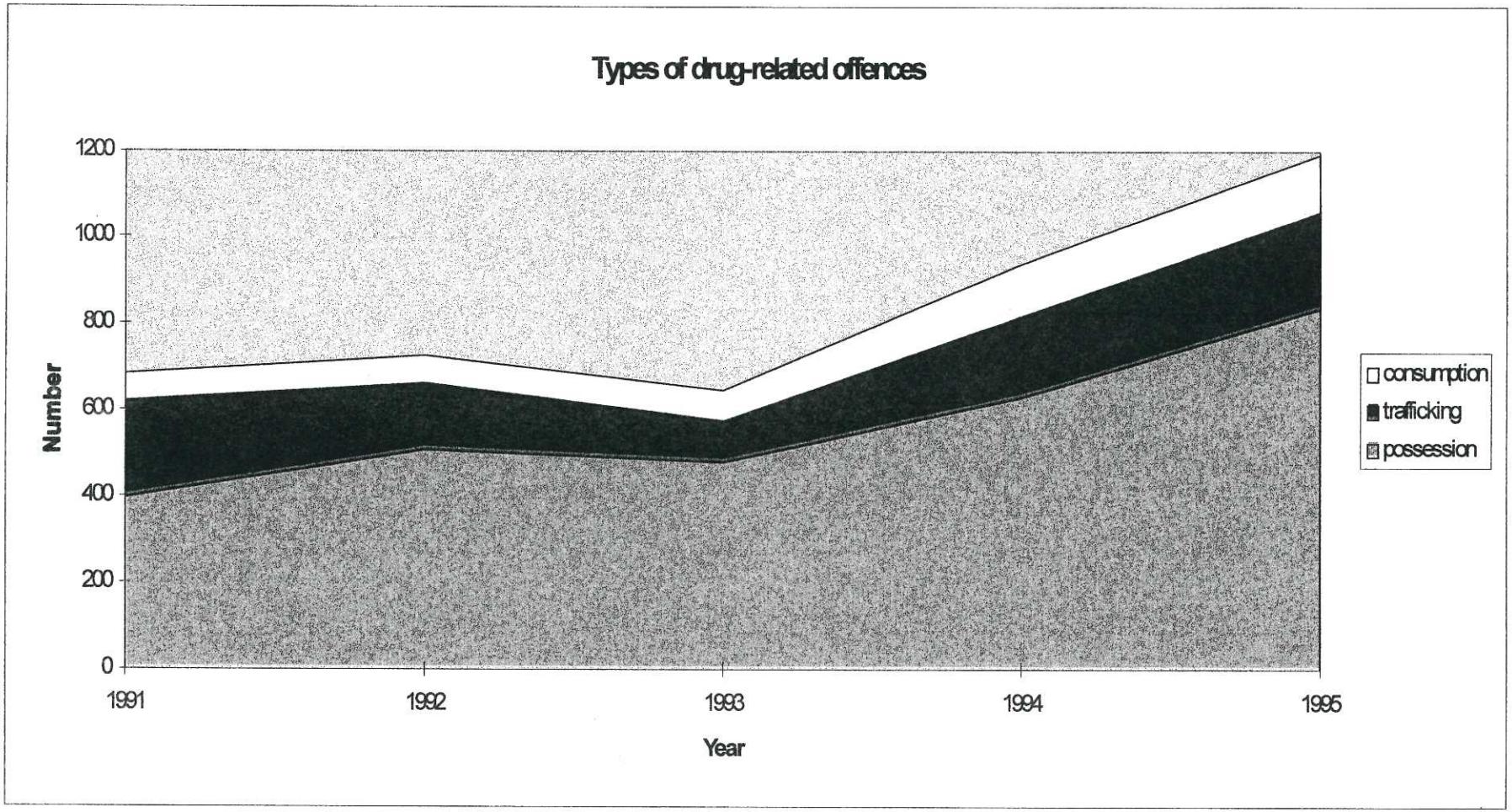
(source: Central Narcotics Bureau Bulletin 1995, Central Narcotics Bureau, Singapore)

4.3 Trend of drug abuse of different age groups



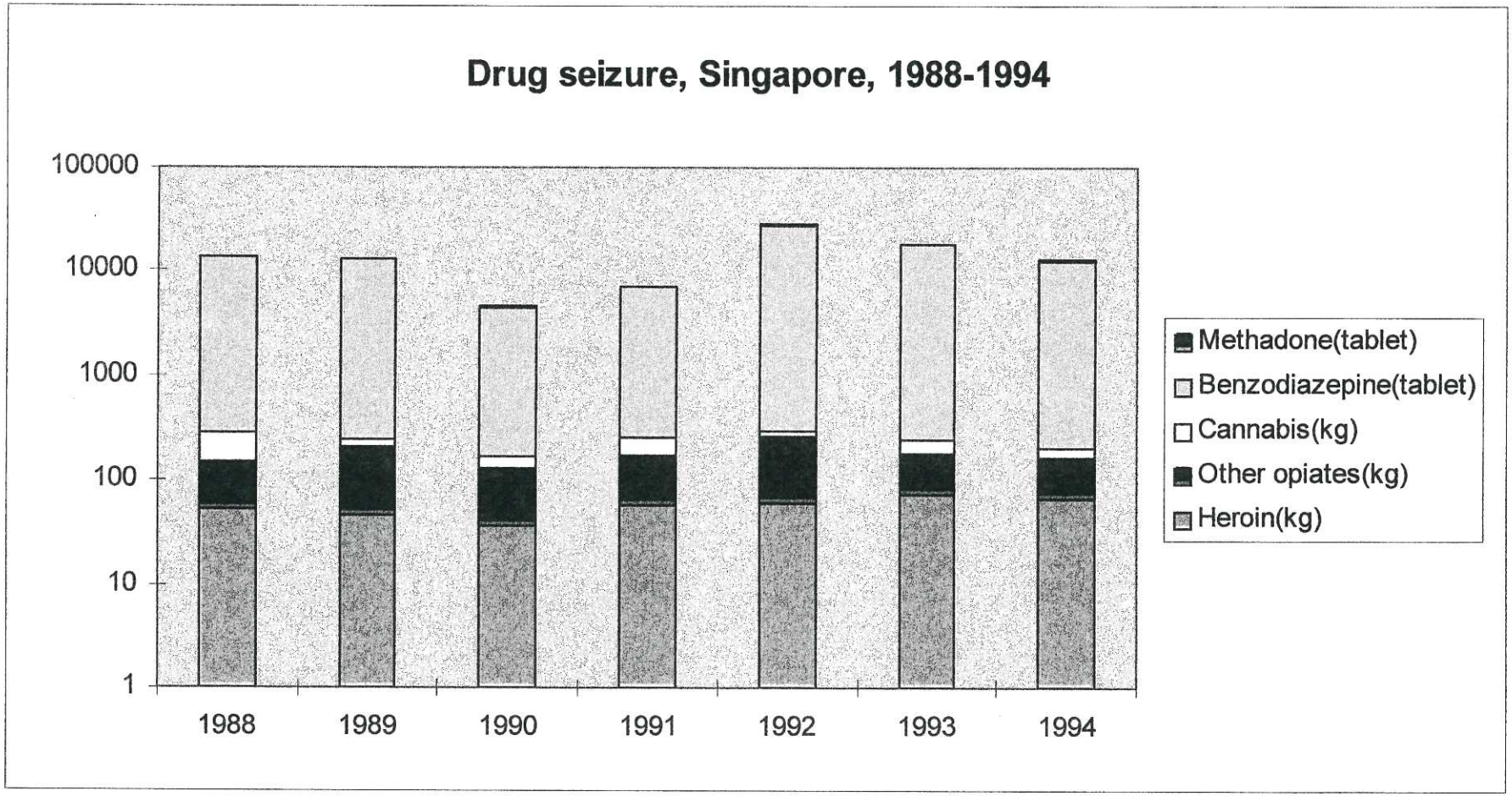
(source: Central Narcotics Bureau Bulletin 1994, Central Narcotics Bureau, Singapore)

4.4 Arrest figures



(source: Central Narcotics Bureau Bulletin 1995, Central Narcotics Bureau, Singapore)

4.5 Seizure figures



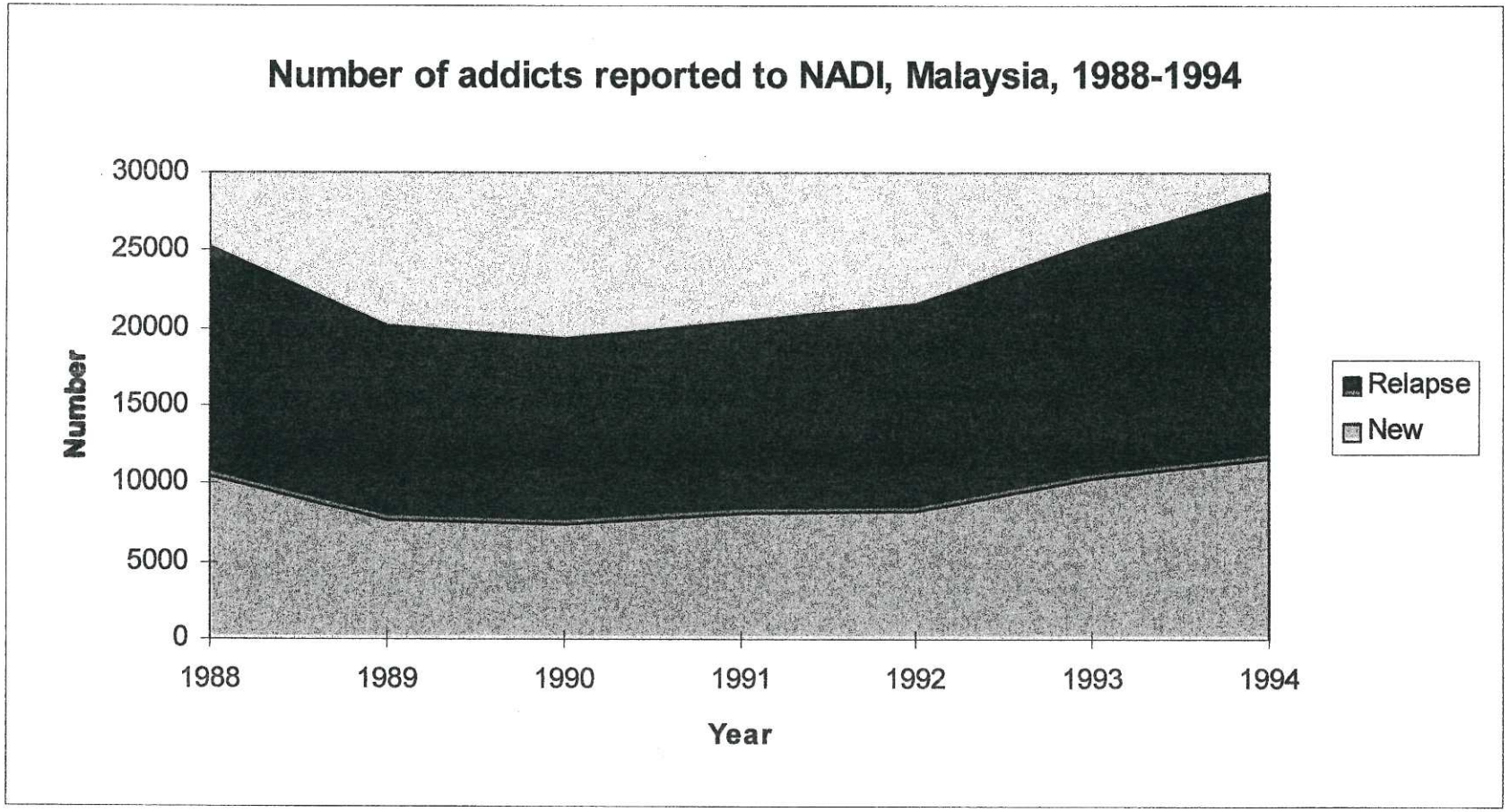
(source: Central Narcotics Bureau Bulletin 1992-1994, Central Narcotics Bureau, Singapore)

4.6 Drug abuse by Education
(data not available)

4.7 Drug abuse by Employment
(data not available)

5. Malaysia

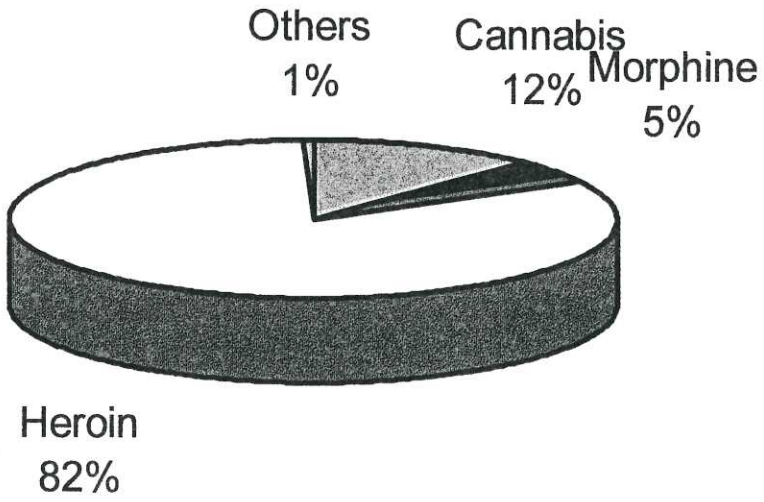
5.1 Longitudinal trend of drug abuse across time



(source: Narcotics Report 1994, Anti Narcotics Task Force, National Security Council, Prime Minister's Department, Malaysia)

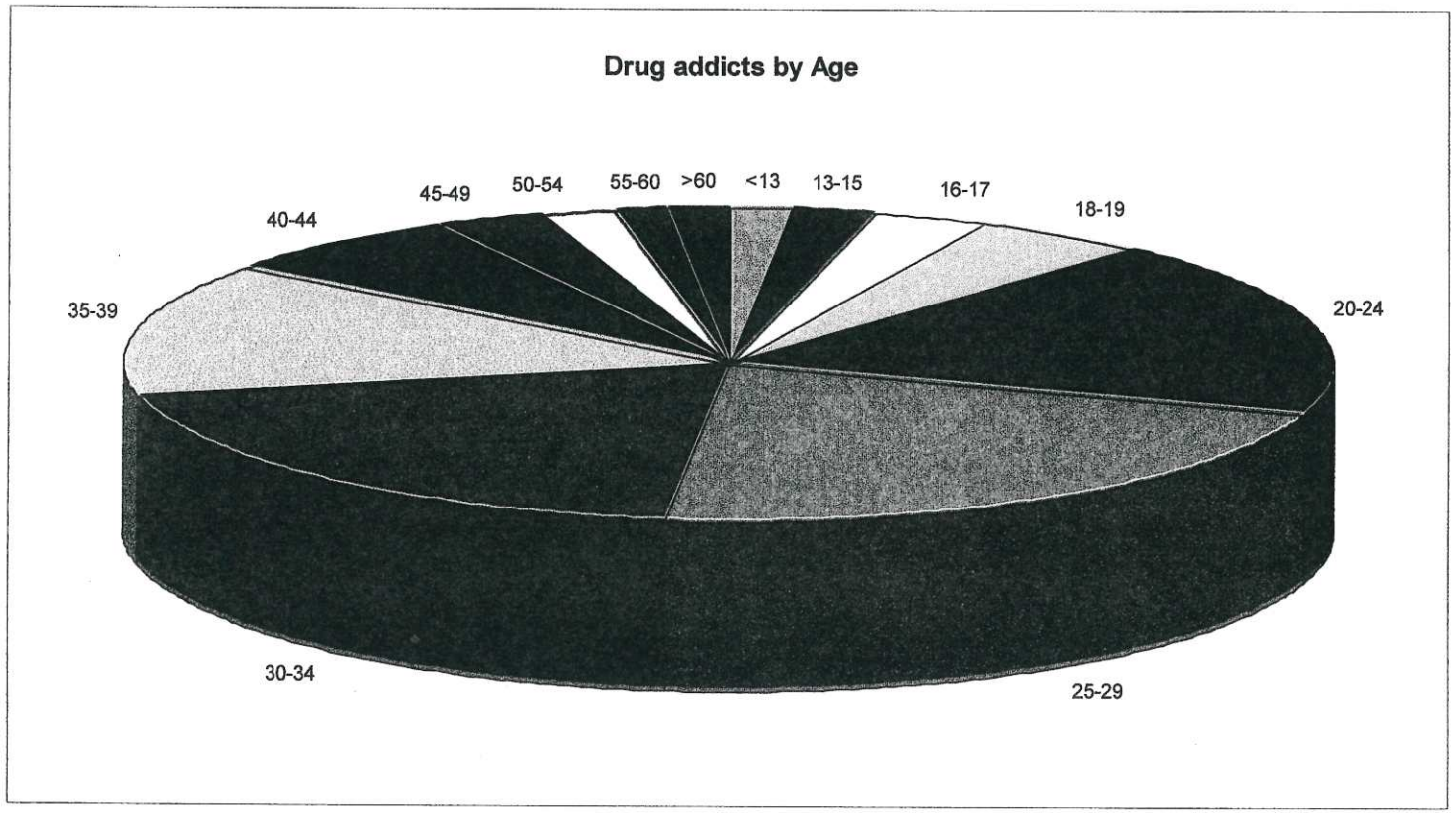
5.2 Pattern of drugs of abuse

Drugs of abuse among reported abusers, Malaysia, 1994



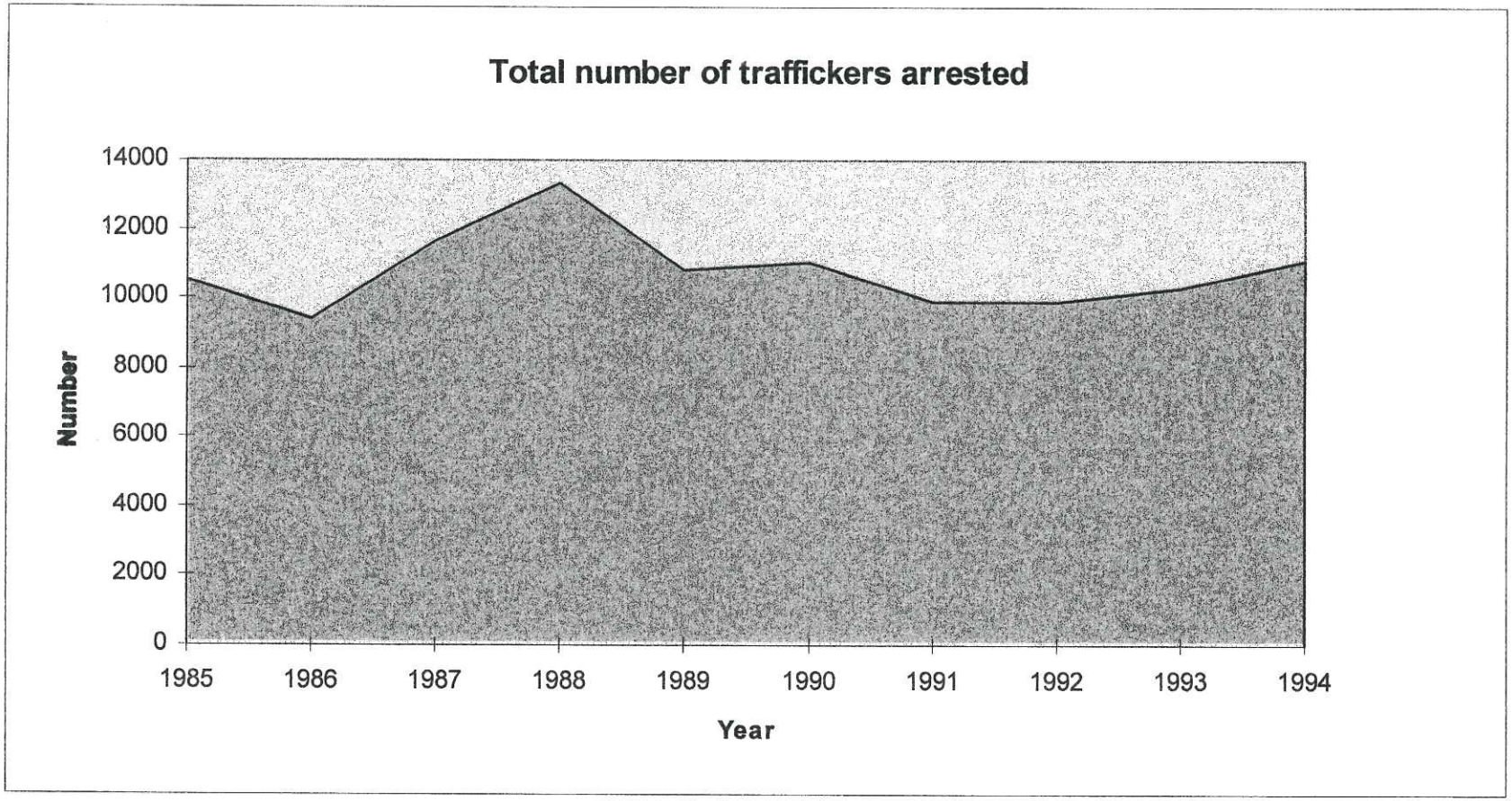
(source: Narcotics Report 1994, Anti Narcotics Task Force, National Security Council, Prime Minister's Department, Malaysia)

5.3 Drug abuse by age groups



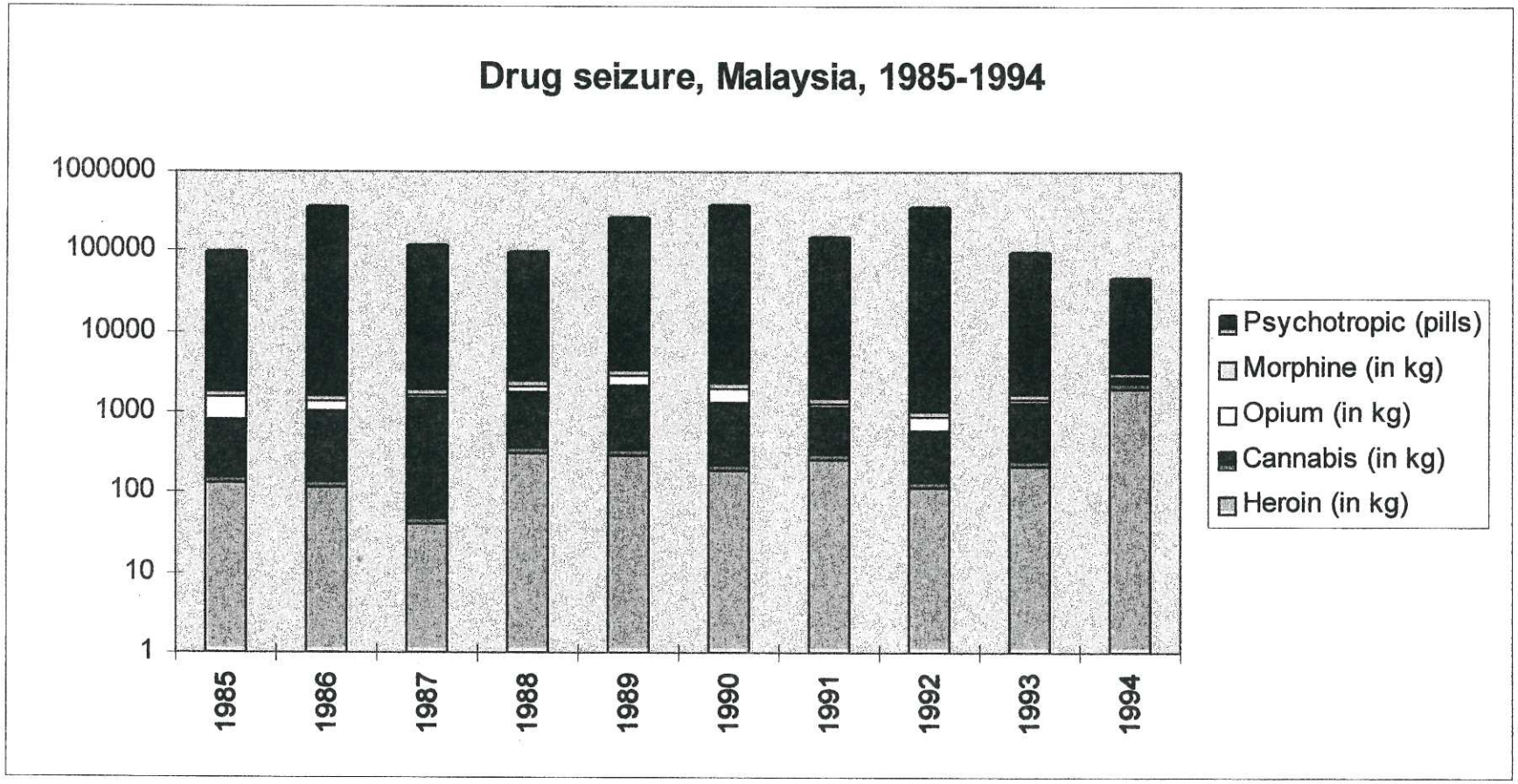
(source: Narcotics Report 1994, Anti Narcotics Task Force, National Security Council, Prime Minister's Department, Malaysia)

5.4 Arrest figures



(source: Narcotics Report 1994, Anti Narcotics Task Force, National Security Council, Prime Minister's Department, Malaysia)

5.5 Seizure figures

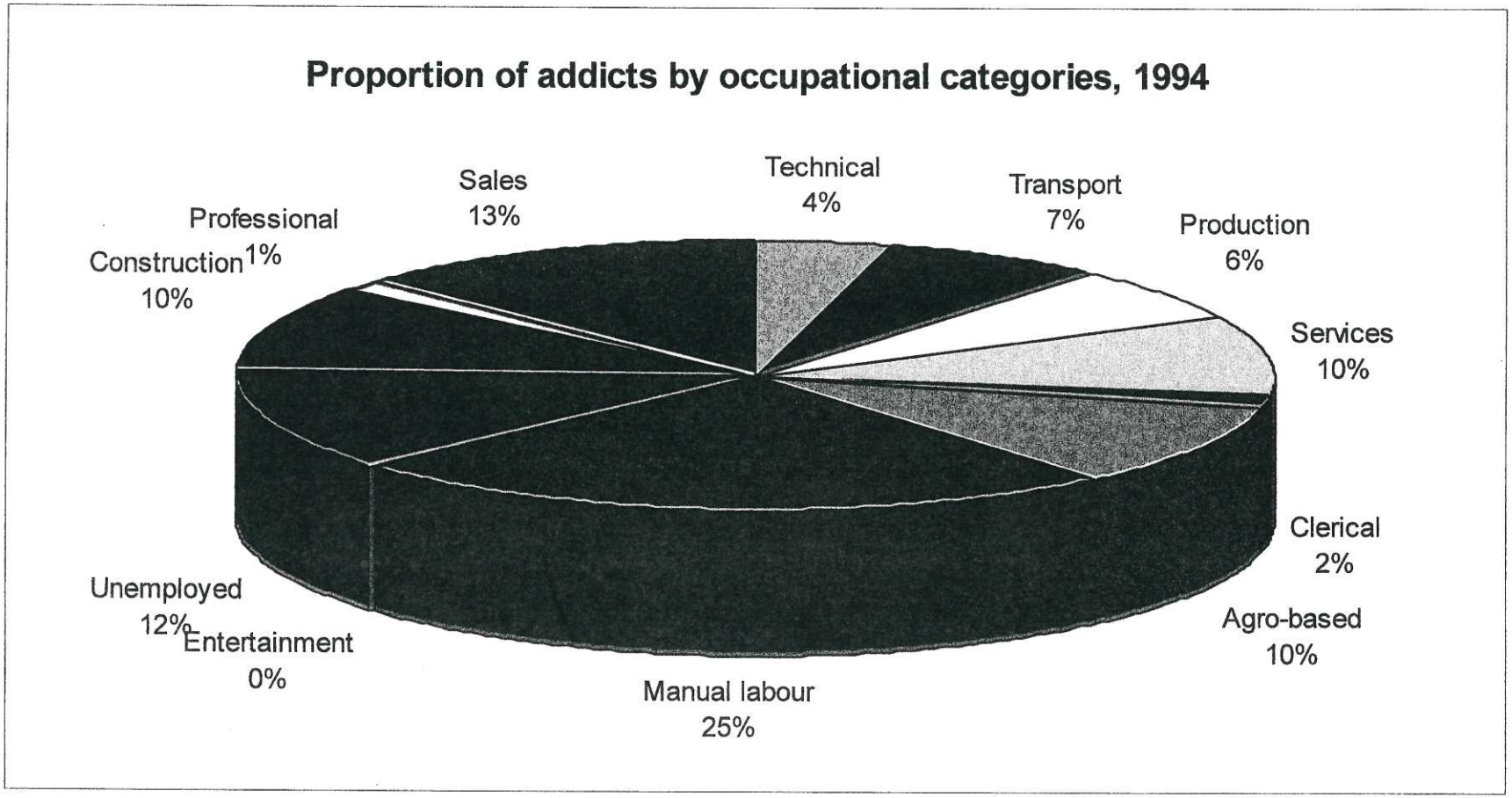


(source: Narcotics Report 1994, Anti Narcotics Task Force, National Security Council, Prime Minister's Department, Malaysia)

5.6 Drug abuse by Education

(data not available)

5.7 Drug abuse by Employment



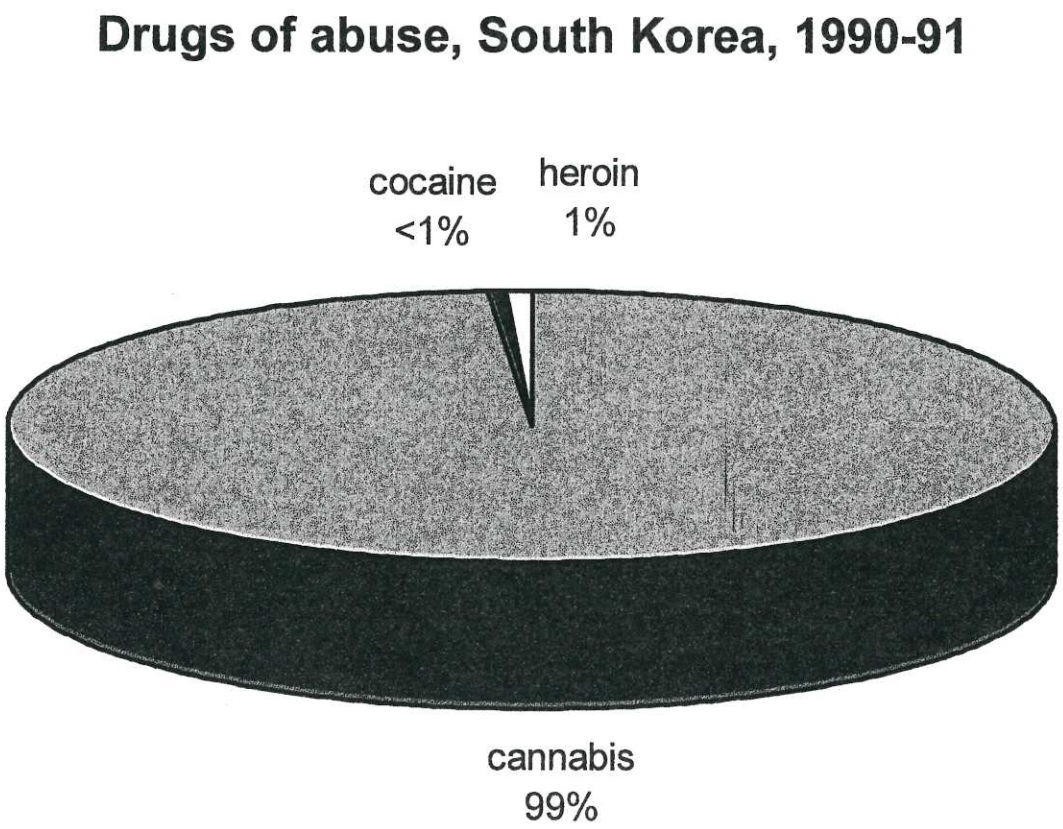
(source: Narcotics Report 1994, Anti Narcotics Task Force, National Security Council, Prime Minister's Department, Malaysia)

6. South Korea

6.1 Longitudinal trend of drug abuse across time

(data not available)

6.2 Pattern of drugs of abuse



(source: Drug abuse: extent, patterns & trends, Commission on Narcotics Drugs, Economic & Social Council, United Nations, 1996)

6.3 Trend of drug abuse of different age groups

(data not available)

6.4 Arrest figures

(data not available)

6.5 Seizure figures

(data not available)

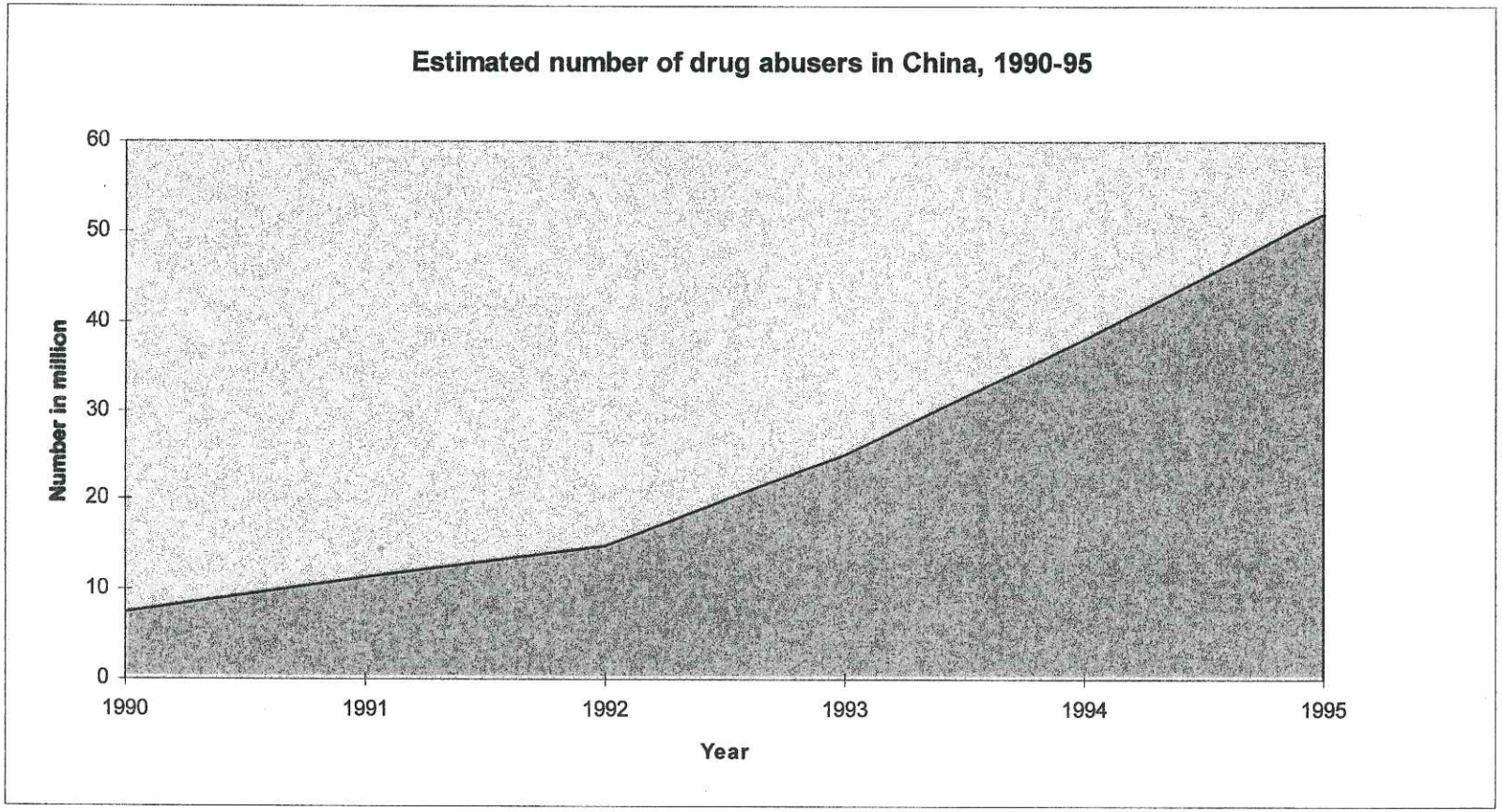
6.6 Drug abuse by Education

(data not available)

6.7 Drug abuse by Employment
(data not available)

7. China

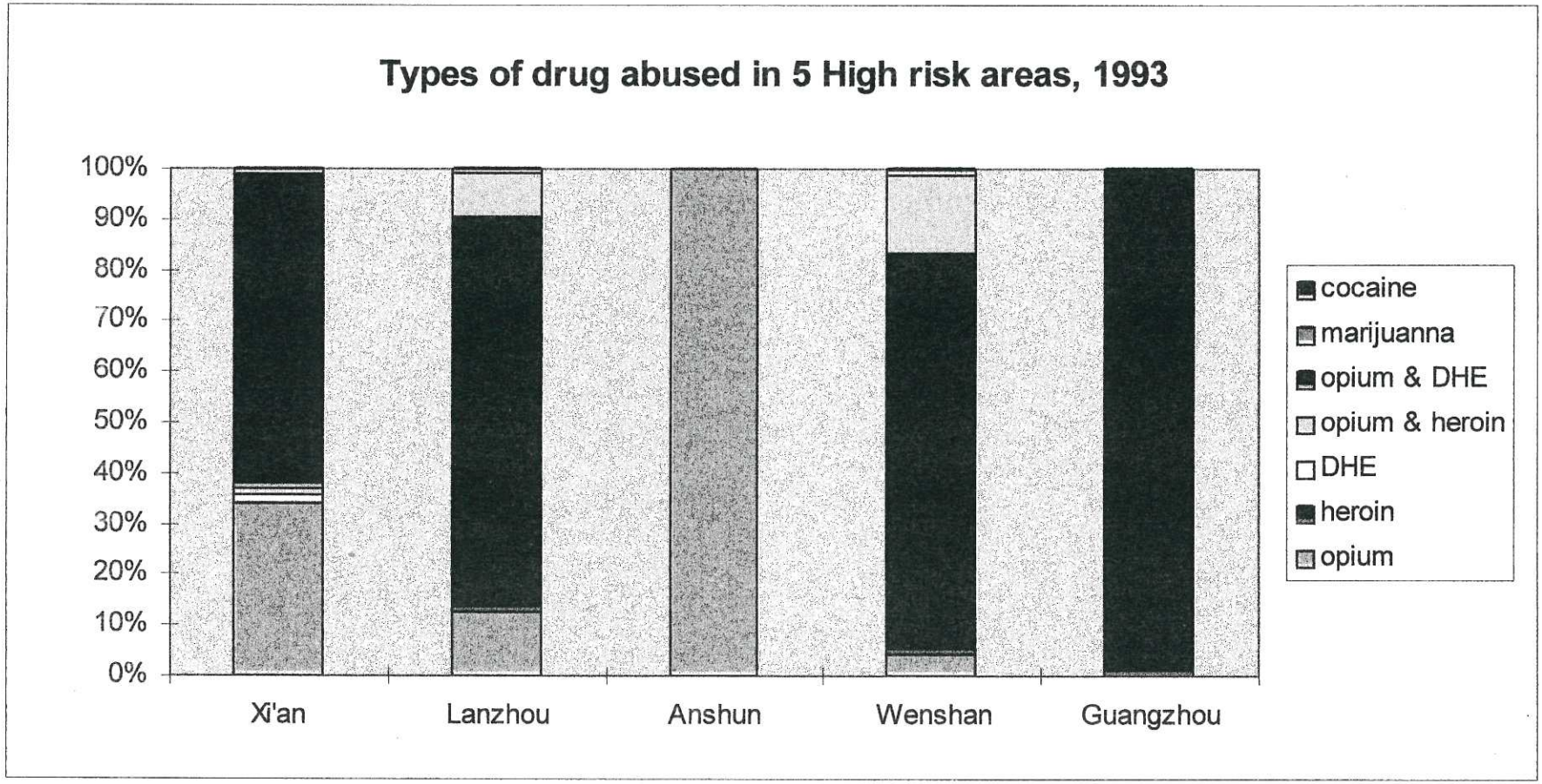
7.1 Longitudinal trend of drug abuse across time



Note: 1991 & 1992 figures are projected

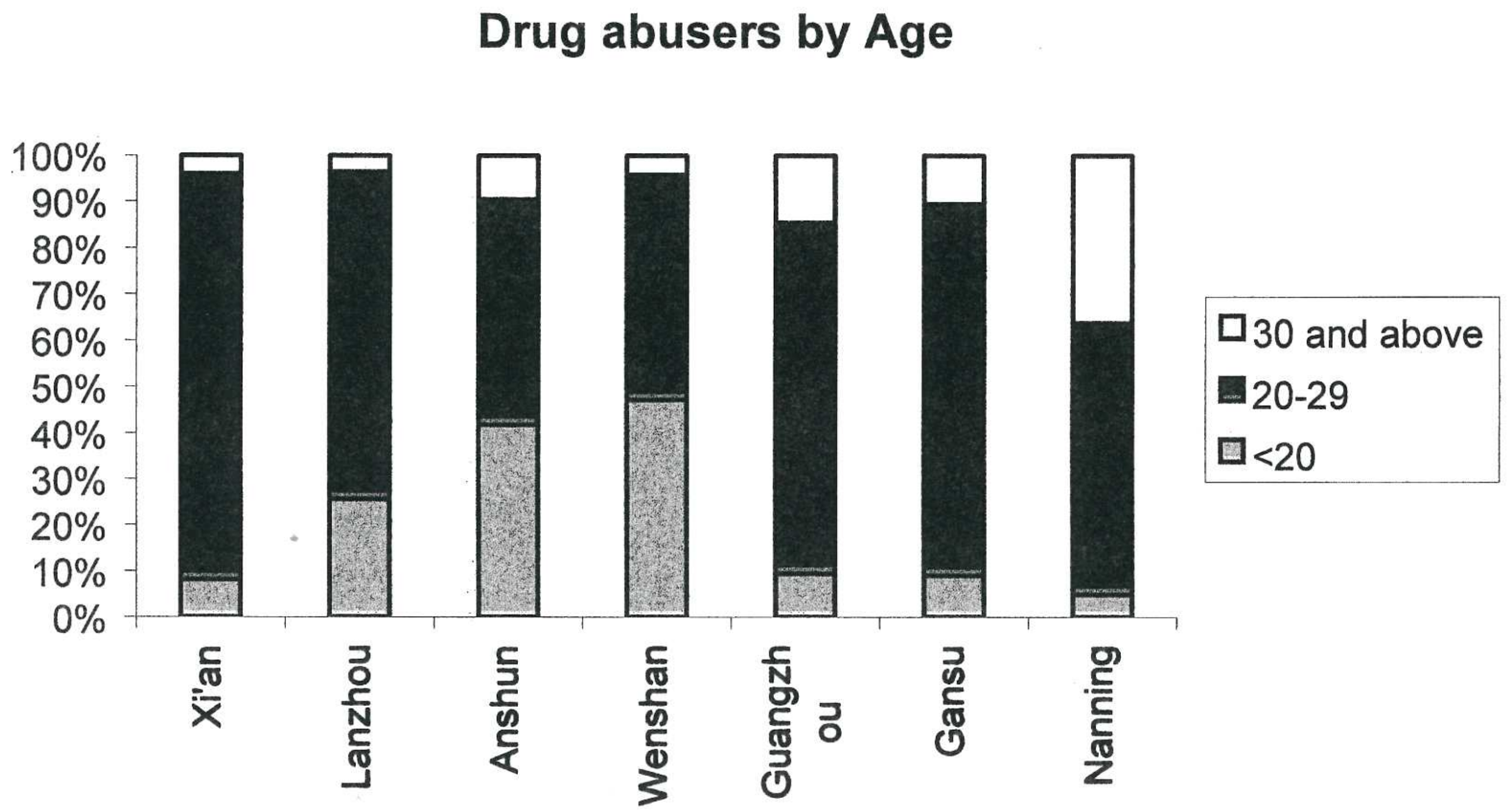
(source: Chinese Academy of Social Science, 1996)

7.2 Pattern of drugs of abuse



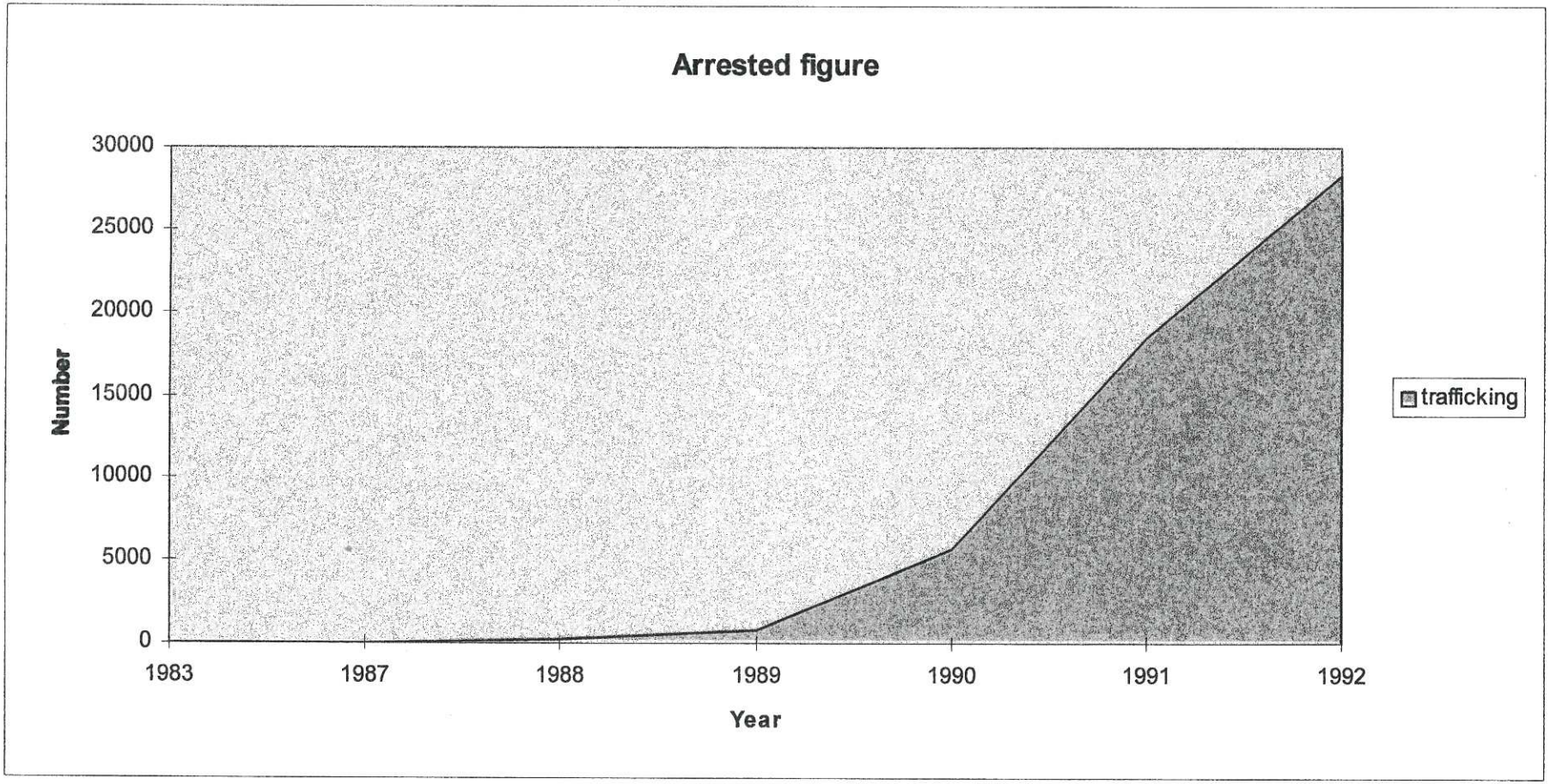
(source: Psychosocial and Biological Aspects of Addictive Behaviors 1996, Mental Health Institute, Hunnan Medical University, China)

7.3 Age distribution of drug abusers



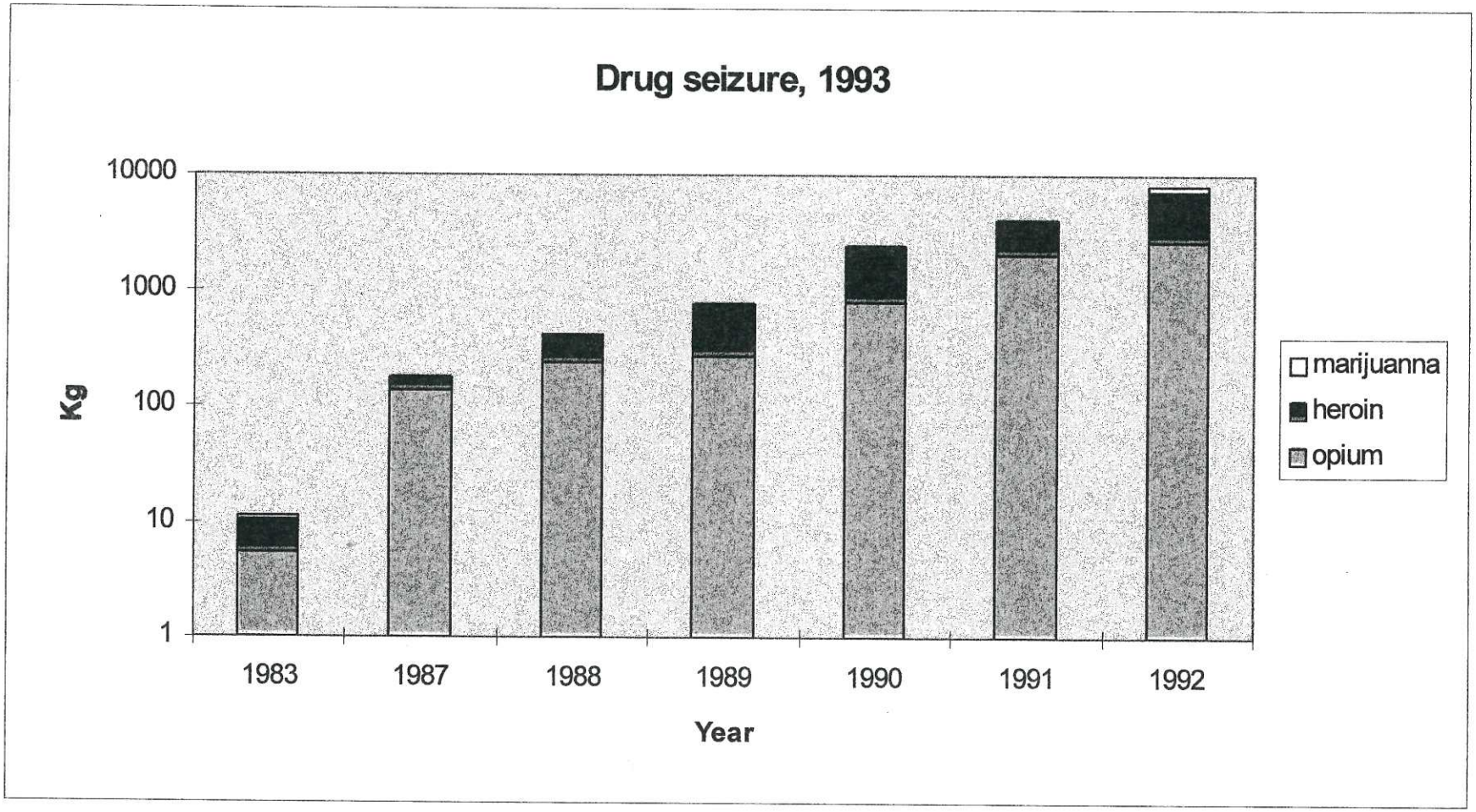
(source: Psychosocial and Biological Aspects of Addictive Behaviors 1996, Mental Health Institute, Hunnan Medical University, China)

7.4 Arrest figures



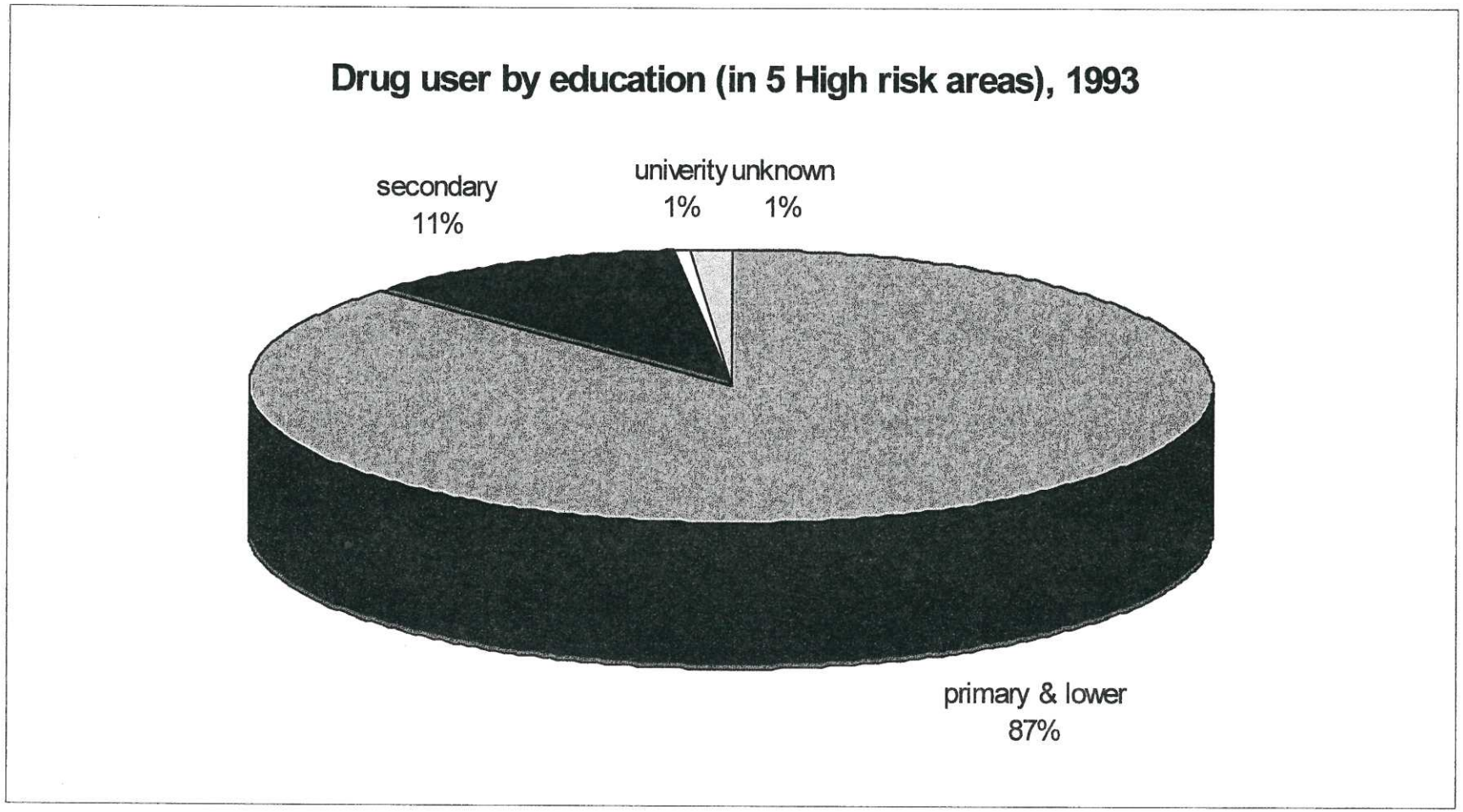
(source: National Institute of Drug Dependence, 1996)

7.5 Seizure figures



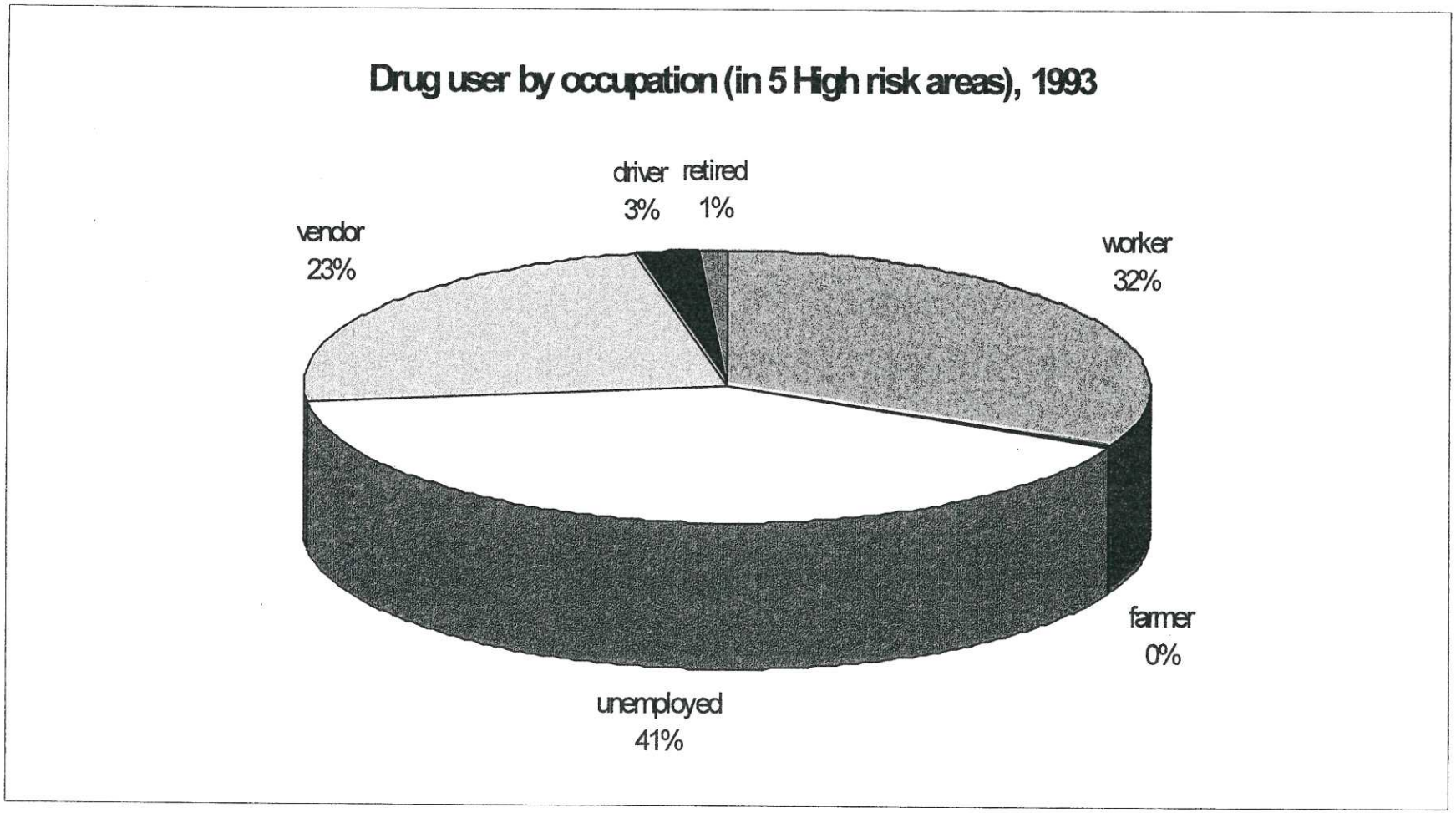
(source: National Institute of Drug Dependence, 1996)

7.6 Drug abuse by Education



(source: Psychosocial and Biological Aspects of Addictive Behaviors 1996, Mental Health Institute, Hunnan Medical University, China)

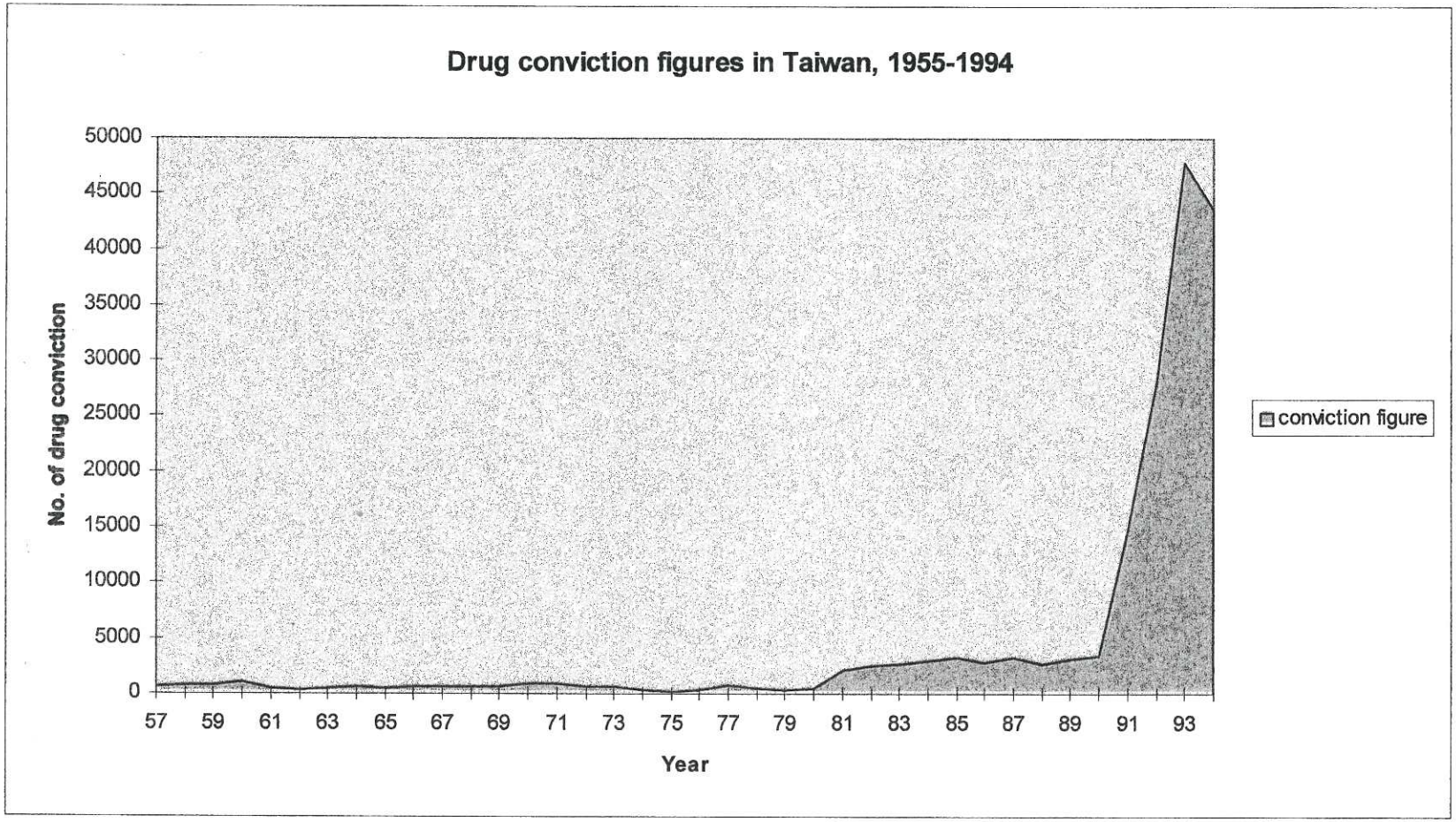
7.7 Drug abuse by Employment



(source: Psychosocial and Biological Aspects of Addictive Behaviors 1996, Mental Health Institute, Hunnan Medical University, China)

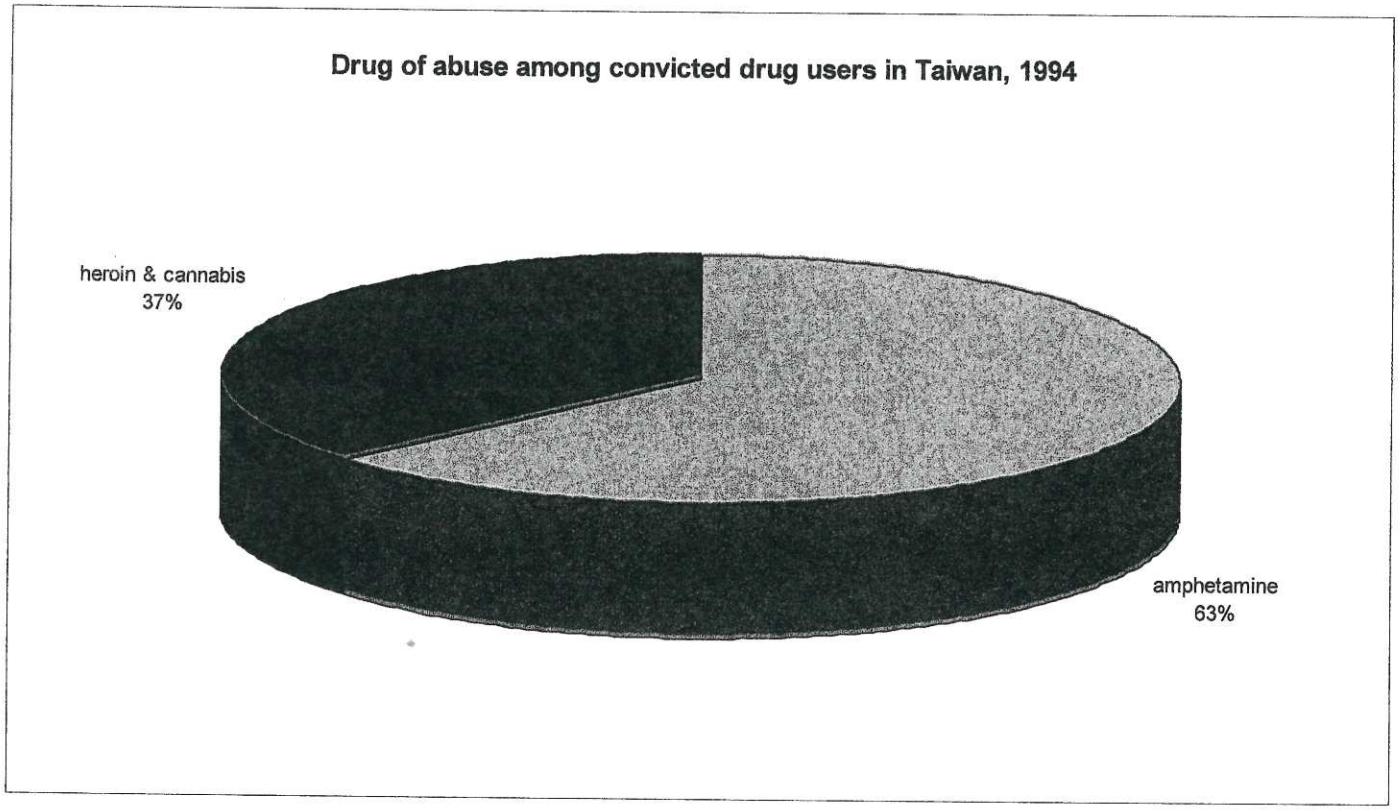
8. Taiwan

8.1 Longitudinal trend of drug abuse



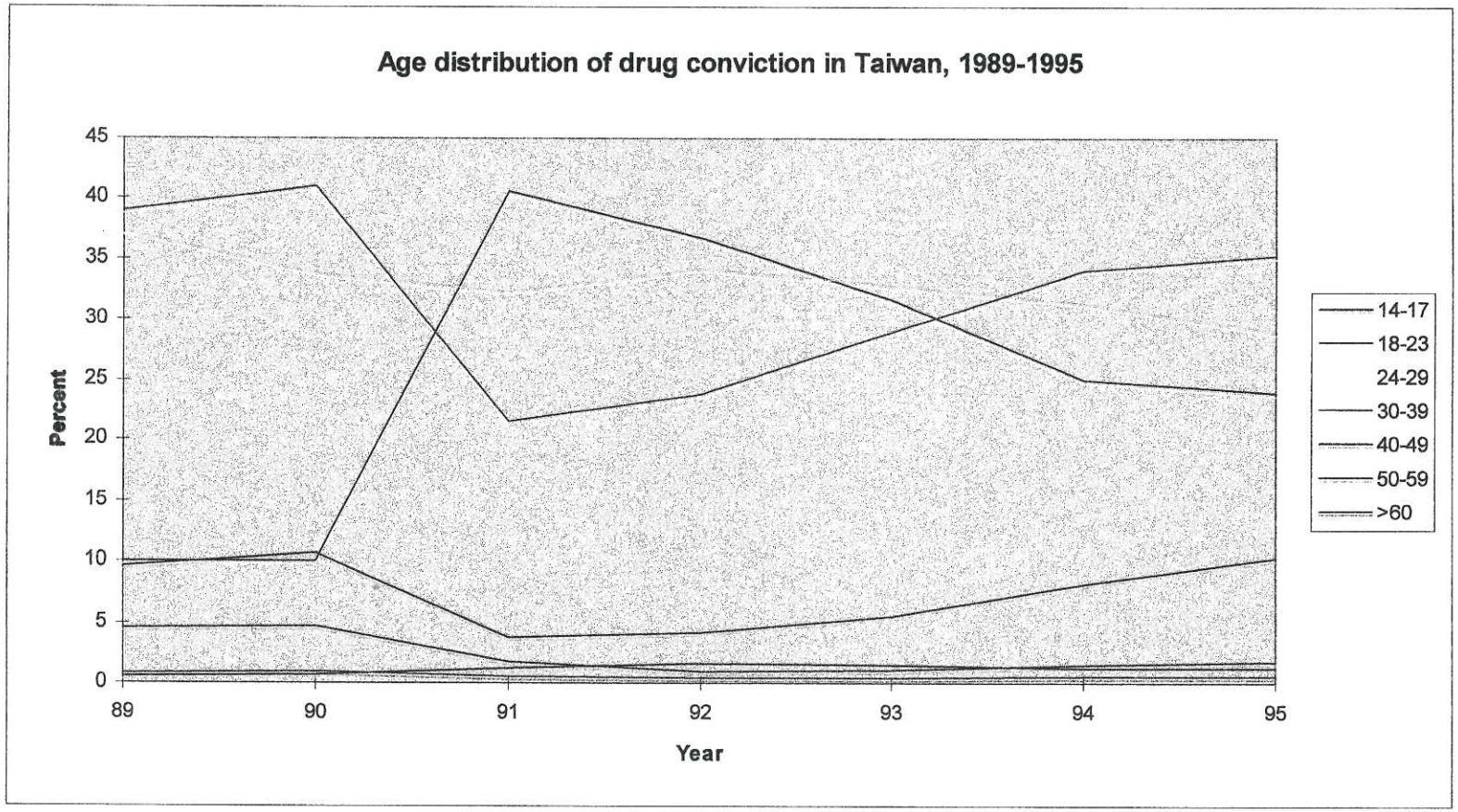
(source: Anti-Drug Report 1995-1996, Judiciary Department, Taiwan)

8.2 Pattern of drugs of abuse



(source: Anti-Drug Report 1995-1996, Judiciary Department, Taiwan)

8.3 Trend of drug abuse of different age groups

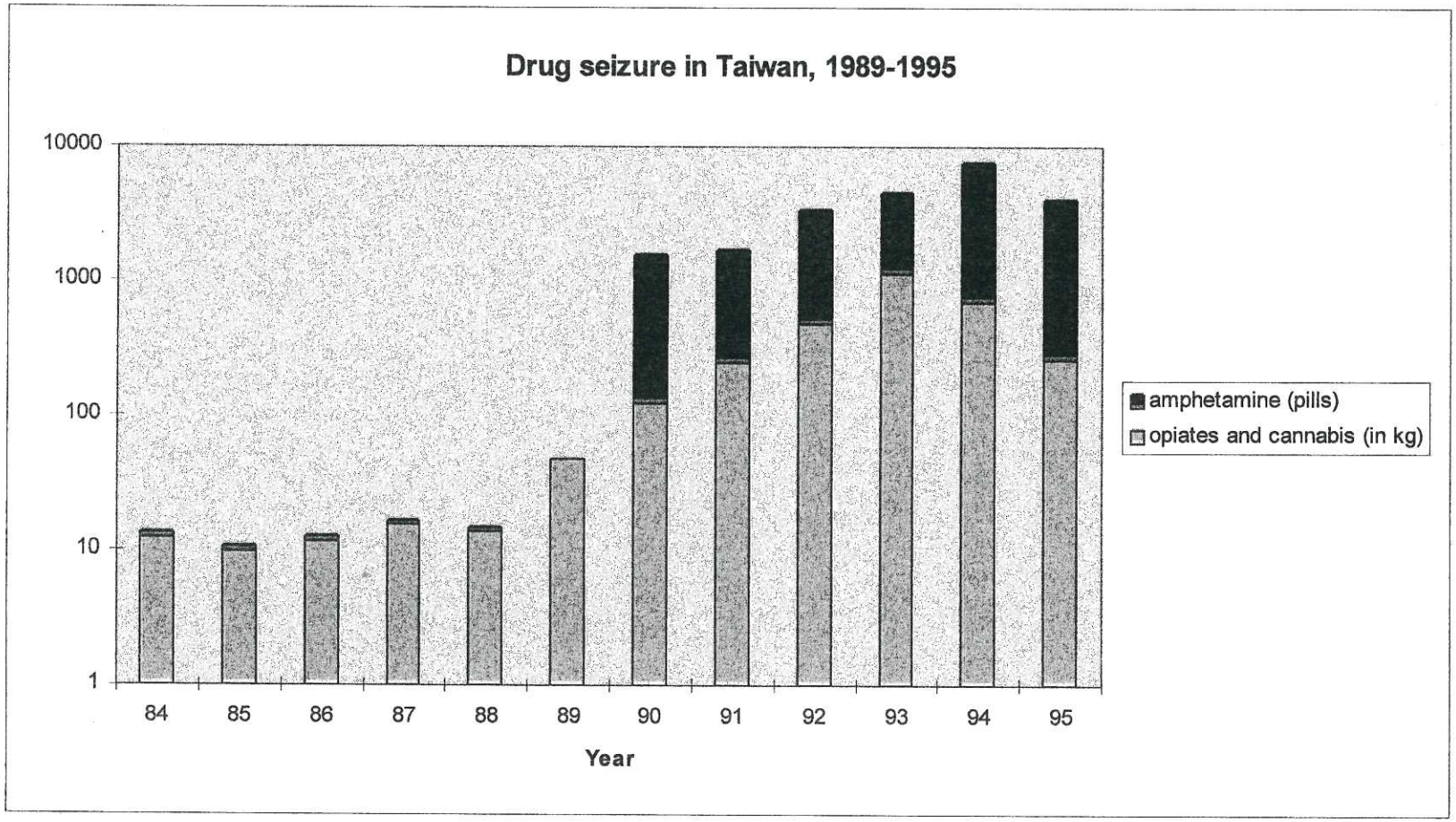


(source: Anti-Drug Report 1995-1996, Judiciary Department, Taiwan)

8.4 Arrest figures

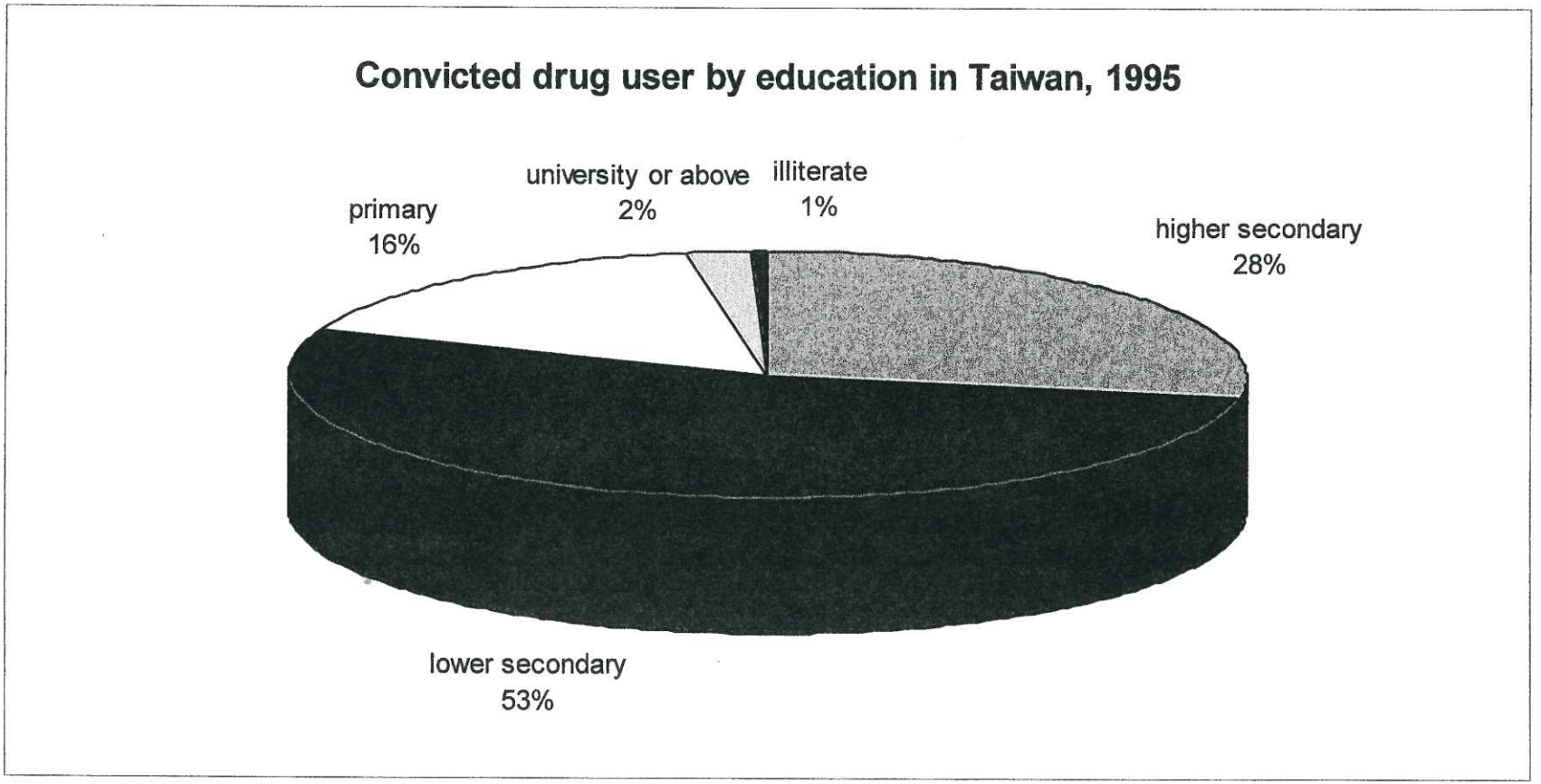
(refer to figure 8.1)

8.5 Seizure figures



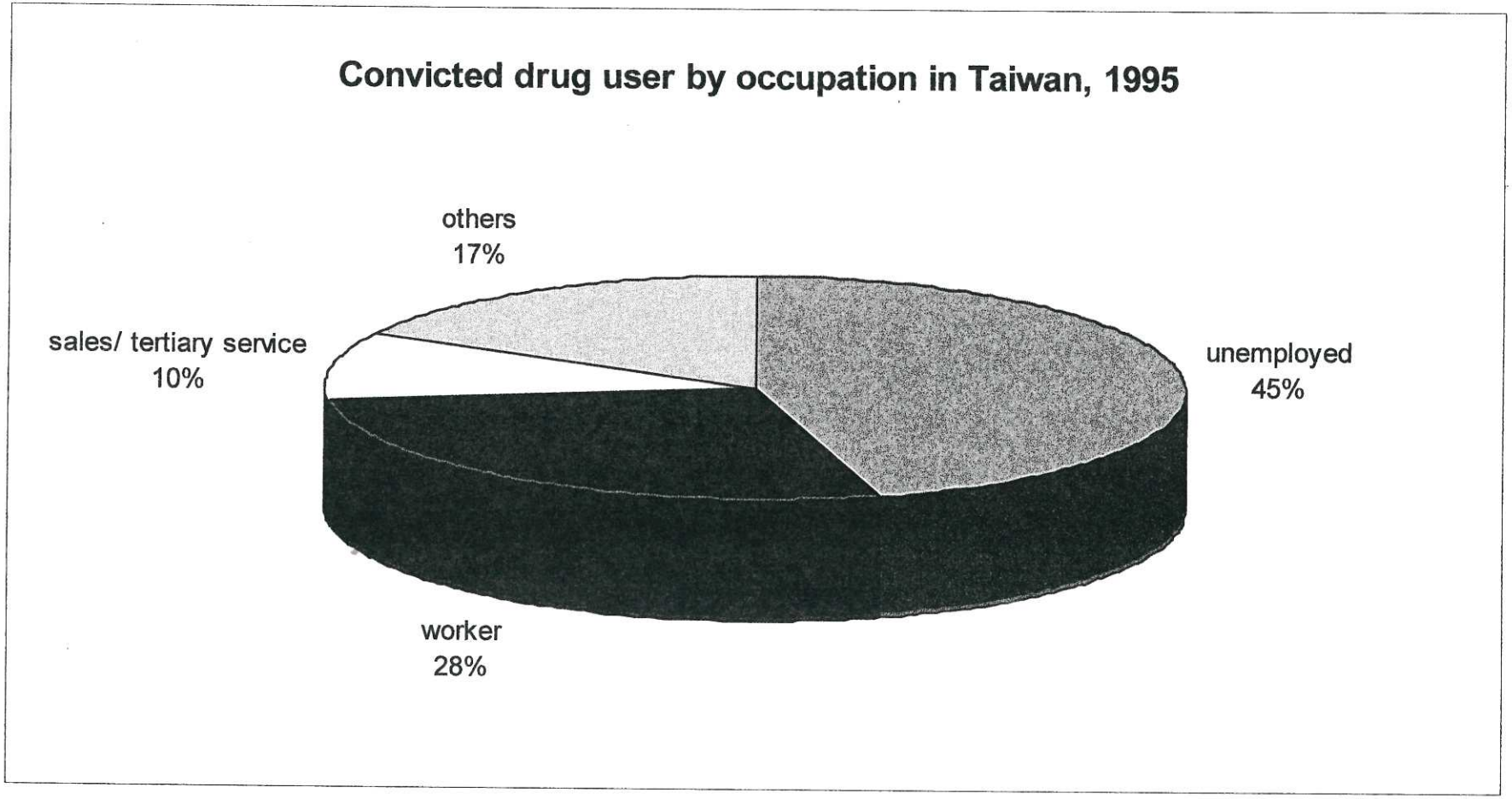
(source: Anti-Drug Report 1995-1996, Judiciary Department, Taiwan)

8.6 Drug abuse by Education



(source: Anti-Drug Report 1995-1996, Judiciary Department, Taiwan)

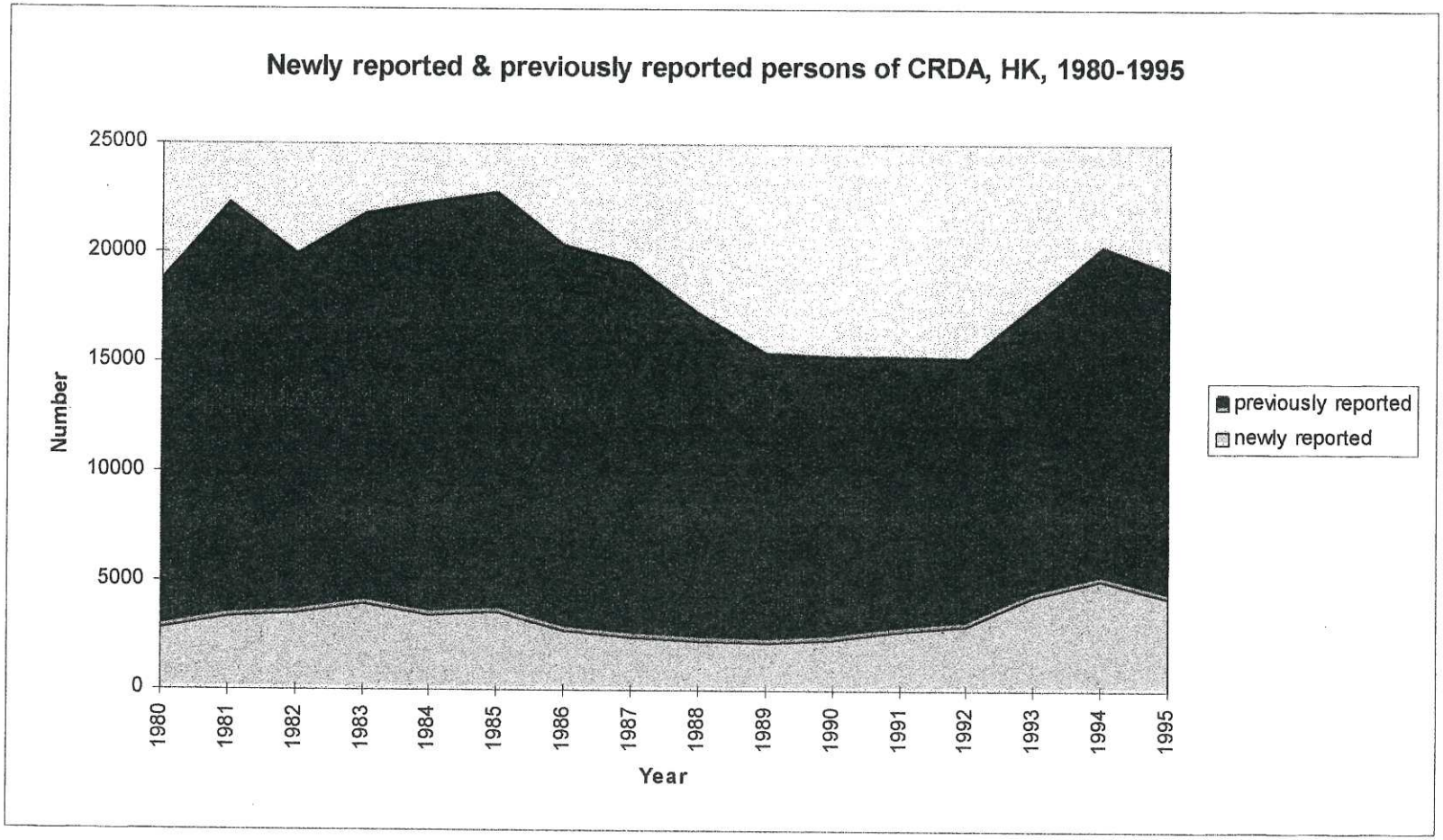
8.7 Drug abuse by Employment



(source: Anti-Drug Report 1995-1996, Judiciary Department, Taiwan)

9. Hong Kong

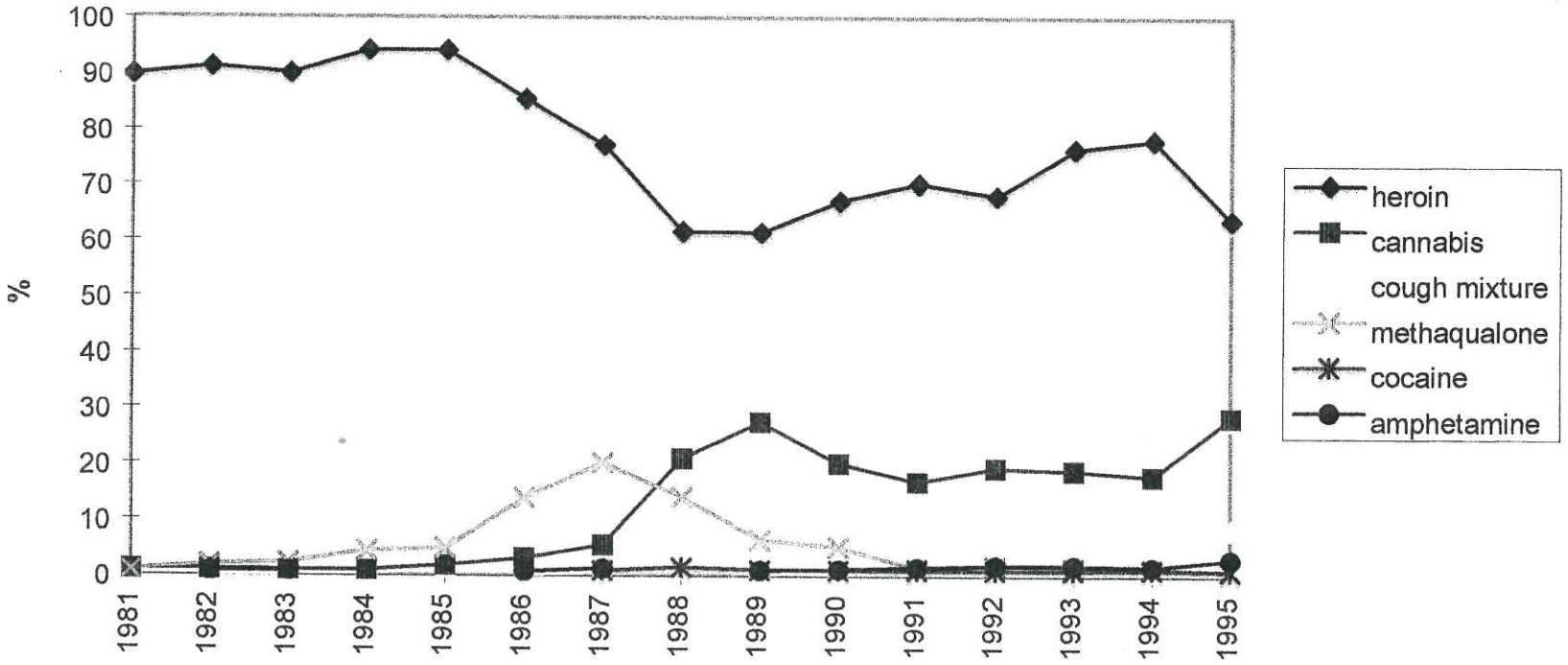
9.1 Longitudinal trend of drug abuse



(source: CRDA Report 1986-1995, Narcotics Division, Government Secretariat, HK)

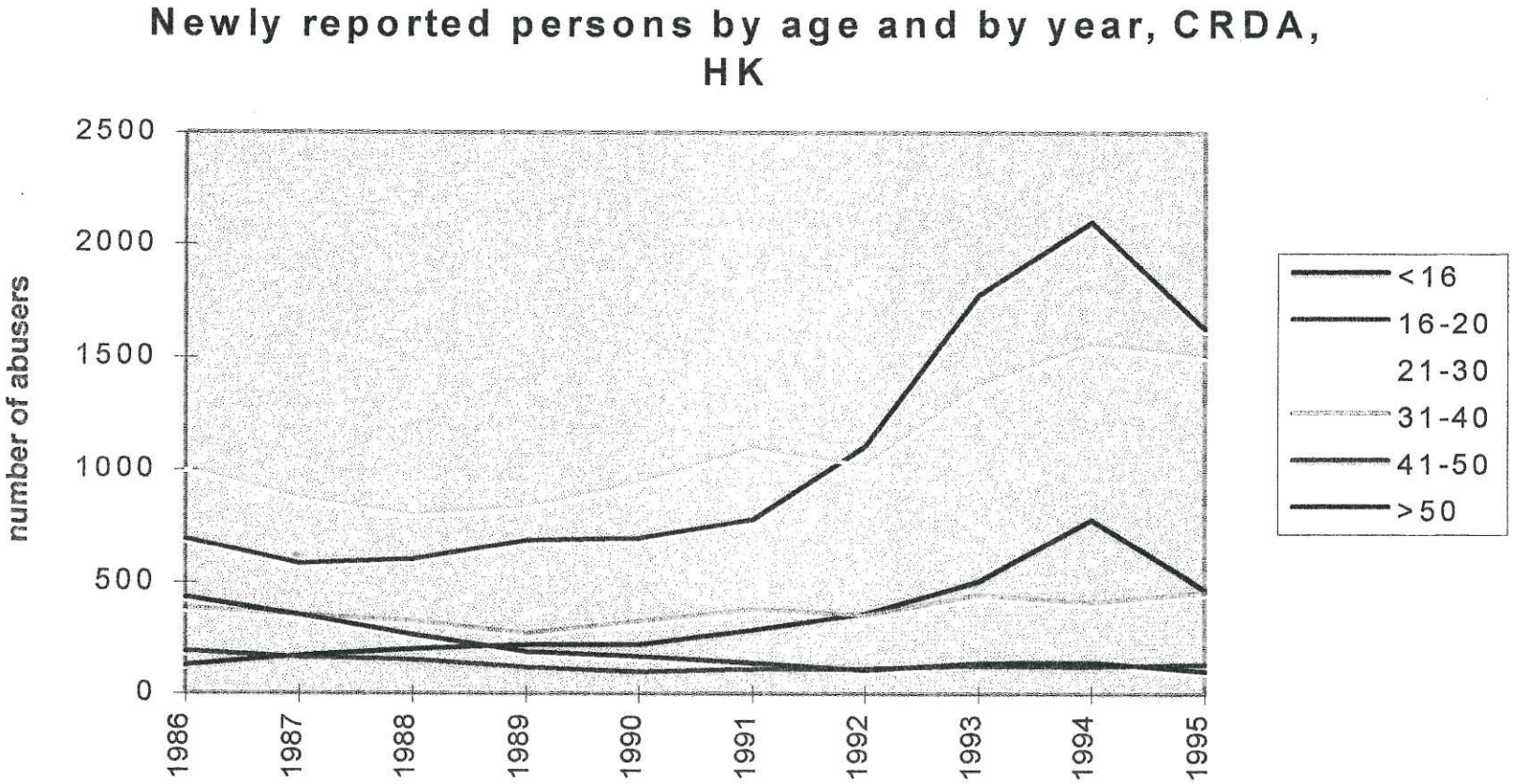
9.2 Pattern of drugs of abuse

Percentage distribution of newly reported drug abusers by type of drug abuse, CRDA, HK, 1981-95



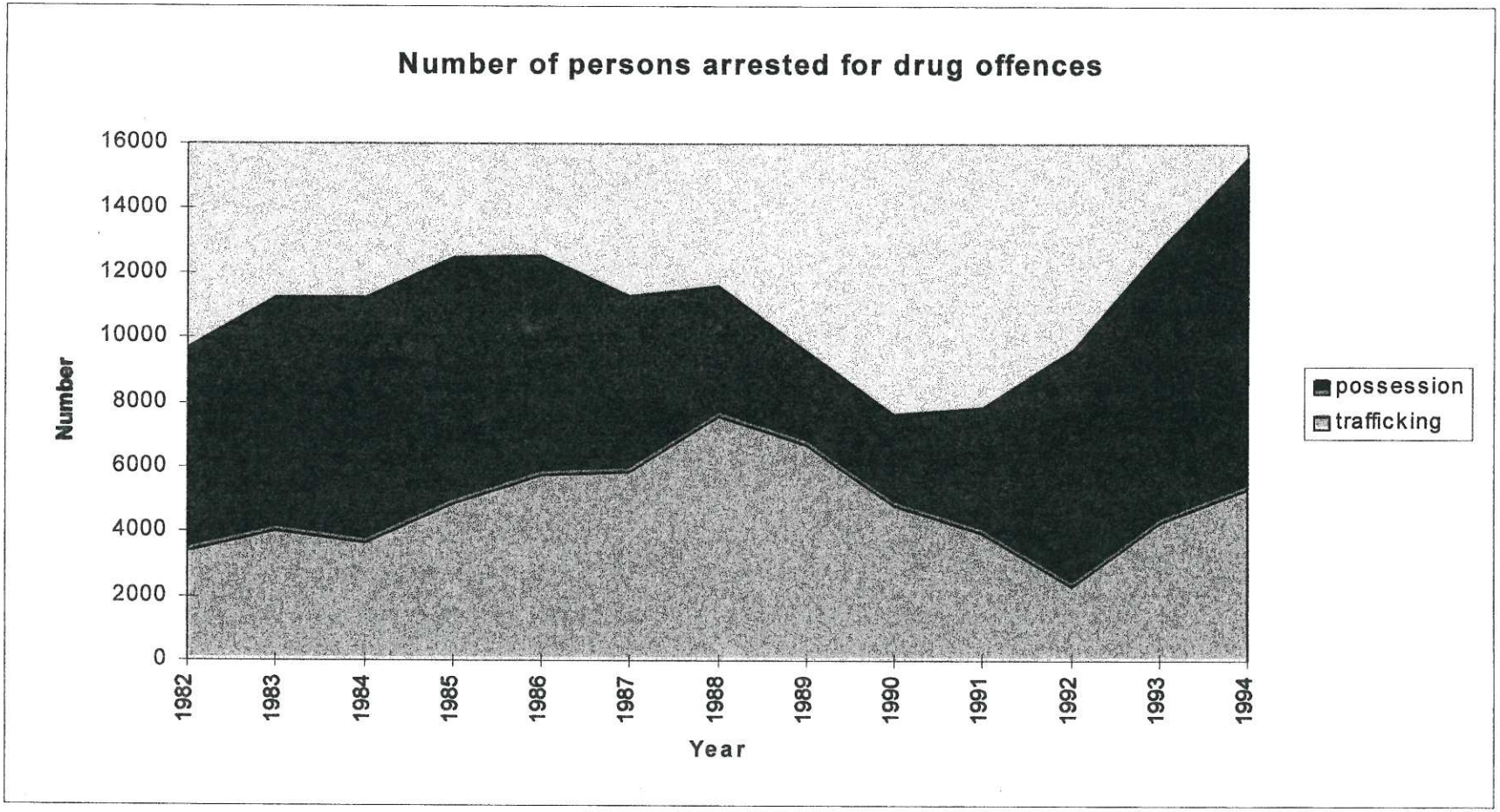
(source: CRDA Report 1986-1995, Narcotics Division, Government Secretariat, HK)

9.3 Trend of drug abuse of different age groups



(source: CRDA Report 1986-1995, Narcotics Division, Government Secretariat, HK)

9.4 Arrest figures

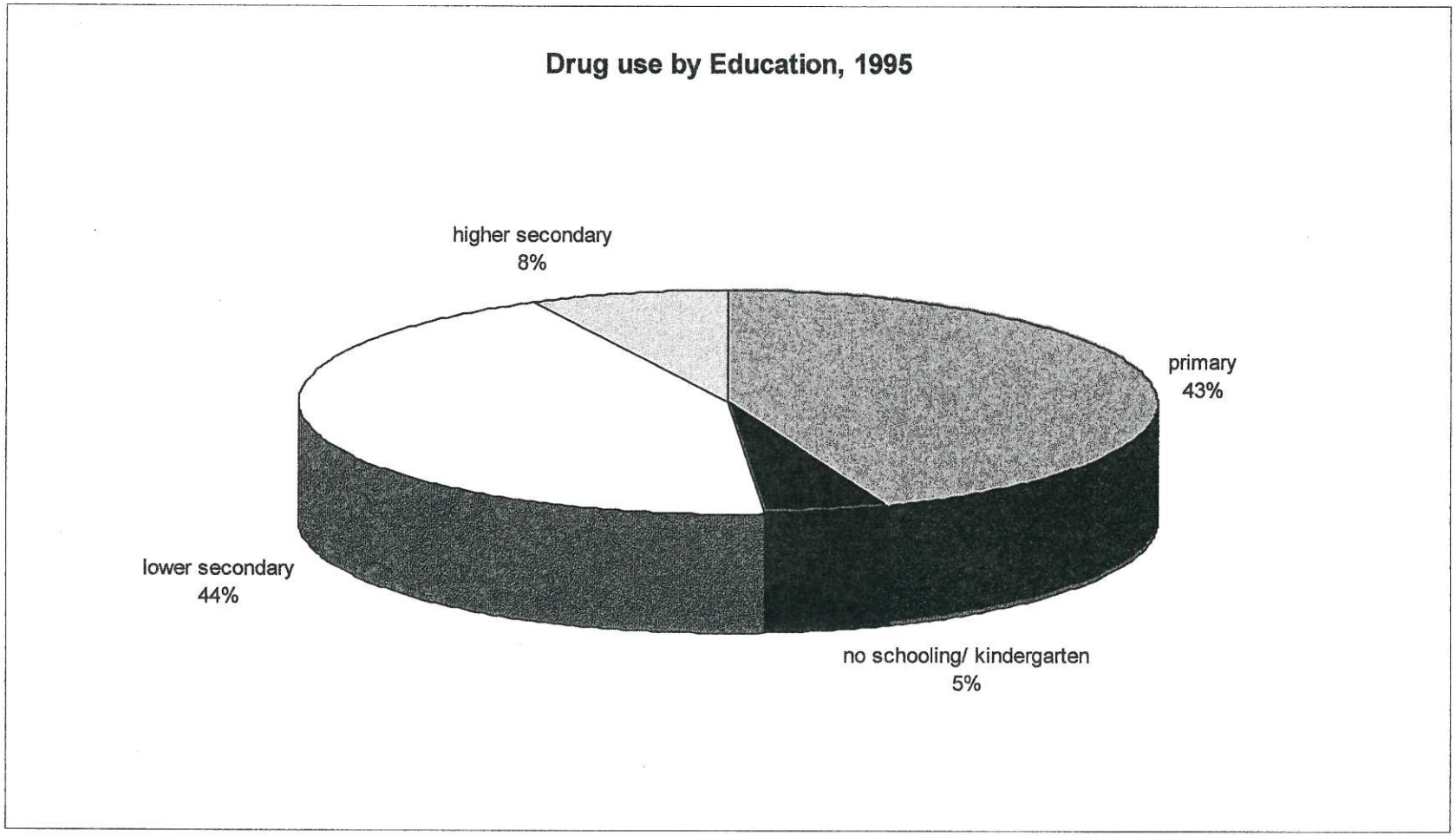


(source: CRDA Report 1986-1995, Narcotics Division, Government Secretariat, HK)

9.5 Seizure figures

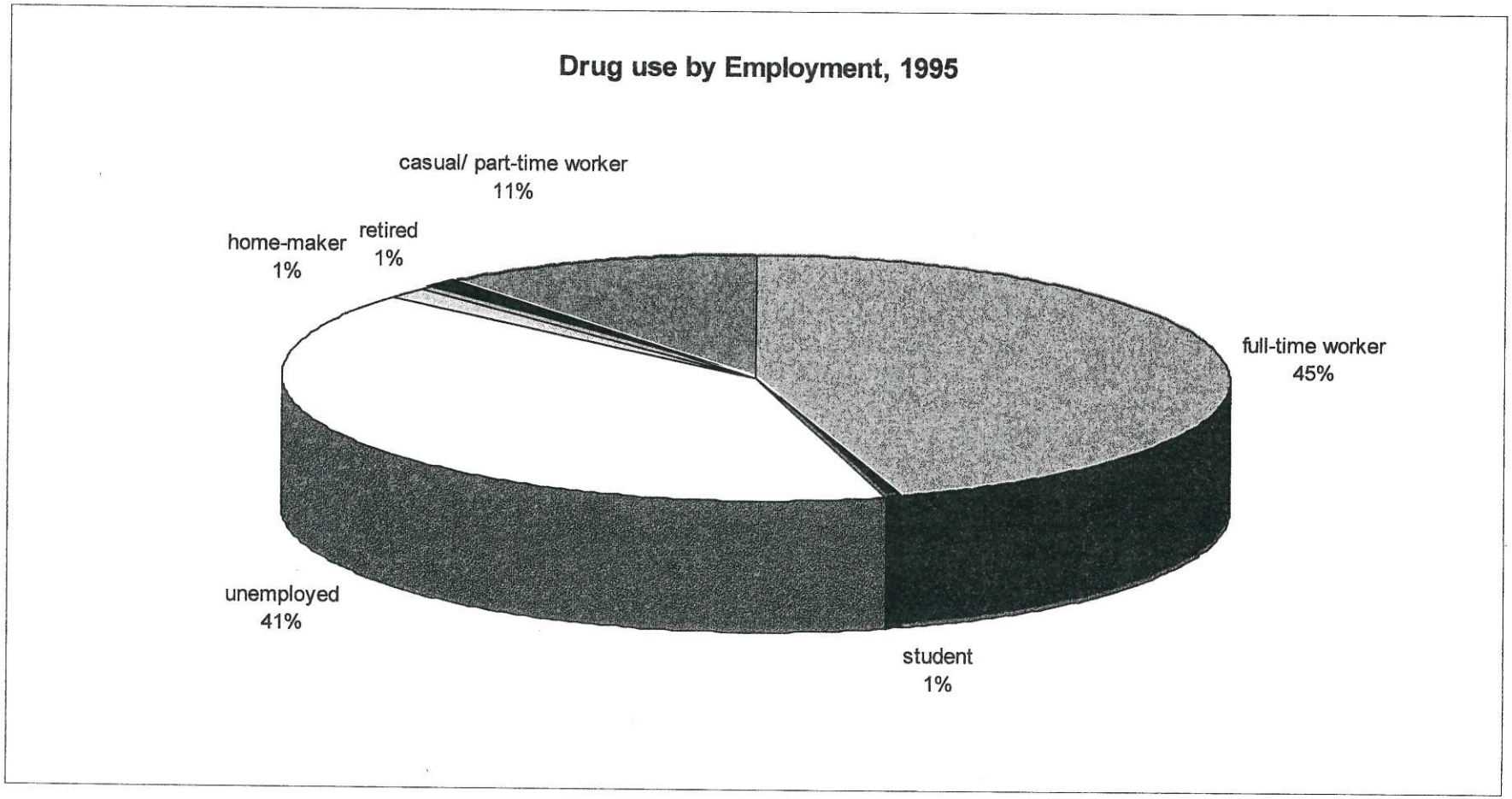
(data not available)

9.6 Drug abuse by Education



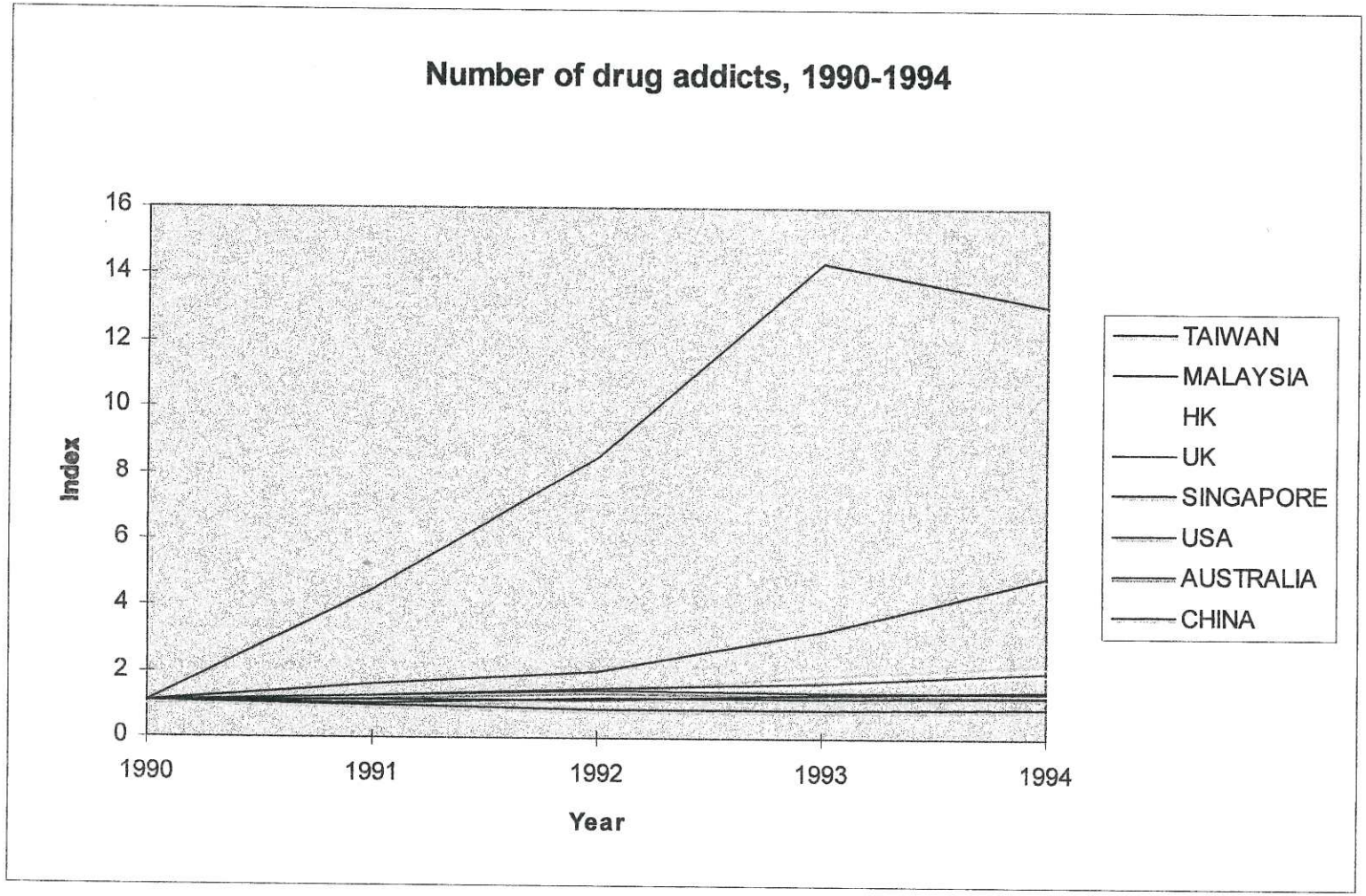
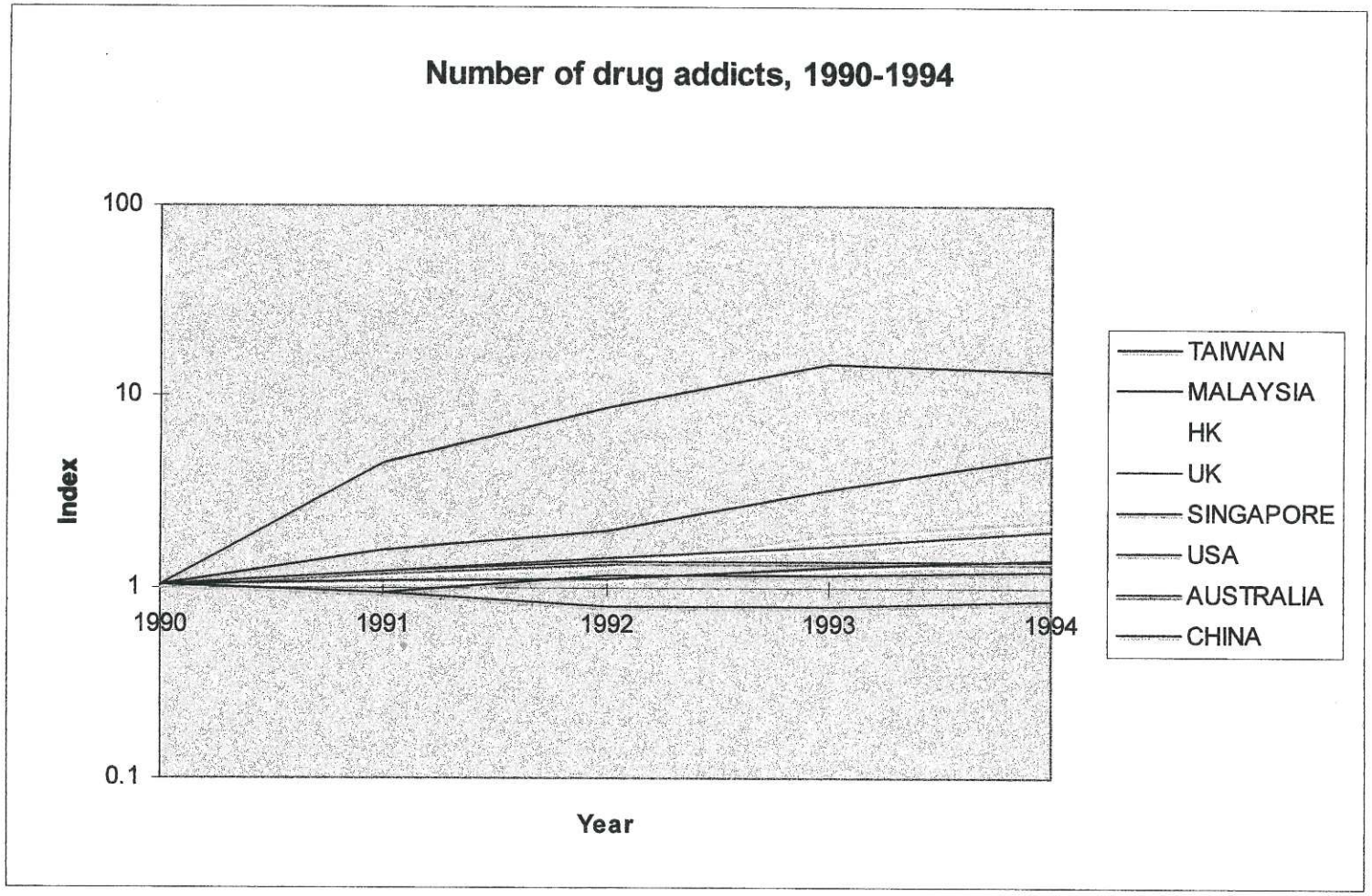
(source: CRDA Report 1986-1995, Narcotics Division, Government Secretariat, HK)

9.7 Drug abuse by Employment



(source: CRDA Report 1986-1995, Narcotics Division, Government Secretariat, HK)

10.1 Index of drug abuse of selected countries



10.2 Index of drug abuse of selected countries (log scale)