OPIATE DRUG CONSUMPTION PATTERNS IN ASIA

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— REPORT OF A REGIONAL WORKSHOP —

Sponsored by

THE GOVERNMENT OF MALAYSIA

AND

THE GOVERNMENT OF

THE UNITED STATES OF AMERICAN

Organised by

THE NATIONAL DRUG RESEARCH CENTRE

(A UNITED NATIONS/WORLD HEALTH ORGANISATION COLLABORATING CENTRE FOR RESEARCH AND TRAINING IN DRUG DEPENDENCE)

9 — 12 December 1981

University of Science Malaysia

Penang, Malaysia.

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Published by

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FOREWORD

The editors, after reviewing the technical papers presented in this volume, believe that a number of summary observations are warranted. First, despite the inadequacies of the existing data base, we are impressed with the differences in consumption patterns that characterize producer versus market countries, even when the market countries are immediate neighbours of the producing areas. The remarkable differences in per capita heroin consumption rates between Thailand and Malaysia are especially illustrative. The interposition of even a single relatively well policed border seems to change market factors (price and quality of product, dependability of supplies, etc.) sufficiently to result in a marked decrease in average daily consumption of refined opiates.

Second, paper after paper stressed the need to consider the variability of opiate consumption patterns. These patterns vary both across different types of users at any one point in time and within individual users across time. It is obvious that we are not even close to understanding these patterns of variation let alone the reasons behind them. Clearly, such variation is equally as important as the obvious central tendencies in the data. In making estimates of overall consumption in a given area, it is important to provide an estimate of the potential variability of the estimate as well as its absolute magnitude. When such variability is taken into account, some estimates of aggregate consumption may be so broad as to be practically useless. It was this concern over the variation in presently available data that led the workshop participants to conclude that it would be premature to make aggregate opiate consumption estimates for the Asian Region as a whole.

Third, it is likewise clear that aggregate regional consumption estimates need not await the development of *totally* accurate national estimates. This is due to the nature of the potential errors in national estimates. Some national totals undoubtedly represent overestimates. However, many national estimates equally undoubtedly represent *under*estimates. When these error-laden national estimates are combined, the *over-* and *under*estimate cancel each other out. In theory, an aggregate regional estimates could be exactly correct even though *all* the component national estimates were wrong, as long as the net overestimate was exactly balanced by the net underestimate. Of course, the same principle also works in reverse—when errors are systematically of one type (over or under), their effect is cumulative. Given the present state of the art in this field, it seems unlikely that national consumption estimates err systematically in a single direction. The editors believe that we may be closer to a workable regional opiate consumption estimation scheme than is apparent at first glance.

Finally, the foregoing should not be interpreted as a defence of indiscriminate error. We believe that the point of greatest agreement during the entire workshop was on the need for more adequate data bases, in particular better estimates of the number and type of opiate *consumers*. In this regard, the editors hope that means will soon be found to carry out further validation of the capture/recapture method of making prevalence estimates. If this methodology can be confirmed, it will provide important new opportunities for making national estimates of the prevalence of opiate use. Similarly it is hoped that every effort will be made to develop a systemmatic regional reporting activity which would stimulate better and more accurate assessment of the national opiate use problem.

ACKNOWLEDGEMENT

The National Drug Research Centre of Universiti Sains Malaysia wishes to express its sincere gratitude to the Governments of the United States of America and Malaysia for their assistance in sponsoring the workshop.

It is also deeply grateful to the previous Vice-Chancellor of Universiti Sains Malaysia, Tan Sri Datuk Haji Hamdan Sheikh Tahir, The Current Vice-Chancellor, Mr. Musa Mohamad and the U.S. Embassy, Kuala Lumpur for its support and co-operation in organising the workshop.

Further, it wishes tc acknowledge the support of the Governments of Hong Kong, Indonesia, Malaysia, Pakistan, Philippines, Singapore and Thailand without whose participation, the workshop could not have been a success.

The assistance extended by the resource persons from the United States of America, together with representatives of the United Nations Division of Narcotic Drugs and the Colombo Plan Bureau is also gratefully acknowledged.

BACKGROUND AND OBJECTIVES OF THE WORKSHOP

1. The Regional Workshop on Opiate Drug Consumption in Asia was a collaborative activity developed as part of the bilateral program for drug abuse control activities initiated by the 1978 Memorandum of Understanding signed between the Governments of the United States of America and Malaysia.

2. The National Drug Research Centre, Universiti Sains Malaysia with consultation of the United States Drug Demand Reduction Program developed an appropriate program with the following objectives:

   i. to synthesise existing information about opiate drug consumption patterns in Asia;

   ii. to attempt to define a standard methodology for estimating current drug consumption levels; and

   iii. to assess the aggregate level of Asian opiate consumption.

3. The effort culminated in a regional workshop which was held at Universiti Sains Malaysia, Penang, Malaysia from 9 to 12 December 1981.

4. The Workshop was inaugurated by the Honourable Mr. Abdul Rahim Thamby Chik, Deputy Minister of Home Affairs, Government of Malaysia. Those attending the Opening Ceremony included Federal and State dignitaries, representatives of the Colombo Plan Bureau and the United Nations Division of Narcotic Drugs, distinguished guests and resource persons from the United States of America, participants and observers from Hong Kong, Indonesia, Malaysia, Pakistan, the Philippines, Singapore and Thailand.

5. The first three days of the Workshop were devoted to presentation of available knowledge on opiate consumption, production and trafficking in the region. The final day addressed the knowledge gaps and current needs as well as future directions for monitoring the drug consuming population and levels of opiate drug consumption.

6. Participating country representatives were invited to give an overview of the research work presently being carried out in their respective countries and also to present a report of the available national data following the standard reporting guidelines provided. With respect to consultant papers, participants were invited to review specific topics particularly on illicit opiate production and trafficking, methodologies for monitoring the illegal drug market and the prevalence of drug abuse.

PART ONE:
Inaugural Session

WELCOMING ADDRESS

by

Y.B. Tan Sri Datuk Haji Hamdan Sheikh Tahir
Vice-Chancellor, Universiti Sains Malaysia

Y.B. Encik Abdul Rahim Thamby Chik, Timbalan Menteri Hal Ehwal Dalam Negeri Malaysia; Y.M. Encik Harvey Lampert, Wakil Kerajaan Amerika Syarikat; Y.B. Datuk Abdul Jabid Mohd. Don, Ketua Pengarah Imigresen Malaysia; Y.M. Encik Robert L. Retka, the United States Regional Co-ordinator for Drug Demand Reduction Program; Y.B. Tan Sri-Tan Sri, Datuk-Datuk dan seterusnya tuan-tuan dan puan-puan.

Dengan segala sukacitanya, saya mengalu-alukan Yang Berhormat Encik Abdul Rahim Thamby Chik yang telah bermurah hati sudi hadir bersama-sama kita pada pagi ini untuk merasmikan Pembukaan Bengkel Serantau mengenai Penggunaan Dadah-Dadah Opiate di Asia. Bagi pihak semua peserta, pemerhati dan Jawatankuasa Pengelola, saya mengucapkan ribuan terimakasih kepada Yang Berhormat.

Ladies and Gentlemen,

It is indeed a great pleasure and privilege for me to extend a warm welcome to the Honourable Deputy Minister of Home Affairs Malaysia, Mr. Abdul Rahim Thamby Chik who has kindly agreed to declare open this Regional Workshop on the Consumption of Opiate Drugs in Asia. On behalf of all of us present, I wish to express our very sincere gratitude and thanks to the Honourable Mr. Abdul Rahim Thamby Chik for sacrificing his valuable time to be with us today.

I would also like to take this opportunity to extend a very warm "Selamat Datang" to Mr. Harvey Lampert, Representative of the United States Government; to Mr. Robert L. Retka, the United States Regional Co-ordinator for Drug Demand Reduction Programs, the participants and observers from Hong Kong, Indonesia, Malaysia, Pakistan, Philippines, Singapore and Thailand; the representatives from the Colombo Plan Bureau and the United Nations; the resource persons and all distinguished guests. I hope your visit will be a profitable and enjoyable one.

You are meeting here to examine the matters of opiate drug consumption in Asian countries. I know all of you are deeply concerned about the problem of drug dependence which today affects numerous countries of the world. Your presence encourages all of us who are associated in many such efforts directed to control and reduce drug abuse.

This Workshop constitutes another important step forward in the bilateral program of drug abuse control initiated by the 1978 Memorandum of Understanding between the Governments of Malaysia and the United States of America. As the Vice-Chancellor of the University, I consider it an honour and a privilege to host and organise on behalf of the Government of Malaysia this Regional Workshop on the Consumption of Opiate Drugs in Asia. At this juncture, I would like to thank the United States Government for making available the funds to hold this Workshop.

I am also happy to report that the Cabinet Committee on Drug Control and the National Executive Action Unit which are chaired by the Most Honourable Deputy Prime Minister and also Minister of Home Affairs Malaysia, Y.B. Datuk Musa Hitam have supported the National Drug Research Centre to become a permanent feature of this University. This is an indication of the seriousness with which the Cabinet Committee views the drug menace and the necessity to carry out good quality work in the field of drug abuse research. The approval may also be viewed as an appreciation of the contributions already made by the Centre towards drug abuse research. I would also like at this juncture, to assure you ladies and gentlemen, especially Y.B. Encik Abdul Rahim, that the Centre will continue to produce research work of high standard in accordance to the wishes of the Cabinet Committee.

I know that the task ahead for all the participants will be an ardous one, but I am equally confident that you will face the numerous issues with confidence, skill and success. I look forward to being informed of your deliberations and I am sure that your report will receive the highest consideration of our Cabinet Committee on Drug Control as well as those of the United States, and the United Nations Commission on Narcotic Drugs.

I wish you all a very successful meeting and a memorable stay in Malaysia.

Thank you.

SPEECH

by

Mr. Harvey Lampert
(Representative of the United States Government)

Your Excellencies, distinguished participants and guests, ladies and gentlemen.

Thank you very much. To begin with, I would like to express my appreciation to the Vice-Chancellor of Universiti Sains Malaysia, for his welcoming comments and the provision of the facilities for this meeting to be held. I would also like to join him now, on behalf of the United States Government and the American Embassy in Kuala Lumpur, to welcome you all to this meeting. I believe the most useful thing I could say now would be some brief comments as to the background of the Workshop.

Considering that opiate drug use is regarded as a major international social problem, it is amazing how little we know in a systematic way about the patterns of use from country to country. The use of opiate drugs has shown many changes during the past two decades and something must be done. Exactly what should be done, however, continues to remain a subject of much disagreement. In part, people disagree about the solution because they have different understandings of the problem. In the situation, a clear formulation of alternative solutions is impossible. It may be a truism, but it remains true nonetheless that to solve a problem, one must first understand it.

Everyone here today knows that the Government of the United States considers the production, trafficking and consumption of opiate drugs to be a major problem in modern society. We recognise well that the problem has international dimensions and ramifications. For this reason, the United States Department of State each year provides approximately US$35 to US$40 million in assistance to countries which have significant problems of illegal drug production, trafficking or consumption. This assistance is to help these countries improve their drug control capabilities and has been available since the early 1970's.

As we have gained experience from these programs, it is becoming increasingly clear that improved understanding of the problem is also required. In particular, it is increasingly clear that there is a need to learn

more about the economics and dynamics that drive the illegal drug market. It was this recognition that led to this meeting.

An increasing level of effort has been dedicated to study the production end of the cycle. Relatively sophisticated procedures have been used to estimate total acreage under illegal crop cultivation, crop yield and farm prices. What has not been examined systematically however, is the movement of these illegal products to markets other than those in the West.

The role of opiate drug consumption within the Asian region in particular needs further study since such consumption provides an ongoing stimulus for continued production of opiates. We need to know the degree to which the regional market keeps the drug machinery operating on its own.

Before any answers to the question can be found, it is necessary to know something about the levels and patterns of drug consumption in the region. To this end, it was decided to hold this Workshop. The objective is to produce a statge-of-the-art picture of opiate consumption in Asia - what do we know and in what areas is our information inadequate? How can we fill these knowledge-gaps?

The United States Department of State is pleased to co-operate with the University of Science and the Government of Malaysia in sponsoring this Workshop. We hope that your work will be fruitful and that progress will be made in understanding the problem of illegal drug consumption. Only with greater understanding will greater effectiveness in controlling the problem be possible.

Thank you.

INAUGURAL ADDRESS

by
The Honourable Mr. Abdul Rahim Thamby Chik
Deputy Minister of Home Affairs
Government of Malaysia

Yang Berhormat
Tan Sri Datuk Haji Hamdan Sheikh Tahir
Naib Canselor
Universiti Sains Malaysia, selaku
Pengerusi
Pusat Penyelidikan Dadah Kebangsaan

Tan Sri-Tan Sri, Datuk-Datuk dan seterusnya tuan-tuan dan puan-puan sekelian,

Sukacita saya menyampaikan setinggi-tinggi terimakasih kepada Jawatankuasa Pengelola yang telah sudi menjemput saya untuk merasmikan Pembukaan Bengkel ini yang akan berlangsung selama empat hari. Saya juga ingin menyampaikan penghargaan kepada pihak Pusat Penyelidikan Dadah Kebangsaan dan Universiti Sains Malaysia yang telah menjayakan Bengkel ini. Dengan pengalaman Pusat Dadah ini di bidang penyelidikan dan bengkel-bengkel seperti ini, saya percaya Pusat Dadah akan terus dapat meneruskan kegiatannya.

Ladies and Gentlemen,

I consider it a great honour to have been invited to address and officially declare open this Regional Workshop on the "Consumption of Opiate Drugs in Asia." On behalf of the Government of Malaysia, I would like to welcome all of you to our country and hope that your stay here for the next few days will be enjoyable, fruitful and educational in the widest possible way.

As you all might be aware, this Workshop activity was collaboratively developed as part of the Memorandum of Understanding signed between the Governments of the United States of America and Malaysia. I would like to take this opportunity to express the sincere thanks of the Government and the people of Malaysia to the Bureau of International Narcotic Control Matters, Department of State, United States of America, for their continuing support of the efforts undertaken by the Malaysian Government.

The fact that the problem of drug dependence is worldwide is demonstrated by the presence here today of both drug enforcement and research personnel from many continents. I am sure all of you will agree with me that this problem has now assumed a notoriety of its own and is creating endless social consequences. The paramount action necessary is for the world community to resolutely tackle this menace before it does really get out of total control.

The problem of drug abuse is especially affecting the countries of the Asian Region which are also developing nations. As such, it is contributing to serious problems related to healthcare services, education, social behaviour, criminality, law enforcement, national security as well as the disintegration of family and community life in these nations. The limited trained manpower and financial resources of these countries, which otherwise could be utilised for more useful developmental purposes, are being siphoned off to deal with this social menace. Malaysia, by virtue of its proximity to the infamous "Golden Triangle" is not only being used as a transit route for the trafficking of illegal drugs, but also has difficulty controlling easy availability of drugs to its young people. It is therefore not surprising that illicit demand for drugs has been increasing in recent years until it has now become a major social problem in the country.

Permit me to give you some idea of the seriousness of the problem. Statistical data available from the National Drug Dependence Monitoring System shows that there are, in this country, 60,664 known and identified drug addicts. Of this number, 80% are males and below the age of 30. Furthermore, our researchers have shown that individuals who are dependent on drugs form the largest group of drug pushers - an activity which they undertake to sustain their expensive habits. Drug abuse has generated a number of undesirable effects. For example, available statistics indicate that there is a close correlation between the increasing number of drug dependent persons in a particular area and an increase in the incidence of petty crimes.

Internally, huge quantities of drug have been recovered. During the period January 1970 to August 1981, 12,168.4 kg. of opium, 530.9 kg. of morphine and 511.9 kg. of heroin were seized.

In spite of the bleak picture that exists when viewed from the overall perspective, the situation is not beyond control. The Malaysian Government is equally committed to a program of multiple action to combat and control the problem of drug abuse. Fully recognising the damaging consequences of this problem, both internally and externally, the Malaysian Government is totally committed to a total flight against drug abuse. In recognition of the need for an intergrated national action program, the Government in the year 1976 set up a Cabinet Committee on Drug Abuse Control under the chairmanship of the Deputy Prime Minister. Subsequently, the Cabinet Committee created an executive National Action Unit which

is based in the Ministry of Home Affairs and is the administrative and executive secretariat of the Cabinet Committee on Drug Abuse Control. The Unit is responsible for ensuring the implementation of the national policy on drug abuse control as well as co-ordination of all activities pertaining to drug abuse control. The National Action Unit will be serviced by a Narcotics Secretariat which has been created in my Ministry - the Ministry of Home Affairs.

Presently, the Cabinet Committee chaired by Datuk Musa Hitam, the Deputy Prime Minister, is making an in-depth study on all component activities relating to drug abuse control. The objective of these efforts is to ensure maximal efficacy of our programs.

But drug abuse cannot be tackled by the Government alone. The year 1976 saw the launching of the National Association Against Drug Abuse or PEMADAM with the objective of bringing together citizens of this nation to get them involved in the prevention area. It has been requested to undertake the co-ordinating function in the voluntary area, working with other organisations like the Rotary Club, Lion's Club, Befrienders, religious and women's organisation throughout the country.

Ladies and Gentlemen,

As you can see, government and public organisations have been taking actions to tackle the drug problem in this country. With impending organisational restructuring to be finalised in the near future, we will have set the stage for a real push in our relentless drive against drug traffickers and smugglers, big and small who can truly be regarded as being human parasites of the Malaysian society, as indeed of any other society or nation. We, the Malaysian Government, recently have publicly declared war against them and in our effort shall regard them as our country's enemies.

Ladies and Gentlemen,

Your meeting today is mainly concerned with the development of the necessary research methods which can be applied to assist countries in determining the extent of the drug problem as well as assessing the level of opiate drug consumption.

Since the main theme of the meeting is research, I feel it appropriate that I draw attention to some of the activities being undertaken in this field. Since 1977, drug abuse research has received increasing priority. The need to develop accurate and up-to-date information on the characteristics, types, patterns and consequences of the illicit demand for drugs has been recognised. The objectives of these investigations clearly are aimed at

developing and establishing the ecological profile of drug abuse and its related problems. In Malaysia where there is an over-supply of illicit drugs, and where multiple drug use occurs, research is being undertaken to examine not only the variance in chemical constitution of these drugs but also on the pharmacological and biological behaviour of these substances. Further, when a developing country like Malaysia undertakes activities in the various areas of drug suppression and prevention, these programs need to be monitored in order to ensure that they are producing the necessary beneficial effects as well as to ensure their cost effectiveness. In fulfillment of the need to implement such a research program, the National Drug Research Centre has been established at the University of Science Malaysia here in Penang. The objectives of the research activities undertaken by the Centre are two-fold: firstly, to provide the type of information and evidence that would facilitate the improvement of the various services and generate a greater understanding of the problem; secondly, to provide the type of support to enable both the National Action Unit and the Cabinet Committee on Drug Abuse Control to make the appropriate and effective policy orientations. At this juncture, I would like to place on record my Ministry's appreciation with regard to the significant contributions that the research program here at the Centre has made in facilitating our understanding of drug abuse, particularly in relation to the extent and nature of the problem, the pharmacology of these substances as well as the treatment and rehabilitation of the addicted individuals. One of the major components of this research centre has been the development and management of a National Data Bank on Drug Abuse which I am pleased to state, has provided the type of information which has been of great value to administrators and policy makers at the national level.

Ladies and Gentlemen,

I have been informed that this Workshop on Opiate Drug Consumption Patterns in Asia is the first of its kind. It aims to synthesise existing information about opiate drug consumption and produce a state-of-the-art picture of knowledge in this area.

What we know is that every Asian country now suffers high levels of opiate addiction. What we do not know, however, is how patterns of opiate consumption vary among and within countries in this region nor are we clear as to what proportion of the opiate production in Asia is consumed within the region. Intelligence indicates that estimates of total opiate production in the region are again increasing. Therefore this Workshop will take, hopefully, the first step towards assessing the level of opiate supply and consumption within the Asian region.

I also believe that a summary report of your deliberations will be presented at the forthcoming Special Session of the United Nations Com-

mission on Narcotic Drugs in February 1982. I am sure that, not only the Commission, but also the Governments of this region look forward to receiving the findings of your deliberations. I am sure this Workshop will be of extreme value as it will facilitate the exchange of ideas, techniques and methodologies and above all, allow greater understanding of the local problems associated with the assessment of opiate drug consumption in the countries concerned. However, I should point out that the drug menace is contagious and spreads like wild fire. This means, as policy makers and administrators, we have to demand rapid action. I hope that you bear this in mind during your discussions and develop appropriate future activities which will bear fruit rapidly.

May I wish you all a very successful meeting coupled with a most enjoyable stay in our country. I take pleasure in declaring open this Regional Workshop on the Consumption of Opiate Drugs in Asia.

Thank you.

PART TWO:
Summary, Final Statements and Recommendations

SUMMARY

Introduction

The Workshop was opened by the Honourable Mr. Abdul Rahim Thamby Chik, Deputy Minister of Home Affairs who pointed to the serious problem of drug abuse in Malaysia. Over 60,664 abusers have been identified, 80% of whom are males under age 30 years. The Government is committed to fight against the problem and supports the management of the National Drug Abuse Data Bank and other operational research at the National Drug Research Centre at Universiti Sains Malaysia. The current Workshop hosted by the Centre will address an important gap in our knowledge of drug abuse regarding the amounts and patterns of opiates consumed in Malaysia and other Asian countries. It is a collaborative effort of the Governments of Malaysia and the United States of America.

The Honourable Tan Sri Datuk Haji Hamdan Sheikh Tahir, Vice-Chancellor of Universiti Sains Malaysia, welcomed the participants and thanked the United States Government for financial support of the Workshop. He introduced Mr. Harvey Lampert of the United States Government who thanked the Government of Malaysia and the University for making its facilities available and wished the participants success in their work.

It was then agreed the Workshop would be co-chaired by Attorney Pio A. Abarro, Mr. R. Retka, and Drs. Leow Kee Fong and V. Navaratnam. Dr. P. Hughes and Miss Poh Siang Choo agreed to serve as rapporteurs.

Background and Objectives for the Workshop

It is clear that several Asian countries suffer high levels of opiate addiction. While data on opium production in the region are becoming increasingly sophisticated, data on opiate consumption remain scanty. For the meeting, participants were invited to prepare working papers, which could later be published in a proceedings of the Workshop. A background paper had also been prepared reviewing the literature on opiate consumption in

Asia. The objectives of the Workshop were:

i. to synthesize existing information about opiate drug consumption patterns in Asia;

ii. to attempt to define a standard methodology for estimating current opiate drug consumption levels; and

iii. to assess the aggregate level of Asian opiate consumption.

CURRENT KNOWLEDGE OF DRUG CONSUMPTION IN ASIA

HONG KONG

A central registry of drug abuse is based upon voluntary reporting of contacts by all treatment social welfare, rehabilitation, law enforcement and correctional agencies in Hong Kong. A uniform reporting form in Chinese and English is used for computer analysis and checks are built into the system to avoid duplicate counting of individuals. Confidentiality of reports is guaranteed. It is felt that the majority of opiate users do, after a short while, have contact with one or more of the many reporting agencies, so that the total registered cases approaches the total number of abusers.

Police and Customs report the amounts of opiates seized as well as the purity of No. 3 heroin. Wholesale and street prices are independently reported by Police and Customs. SARDA (a voluntary agency for treatment and rehabilitation) reports street prices which may be inflated by patients who seek higher doses of medication during their withdrawal.

The Golden Triangle drought in 1978/79 markedly increased the price of heroin until mid-1980. Attendance at treatment centres rose by 60% (from 5,000 a day to 8,000), in many cases by new patients. Even the very wealthy could not afford drugs. During this period, about 10,000 were in treatment and 5,000 in some form of aftercare, leaving about 19,000 registered cases that may have taken alternative drugs; some may have died of left the country; and others may have withdrawn themselves.

The following formula was presented for calculating the number of active heroin abusers; A-B-C = D where A = the total estimated number of heroin abusers; B = the number who are free of drug use i.e. in treatment, prison, etc.; C = the remainder who are otherwise abstinent from drugs (i.e. dead, living drug free in the community, etc.); and D = the number of active heroin abusers. The calculation of daily and annual dose is a more straightforward procedure. No national consumption figures were presented but the methodology and data are available for use by law enforcement agencies of the Government of Hong Kong, as a yardstick against which they can measure their success in seizing illicit drugs.

INDONESIA

One "cekak" containing 3 mg. of heroin costs between Rp. 1500 and Rp. 2500 (US$1.00 = Rp. 640). The average daily cost is about Rp. 22,000

for 11 cekak or about 33 mg. pure heroin for the regular user. It is less for the occasional user. No data were presented on the number of heroin abusers in the country, but the numbers are believed to be low.

All psychiatric facilities submit standardised forms for computer analysis to the central government on all admissions, and these forms contain drug abuse information. In addition, there are two rehabilitation centres managed by the Corrections and Social Welfare Departments; their case records are managed separately.

There are traditional opium abusers over age 50 years in isolated geographical areas but their numbers are small and no data were presented on their consumption levels.

MALAYSIA

The principal drugs abused are heroin, morphine base and opium in that order. A total of 60,664 drug abusers were identified between 1970 and 1980, 80% or 48,531 of whom were heroin abusers. Most smoke heroin in cigarettes, but some have recently shifted to the "chase the dragon" method. Heroin is purchased in plastic straws with about 60 mgs. of 20% to 60% pure drug. The average dose is 3 straws per day, which is about 74 mg. of pure heroin. This is 3.5 kg. of pure heroin per day for all users or 275.4 kg. pure heroin per year for the country. The price per straw is about M$7.00 or M$21.00 per day (US$1 = M$2.1) per user. In 1979-1980, there was a scarcity of heroin and many users shifted to the injection route. Although morphine base (an illicit precursor to illicit heroin) is not widely abused, it is taken when heroin is in short supply.

Opium is primarily smoked in dens at an average cost of M$5.00 per pellet of prepared opium. About 2 pellets are taken each day by an estimated 4,277 opium abusers. The annual national consumption cost is about M$42,770. The amount consumed was not estimated because of the difficulty in determining average weight and purity of opium pellets. Studies completed subsequent to the Workshop indicate that, on average, opium used in Malaysia is generally sold in pellets weighing 0.2 gms. and having a morphine content of 8-9%.

Much of the data on Malaysian consumption is derived from the National Data Bank on Drug Abuse at the Universiti Sains Malaysia. Data on the number of abusers are based upon uniform computerized case reports from all treatment, enforcement and correctional agencies which have contacts with drug abusers. The data on dose and price are obtained from street purchase of drugs in various communities.

PAKISTAN

Production of opium is concentrated in the Northwest frontier region bordering Afghanistan and the northern area bordering China. These areas have been outside the central government's normal administrative control.

Pakistan has, until recently, had a system of licensed shops or "vends" which maintained opium addicts at very low cost. In 1979, these was changed to a registration system with greater control over government opium. But many addicts fear being identified and have shifted to the illicit market.

Heroin abuse was unheard of until 1980. It is now spreading in Peshawar, Karachi and Quetta. One hundred kilograms of heroin have now been seized.

When the licensed shops freely dispensed opium, the total sold by the Government was approximately 6,000 kg. per year. However, it is believed that they actually sold 3 times this much with the licit amount being supplemented by illicit opium. This would account for 18,000 opium abusers based upon an average dose of 3 g. per day. These figures do not include the large population of rural opium users who did not buy from the licensed shops. Therefore the total population of abusers and consumption of opium is much higher.

An estimate of 100,000 opium abusers is often cited for Pakistan, but there is no systematic study to support this figure. A more recent figure of 250,000 has been suggested.

The average heroin user smokes about 1 g. per day of cut heroin which costs about 60rp (US$6) and is 20-60% pure. The average consumption of pure heroin is about 400 mg. per day. It is not possible to estimate the number of heroin users.

PHILIPPINES

The heroin epidemic of the early 70's was effectively controlled following aggressive law enforcement under the martial law passed in 1972. At that time, the number of heroin abusers was estimated at 10,000. In 1981, only 27 heroin abusers were reported; their intake was only twice a week or less because of the scarcity of the drug. The calculation of average dose is not relevant in such circumstances.

SINGAPORE

Heroin use began to spread in the early 1970's with 110 arrests in 1974 rising to 5,262 by 1978. Arrest records suggest that the total number of drug

abusers was about 10,000 as of September 30, 1981. About 92% of those admitted for rehabilitation are heroin addicts.

The average heroin addict smokes about one 3 cm. plastic drinking straw per day. The straw costs S$20 (US$1 = S$2.0) and contains about 60 mg. of 35% pure diamorphine or 21 mg. of pure heroin. The average annual consumption of heroin per addict would thus be 7.67 g. But about 25% are new young abusers who tend to use less heroin i.e. 5.25 to 10.5 mg. per day; the average aggregate annual heroin consumption is therefore 1.92 to 3.84 g.

To calculate consumption rates, the number of active heroin addicts was estimated in the following way: of 10,000 drug abusers, 3,000 are in prison or rehabilitation centres and 2,900 are under community supervision. Ninety-two percent of the remaining 4,100 might be using heroin (or 3,772). By extrapolation, one calculates about 23.5 to 47.0 kg. of pure heroin consumption for the country. Certainly some significant proportion of the abusers in the community have not relapsed, so this must be considered a high estimate.

Opium abusers represent about 6.7% of rehabilitation admissions or 670 of the total abusers. Generally, they buy a bag of 4 opium pellets for about S$6.00. Opium eaters consume 1.2 pellets per day and smokers generally consume more. No information is available on the weight/purity of pellets so national consumption cannot be calculated.

THAILAND

The paper reviewed many of the methodological problems encountered in making national consumption estimates. First noted was the problem of estimating the numbers of abusers based upon surveys by different investigators who use different data gathering methods and who do not check the reliability and validity of their methods.

Developing average daily dose estimates for rural opium smokers is straightforward based upon interviews and weighing of samples in the field. One study suggested a daily dose of 1 to 3 g. of opium. Another study reported 1.3 kg. of opium smokers per year and another reported 1.7 kg. per year. But daily dose varies not only between individual but also according to season of the year i.e. highest dose at harvest time because of availability, but lower doses for those who cannot work efficiently in the field wen doses are very high. Daily dose declines when the price goes up.

Data which monitored the cost of the daily habit for opium and heroin users in different parts of the country showed strikingly consistent patterns. Costs rose sharply in late 1979, peaked in 1980 and levelled off at a higher cost in 1981.

Variability in Opium Dosage

A working paper reviewing the opium use patterns in Laos noted a great variability in the dosage of opium consumed. The assumption that addicts consume a specific, stable dose of opium over years or decades may be true, but need not necessarily be the rule. The observations of opium addicts in Laos revealed that the daily dosage of opium varied widely from place to place and among different addicts. Also, most opium addicts were found to vary their daily dose over time. In the early years of addiction, there was a gradual trend for addicts to increase their daily dose. But after a few decades of addiction, the older addicts in particular would tend to cut down their dosage. Decreased dosage among older addicts was especially noted because of their limited financial resources which prevented them from purchasing the large amounts they had previously used. Among the younger addicts, variations in dosage over time usually followed the fluctuations in their moods, workload and financial resources. Environmental events influencing supply and cost of opium also greatly affected the dosage of opium consumed.

The paper also noted the difficulties in trying to ascertain daily dose using weight. Most addicts were better able to estimate their daily dose in money value than in weight. The amount spent daily by addicts in Laos varied tremendously, ranging from US$0.25 to US$9.25, a factor of 37. But generally, most addicts were reported to spend within a narrower range – US$0.50 to US$2.50 per day (still a factor of 5). On the average, the men spent more on opium per day than did the women. By routes of administration, the average opium eater spent the least (US$1.07), followed by those who consumed it by eating and smoking (US$1.35). Those who were exclusively opium smokers spent the most (US$1.74 per day on average).

Estimating Regional Opiate Consumption

In the absence of opiate consumption data for most countries in the region, one paper developed hypothetical estimates for the region. The study first developed an estimate of the number of opium and heroin users in each Asian country based upon a review of published statistics in United Nations reports and in the scientific literature. National consumption data were then calculated using hypothetical average daily doses of 50 mg. and 100 mg. pure heroin and 1 g. and 3 g. for opium abusers.

The paper then converted heroin consumption into demand for raw opium using the ratio 1 kg. heroin = 10 kg. opium thus making it possible to estimate national demand for illicit opium.

If the resultant consumption levels could be equated with illicit opiate demand in the region, it would then be possible to examine broadly the interplay between demand and supply.

It was shown using these hypothetical data that opium demand in the region from Egypt in the West to Hong Kong in the East resulted in an estimate of 1,200,000 opium users in the region. Heroin abusers were estimated at about 150,000 or only about 1/8 of the number of opium abusers. Also if one used the hypothetical daily consumption level of 100 mg. heroin and 3 g. opium per day, for the two groups, the regional demand for opium exerted by heroin users would be 50,000 kg. in contrast to the 1,200,000 kg. exerted by the opium users. The paper also used the same hypothetical dose levels, to assume how the region itself exerts a demand for most of its estimated illicit production. It was also observed that large populations of opium users maintained by some governments under legal registration systems would exert demand for illicit opium if government policies and political instability suddenly deprived these abusers of licit sources of the drug.

The paper ended with a reminder of the great limitations in the data on consumers used in the exercise and the hypothetical nature of the daily dose levels. There were strong reservations on the accuracy of estimates on the number of consumers for many countries and no corrections had been made for the proportion who would be active consumers at any given time. The authors hoped that methodological guidelines could be developed so that governments could eventually calculate reasonably accurate consumption estimates.

Overview of Illicit Opiate Supply

Illicit Opium Production and Traffic - The United Nations representative gave a working overview of illicit production and trafficking, noting that the figures are not precise but are based upon estimates provided by governments and developed in official meetings.

Illicit opium poppy cultivation in Lebanon appears to be negligible and it is claimed that it has been consistently destroyed. The small amount of illicit opium produced in Egypt is consumed within the country. Iran possibly produces sufficient opium for consumption by its estimated 600,000 addicts. All opium production is now illegal and much has been seized and illicit cultivation destroyed. Afghanistan previously had an estimated 350 tons of opium production. Current production is probably down to 200 tons. Pakistan reported a record of 800 tons illicit opium in the 78/79 season. Following aggressive enforcement activity, recent illicit production estimates are down to 80 to 120 tons per year; however, there may be residual stockpiles of up to 400 tons.

In the "Golden Triangle" area, a 600-ton crop has been estimated for 1981. Drug availability, purity and seizures are increasing in the region.

In Mexico, illicit opium cultivation is now limited to very inaccessible areas.

Estimates for the "Golden Crescent" area of the Middle East are based upon a 15 to 20 kg. per hectare yield rate. In the Golden Triangle area, governments use the figure of 5-9 kg. per hectare, as the planting appear less dense and the capsules are lanced less often. In Mexico, 7 to 10 kg. per hectare has been estimated. A total worldwide illicit crop of 1,500 to 2,000 tons is expected for 1981. Pakistan should become a net importer while Afghanistan will continue to be an exporter.

Worldwide seizures have been about 2.5 tons of heroin per year during the past 4-5 years. About half of this was seized in Western Europe in 1980. The estimated illicit traffic into the United States is about 5 tons of heroin per year.

A discussion followed on the influences of law enforcement on illicit opium production. It would appear to have had consistent effects in Mexico and Pakistan, but there was no evaluation yet of the medium-term impact of law enforcement approaches applied in the Golden Triangle area where weather conditions are clearly a key factor.

Factors Affecting Opium Production - A major issue in the discussion of opium production centres around the question of elasticity of supply; that is, to what extent is opium production in the South-East Asian highlands influenced by price? To what degree is an increase in the village level price reflected in increased production the following year? To what extent are farmers' cultivation choices responsive to price fluctuations, and what are the constraints placed upon those choices?

The traditional swidden farmer can manipulate two production variables for any crop, land and labour. To increase production, the farmer may expand the area under cultivation and/or his labour input. Opium is a highly labour intensive crop. For the Akha tribe, for example, it requires a minimum of 387 man-hours to produce 1.6 kg. or 1 Joi of opium. Among the Lahu, productivity is even lower. This represents nearly 80% more labour input than to produce upland rice. In all of the studies conducted by intensive has been shown to be the key constraint on total production, given specific climate conditions. In any year, however, the key determinant of total output has been the weather. It should be noted as well that the measured production of any particular field may vary by as much as 300% from year to year.

Given a choice, farmers prefer to grow both rice and opium, rather than opium alone because rice allows the farmer to control his own food supply. This is extremely important in regions where communication systems are poor. Import costs of rice are high especially in time of general

scarcity. Opium is more forgiving of land than rice, and can thrive under conditions of lowered soil fertility that are detrimental to rice. In the hill areas, rice yields have tended to diminish over the years, while opium yields have tended to maintain themselves through time. Moreover, opium swiddens tend to become more efficient over time, compared to rice swiddens.

In reviewing economic aspects, the paper noted there can be as much as 50% fluctuation in local opium prices over the course of the year: the price being lowest at harvest and highest just prior to the next harvest. Opium is not only a cash crop, recreational substance and medical drug; it also operates as a consumable currency underpinning the liquidity of trade from Southern China, across the Burmese Shan States, through Northern Thailand and Laos. Consumable currencies are relatively rate throughout the world. This liquidity function of opium in the upland economy must be considered in any programme of income substitution.

Traditional economics in the highland region of Burma and Thailand have become increasingly monetized. In the absence of a modern transport and marketing infrastructure, such monetization favours the production of drug crops over food crops to the extent that these may be interchanged.

Historical research has demonstrated that in the main opium producing regions of Burma, there has been considerable continuity in production over the last century; that is, the major producing areas today were the major producing areas in 1981 - 92. Moreover, similar seasonal price fluctuations were demonstrated. Because of the key role of opium in the highland economy, the author believed any effective supply control program must address the needs of the hill farmers and obtain their co-operation if it is to have any real chance of success.

United Nations Monitoring of Illicit Drug Traffic - Drug law enforcement agencies monitor and report to the United Nations the "wholesale" illicit movement of opiates to the extent possible. Assessment of quantities moved, the "purity" of consignments, sources, routes, prices and destinations are some of the factors essential for effective enforcement. Some drug enforcement agencies also regularly monitor retail prices with an enforcement objective. Apart from any other factors, this monitoring can show the relative success of drug law enforcement operations. Information on both wholesale and retail prices and purity should be provided to the United Nations annually; however, the statistics are frequently incomplete and sometimes show inexplicable discrepancies. Trends in production and consumption could be more accurately compared if more precise information were provided by governments. It was noted that the 'purity' of samples seized from the wholesale traffic was not being assessed with more accuracy since a system for exchanging samples for analysis had not been introduced.

Illicit Opiates Seized in 1980 - In 1980, the world's total seizure of illicit opium reported by the United Nations Division of Narcotic Drugs was 45.3 tons. The total of 45 tons of opium seized in the Middle East and Asia constituted 99.2% of the world's total opium seizure in 1980. In the Americas, a total of 101.3 kg. of opium was seized in 1980, in Europe 163.8 kg. and in the Western Pacific Region 0.016 kg. In Africa, 76 kg. of opium were seized in Mauritius. The countries with the largest opium seizures were Iran, 30,000 kg.; Pakistan, 4,966 kg.; and India, 4,198 kg.

The world's total seizure of illicit morphine base in 1980 was 1.4 tons, with the Middle East and Europe reporting the largest seizures of 975.1 kg. and 45.2 kg. respectively. In Asia, 17.6 kg. were seized; in the Americas, 1.1 kg; and in the Western Pacific Region, 0.2 kg. No data were available from the African countries.

The total world seizures of heroin in 1980 were 2.15 tons, with Europe having the largest seizure of 1.3 tons, followed by the Middle East, 531.8 kg.; Asia, 38.3 kg.; and the Western Pacific Region, 12.9 kg. No reports were available from Africa. The countries with the largest heroin seizures were Iran, 500 kg.; Yugoslavia, 300 kg.; and Germany, 267 kg. However, in all these countries, the purity of the heroin seized was not reported.

The purity of heroin seized varies with the regions. For the Americas, Canada reported a minimum purity of 3% and a maximum of 6%, whilst in the United Stats the figures given were minimum, 60% and maximum, 90%. In the Western Pacific Region, Australia reported a minimum purity of 30% but no maximum figure was provided. In Europe, only United Kingdom and Luxembourg reported purity of the heroin seized, the figures being 70 to 90% and 49 to 82% respectively. In Asia, Malaysia and Sri Lanka were the only countries reporting purity of the heroin seized, and both gave a minimum purity of 30% and a maximum of 40%.

Methodological Issues

Estimating Prevalence of Opiate Abuse - There are several methods for estimating the prevalence of opiate abuse: population surveys, registries and indirect estimations.

While the use of population surveys or a complete registry is certainly optimal in terms of scientific criteria of accuracy, these methods cannot always be applied for economic, technical or political reasons. In addition, a population survey often under-represents the hard core users and must be repeated over time to be useful. With registries, one sometimes has difficulty estimating the number of individuals who have not been identified.

For these reasons, a variety of indirect estimation procedures have been

considered by drug researchers. But indirect estimation methods will only be of value if they can make use of available data; have a design which is simple, flexible and robust; have broad applicability; and are accurate and provide an estimate of the error involved in the method.

A variety of indirect methods were evaluated against these criteria and one method found to stand out was the *capture-recapture* method (or indicator dilution method). Research has been conducted to evaluate the accuracy of the method and circumstantial evidence available to date (Woodward, Retka & Lin, 1981) indicates a surprising accuracy. However, it was stressed that a final validation study needs to be carried out in a setting where the actual number of abusers is known through another method such as a complete registry. Such a definitive validation has never been carried out and is seen as a requirement before widespread use of the method can be recommended.

Monitoring the Illicit Drug Market – A working paper proposed a methodology for monitoring the street drug market. The objectives for such monitoring would be (i) to monitor price, dose and quality of street drugs and (ii) to monitor the impurities for public health reasons.

To study retail price and quality of illicit drugs at the retail level, a systematic approach is required, one that would be used consistently over time. But where do we assess the drug market? One logical place would be to gather from new admissions to treatment centres data on price and on location of drug distribution centres. Ex-drug users or other field workers could then visit these sites to help construct a sample frame and establish the co-operation needed to purchase drug samples. The number of purchases at representative drug distribution centres would be proportional to the numbers of addicts who indicate they buy there. Drugs would be analysed for percentage purity and the types of diluents and impurities found.

This methodology would permit one to determine the amount of pure drug per dose and to monitor the monthly quality of the drug as well as variations in quality over time. Consumption levels could be calculated from cost of the daily habit, street retail costs, weight and purity data. This paper preferred to sample the illegal market as a separate activity and not as a subsidiary activity of law enforcement which buys selectively to make new arrests.

Malaysian data were examined in greater detail in order to illustrate the type of information that could be obtained. For example, median daily expenditures for heroin during the 1975-1981 period were stable except for 1980 when they rose from M$9.00 to M$13.00. When converting purchases to cost per mg. the cost fluctuated but in 1981, consistently fell between M$0.20 and M$0.30 per mg. It was also observed that median consumption varied little between 1980 (48 mg./day) and 1981 (41.4 mg./day). To gather

the Malaysian data, sample sites were selected on the advice of enforcement personnel, supplemented by patient interviews to determine actual drug distribution sites. Six to seven purchases are made each month for about M$7.00 per purchase. Trained field workers who are not addicts make the purchases. Similar methods have been employed in other Asian countries.

Constraints on such monitoring are the *costs* of the purchases and staff qualified to undertake this hazardous activity. To analyse drug content and purity, the thin layer chromatography system is relatively cheap and effective, but Malaysia uses the gas chromatography system. It was agreed that monitoring purity of drugs at the retail level is of value. Whether there are clear advantages to using a system independent of police, buys and seizures needs to be studied.

FINAL STATEMENTS

1. The Regional Workshop was the first international meeting convened specifically to examine the quality of the data and the status of methodology in the field of illicit opiate consumption in the Asian region. The Workshop recognises the clear advantages for policy-makers to have more accurate knowledge of national, regional and international consumption levels for illicit opiates as well as for other drugs of abuse. The participants felt that the current work to develop systematic data shows considerable promise as an important aid for assessing the real demand for illicit drugs and also for planning effective intervention strategies.

2. The illicit drug market like any other market was observed to fluctuate continuously with respect to the numerous factors which influence drug use patterns. This complexity obviates the use of any simplistic methodology. To measure consumption levels, the Workshop noted the need for valid data on the number of abusers, their average daily dose and some corrective factors such as the percent of time that abusers are active during a given period. For estimating average daily dose, it is essential to have reliable data on the price and purity of the drug as well as information the individual's level of use, chronicity and route of ingesting the drug.

3. The Workshop participants discussed several different approaches for calculating illicit opiate consumption depending on the type of data available in the different settings. None of these simple and direct formulations for estimating consumption appeared to take into account the numerous factors that influence consumption trends.

4. No standard methodology for estimating current drug consumption levels or the number of illicit drug abusers has been developed. The

participants felt that it was likely that complete standardisation would never be possible. However, one method which shows promise for estimating the prevalence of drug abuse is the "capture-recapture" method.

RECOMMENDATIONS

The Workshop made the following recommendations:

i. The existing monitoring systems applied to the consumption of illicit opiates or other drugs should continue to be refined and extended so as to achieve accurate long-term data which take account of as many variables as possible.

ii. The capture-recapture method of estimating total prevalence of drug abuse should be further developed, tested and refined for more accurate assessment of its applicability in diverse settings.

iii. An inexpensive and practical methodology for measuring consumption levels of illicit drugs should continue to be pursued to help governments assess more accurately their national illicit opiate consumption levels.

iv. The relationship between consumption of illicit drugs and clinical syndromes needs to be examined further so as to help clarify disparate reports on the adverse effects of drug abuse.

v. The exchange of experiences and collaboration of studies of drug consumption so as to generate comparable data in different settings should be pursued. The United Nations Division of Narcotic Drugs, the Colombo Plan Bureau and all concerned bodies and agencies should be asked to assist in facilitating such exchange of experiences and collaboration.

vi. The confidentiality of certain data and their sources as well as the confidential use of findings in certain circumstances should be maintained in order to ensure more effective monitoring of drug consumption data.

PART THREE:
Workshop Papers

CONSUMPTION OF OPIATE DRUGS IN ASIA
(Background Paper for Workshop)

by

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WORKSHOP RATIONALE AND OBJECTIVES

Opiate drugs have been used in Asia for hundreds of years but little is known in a systematic way about current consumption patterns of these drugs in the region. It is clear that several countries of Asia are suffering from high levels of opiate addiction. However, much pertinent and important knowledge about the patterns of opiate drug consumption among and within countries of the region is still lacking.

While estimates of total opiate production in the region are steadly improving, nothing systematic has been done to improve our understanding of the regional opiate consumption patterns. This workshop will take a first step towards filling this information gap. The main objectives of the workshop are:

i. To synthesise existing information about opiate drug consumption patterns in Asia;

ii. to attempt to define a standard methodology for estimating current opiate drug consumption levels; and

iii. to assess the aggregate level of Asian opiate consumption.

HISTORICAL BACKGROUND

Opium

The use of opiate drugs (particularly opium) in Asia has historical roots which can be traced back many centuries. The history of opium began several thousand years ago in Sumeria (now Iraq). From there is spread to Egypt, Persia, India and other parts of Asia. In the 10th century, opium found its way to China. Throughout this time, opium was taken orally as a medicine and generally not abused. However, in the 17th century, the Western custom of smoking came to Asia and opium smoking became popular.

Evidence suggests that opium found its way to South and East Asia around the 9th century after it was brought by Arab traders into Pakistan. Since then, opium has been produced in Pakistan. The later rise of the Moghul Dynasty brought about a concomitant spread of opium production. The founder of the Moghul Dynasty, Emperor Babar, was addicted to opium and this habit was shared by others in the lineage. This royal indulgence promoted the widespread use of opium as an intoxicant and as an easily available household remedy. During the time of the Moghul ruler, Akhbar the Great, opium was encouraged as an international cash crop to fill government coffers. This primary emphasis on opium production for revenue was further reinforced with the arrival of the British in India.

The widespread use and cultivation of opium poppy in India spread to Burma. Under the Burmese kings, opium use was initially punishable by law and later prohibited completely. Prohibition was not wholly effective because the British in their occupied areas of Burma continued to supply the opium. With the annexation of Burma by the British, opium production was introduced in 1927 into the Tenaserim and Arakan regions, and in 1878 into the Shan and Kachin States. By 1904, numerous opium dens were found in the Tenaserim and Arakan regions, and in 1923 many more were legally opened in the Shan and Kachin States (Mya May, 1978). During the early 1900's manual labourers working on roads were paid their daily allowance in opium.

The opium picture in Burma saw a change in 1962 when the Revolutionary Council took power. Its use and production were made illegal and existing opium stocks were ordered to be destroyed. Despite these edicts, heavy addiction is still prevalent in Burma particularly among the hill tribes.

In the mountainous regions of the Shan and Kachin States, opium production is widespread. This region provides opium and other opiates for addicts of the region and for the international market as well.

Besides Burma, opium from India was also carried by British traders to China. During the later part of the 17th century, opium smoking became a Chinese custom and vice despite Chinese government edicts against its use and sale. Western traders (especially the British) were bringing large quantities of opium from India, and opium addiction in China became widespread and serious. Efforts by the Chinese Government to enforce edicts banning opium importation led to the Opium Wars of 1839 and 1856. As an outcome of these wars, China was forced to legalise the opium trade – a factor leading to more serious problems of opium addiction in the country.

The large migration of Chinese from China to countries such as Taiwan, Hong Kong and the Philippines helped spread opium abuse to these countries. Although the problem of opium addiction was first recorded in Thailand in 1360 A.D., it was not until the 19th century, that opium addiction became a formidable problem. This was because of the large wave of Chinese immigrants into the country around 1821. These Chinese immigrants brought with them their habit of opium smoking. This habit spread rapidly despite strict legislation against its use. In 1951, the decision to legalise opium smoking (for purposes of collecting revenue) did not help solve the problem.

In 1958 in accordance with United Nations recommendations, Thailand passed legislation to terminate the legal opium trade and the non-medical consumption of opium. Opium dens were closed, smoking utensils were destroyed, and a treatment centre was set up to detoxify the addicts. Despite prohibitions against opium use, addiction continues among the lowland rural villagers and hill tribes. In the hilly regions of Thailand, opium is being grown as a cash crop and is also used widely as a local therapy for pains, illness and old age (Nepote, 1976; Suwanwela 1976).

In other South East Asian countries, the history of opium shows a similar pattern. Opium smoking in Malaysia, Indonesia and Singapore dates back to the colonial period. The habit was especially known to the Chinese who had come from mainland China.

Opium in Singapore has been reported since its founding. In 1819 after the treaty establishing Singapore was signed, opium was among the prestigious items presented by the British (Leong, 1974). Soon after the founding of Singapore, large numbers of Chinese came to work in the new port. Because living conditions were hard and medical facilities nonexistent, opium was used as a panacea for all ills as well as euphoriant after a hard day's work. Opium smoking became widespread and was socially ac-

cepted by the Chinese community. Later, labourers from India working in Singapore were also introduced to opium. Unlike the Chinese, the Indians took up the habit of opium eating.

The history of opium abuse in Malaysia and Indonesia is similar to that of Singapore. In the 1800's large numbers of Chinese came to these countries to fill the labour market in the tin-mining and agricultural industries. With them came opium smoking. The opium problem in Asia was further reinforced by the European colonisers' policies of registering and selling the drug and their indifference towards the problem.

Today most countries in Asia have enacted laws and increased penalties against opium use and production. Despite this, opium is still being grown, and a substantial segment of the rural population continues to be dependent on it. Such regions include large areas of Burma, Laos, Thailand, India, Iran, Afghanistan and Pakistan.

The exact number of persons dependent upon opium cannot be determined on a worldwide basis. However, the rate of addiction reported for adults among selected hill tribe villages in Thailand varies between 6.6% and 16.8% of the population (Suwanwela et. al., 1978). In Fars, a rural province of Iran, the average rate of registered addicts was 7.5 per 1000 (Mehyrar and Moharreri, 1978) and in the rural area of Punjab (India) the percentage of "regular" users of opium was about 3.7% for male and 2% for female (Ministry of Health and Family Welfare, 1977).

In other areas, proximity to production does not appear to be an important factor. Addiction among opium farmers in Turkey has been reported to be rare (Akcasu, 1976). In the Northwestern Frontier Province of Pakistan, where opium is extensively grown, relatively few addicts were found, except in one rural village where more than 10% of the inhabitants were addicts (Khan, 1977).

In the non-opium producing countries of South-East Asia such as Malaysia, Singapore and Indonesia, the opium problem which remains is confined mainly to the older generations of the Chinese. The total number of these opium users is gradually diminishing, but they are being replaced by a younger generation using other opiates such as heroin.

Heroin

The abuse of heroin is a recent phenomenon. For a long period after the technology for producing heroin had been developed, opium continued to be the drug of choice across Asia. It is only in recent years that heroin addiction has appeared and is spreading rapidly in Asia. Studies by Westermeyer (1976) in 3 Asian countries showed that the recent substitution of heroin for

opium was directly associated with the increasing suppression of opium use. In Hong Kong, Thailand, and Laos, Westermeyer's findings showed that the enactment of the anti-opium laws led many opium smokers to switch to heroin and many new addicts to begin with heroin rather than opium. The ease of handling heroin and its greater convenience for surreptitious use made it a better opiate choice for the drug abuser.

Heroin use was reported to begin in Hong Kong in the late 1940's and early 1950's (Westermeyer, 1976). From Hong Kong, heroin was first imported into Thailand in September 1959. Since the mid-1960's heroin abuse has become a problem challenging the future of that nation (Suwanwela, 1976). In Indonesia, the switch from opium smoking to heroin and morphine use occurred about 1968 when morphine was first known in the country (Indonesia Country Report, 1979). Since then, heroin abuse in country has been limited in its absolute extent but has at times indicated a slow increasing trend.

In Singapore and Malaysia, heroin addiction was not reported until after 1970. Heroin abuse in Singapore was first reported in December 1971 (Leong, 1977). The problem became serious in 1974 and by 1975 it was spreading very rapidly. Operation "Ferret" was launched in April 1977 to ferret out as many drug abusers and traffickers as possible and to commit them to treatment or incarceration. As a result of this successful operation, the abuse of heroin in Singapore is now contained (Singapore Country Report, 1979).

At the same time when heroin abuse in Singapore was at its height, heroin addiction in Malaysia was also spreading like a "communicable disease" among the younger generations. A restrospective study of male opiate addicts admitted to University Hospital (Kuala Lumpur) for treatment during 1970-1976, disclosed that during these 7 years, the picture of drug addiction had become one primarily of heroin dependence (Parameshvara, 1978). In 1970, no heroin addiction was reported in the study, but by 1976 the place of heroin as the principle drug of abuse had been established - 86.2% of the patients admitted in 1976 in the study were heroin abusers. The rate of heroin abusers in Malaysia has remained constantly high. Recent figures released by the National Drug Research Centre (1981) indicate that about 85% of the identified drug abusers in the country in 1980 were abusing heroin. The abuse of heroin in Malaysia is similar to that in other Asian countries. It is primarily the younger age groups in the urbanised areas that have been affected.

OVERVIEW OF METHODS OF USE FOR VARIOUS OPIATE DRUGS

The methods of using opiate drugs vary with the types of drug used, the availability of the drug, and individual preferences. For opium, the

methods commonly used are eating and smoking, whilst for heroin, a variety of methods are employed, i.e. smoking in cigarettes, "firing the ack'ack gun" technique, "chasing the dragon", "playing the mouth organ", and injecting the drug intravenously, intramuscularly, or subcutaneously ("skin popping").

Opium Eating - Opium may be taken in its raw form, directly from the poppy plant. Usually it is dissolved in water and strained through a cloth to remove grit, inert substances, and impurities before it is consumed orally. Opium eating is the most prevalent mode of administration in India (Westermeyer, 1979) and in parts of Pakistan (McGlothlin, 1978).

Opium Smoking - Opium for smoking is prepared by dissolving it in water and boiling the solution until it becomes paste-like and ready for use. During smoking, a smoker lies down and holds a pipe which is connected to a hollow ball with an aperture. The pipe is held over a burning lamp in such a position that the flame just touches the aperture where a small quantity of the opium is held with an iron wire. The opium is allowed to burn while the fumes are inhaled repeatedly. This route of use is popular among the hill tribes of Thailand and Burma. (Mya May, 1979; Suwanwela, 1978) and in rural areas of South East Asia (Posyachinda, 1978; Salan, 1978) and Pakistan (Masood, 1979; McGlothlin, 1978).

Of the two methods of use, opium smoking is often preferred because it produces a "rush" that is highly favoured by most addicts. However, opium smoking is more wasteful than eating since a considerable amount is lost through volatilization. Nevertheless, it has been noted that when opium becomes sczrce or more expensive, addicts will switch from the more satisfying smoking route to the eating route (Westermeyer, 1978), thereby reducing the dosage and thus the expense of their habit.

Heroin Smoking

(a) *In cigarettes* - Heroin is mixed with the tobacco in a cigarette, and the cigarette is smoked just like any ordinary cigarette. This method of heroin abuse is common among the cigarette smokers when they first take heroin (Leong, 1977; Navaratnam 1978).

(b) *"Firing the Ack-Ack Gun" Technique* - This technique is also known as smoking heroin-tipped cigarettes. In this method, a few granules of heroin are placed on the tip of a cigarette from which some of the tobacco has been removed. The heroin-tipped cigarette is smoked with the head held back and the cigarette in a vertical position to prevent the heroin from falling off. A lighted cigarette may also be dipped into the heroin powder. This method is often used by addicts when they first begin to take heroin,

although in Singapore this is the most common method of heroin abuse by long-time drug addicts (Leong, 1977).

(c) *"Chasing the Dragon"* - In this method, heroin (which may be mixed with a quantity of barbitone) is placed on a piece of tin foil and heated by means of a lighted taper or candle placed under the foil. The resulting fumes of the heated drug are inhaled through a small tube usually made of paper or a straw. The drug will run in various directions on the tin foil with the result that the fumes will rise in an undulating manner resembling the tail of a dragon, hence the term "chasing the dragon". This method was started in Hong Kong but is now commonly used by heroin addicts in many Asian countries.

(d) *"Playing the Mouth Organ"* - This is a variation of "chasing the dragon". It uses a match box cover to inhale the fumes instead of a small tube. The reason for this is to inhale as much of the vaporised heroin as possible which is particularly difficult for a beginner trying to "chase the dragon" with a small tube.

Heroin Injection - Heroin can be injected intravenously (injection into the vein), intramuscularly (injection into the muscles) or subcutaneously (injection just under the skin). Heroin injection is often used by chronic heroin addicts to obtain a faster and more intense response from the drug. It is also the least wasteful of the administration routes for heroin. Injection, of course, carries with it the possibility of a variety of illnesses resulting from non-sterile injection techniques, instruments and foreign matter.

PHARMACOKINETICS OF OPIATE DRUGS AND METHODS OF ADMINISTRATION

The opiate drugs are abused via various routes of administration, the most common of which are the oral, inhalation and intravenous routes. The use of various routes leads to the achievement of different blood levels and thus different degrees of intensity and duration of effects. The availability of the administered drug to the site where it exerts its pharmacological effects depends on the various pharmacokinetic properties of the drug in question, the most important of which are absorption, distribution and elimination (metabolism and excretion).

Absorption - The opiates are readily absorbed from the gastro-intestinal tract, from the nasal mucosa and lungs, and via subcutaneous and intramuscular parenteral routes. For most opiates, first-pass metabolism occurs in the liver and significantly reduces the effect after an oral dose. Lipid soluble morphine congeners are better absorbed and give better bioavailability from a subcutaneous injection. The time-effect curve depends on the route of administration used. Generally the duration of action is

longer with the oral route, although peak effects may be lower. This is illustrated in Figure 1. Any drug given intravenously achieves maximum and very rapid effects. This applies to morphine and heroin as well. Thus the intravenous route of administration is often the preferred route among abusers. However, the duration of effects may be shorter when compared to the oral route.

Opiates given orally are well absorbed from the gastro-intestinal tract. However, first-pass metabolism occurs in the liver and this causes a reduction in the effects experienced. Thus the effect of oral administration of opiates is usually less than that of parenteral administration. The presence of the benzylisoquinoline alkaloids (example noscapine) and some inactive gum-like substances delays the absorption of the pheneanthrene group of opiate alkaloids (morphine-like compounds), thus attenuating as well as prolonging the effects or orally ingested opium (Bordbar, 1975).

Inhalation of heroin and opium is a very common route of administration among drug abusers in Asia. Two common inhalation techniques are used in the abuse of heroin; they are the "chasing the dragon" and "firing the ack-ack gun" techniques. The efficiency of these two methods differs. It has been found that the efficiency of "chasing the dragon" is twice that of "firing the ack-ack gun" but only two-fifths that of intravenous administration (Mo and Way, 1966). The maximum amount of heroin available has been estimated to be approximately 75% in "chasing the dragon" and 30% in the case of "firing the ack-ack gun" (Mo and Way, 1966). This apparent difference is due mainly to the temperature involved in the two techniques. At temperatures around the melting point of heroin hydrochloride (244°C), the heroin availability is increased with increased temperatures. However at higher temperatures such as (approximately 700°C) that is achieved during the burning of a cigarette, thermal decomposition of heroin occurs, thus reducing its availability. In summary, the bio-availability of heroin using the inhalation route depends on the temperature and other physical conditions attained during the volatilization process of the drug.

Distribution - Morphine accumulates in the parenchymatous tissues such as the spleen, kidney, lung and also in smaller amounts in skeletal muscles. It is approximately 33% protein bound. Only small quantities of morphine pass the brain barrier to exert central effects. Codeine, heroin and methadone penetrate the blood/brain barrier to a greater extent than morphine (Ordendorf et. al., 1972).

Elimination - The main metabolic pathway for elimination of morphine is conjugation to form morphine 3-glucuronide. Heroin is rapidly hydrolysed to monoacetyl-morphine (MAM) which is then again hydrolysed to form morphine. Recent evidence suggests that morphine and MAM are responsible for the pharmacological actions of heroin. Generally, N-demethylation

of the parent compound is a minor metabolic pathway for the opiates. About 10% of codeine is demethylated to form morphine, although the codeine molecule itself has an inherent affinity for the opiate receptor. Morphine is predominantly excreted in the urine as its conjugated metabolite via glomerular filtration; almost 90% of a dose excreted over 24 hours and almost all the rest over 48 hours. Small amounts of free morphine are excreted in the urine, while 7-9% appears in the faeces as conjugates.

Studies to determine the apparent half-life of morphine have given a wide range of results (from 74 minutes to 44 hours). This wide discrepancy is probably attributed to the specificity of the quantitation method and the design of the experiment (Cathin, 1977).

Routes of Administration - The following table summarises the common routes of administration frequently used by abusers for morphine, opium and heroin:

Table 1

	Oral	Inhalation	Intravenous
Morphine	x		x
Heroin	x	x	x
Opium	x	x	

LEVELS OF OPIATE DRUGS CONSUMED IN COUNTRIES IN ASIA

The present level of opiate drugs consumed in South and East Asia is difficult to estimate with any precision. There is at present very little pertinent and up-to-date information available. Most of the current studies are incomplete and have been focussed mainly on specific population. The findings cannot be extrapolated to represent the general situation of opiate drug consumption in all the countries of the region. Despite all these problems, it is useful to review the basic information that is available on opiate drug consumption in a few Asian countries. In particular it will be useful to examine the range and variation in consumption estimates for various types of opiate drugs, for various routes of administration and for populations at varying distance from the site of production.

Opiate Drugs Abused in Asia

The principal opiate drugs being abused in Asia are opium, heroin and morphine. The consumption level of these drugs in Asia varies greatly depending on the consuming population, the route of use and the availability of the drug. Kramer (1979) in his review of opium consumption among Chinese smokers in China and North America during the 19th century, noted that the average daily consumption was about 6.0 grams whilst among those seeking treatment for dependence, it was about 12.0 grams. In Singapore, Leong (1977) reported that the average daily consumption of opium by smokers just after World War II was about 2.4 grams. In more recent studies on the abuse of opiate drugs in Asia, varying levels of consumption were reported among and within countries of the region, (see Tables 2 and 3).

Burma

In Burma, no systemmatic research has yet been carried out to determine the level of opiate drug consumption in the country. Although opium addiction is a serious problem among the hill tribes in Burma, it is at present virtually impossible to estimate the consumption of the drug since no information is available. However, in a recent paper presented at the WHO Workshop in Chiengmai (1979), Mya May reported that the daily dose of opium consumed was about 4 to 8 grams for urban addicts whilst among the rural addicts, the range was about 4 to 16 grams. In the report, opium swallowing was the mode of administration reported among the urban addicts whilst among the rural addicts it was smoking.

The estimate of opium abusers in Burma available from government sources was about 94,000 in 1973 (U.N. Commission on Narcotic Drugs, 1975). In a more recent report to the United Nations, 200,000 opiate addicts were estimated, but no distinction between opium and other opiate drugs was made (U.N. Commission no Narcotic Drugs, 1979). If a constant estimate of 100,000 opium abusers, is assumed to consume an average of 8.0 g. of opium each day of the year, the total consumption of opium in the country would be 800 kilograms a day or an equivalent of 292 metric tons a year.

Hong Kong – In Hong Kong, the primary drug of abuse is heroin. Routes of heroin use in Hong Kong include injection, smoking and fume inhalation. Methods of inhaling heroin fumes include "chasing the dragon", "playing the mouth organ" and "firing the ack-ack gun" technique. Recent reports on the mode of heroin administration showed an increase in the intravenous route of using the drug (Hong Kong Narcotics Report, 1979).

The intravenous route offers an economical method of heroin abuse. In a report presented by the Counsellor for Hong Kong Affairs at the First

Commonwealth Meeting (1979), the estimated mean daily consumption of heroin by intravenous injection was about 0.32 g. whilst among those who consumed the drug by fume inhalation, the mean daily consumption was about 0.64 g. (purity = 25 to 26%). The number of heroin abusers in the country at the end of 1979 was estimated to be from 35,000 to 40,000 (Counsellor for Hong Kong Affairs, 1979; Hong Kong Narcotics Report, 1979).

Iran – Opium is the principal opiate drug abused in Iran. Its use is viewed both as a social and as a medical problem. Licensed physicians were previously authorised to distribute specific rations of opium to addicts above 60 years of age and also to those of the younger age for health reasons. In Shiraz City and Fars Province, a rural province in Iran (which had the largest number of registered opium addicts), over three-quarters of the registered addicts were prescribed with 5 to 10 grams of opium per day (Mehryar and Moharreri, 1975). The average daily dose prescribed was about 7.06 grams.

In another study on patients admitted to Nemazee Hospital between 1969 and 1976, findings revealed that the average level of opium consumed by opium users was about 5.7 grams a day (Sadeghi and Bermard, 1979). Over half (55%) of this sample of opium addicts consumed it by smoking, whilst about two-fifths (43%) reported smoking and eating and only 2% were exclusively opium eaters.

Records on opium addiction in 1976 showed an estimate of 170,000 officially registered addicts in the country (Moharreri, 1976). In 1977, the estimated opium consuming population in the whole country was reported at 350,000 (U.N. Commission on Narcotic Drugs, 1979). If the 180,000 unregistered opium users in Iran could be assumed to consume an average daily dose of opium equivalent to that of the registered addicts, i.e. about 6.4 grams (mid-point for 5.7 and 7.06) of opium per day, the total estimate of opium consumption in the country would approximate 2.23 metric tons a day or an equivalent of 815.0 metric tons a year.

Malaysia – The principal drug of abuse in Malaysia is heroin. 84.9% of the identified drug abusers in the country in 1980 were reported to use heroin (National Drug Research Centre, 1981). Data from the National Drug Research Centre indicate that the mean daily consumption of heroin in the country in 1980 was about 46 mg. of pure heroin. The routes of heroin use reported were smoking, injection, sniffing, eating and drinking. A baseline survey of 300 drug abusers in 1980 showed that, based on the amount of money spent and the average price of heroin in the illicit market, the estimated mean daily consumptions of pure heroin by various routes of use were 36.9 mg. for injection, 31.5 mg. for smoking, 33.3 mg. for eating and drinking and 19.8 mg. for sniffing (National Drug Research Centre, 1981).

Statistical data on heroin abuse in Malaysia showed that up to July 1981, there were as many as 60,664 identified individuals abusing heroin in the country (National Drug Research Centre, 1981). If the average number of individuals presently consuming the drug can be assumed to be constant at 48,000, the total amount of heroin consumed in the country would approximate 2.2 kg. of pure heroin a day or an equivalent of 805.9 kg. of pure heroin a year.

Pakistan – In Pakistan, considerable variation in the levels of opium consumption has been reported. A survey of 618 smokers in the Northwestern Frontier Province in 1975 showed a mean opium consumption level of 4.7 gm. per day (Masood, 1979). Among the opium producers in Buner, the daily consumption of opium per addict ranged from 7.7 to 23.1 gm. (Pakistan Narcotics Control Board, 1975). In Kuria, a rural opium growing village, where smoking was prevalent, mean daily consumption of opium was 10.7 gm. whilst in Rawalpindi, an urban area with opium eating being most common, the mean daily consumption level of opium was only 0.9 gm. This difference in levels of opium consumed and the route of use, also reported in Thailand (Suwanwela et. al., 1977a) and Burma (Mya May, 1979), clearly shows that the route of opium administration is a critically important variable in estimating consumption.

Route of opium use in Pakistan varies with the location of the consuming population. In a study which compared the patterns of opium use between urban and rural users, smoking was reported as the preferred route of use among the rural users, whilst for the urban users, opium eating was more common (McGlothlin, et. al. 1979). This finding is consistent with Mya May's report from Burma (1979) which stated that opium swallowing was prevalent among urban users whilst smoking was more common among rural users.

The usual estimate of addicted or regular opium users in Pakistan in recent years has been about 100,000 (Khan, 1977; U.N. Commission on Narcotic Drugs, 1979). If this conservative but constant estimate of abusers is assumed to consume an average of 5.0 grams of opium each day of the year, total opium consumption in Pakistan would approximate 500 kilograms a day or 182.5 metric tons per year.

Singapore – The main opiate drug abused in Singapoe is heroin. In 1977, Leong reported that the average "hooked" person would consume from 1 to 1.5 grams of heroin (purity not specified) per day by smoking in heroin-tipped cigarettes. Among the relatively new users, the amount of heroin No. 3 (purity = 35-40%) consumed by smoking in cigarettes was about 0.4 to 0.8 grams (Leong, 1977b). In a more recent report, new users were estimated to take no more than 0.2 grams of heroin No. 3 per day (McGlothlin, 1980). For morphine, Leong (1977) noted that among the

opium addicts who switched to morphine, the average consumption of morphine (by injection) was about 1.4 gram per day.

The present situation of opiate drug abuse in Singapore is contained McGlothlin, 1980; Singapore Country Report). This is greatly attributed to the effective counter-measures against drug trafficking and the comprehensive rehabilitation programmes for abusers.

Thailand – In Thailand, opium and heroin are the opiate drugs commonly abused. Mean daily consumption levels of opium which have been reported range from 1 to over 30 grams (Thailand Country Report, 1979), for the Red Lahu (a hill tribe in Thailand), Walker (1966-70) reported that the average daily consumption of opium by addicted smokers was about 3.0 grams. Among the Karens, the daily consumption of opium is reported to range from 4.5 to 13.5 grams (Suwanwela, et. al., 1978). In a retrospective study of 1,382 patients admitted to the Narcotic Treatment Centre for Hill Tribes in 1978, the mean daily consumption of opium was 3.9 grams for males and 3.2 grams for females (Suwanwela et. al., 1978b). The study also reported higher levels of opium consumption among the Hmong and Akha, their means being 5.0 and 4.9 grams respectively.

Routes of opium use by hill tribes in Thailand are smoking, eating and a combination of the two (Poshyachinda, et. al., 1977; Suwanwela, et. al., 1978; Walker, 1966-70). Of these routes, smoking is more common (Suwanwela, et. al., 1978a). Among the Hmong, a higher daily dosage of opium consumption has been reported for the smokers (2.3 to 15.0 grams) than among the exclusively opium eaters (0.75 grams), (Suwanwela, et. al., 1977a).

Opium use in Thailand is also prevalent among lowland rural villagers (Poshyachinda et. al., 1977; 1978; Suwanwela, 1976), but among the latter, little is known about the extent of the problem. The gross prevalence of rate of opium addiction among hill tribes had been estimated at 9.6% of the population (Suwanwela et. al., 1978b). If this addiction rate can be assumed to hold for all hill tribes, the number of opium addicts in the estimated hill population of 350,000 in 1976 (Walker, 1979) would approximate 33,600. If each of these addicts consumed an average of 5.0 grams of opium per day, the total amount of opiate consumed by the hill tribe addicts in Thailand for 1979 would be 168 kilograms a day or an equivalent of 61.3 metric tons for the whole year.

Besides opium, heroin is widely abused in Thailand. Based on the amount of money spent and the average price of the drug in the illicit market, the estimated mean daily consumption of heroin No. 4 (average purity = 95%) in 1977 was about 250 to 300 mg. or an equivalent of 237.5 to 285 mg. of pure heroin a day (Poshyachinda et. al., 1977). This level is very high compared to that of other countries such as Malaysia, Singapore and Hong Kong.

The most common routes of heroin use reported in Thailand are intravenous and intramuscular injections (Poshyachinda, et. al., 1978; Suwanwela, 1976). Smoking and fume inhalation of heroin are also reported but to a lesser extent.

Concluding Remarks

In this attempt to review available information on consumption estimates of opiate drugs in Asian countries, 3 variables which have been identified as important correlates of consumption are drug type, route of use and proximity of the consuming population to the site of opium production.

The consumption estimates for different opiate drugs vary greatly depending on the potency of the drugs. In terms of weight, the amount of opium consumed by addicts is very much higher than heroin or morphine. This is attributed to the potency of opium which is very much lower than that of heroin and morphine. The potency of opium is only about one-tenth that of morphine while, heroin has been estimated as 2.4 to 10 times as potent as morphine (Martin, and Fraser, 1961; Seever and Pfeeffer, 1931).

The mode of drug administration is an important variable in estimating consumption. The route of drug use affects the quantity of the drug absorbed into the body. Intravenous injection offers the most efficient method of administration since a small amount of the drug is required to produce a 'satisfying' effect. The smoking route is a wasteful method since a great deal of the drug is destroyed through volatilization and exhalation. As such, a larger quantity of the drug is required. The use of opium by eating seems to offer a more economical method of drug use than smoking. In Pakistan, Thailand and Burma, smaller dosages of opium were reported for opium eaters than for smokers.

The proximity of the drug consuming population to the site of production has been observed to affect consumption estimates. In Pakistan and Burma, reports revealed that opium consumption was much higher and prices much lower in the rural producing areas than in the urban areas. In Thailand, the exceptionally high level of heroin consumption relative to those reported for Malaysia, Singapore and Hong Kong also reflects that proximity to the site of production is related negatively with price and positively with the level of consumption.

Consumption patterns for opiate drugs in the Asian countries reviewed showed an elastic demand. An increase in the price of the drugs is correlated with a shift towards more efficient routes of drug use. Reports from Hong Kong (Hong Kong Country Report, 1979) clearly show that the recent increase in heroin prices has motivated a large number of addicts to switch to the intravenous route, thereby reducing the dosage of heroin consumed. More recent (unpublished) reports also indicate that as the street level price of heroin escalated in recent years, consumption levels declined.

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OPIATE DRUG CONSUMPTION IN MALAYSIA

by

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Drug abuse in Malaysia is certainly not a new phenomenon. Historical documents reveal that in 1936 there were 60,000 registered opium smokers in the country with an estimated equal number of unregistered users. In the recent years, however, the spread of industrial technology and rapid urbanisation have eroded some of the traditional controls on the use of these substances. Malaysia, like other nations in this region undergoing rapid economic and social changes, is seriously affected by drug abuse and its related problems. Evidence has shown that the illicit demand for drugs has been increasing in recent years and has now become a major social problem in the country.

The principal drugs abused in Malaysia are heroin, morphine and opium. Statistical data available from the National Drug Research Centre at Universiti Sains Malaysia, indicate that from 1970 to July 1981, a total of 60,664 persons were reported to have used drugs. About 80% of these were heroin users followed by a small percentage of illicit morphine base and opium users.

Consumption of Heroin

In Malaysia, a majority of the heroin users consume the drug by smoking it in cigarettes. Of late, however, many users have changed their mode of administration to that of "chasing the dragon." Heroin is purchased in plastic straws containing approximately 0.06 g. with a purity ranging from 20 to 60%. A heroin user, on the average, is reported to consume about 3 straws or 0.18 g. of the drug per day. This is equivalent to about 72 mg. of pure heroin per user per day. With a total of 48.531 identified heroin abusers in the country, the estimated national consumption of heroin would be in the region of 3.5 kg. of pure heroin per day, or an equivalent of 1,275.4 kg. of pure heroin per year.

Price of Heroin

The average price in December 1981 for 0.06 g. (1 straw) of heroin on the street was about M$7.00 (US$1 = M$2.2). Since the average heroin abuser requires about 0.18 g. of heroin per day, the mean daily expenditure for heroin would be M$21.00. With the estimate of 48,531 heroin abusers in the country, the national expenditure for the drug would amount to M$1.02 million a day or an equivalent of M$372 millions a year.

The increase in heroin prices has been observed to affect drug consumption patterns in this country. In 1979 and 1980, as a result of the increase in prices of heroin due to the scarcity of opiate drugs in the market, many hard-core heroin users were reported switching from smoking to the more economical injection method or "mainlining". It has also been observed that experimenters and new users are turning to medical clinics, both government and private, for alternative drugs like "Flurnitrazepam" to relieve withdrawal symptoms rather than to kick this habit.

Morphine Base

The consumption of illicit morphine base is not widespread in this country. However, it is commonly used for injecting when there is a shortage in the supply of heroin on the street. The average price of morphine is approximately M$6.00 per packet for one injection, and a morphine base abuser would require an average of 3 injections per day. Because morphine base is mainly used as a substitute for heroin, no separate consumption levels will be calculated.

Opium

Opium consumption in this country has existed since the 19th century. However, its use has been confined mostly to elderly people who take the drug to treat certain illnesses. Recent statistical data from the National Drug Abuse Data Bank at Universiti Sains Malaysia disclose that between 1978 and June 1981, only about 7.1% of the total drug abusers identified in the country were opium abusers.

Opium is usually consumed in its prepared form, often in opium dens using a pipe and other paraphernalia. Prepared opium is sold in "pellets" each costing about M$5.00 and weighing about 0.2 g. An opium user consumes an average of 2 pellets per day to sustain addiction. With the estimated total of 4,300 opium abusers in the country the daily national consumption estimate would approximate 1.72 kg. or 627.8 kg. per year. This would amount to a national expenditure of M$43.000 a day or an equivalent M$15.7 millions per year.

Conclusion

In view of Malaysia's close proximity to the "Golden Triangle" and the availability of the illicit opiate drugs, the abuse of these drugs can be expected to continue. The most common opiates abused in Malaysia are heroin No. 3 followed by morphine and prepared opium. The average purity of the heroin No. 3 varies between 20-60% depending on availability.

The price of heroin No. 3 has been quite stable but the purity fluctuates with the availability of the drug. When heroin is readily available, street dealers maintain a relatively high purity (above 40%). Street pushers do not "cut" it further as they try to maintain its quality and popularity. When there is a scarcity of heroin, the pusher will "cut" the heroin many times, thereby reducing the purity content (less than 40%), but cost per packet will remain the same. Addicts will continue to pay the same amount but for poorer quality heroin. When the addicts find the poor quality heroin will not sustain their habit, they resort to other forms of drug abuse e.g. injecting morphine, swallowing opium or other patent drugs before they finally seek medical treatment at government or private clinics.

Reference

National Drug Research Centre, Universiti Sains Malaysia, unpublished data, 1981.

ILLEGAL OPIATE CONSUMPTION IN THAILAND: POPULATION AND PATTERN OF USE

by

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Introduction

The earliest document on opium dependence in Thailand is the Criminal Law dated to the 14th century.[1] There is more than sufficient evidence that the condition still prevails in many provinces at present.[2,3,4] In 1959, the first heroin dependence epidemic started subsequent to the opium ban legislation.[2] Another major heroin dependence epidemic began in 1968-1969 and continues until the present time.[2,5,6,7] Two short periods of increased morphine dependence in localised areas were also noted between 1970 and 1979[2,8] Statistics from the treatment service in 1978 and 1979 demonstrated that opiate dependence is spreading throughout the entire country.

It is evident that the long-standing indigenous opium dependence has evolved into a complex and heterogenous pattern of opiate dependence. Such an extensive problem can hardly be covered in totality by the statistical records and research studies currently available. The rapid evolution of opiate dependence patterns also imposes additional difficulties on the attempt to define the extent of the problem. Hence, the following Presentation does not claim to be an exchaustive review of the current status of national opiate consumption but rather represents what is known to the author. All the data referred to in the material which do not carry a specific reference are taken from research studies undertaken by the Drug Dependence Research Centre, Institute of Health Research (DDRC/IHR), Chulalongkorn University.

Opium Consumption of the Hill Tribes

The extent of opium dependence - The hill tribes constitute a minority group in Thailand. The total population recently reported by the Hill Tribes Research Centre, Department of Public Welfare, Ministry of Interior was 354,387. These people live in small villages widely scattered over the broad mountainous area of 18 provinces in the northern and central regions (Table 1). The majority reside in Chiengmai (32.6%), Mae Hong Son (17.0%) and

Table 1

Rate of Opium Dependence Among Hill Tribe Populations Reported by Survey Studies Between 1965-1981

Tribe	Province	Village (Number)	Population (Number)	Rate of Opium Dependence (%)	Survey Date	Agencies Conducting the Survey
Karen	Chiengmai	1	135	8.1	1976	DDRC/IHR
	Chiengmai	1	125	29.6	1977	DDRC/IHR
	Chiengmai	1	101	10.9	1977	DDRC/IHR
	Chiengmai	37	8380	7.2	1979/80	ONCB
	Chiengmai	19	2983	4.3	1981	Chiengmai Provincial Health Office
	Mae Hong Son	1	157	5.7	1979/80	ONCB
Hmong				9.5	1965/66	UN survey team & DPW
	Chiengmai	1	225	4.9	1976	DDRC/IHR
	Chiengmai	1	65	10.8	1976	DDRC/IHR
	Chiengmai	1	182	10.4	1977	DDRC/IHR
	Chiengmai	39	8613	4.8	1979/80	ONCB
	Chiangrai	5	1513	5.8	1979/80	ONCB
	Mae Hong Son	5	1080	3.2	1979/80	ONCB
Lahu				11.7	1965/66	UN survey team & DPW
	Chiengmai	1	220	9.1	1977	DDRC/IHR
	Chiengmai	1	496	7.3	1980	DDRC/IHR
	Chiengmai	35	6136	8.3	1979/80	ONCB
	Chiangrai	23	2686	7.0	1979/80	ONCB
	Mae Hong Son	14	2949	21.7	1979/80	ONCB
Yao				15.9	1965/66	UN survey team & DPW
	Chiangrai	14	2114	12.2	1979/80	ONCB
	Phayao	2	224	2.7	1979/80	ONCB
Lisu	Chiengmai	1	367	4.1	1977	DDRC/IHR
	Chiengmai	9	1993	4.1	1979/80	ONCB
	Chiangrai	12	4495	9.0	1979/80	ONCB
	Mae Hong Son	8	2205	1.5	1979/80	ONCB
Akha	Chiangrai	9	1028	10.9	1976	DPW
	Chiangrai	13	5243	9.5	1979/80	ONCB

DPW = Department of Public Welfare, Ministry of Interior
ONCB = Office of the Narcotics Control Board, Office of the Prime Minister
DDRC/IHR = Drug Dependence Research Centre, Institute of Health Research, Chulalongkorn University

Chiengrai (14.8%) (Table 2). Most of the studies on opium dependence have been confined to the provinces in the upper part of the northern region. No information is available for those in the lower part of the northern and the central regions.

The government carried out a socio-economic survey in the northern region from December 1965 to March 1966. The United Nations Survey Team in this study reported that the rates of opium dependence among the Hmong, Lahu and Yao were 9.55, 11.7 and 15.9% respectively.

During January - April 1976, the Department of Public Welfare carried out a reconnaissance survey of 9 Akha villages in Mae Chan district of Chiangrai province.[10] The sample covered by the survey was 1,028 (10.9% of the Akha population in Chiangrai according to the investigator). The rate of opium dependence reported ranged from 7.5 - 16.4%. The mean rate was 10.9%.

The DDRC/IHR conducted a health survey in 9 villages between October 1976 and May 1977. Self-reported opium use was verified by urine examination. The opium dependence rates ranged from 4.1 to 21.6%. The mean rate was 9.6% (Table 3)[11]. Another survey in a Lahu village (Muser Pak Tang, population 496) in Amphoe Om Koi, Chiengmai Province in January 1980 reported an opium dependence rate of 7.3%.

Between 1979 and 1980 the Narcotics Cultivation Control Division, Office of the Narcotics Control Board conducted a major survey of the extent of opium cultivation and dependence. The provinces surveyed were Chiengmai, Chiangrai, Mae Hong Son and Phayao. The extent of opium dependence was assessed by interviewing selected villagers. The rates of opium dependence reported for the Karen, Hmong, Yao, Lisu, Lahu and Akha were 7.2, 4.8, 11.2, 6.1, 11.4 and 9.5 respectively.

Under the public health development programme for Amphoe Mae Cham and Chiengmai Province, the Provincial Health Office has this year conducted a series of surveys. Their preliminary study included a total of 33 villages and a sample of 2,983 (1,525 males and 1,458 females). The study revealed 104 male and 15 female opium dependents. The overall rate of opium dependence was 4.3%. But in one large village with 41 households, no opium dependence was reported.[13] Table 1 shows the various rates of opium dependence reported among the hill tribe population between 1965 and 1981.

Pattern of Opium Use and Daily Consumption

The hill tribe opium dependent generally smokes raw opium. Opium eating is adopted by some of the elderly or very poor persons. Some change from smoking to eating temporarily to moderate their dose or for various reasons such as an opium price increase or a heavy work load during the agricultural cultivation season. The smoking frequency is commonly 2-3 times per day. The statistics of the Narcoyics Treatment Centre for Hill Tribes in Chiengmai from October 1st, 1976 to December 31st, 1977 show that reported daily consumptions ranged from 1 to over 30 g. The majority smoked about 1-3 g. per day (Table 2). The males tend to consume slightly more than the females. There are differences among the tribes. The Hmong appear to smoke the highest dose per day.[14] Health surveys conducted in 6 hill tribe villages in Mae Cham district of Chiengmai Province in October 1981 show rather similar patterns of daily opium consumption (Table 3). The majority of the opium dependents smoke about 1-3 g. per day and the Hmong tend to consume more than the Karen.

Table 2

Amount of opium smoked per day by hill tribes receiving treatment at the Narcotic Treatment Centre for Hill Tribes, Chiengmai, Department of Medical Services, Ministry of Public Health, October 1st, 1976 - December 31st., 1977.

Tribes		Amount of Opium Smoked Per Day (g.) 1-3	4-6	7-11	12-18	19-30	30	Total	(No.)	Mean g.
A. Male										
Karen	%	73.7	18.7	7.9	4.1	0.5	0	99.9	(556)	3.5
Luhu	%	64.1	24.7	4.4	6.8	0	0	100.0	(251)	3.9
Hmong	%	56.3	26.8	2.1	12.7	2.1	0	100.0	(142)	5.0
Akha	%	71.7	14.4	2.9	4.8	5.8	1.0	100.0	(104)	4.9
Lua	%	74.3	20.0	2.9	2.9	0	0	100.0	(35)	3.2
Lisu	%	60.0	30.0	5.0	5.0	0	0	100.0	(20)	3.9
Yao	%	80.0	15.0	0	5.0	0	0	100.0	(20)	3.1
All tribes	%	69.1	20.8	3.1	5.9	1.1	0.1	100.1	(1128)	3.9
B. Female										
Karen	%	73.7	21.1	0	5.3	0	0	100.1	(19)	3.3
Luhu	%	73.4	22,8	1.3	2.5	0	0	100.0	(79)	3.1
Hmong	%	65.1	30.2	0	4.6	0	0	99.9	(43)	3.5
Akha	%	77.8	22.2	0	0	0	0	100.0	(9)	2.7
Lua	%	100.0	0	0	0	0	0	100.0	(1)	3.0
Lisu	%	80.0	0	20.0	0	0	0	100.0	(5)	3.4
Yao	%	80.0	20.0	0	-	0	0	100.0	(5)	2.6
All tribes	%	72.0	23.6	1.2	0	0	0	99.9	(161)	3.2

Table 3

Amount of opium consumed per day
Source: Health survey of hill tribes in Chiengmai Province, 1981

Villages	Tribe	No. of Opium Dependents	Opium Consumption g./day					Total Village Population
			No Info.	1	1-3	4-6	7-9	
Ban Phyi Yang*	Karen	12	0	0	8	4	0	153
Sun Pu Loei*	Karen	36	0	4	30	2	0	111
Ban Yang Khun Wang**	Karen	13	3	3	5	2	0	106
Ban Phui Meo*	Karen	6	2	1	2	1	0	265
Ban Phui Pule*	Hmong	11	0	0	2	8	1	90
Bhan Khun Wang*	Hmong	15	2	0	9	4	0	232
Total		83	7	8	56	21	1	956

* Amphoe Mae Cham, surveyed in October 1981
** Amphoe San Pa Tong, surveyed in May 1981

An attempt was also made to study variations in daily dose among the hill tribes in their villages. The results indicated that those who produced their own opium frequently reported quantities in vague approximations. There is no need for them to purchase a specific quantity. Urinary excretion patterns of morphine-like substances were used as an objective indicator to monitor the trend of daily dose variation. Since opium dependence is partially accepted by hill tribe society and law enforcement against opium use has not been applied, the smoking period each day is fairly regular. Urine collection in relation to opium smoking time can be standardised by fixing the specimen collection at a particular point of time each day. This method has been tested and the findings indicate that morphine-like substance concentrations in urine on consecutive days do not differ much from each other if the daily dose is maintained (Table 4).

Nine Karen in one village* and one Hmong in a nearby village** were studied. All cases cultivated opium poppy. None of the Karen produced

opium in excess of 1 kg./year during the study period while the Hmong produced more than 5 kg./year. Large variations in daily dose within each year were found in all cases and also between consecutive years (Fig. 1, 2, 3, 4 and 5). There was no precise correlation between the pattern of dose change with either opium availability or price. Although the freely available opium during the post-harvest period obviously stimulated a dose increase, the magnitude of the response was highly varied (Fig. 2). Husbands and wives appeared to respond differently as well (Fig. 3 and 4).

The annual variation of daily dose among the Hmong was less related to opium availability during the post-harvest period than it was among the Karen. This is probably due to the Hmong's large production which is more than sufficient for their personal consumption. If was also noted that the low urinary concentration levels of morphine-like substances each year are fairly close to each other while the maximum concentrations differ more than six-fold from each other (F.g 5). The period of low level urinary concentrations shows some degree of correlation with the period of intensive labour demand related to agricultural cultivation. The period between July and September is devoted to corn harvesting, opium field clearing and planting which require quite intensive labour.

Table 4

Morphine-like substance concentration in urine of a Hmong opium smoker

Spot urine collection time	Morphine-like substance ug/ml.
April, 1978 (Daily dosage approx. 1.5g.)	
Day 1: 06-35	34.5 ug/ml.
19:45	23.1 ug/ml.
Day 2: 06:35	20.3 ug/ml.
19:40	33.7 ug/ml.
Day 3: 06:55	22.2 ug/ml.
February, 1979 (Daily dosage approx. 1.5g.)	
Day 1: 07:00	30.6 ug/ml.
Day 1:	53:1 ug/ml.
Day 2: 07:00	27.8 ug/ml.
Day 2:	34.7 ug/ml.
Day 3: 07:45	30.0 ug/ml.

Figure 1: Pattern of Urinary Excretion of Morphine-like Substances of a Female Karen Opium Dependent and Opium Price. Sun Pu Loei Village, Amphoe Mae Cham, Chiengmai Province.

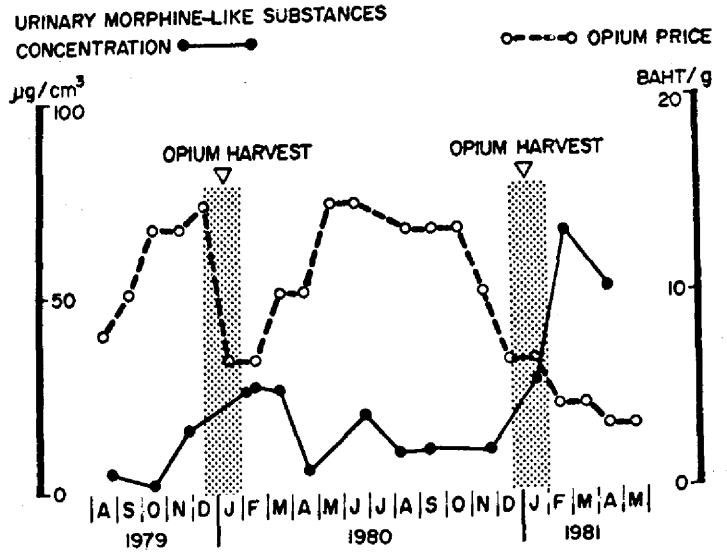


Figure 2: Patterns of Urinary Excretion of Morphine-like Substances of a Male Karen Head of Household and a Female Karen Widow Head of Household and Opium Price, San Pu Loei

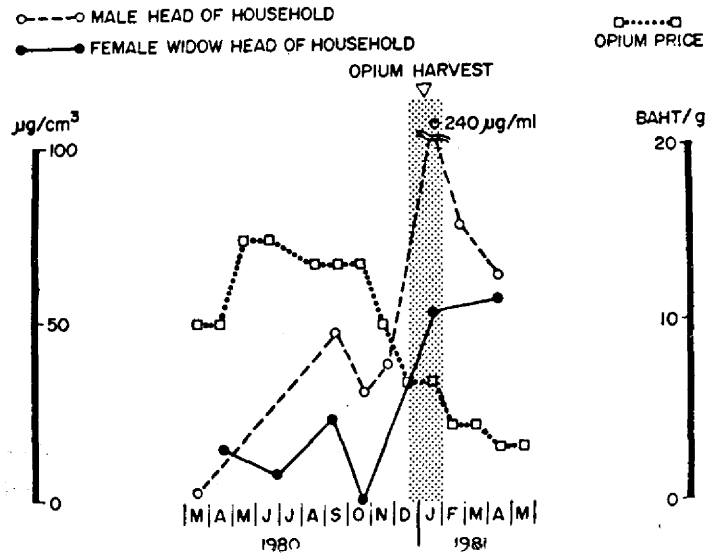


Figure 3: Patterns of Urinary Excretion of Morphine-like Substances of Karen Opium Dependent Husband and Wife (House No. 17) and Opium Price, San Pu Loei Village, Amphoe Mae Cham, Chiengmai Province.

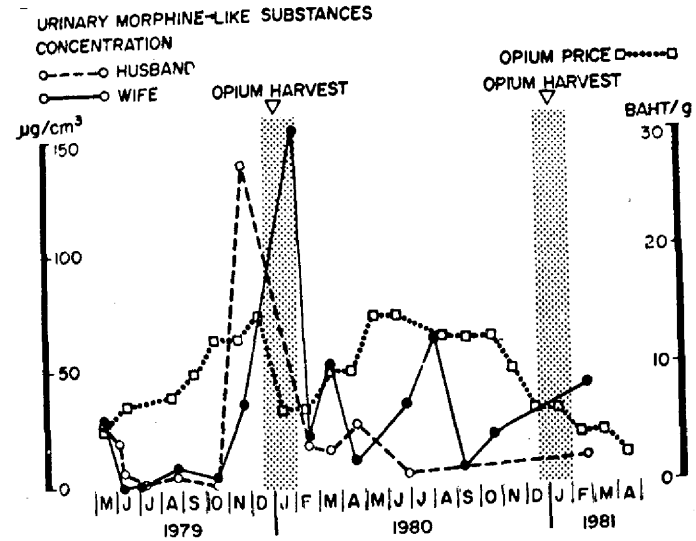


Figure 4: Patterns of Urinary Excretion of Morphine-like Substances of Karen Opium Dependent Husband and Wife (House No. 4) and Opium Price. San Pu Loei Village, Amphoe Mae Cham, Chiengmai Province.

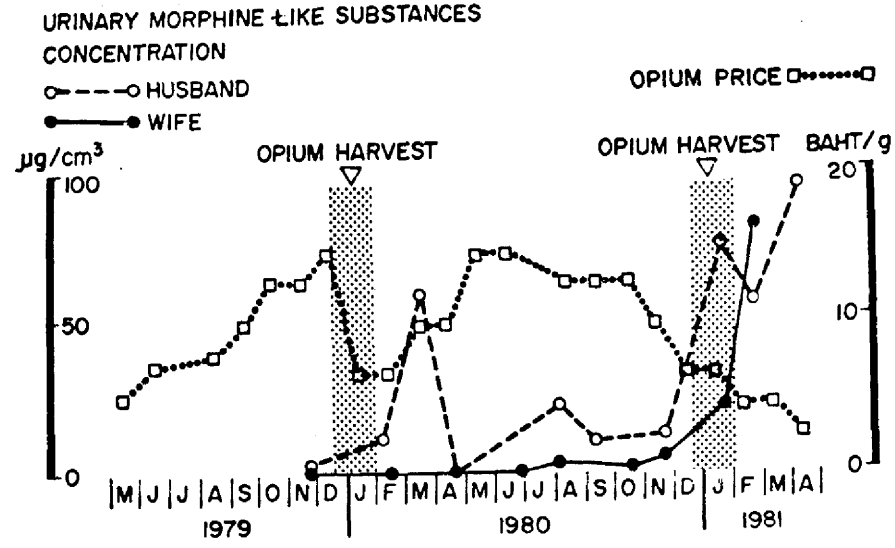
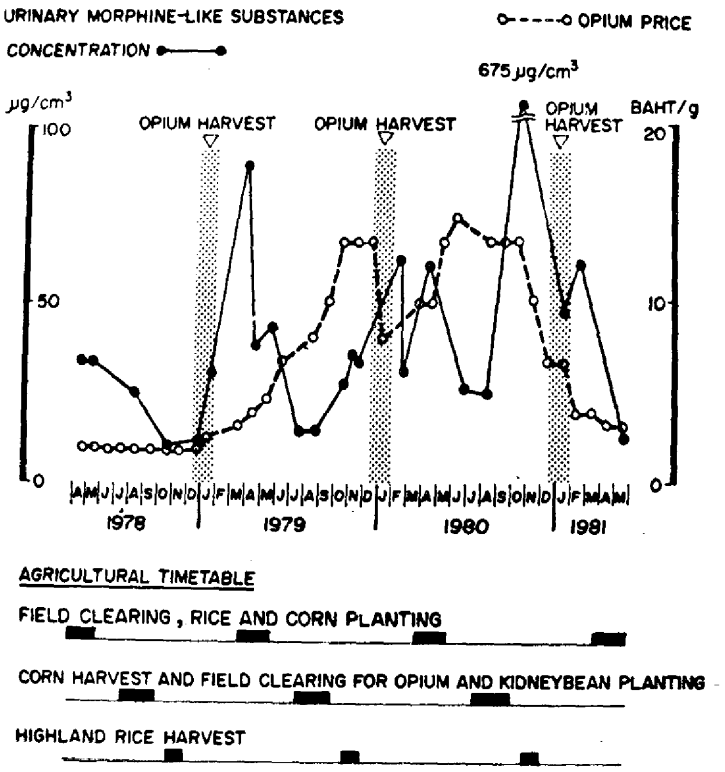


Figure 5: Pattern of Urinary Excretion of Morphine-like Substances of a Male Hmong Opium Dependent and Opium Price, Baan Phui Village, Amphoe Mae Cham, Chiengmai Province.



The strong impact of increased opium price on the daily dose was clearly observed among the poor Karen opium dependents. From March to April 1979, the price of opium in San Pu Loei village increased more than 3 times. All the opium dependents in the village (35 cases among a population of 105) decreased their dose, and 3 cases actually abstained from opium smoking for 7 months. Poor economic status also modified the period of dose increase in response to the individual's production of opium. Opium dependents are commonly in financial debt. The terms of payment are usually settled in the amount of opium. Opium dependents are commonly in financial debt. The terms of payment are usually settled in the amount of opium to be delivered after harvest. This system of lending is locally called "the green loan." It frequently happens that the poor opium dependent cannot produce a large quantity of opium, so that major share or sometimes nearly all his production goes to the money-lender. The period of time during which he can enjoy the fruits of his labour becomes very brief.

High daily dose variation was also observed among the elderly opium dependents who were no longer able to work actively in the fields. Their supply of opium depends heavily upon the resources and generosity of their extended family and neighbours. Intermittent periods of very low dose or abstinence can occur haphazardly throughout the year.

Opium Consumption Among the Thais

The known opiate dependent population - Treatment and convict populations constitute the principal known groups of opiate dependents in the country. Annual statistics of the total number receiving treatment from all operating treatment centres in 1978, 1979 and 1980 were 12,277, 15,415 and 13,440 respectively[15]. The treatment centres have been asked to use a standardized data form and to send completed copies to the Office of the Narcotics Control Board. The distribution by region of the residence of the treatment population in 1979 and 1980 where the principal drug used during the last 80 days before admission was an opiate is shown in Table 5. Some degree of duplicate counting is expected since treatment services are voluntary and mostly focus on short-term detoxification. Only a few centres prohibit clients from re-admission for a period of 3-6 months after discharge. Hence, the above-mentioned statistics are most likely over-counted.

The total numbers of persons convicted of a drug offence as reported by the Department of Corrections, Ministry of Interior were 9,216, 9,118 and 8,065 cases in July 1978[16], September 1979[16] and December 1980[15] respectively. The were categorized by type of indictments into crimes of possession, use, use and possession, and distribution of narcotics (Table 6). Not all of these convicts are opiate dependents. Epidemiologic study of the drug dependents among the convicts in Bang Khaen Prison, Bangkok and the Khon Kaen Prison, Khon Kaen Province (in the Northeastern region) reveal that about 80% of those persons convicted of possession, use, or use and possession of narcotics were opiate dependents. Most of those convicted of crimes of narcotic distribution are not opiate dependent. Only 29.1 and 4% in the Bank Khaen Prison and Khon Kaen Prison respectively were opiate dependent before being arrested. Hence, the total number of persons convicted of drug offences is most likely an over-estimation of the number of opiate dependents. The term of imprisonment of most persons convicted of possession, use, or use and possession is about 9-18 months. Since the number of convicts each year during the last 3 years has not been too different, the number could legitimately be counted as a group of known opiate dependents although the total may be slightly over-counted. Juvenile convicts are another group who can be studied by the same approach. However, the numbers of juveniles who were indicated of drug offences related to opiates are very small, 491 and 297 cases in 1978[18] and 1979[19] respectively.

The total opiate dependent population as known from treatment and convict sub-groups in the last few years is probably about 20,000 for heroin and about 2,000 for opium. It should be reiterated that these numbers contain an underfined margin of overcount. Thus, these numbers can perhaps be considered as the maximum known populations on record.

Table 5

Distribution of opiate dependants receiving treatment from government treatment centres by residence and primary drug abused

Type of Opiate	REGIONS					
	BKK.	C.R.	N.R.	NE.R.	S.R.	Total
A. 1979						
Heroin No. 4						
Number	5,430	1,690	389	47	165	7,725
%	70.3	21.9	5.1	0.6	2.1	100.0
Heroin No. 3						
Number	84	70	80	19	5	258
%	32.6	27.1	31.0	7.4	1.9	100.0
Morphine						
Number	44	3	6	0	0	53
%	83.0	5.7	11.3	0	0	100.0
Opium						
Number	91	142	935	314	9	1,491
%	6.1	9.5	62.7	21.1	0.6	100.0
B. 1980						
Heroin No. 4						
Number	7,402	2,885	565	73	662	11,547
%	64.1	25.0	4.9	0.6	5.4	100.0
Heroin No. 3						
Number	7	15	21	3	1	47
%	14.9	31.9	44.7	6.4	2.1	100.0
Morphine						
Number	7	0	7	0	0	14
%	50.0	0	50.0	0	0	100.0
Opium						
Number	96	228	325	209	5	863
%	11.1	26.4	37.7	24.2	0.6	100.0

BKK. - Bangkok, C.R. - Central Region, N.R. - Northern Region.
NE.R. - Northeastern Region, S.R. - Southern Region

The size of the morphine user population is perhaps negligible in comparison with the heroin and opium dependent populations. The deviation of the number further enhances the neglibility of the morphine user population.

Table 6

Number of Persons Convicted of Drug Offences in the Prison System All Over the Country (1979 - 1980)

Opiate Type	Indictment				
	Possession	Use	Use and Possession	Distribution	Total
A. Number reported in July 1978					
Opium	121	515	515	41	730
Heroin	1,364	4,968	1,166	988	8,486
Total	1,485	5,483	1,219	1,029	9,216
B. Number reported in September 1979					
Opium	143	353	182	110	788
Heroin	700	4,761	1,451	1,710	9,118
Total	843	5,114	1,451	1,710	9,118
C. Number reported in December 1980					
Opium	121	336	42	17	516
Heroin	1,140	4,850	1,218	341	7,549
Total	1,261	5,186	1,260	358	8,065

Source: Statistical reports of the Office of the Narcotics Control Board, Office of the Prime Minister

The college students - During the last few years there have been 2 survey studies of college students. The survey in teachers' colleges recruited all students attending the colleges on the data gathering day. Eight teachers' colleges (2 colleges in the northern, central, and southern regions, and the Bangkok municipal area) were included in the survey. The total recruitment was about 11,500 students. The studies were carried out during the educational year 1977-1978. The data were gathered by standardized procedures using self-report questionnaires. Twelve vocational colleges were studied by the same method in the academic year 1978-1979 (3 colleges in the northern, northeastern, central, and southern regions and the Bangkok municipal area). The total recruitment was also about 11,500 students. The 2 populations were mostly between 17 and 23 years of age.

The rates of the teachers' college students who reported ever use of opium and heroin No. 4 showed higher levels for males than for females, 2.8 - 8.4% and 1.2 - 4.6% respectively for males, 1.5 - 3.2% and 0.8 - 2.8% respectively for females. The rates of opium use during the last 30 days with a frequency of 20 days and more were 0.3% in 1 college, 0.2% in 3 colleges and 0.0% in 4 colleges for males, and 0.2% in 1 college, 0.1% in 5 colleges and 0.0% in 2 colleges for females.

The ever use rates of the vocational college students for opium and heroin No. 4 reaffirmed the higher rates for the males over the females, 1.9 - 5.6% and 1.2 - 5.8% respectively for males, 0.4 - 2.0% and 0.4 - 2.2% respectively for females. The use rates during the last 30 days with a frequency of 20 days and more were 0.1 - 0.6% for opium among the male except for 1 college with a rate of 0.0%. The females in all colleges reported no use of opium at this frequency except one college which had a rate of 0.1%. For heroin No. 4, the male students had a rate of 0.1 - 0.4% at this frequency of use, but one had a 0.0% rate. The rate for female use of heroin No. 4 at this frequency was identical to opium.

Under-reporting of opiate use by the students is expected. Concurrent with the survey study, an intensive case finding effort was carried out in one teachers' college in the northern region. Students who were found to use heroin No. 4 actively were all male. The number was 3.7% of the total males recruited while the rate of heroin use at the frequency of 20 days and more during the last 30 days were 0.2% for males and nil for females. However, the ever use rate for the males was 4.2%.

The slum inhabitants - The extent of opiate use among slum inhabitants was studied in a small Bangkok slum. The total population of the slum is 867. Intensive case finding was adopted as the method to identify active heroin users in the community. The number of identified active heroin users who actually resided in the slum was 0.9% of the total inhabitants. All were young adult males between 20 and 30 years of age. However, long-term observation and participation in some of the group activities revealed that

resident heroin users were frequently joined by their friends from other communities during the day for various activities including heroin use. To the casual observer, the number of active heroin users in the community would appear to the larger than actually is the case.

The rural Thais - Rural Thai opium dependents in most areas of the country smoke cooked opium. Some in the vicinity of the opium poppy cultivation areas smoke raw opium like the hill tribes. The smoking method is in general the same as that used by the hill tribes. However, some variation is seen in certain areas like the northern Thai villages in Tambol Mae Tuen, Amphoe Om Koi, Chiengmai Province. The raw opium is dissolved in water by heating over a low fire in a small pan. The solution is strained through a thin cloth. The filtrate is mixed with analgesic powder (Salicylates) and boiled to a thick paste. Finely shredded fibre from various plants like the pumpkin vine, banana leaves and bamboo is soaked in the paste and toasted until completely dry. The fibre is smoked in a water pipe in a sitting or semi-reclining posture.

In June 1979, intravenous injection of opium solution was found among the patients at the Khon Kaen Hospital, Khon Kaen Province in the north-eastern region. The patients reported that they dissolved opium in water by heating, filtered it with cotton or the filter tip of a cigarette, and then injected it. This bizarre method of opium administration was found with increasing frequency especially among the young adult opium dependants who sought treatment in this region as well as among those convicted of drug offences. This group of young adult opium dependants who adopted intravenous injection of opium were found to use other drugs like diazepam and amphetamine in combination with the opium. They dissolved the drugs together and injected them in a single dose.

The daily consumption of opium in terms of amount of money spent on opium each day is highly varied. Intake records of all government approved treatment centres showed that the opium dependants residing in various regions of the country were spending widely varying amounts each day. The variations were apparent between consecutive months in the same region and between different regions (Fig. 6 and Table 7). The average amount in 1979 for the northern, northeastern, central, Bangkok and southern regions were 18.1 ± 20.0 bahts respectively. The average amounts in 1980 in the same regional sequence were 40.0 ± 38.1, 33.2 ± 28.0, 56.5 ± 47.0, 62.5 ± 54.4 and79.5 ± 74.7 bahts respectively. The coefficients of variation in any month during these two years ranged between 39.9 - 187.5%. Reports were also provided on daily consumption in term of purchasing units, but the weight per purchasing unit in provincial cities of the same and different regions varied tremendously (Table 8). It was considered futile to compute the quantity consumed by using purchasing unit data.

Modification of opium dose in response to price increase was reported by some rural opium dependents. The range of the dose change has never been systematically studied.

Pattern of heroin use and daily consumption

Two types of heroin are currently used by heroin dependents. The Drug Analysing Division, Department of Medical Science, Ministry of Public Health classifies heroin No. 3 as heroin hydrochloride containing adulterants such as caffeine, strychnine, quinine, barbital and dye. Heroin No. 4 is basically pure heroin hydrochloride. The use of heroin No. 3 is not included in this report because the known population is too small as mentioned earlier.

Figure 6: Intake Records of Official Treatment Centres, ONCB

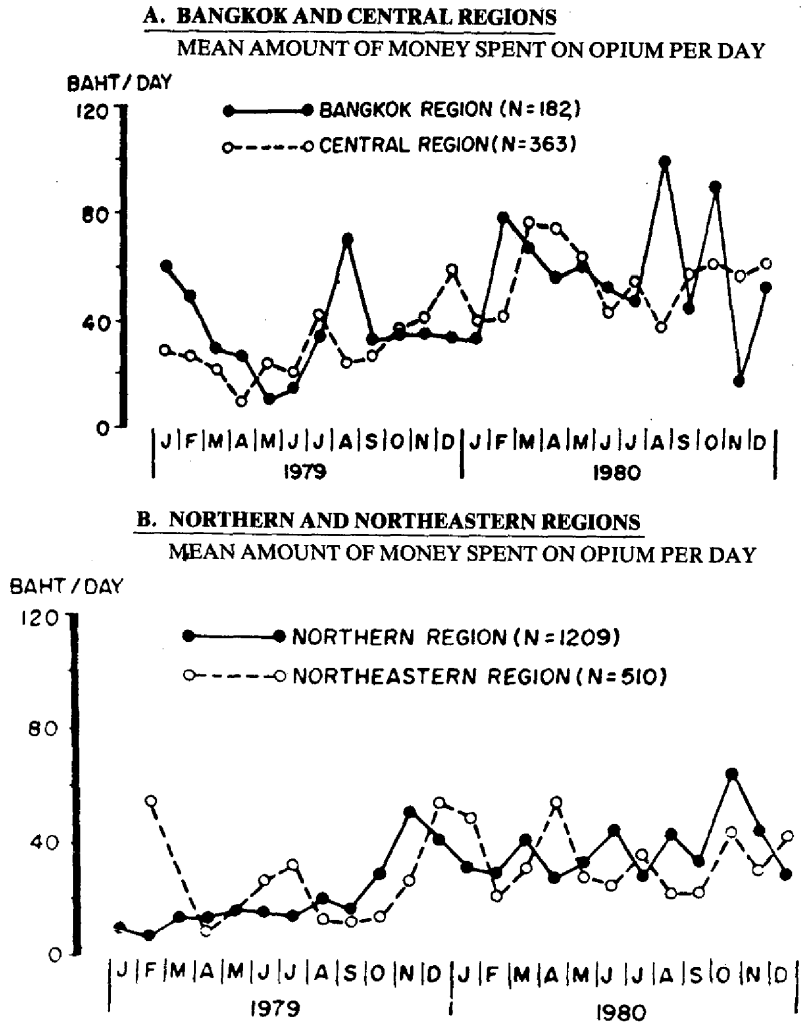


Table 7

Average amount of money spent on opium per day treatment clients, from treatment centres holding official permission, 1979-1980

	Money Spent on Opium Per Day				
	Northern Region	Northeastern Region	Central Region	Bangkok	Southern Region
1979					
Number	896	309	139	88	8
Median	10.9	5.5	20.7	21.3	20.8
Mean	18.1	17.4	34.6	38.3	29.2
Standard Deviation	22.3	24.5	37.8	36.9	20.0
Coefficient of Variation (%)	123.2	140.8	109.2	96.3	68.5
1980					
Number	313	201	224	94	5
Median	21.2	21.2	41.0	40.8	41.2
Mean	40.0	33.2	56.5	62.5	79.5
Standard Deviation	38.1	28.0	47.0	54.5	74.7
Coefficient of Variation (%)	95.2	84.3	83.2	87.2	94.0

Table 8

The weight, morphine content and price per purchasing unit of cooked opium in provincial cities. (22 Baht — US$1.00)

Province	Date	Purchasing Unit	Price/Unit (Baht)	Weight/Unit (g.)	Price/g. (Baht)	Morphine Content (%)
Central Region						
Nakorn Pathom	20 Nov. 1978	1 tua	5	0.352	14.2	7.8
Nakorn Sawan	25 Nov. 1978	1 Kak	100	9.498	10.5	-
Kampang Pet	5 Dec. 1978	1 Kak	50	9.630	5.2	-
Kampang Pet	17 Dec. 1978	1 Keet	240	79.874	3.0	-
Northern Region						
Pichit	16 Dec. 1978	1 Kak	60	4.730	12.7	-
Chiengmai	29 Nov. 1980	1 tua	10	0.267	37.5	2.4
Chiengmai	30 Nov. 1980	3x1 tua	-	0.282 ± 0.048	-	1.5
Prae	21 Nov. 1981	1 Kak	400	10.57	37.8	-
Northeastern Region						
Khon Kaen	12 Aug. 1979	4x1 tua	10	0.050 ± 0.007	199.8	0.5
Khon Kaen	26 Aug. 1980	12x1 tua	15	0.410 ± 0.032	36.5	0.8
Khon Kaen	9 Aug. 1981	20x1 tua	20	0.496 ± 0.115	40.3	0.9
Khon Kaen	18 Aug. 1981	20x1 tua	20	0.282 ± 0.047	71.0	0.9
Udorn	28 Aug. 1980	2x1 tua	70	1.173 ± 0.030	59.0	2.3
Loei	24 Aug. 1980	2x1 tua	50	2.679 ± 0.001	18.7	1.0
Loei	24 Aug. 1980	2x1 tua	10	0.229 ± 0.042	43.7	1.8
Nakorn Panom	11 Aug. 1981	5x1 tua	50	1.629 ± 0.220	30.7	-

Heroin No. 4 is commonly administered by intravenous injection. The clients of treatment centres reported to the Central Registry Unit in 1979 and 1980 adopted this method of administration at the rate of 87.3 and 89.9% respectively. Comparable rates were also found among persons convicted of drug offences.

The attempt to quantify daily consumption of heroin No. 4 from reports on purchasing units in 1979 and 1980 revealed the same variations in purchasing unit as was found with respect to cooked opium. The differences of weight per purchasing unit appear to be greater for the smaller units, i.e. plastic straws and paper packages, than for the large units such as plastic vial No. 5 (Table 9 and 10). The amount of money spent on heroin No. 4 was again not unlike opium. Wide variations were quite apparent each month in all regions of the country. There was a pattern of increased spending during the first half of 1979, fluctuating with monthly coefficients of variation of 17.5 - 114.3% to the end of 1980 (Fig. 7 and Table 11).

The period of active daily heroin No. 4 use has been studied in a group of chronic heroin dependents in a Bangkok slum. Examples of 3 cases are shown in Figure 8. The durations of heroin No. 4 use between first daily heroin use to the end of 1980 were 9, 8 and 8 years. The periods of active daily heroin use were 53,42 and 41 months respectively. These periods were all less than half of the time from first daily use to the end of 1980. The abstinence periods were the results of incarceration, treatment, army draft and religious training. In a two-year follow-up study of a total of 176 cases of relapse were reported. A rather similar pattern of periodic heroin No. 4 abstinence was found among a small group of 21 cases. The intervening drug abstinence periods of these cases was 57% of the total months following discharge. There reasons for the abstinence are again incarceration, readmission to treatment, etc.

Morphine content and price of raw opium - The morphine content of raw opium was studied from samples purchased in hill tribe villages at Amphoe Mae Cham and Amphoe Om Koi of Chiengmai province between 1977 and 1979. Morphine content varied widely from 2.2% to 26.7%. Table 12 demonstrates the range found in samples purchased from Baan Phui Nua, Amphoe Mae Cham. Lower morphine content was frequently found among samples purchased at the beginning of the year and higher content was purchased towards the end of the year.

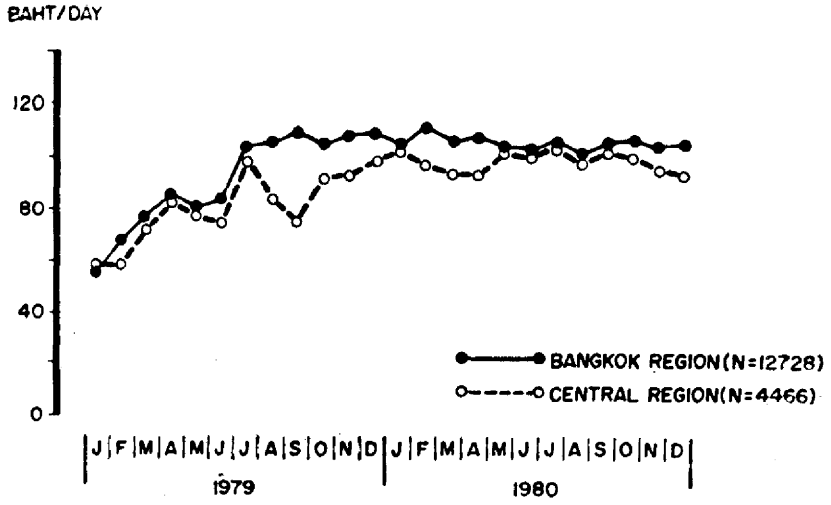
Systematic studies were conducted to elucidate the factors which give rise to this pattern of variation. One obvious factor is the dessication of the opium during storage. Five samples of raw opium were purchased from the hill tribe opium poppy cultivator within 2 weeks after the harvest. A portion of each was brought to the DDRC/IHK laboratory. The samples were left in room temperature of about 20°C. The dessication process in terms of weight reduction was rapid during the first 6 weeks. No remarkable change

Figure 7: Intake Records of Official Treatment Centres, ONCB

MONEY SPENT ON HEROIN NO. 4 PER DAY

A. BANGKOK AND CENTRAL REGIONS

MEAN AMOUNT OF MONEY SPENT ON HEROIN NO. 4 PER DAY



B. NORTHERN, NORTHEASTERN AND SOUTHERN REGIONS

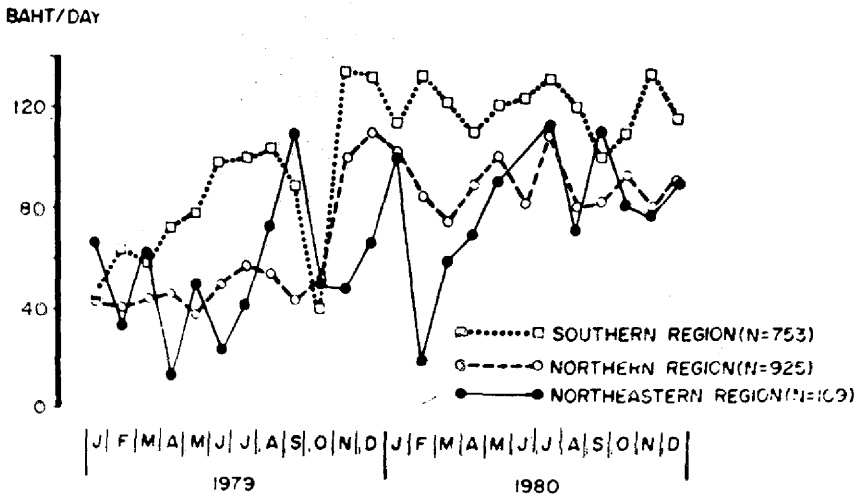


Table 9

Weight of purchasing units and retail price of heroin No. 4 in various districts of Bangkok in March and August 1981

District	Date	Package	Weight/ Package (Gram)	Price/ Package (Baht)	Price/g. (Baht)
Bang Kapi	27 Aug. 1981	Plastic straw	0.013695	20	1460
Bang Rak	13 March 1981	Plastic straw	0.028447	30	1055
Bangkok Noi	11 March 1981	Paper package	0.008631	20	2317
	20 Aug. 1981	Plastic straw	0.012232	20	1635
Dusit	5 March 1981	Paper package	0.007914	30	3791
	5 March 1981	Paper package	0.008767	30	3422
	5 March 1981	Paper package	0.008248	30	3637
	5 March 1981	Plastic straw	0.006313	20	3168
	5 March 1981	Plastic straw	0.007156	20	2795
	5 March 1981	Plastic straw	0.008770	30	3421
	5 March 1981	Plastic straw	0.007969	30	3765
	3 Aug. 1981	Paper package	0.032395	30	926
	11 Aug. 1981	Paper package	0.025239	50	1981
	28 Aug. 1981	Plastic straw	0.010710	20	1867
Phra Khanong	18 March 1981	Plastic straw	0.004600	20	4348
	27 March 1981	Plastic straw	0.016048	20	1246
	6 Aug. 1981	Paper package	0.191530	100	522
	6 Aug. 1981	Plastic straw	0.042956	20	466

Figure 8: Drug Use Dynamic

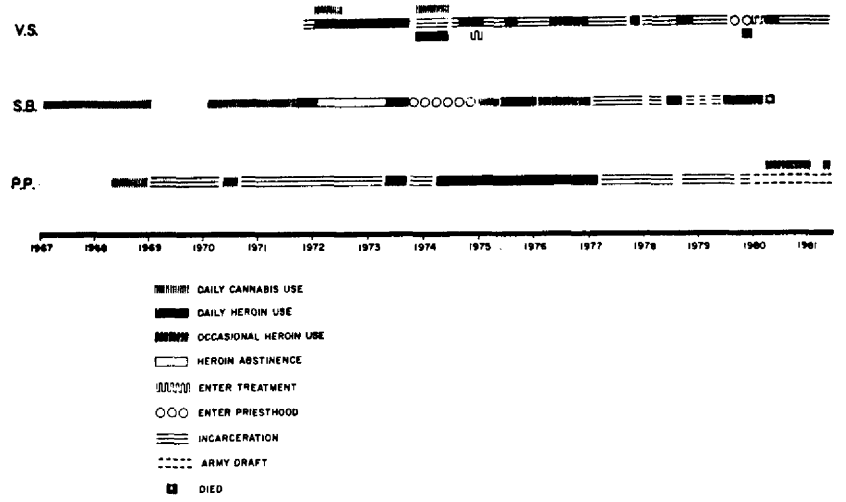


Table 10

Weight and price of heroin No. 4 purchased in plastic vial No. 5, code name "big No. 5" from a single selling place in a slum in Pom Prab District, Bangkok.

District	Date	Package	Weight/ Package (gram)	Price/ Package (Baht)	Price/g. (Baht)
Bangkok					
Pom Prab	18 Jan. 1979	Plastic vial No. 5	1.076100	120	111.5
	15 March 1979	Plastic vial No. 5	0.975526	250	256.3
	17 April 1979	Plastic vial No. 5	1.213788	240	197.7
	17 April 1979	Plastic vial No. 5	1.295300	240	185.3
	19 June 1979	Plastic vial No. 5	0.729628	240	328.9
	9 Dec. 1979	Plastic vial No. 5	1.018117	450	442.0
	9 Dec. 1979	Plastic vial No. 5	1.010800	450	445.2
	31 March 1980	Plastic vial No. 5	0.890000	400	449.4
	31 March 1980	Plastic vial No. 5	0.646000	400	619.2
	1 Oct. 1980	Plastic vial No. 5	0.700000	430	614.3
	1 Oct. 1980	Plastic vial No. 5	0.678000	430	634.2
	5 March 1981	Plastic vial No. 5	0.961350	400	416.1
	5 March 1981	Plastic vial No. 5	0.973612	400	410.8
	16 June 1981	Plastic vial No. 5	0.770000	360	467.5
	16 June 1981	Plastic vial No. 5	0.750000	360	480.0
	12 Oct. 1981	Plastic vial No. 5	1.033201	330	319.4
	12 Oct. 1981	Plastic vial No. 5	1.061014	330	311.0

Table 11

Average amount of money spent on heroin No. 4 per day - clients from treatment centres holding official permission, 1979-1980.

	Money Spent On Heroin No. 4 Per Day				
	Northern Region	North-eastern Region	Central Region	Bangkok	Southern Region
1979					
Number	378	44	1652	5388	151
Median	40.9	41.0	61.0	71.0	90.6
Mean	57.7	51.2	80.2	90.1	94.8
Standard Deviation	47.7	39.0	51.0	55.7	55.9
Coefficient of Variation (%)	82.7	76.2	63.6	61.8	59.0
1980					
Number	547	65	2814	7340	602
Median	70.7	51.1	90.6	90.9	100.8
Mean	91.9	81.3	98.8	106.2	119.7
Standard Deviation	61.7	60.5	56.9	83.5	62.9
Coefficient of Variation (%)	67.1	74.4	57.6	78.6	52.5

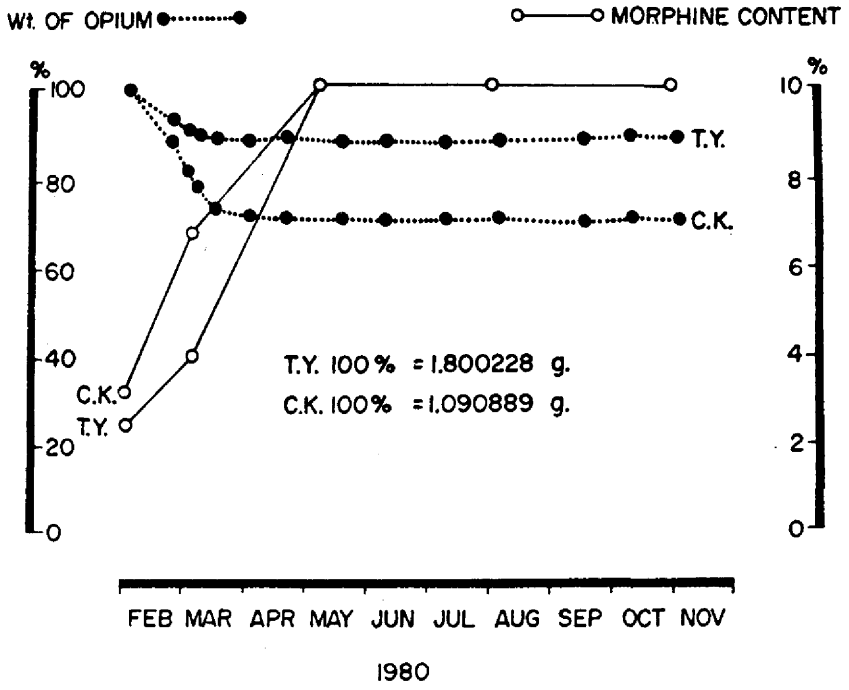
Table 12

Morphine content of selected raw opium samples purchased from Ban Phui Nua, Amphoe, Mae Cham, Chiengmai Province

Date Purchased	Morphine Content %
11 Aug. 1977	26.7
11 Aug. 1977	20.0
11 Jan. 1979	2.2
11 Jan. 1979	13.3
15 March 1979	6.7

in weight was observed during the subsequent months. The weight loss ranged from 13.8% to 29.7% with a mean value of 21.4%. The remaining part of the samples were left in the storage of the sellers. A small portion from each was carried from the village to the laboratory periodically. The morphine content of these samples showed rising concentration against time well correlated with the pattern of weight lost (Fig. 9). However, the degree of change in morphine content cannot be accounted for by the decreased weight from the dessication process as the morphine content increased from 3-4 times within the storage time of 3 months. Further study of raw opium from different plots of cultivation on the same mountain revealed that the morphine content can range from 2.5% to 11.2%.

Figure 9: Weight and Morphine Content Change on Storing Raw Opium



The price of raw opium in the hill tribe villages of Amphoe Mae Cham, Chiengmai Province was highly varied (Figures. 1 and 5). During 1979 and 1980, the price dropped sharply immediately after the harvesting and increased gradually towards the end of the year. However, at the end of 1980 the price began to decrease prior to the harvesting season and kept decreasing until the present time. Recent studies of the opium price in Lahu and Karen villages in Amphoe Om Koi, Chiengmai Province also indicate a rather similar trend of price change i.e. low prices at the beginning of the year with gradual increases towards the end of the year. It should be noted that the trend in Amphoe Om Koi does not follow the unusual change in Amphoe Mae Cham during the same period of time. The price per gram is also considerably higher (Table 13). During October 1981, the author interviewed 4 Karen opium dependants at the Sri Sangval Hospital in Mae Hong Son Province. These patients came from 2 districts. The reported price of raw opium was 25% lower than the price in Amphoe Mae Cham, Chiengmai Province during the same month.

The price of raw opium in the northern Thai villages of Amphoe Om Koi during April and June 1981 was about 40% higher than prices in the Lahu and Karen villages in the same area. However, in October the prices became comparable (Table 13).

The Narcotics Law Enforcement Division, Office of the Narcotic Control Board records the price of raw opium from various groups of enforcement divisions in the northern region. The price is an average approximate in each month per large unit commonly used by traffickers i.e. the raw opium price per joi (1.6 kg.). The trend of price changes is similar to the pattern found in the opium cultivating area (Fig. 10).

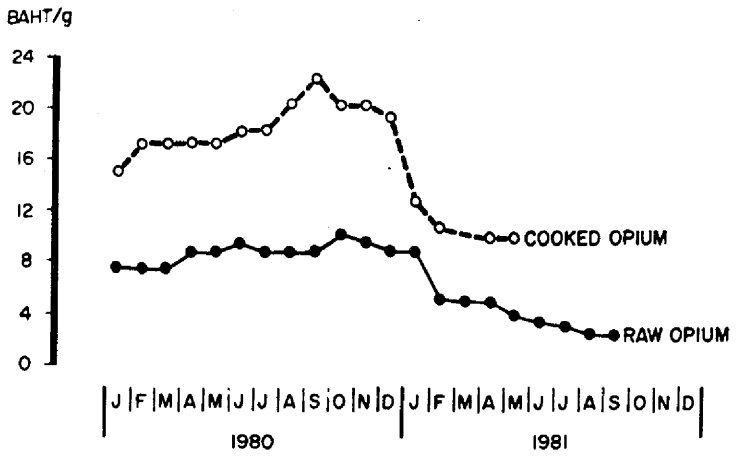
Table 13

Retail opium price in Amphoe Om Koi, Chengmai Province

Villages	Sub District	Ethnicity	Date		Weight/ Package (g.)	Price/ Package (Baht)	Price/g. (Baht)
Muser Pak Tang		Luhu	21 Apr.	'81	10.393	90	8.66
			15 June	'81	10.368	90	8.68
			2 Oct.	'81	10.149	120	11.82
Mae Hair	Mae Tuen	Karen	21 Apr.	'81	10.877	100	9.19
Huay Nam Kao	Mae Tuen	Karen	28 Apr.	'81	10.672	100	9.37
			15 June	'81	9.671	120	10.34
			2 Oct.	'81	8.002	120	15.00
Baan Mai	Mae Tuen	Thai	4 July	'80	0.399	10	25.06
			4 July	'80	0.809	20	24.72
			25 Apr.	'81	9.465	125	13.21
			15 June	'81	8.867	120	14.66
Ban Luang	Mae Tuen	Thai	2 Oct.	'81	10.109	120	11.87

Figure 19: Price of Raw and Cooked Opium in the Northern Region

Source: The Narcotic Control Division, Office of the Narcotic Control Board, Office of the Prime Minister



REMARK: THE PRICE IS AN AVERAGE APPROXIMATE IN EACH MONTH PER LARGE UNIT COMMONLY USED BY TRAFFICKER i.e. RAW OPIUM IN "JOI" (1.6 kg.) AND COOKED OPIUM IN kg.

Morphine content and price of cooked opium - Samples purchased from 2 provincial cities in the lower part of the northern region and one provincial city in the central region on December 1976, March 1977 and November 1978 contained 6, 13.2 and 7.8% morphine respectively. One sample purchased in August 1979 in another provincial city in the north-east contained 0.5% morphine. Eight samples from various cities were studied during 1980 and 1981. The morphine content ranged from 0.8 - 2.4% (Table 8). These fairly limited studies suggest that the morphine content of cooked opium started dropping in 1979 and remained low until the present as compared to those found from 1976 through 1978.

A large difference in cooked opium prices was found from purchasing in provincial cities of the central, northern and northeastern regions. In 1978 the price of the same selling unit at about the same time in cities within the central region, and between the central and northern regions differed from each other by 1-fold. A larger difference was found during 1980 and 1981. The prices from different sellers in the same magnitude of difference was noted in different cities within the same month (Table 8).

The trend of price change cannot be observed from the studies just mentioned, but the cooked opium price records of the Narcotics Law Enforcement Division, Office of Narcotic Control Board indicate some fluctuation during 1980 between the level of 15-22 Bahts/g. (Fig. 10) The prices dropped sharply during January and February of 1981 and appeared to level off at around 10 Baht/g.

Purity and price of heroin - The Drug Analysis Division, Ministry of Public Health is the principal official agency responsible for the analysis of narcotic seizure samples. In 1980, 142 samples of heroin were analysed. Among these, 111 samples were in the form of white powder, 27 in various shades of brown fine powder or coarse granules and the rest were in the form of white coarse granules (1 sample), grey (1 sample) and purple (2 samples). These samples were confiscated from users, distributors and couriers in all regions except the northeastern region. About 37% came from the northern region. The white powder heroin samples had a purity ranging from 0.6 - 86.2% (Fig. 11). 91.0% had a purity ranging from 50.4 to 86.2% with a mean value of 71.6% (Table 23). The sample with the lowest purity of 0.6% contained 68.6% caffeine. Among the high purity samples, there were 4 which contained some acetyl codeine (concentrations ranged from 3.7-6.7%). The borwn fine powdered heroin samples (excluding one sample* with the lowest purity of 0.1%) had a mean purity of 75.3% (Table 14). The brown granulated heroin samples (excluding one sample with a purity of 65.2%) had a mean purity of 31.5% (Table 14). One sample (purity 20.9%) contained 75.7% caffeine.

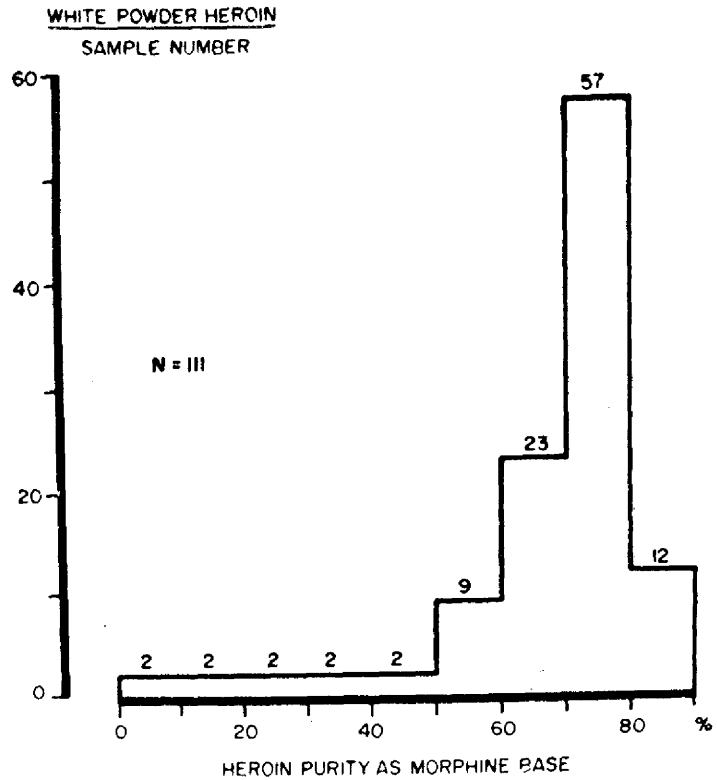
Table 14

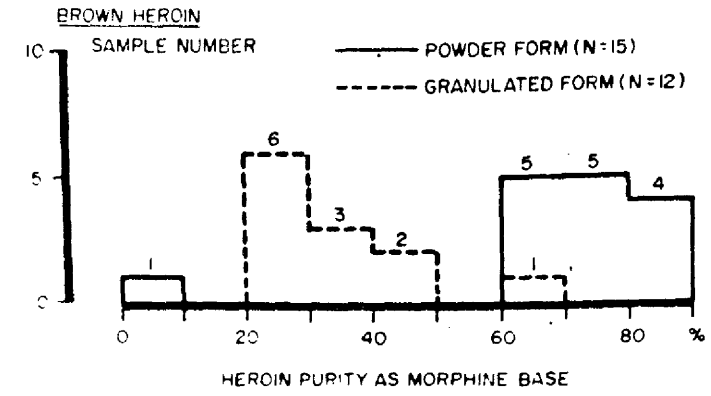
Average purity of heroin as morphine base in 1980

	Purity of Heroin as Morphine Base (%)		
	White Powder Heroin	**Brown Powder Heroin**	**Brown Granule Heroin**
Range	50.4 - 86.2	60.7 - 89.7	20.9 - 49.5
Mean	71.6	75.3	31.5
Standard Deviation	7.3	8.3	9.4
Coefficient of Variation	10.2	11.00	29.8
Number	101	14	11

* This sample had been adulterated with detergent.

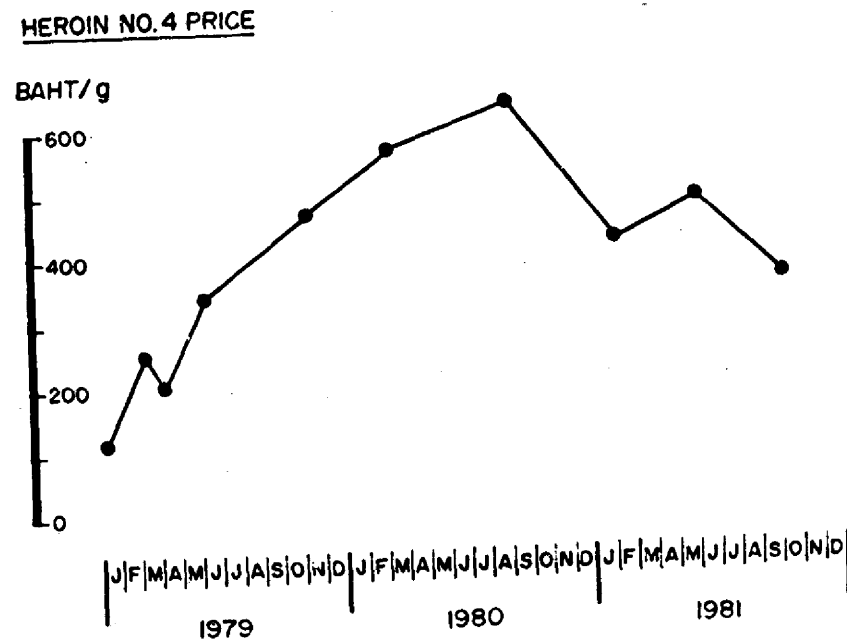
Figure 11: Heroin Purity of Seizure Samples Analysed by the Drug Analysing Division
Department of Medical Science, Ministry of Public Health





Heroin users commonly buy from retail distributors in 3 types of packages, plastic vial No. 5, paper package and plastic straw. The price of heroin No. 4 purchased in plastic vial No. 5 has been studied systematically. The materials were all purchased from a single retail distributor in a Bangkok slum. The price changed continuously from the beginning of 1979 to the present (Fig. 12). In 1981, an attempt was made to monitor the variation of price per gram of units purchased by users (paper package and plastic straw) in many districts in the same month (Table 9). The maximum price was about 136% of the minimum price. Between different months in the same district, the maximum price was 6.7 times the minimum.

Figure 12: Heroin No. 4 price at a distribution site in a Bangkok slum, Pim Prab District. The purchasing package is a plastic vial coded name "Big No.5" (content approx. 1 g.)

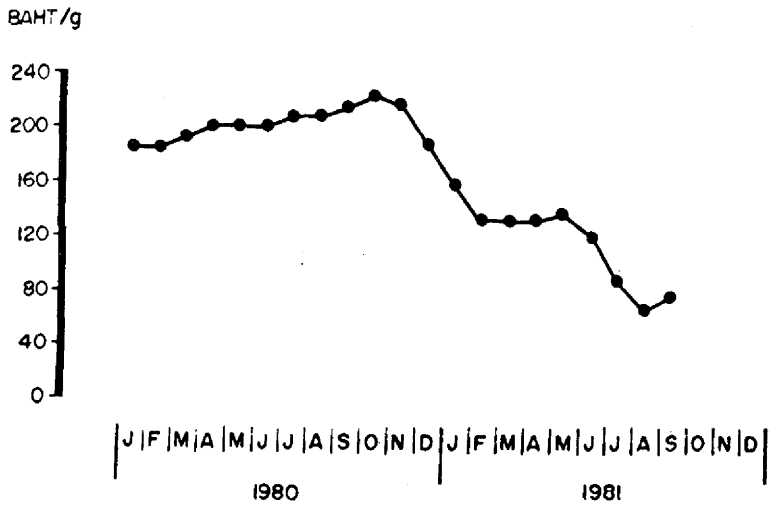


The price of heroin purchased by users in the provincial cities has never been studied systematically. However, the average approximate prices in the northern region recorded by the Office of the Narcotic Control Board (ONCB) in 1980-1981, demonstrate a rather similar trend of price change to that in Bangkok (Fig. 13). The difference in prices is probably partly due to the fact that the ONCB records price per large unit commonly used by traffickers. Nevertheless it is known that the retail price of heroin in Chiengmai

and Chiangrai provinces is lower than in Bangkok. Sufficient data on prices of heroin in the northeastern and southern region are still lacking. However, there are incidental reports from a few that the price is higher in these regions than in Bangkok. Repeated attempts to purchase heroin No. 4 in 6 urbanized cities in the northeastern region in 1981 completely failed to identify any selling place. Information from many drug using groups in these cities confirmed that heroin No. 4 has been extremely difficult to find since 1980.

Figure 13: Heroin No. 4 Price in the Northern Region

Source: The Narcotic Control Division, Office of the Narcotic Control Board, Office of the Prime Minister



REMARK : THE PRICE IS AN AVERAGE APPROXIMATE IN EACH MONTH PER LARGE UNIT COMMONLY USED BY TRAFFICKER i.e. "TUA" (700 g.)

Constraints on the extrapolation of the parameters for the estimation of opiate consumption in Thailand – The data on opium dependence in all reports were gathered by interview. The degree of reliability of this method has never been established except for those surveys conducted by the DDRC/IHR which applied urine analysis as confirmation of reported and unreported use.

In 1976, the accuracy of the data gathering methods for assessing the extent of opium dependence among the hill tribes was critically evaluated.

In a Hmong village in Chiengmai province, the health worker who was stationed in the community for 5 months to provide health care services reported 4 cases of opium dependants in the village. Interviews of selected villagers by a visiting physician revealed the names of 5 cases. A subsequent health survey by a medical team which included history taking on past illness and opium use, physical and laboratory examination and interviews of heads of household revealed 9 cases. Through the following periodic visits by the same team, 2 more cases were identified.[22] It is apparent that at each state of the assessment which applied different methods of data gathering, the rate of opium dependence gradually increased from 1.8% to finally 4.9% (Table 15).

Table 15

Rate of opium dependence in a Hmong village, population 225, according to various sources of information

Source of Information	Number of Opium Dependents	Rate of Opium Dependence
Health worker	4	1.8
A group of villagers	5	2.2
Health survey	9	4.0
Long-term observation and informal interview	11	4.9

In another large survey carried out by one government agency, 3 of the sample villages coincided with the DDRC/IHR research sites for its long-term studies. The large survey reported the rate of opium dependence as 3.0, 7.7 and 8.2% while the DDRC/IHR study in the same period of time revealed 8.3, 2.8 and 6.5% respectively. The discrepancy arises from differences in the estimates of the village populations and in the number of opium dependents identified.

It is clear that under- or over-count of the number of opium dependents and the village populations under these circumstances is to be expected. The surveyed rate of opium dependence could frequently be either double or half of the actual rate. Furthermore, the socio-cultural and environmental factors which introduce errors into the assessment would most likely vary from one location to another and would add an extra margin of variation to the reliability assessment.

Another factor which has not yet received due attention is the possibility of differences in opium availability among various hill tribe villages. The

majority of the Karen live at an altitude below 1,000 metres. There are a fair number of Karen villages located among the cluster of the northern Thai in the plains around the foothills. Morever, about 15.3 and 7.4% of the Karen live in the provinces in the lower part of the northern and the central regions respectively. The geographical as well as climatic conditions in these areas are not as suitable for opium cultivation as they are in the upper part of the north. It could be further assumed that the extent of availability of the opium in these villages ought to be less than in the upper part of the north. The extrapolation of an assessment rate of opium dependence from the high opium production areas to the low production areas is thus probably not quite legitimate.

The daily consumption of opium by the hill tribes appears to have some degree of consistent pattern in a short temporal scale. Nevertheless, the dose deviations within the year could be quite considerable. Further study is needed to gain a better understanding of the influencing factors before a really valid basis for assumption and extrapolation can be established.

Opiate consumption of the Thais – Although the data on the known opiate dependent population suggests a dominating prevalence of heroin over opium dependence, it is questionable whether the data reflect the real status. The principle biases are due to (i) the strong preoccupation with heroin dependence expressed through stiff enforcement activity and (ii) the irregular distribution of treatment services which does not align well with the distribution of the total opiate dependent population. The concentration of treatment in the Bangkok and surrounding central regions enhances the dominating number of heroin dependents in the treatment population but it nevertheless is well aligned with the distribution pattern of the heroin dependent population (Fig. 14 and 15).

The heterogeneous distribution of known opiate dependents imposes additional difficulty on the population projection. The current data certainly do not encourage extrapolation of the known to the total population. Further, the survey studies of specific populations are simply too limited in representativeness.

The large variation of the purchasing units, price and amount of money spent per day on drugs has been observed. It is possible that the data base is lacking in representativeness. However, research studies predating 1979 indicate much less variation in all these parameters. It is perhaps more probable that the findings reflect the instability of the 1979-1980 period due to the drought in the "Golden Triangle" region.

A discussion of the conversion of heroin to opium-equivalent at this stage is not quite appropriate in the absence of consumption estimates. Nevertheless, laboratory studies reveal a series of subtle variations inherent in the biosynthesis and storage of opium gum. Over-looking these factors could possibly enter significant errors into the computation.

Final Remarks

The reservations which have been expressed on the variability of opiate consumption legitimacy does not mean they may not be feasible. A cautionary note, however, is necessary.

Figure 14: Residential Distribution of Drug Dependence Treatment Population (January - September 1976)

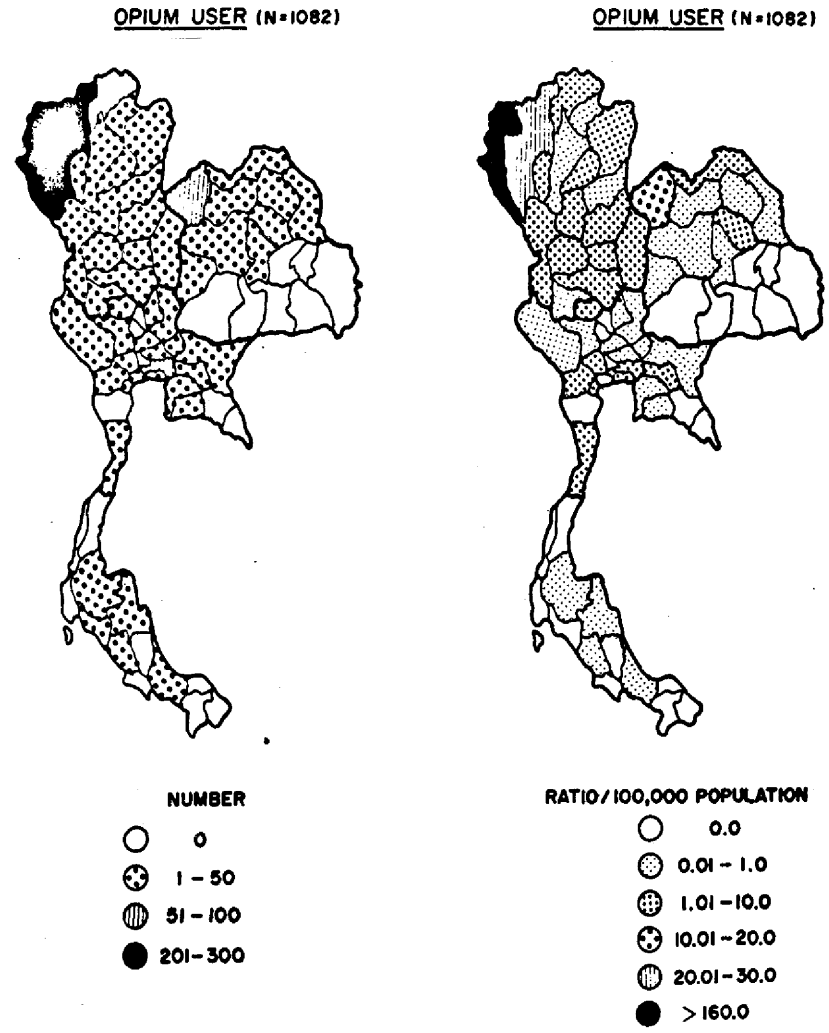
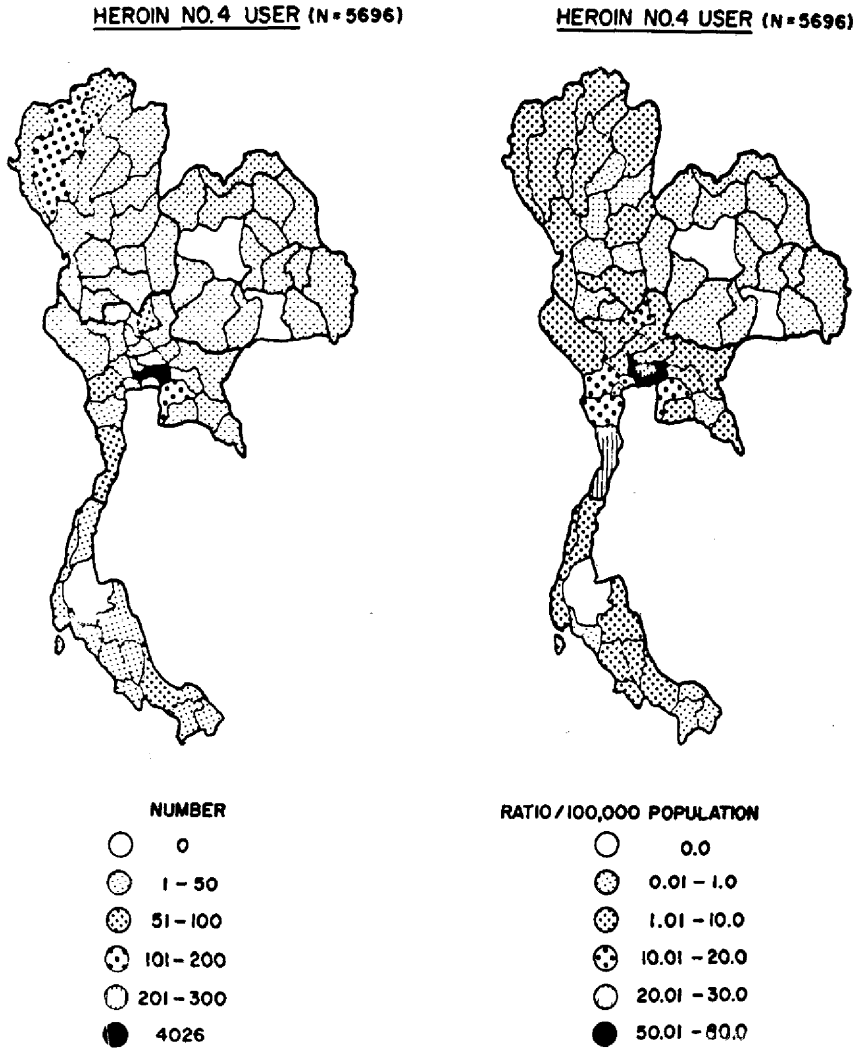


Figure 15: Residential Distribution of Drug Dependence Treatment Population (January - September 1979)



This estimation study could arrive at a few target numbers i.e. the maximum, minimum or simply a vague approximation. Specific objectives relating to the application of the results are needed to guide assumptions for the computations. Each target number requires different assumptions and computation. The final number contains a degree of deviation specific to the reliability of the basic parameters used in the derivation.

The substance of the material already presented probably covers a comprehensive range of basic data commonly needed for computing estimates of opiate consumption in Thailand. Nevertheless it should be reiterated that regardless of the derivation, the estimate will contain an ill-defined deviation of considerable magnitude. No computation or estimate is offered in this report because it is considered appropriate to leave that task to the ingenuity of the person who will use the number. He or she can choose the best approach that will yield results suitable to their specific objectives.

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OPIATE DRUG CONSUMPTION IN SINGAPORE

by

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The abuse of opiate drugs, particularly opium, in Singapore began hundreds of years ago with the arrival of the Chinese who brought with them the habit of opium smoking. Opium use in Singapore was allowed under the Colonial Government until the start of World War II when the British Military Administration passed legislation against its use and made the possession of both opium and smoking utensils an offence.

During the 1950's, morphine and ganja were introduced, though opium remained the main drug abused. In the 1970's, however, the drug situation changed dramatically with the spread of heroin. The epidemic of heroin abuse in Singapore can be seen from the rapid increase in the number of persons arrested for heroin offences. The total jumped from 110 in 1974 to 2,263 in 1975 and reached 5,262 in 1978.

In view of this alarming trend, the Singapore Government responded in April 1977 with an all-out enforcement strategy aimed at rapid detection, arrest and incarceration of drug offenders in a joint operation codenamed "FERRET". The Central Narcotics Bureau and the police met with considerable success in apprehending drug abusers.

In Singapore today, the drug problem is essentially a problem of heroin abuse as can be seen in Table 1 from the number of admissions to the Drug Rehabilitation Centres.

Table 1

Number of Admissions to Drug Rehabilitation Centres

Period	1979		1980		1981	
Type of Drug	Jan.-June	July-Dec.	Jan. June	July-Dec.	Jan.-June	July-Sep.
Heroin	989	692	842	1,253	1,042	590
Opium	340	188	132	124	105	12
Morphine	10	4	3	3	4	nil
Others	1	nil	nil	nil	nil	nil

Patterns of Opiate Consumption

Though heroin and opium are the main opiate drugs being abused in Singapore, it is difficult to calculate accurate consumption data because of the following:

i. We do not know the exact number of drug abusers in Singapore, though it has been estimated from existing records that there were approximately 10,000 as of 30 September, 1981. There are probably many more addicts who have not been discovered.

ii. Assuming that the drug abuse population were known, it would be difficult to know their consumption behaviour as this depends on such factors as the availability of opiate drugs in the market, the price of the opiate drugs, the availability of substitute drugs, etc. Morever, there is a certain percentage of drug dependent persons who are either in detention or under police supervision and hence they may constitute the inactive pool, who if given a chance might resume consumption of opiate drugs.

iii. For those addicts under detention in prisons or drug rehabilitation centres, the majority would not disclose the exact amount of opiate drugs they consumed for fear this would affect their legal status. They would deny consumption or report their consumption activities as being occasional when in actual fact they may be consuming drugs daily. Hence, the frequency of use reported by them may be misleading.

Fully recognizing these limitations, the attempt made is to calculate very rough consumption levels in the hope that they may show a general trend.

Opium - Of the total admissions to the Drug Rehabilitation Centre from January-September 1981 (1,749 addicts), about 6.7% or 117 persons were opium addicts, the majority of whom were above forty years old.

In Singapore, raw opium is rarely used. The raw opium smuggled in is cooked locally to be prepared opium. This is then compressed into pellets which are packed in small plastic bags each containing an average of 4 pellets. Each bag costs about S$6.00. The weight of each pellet may vary and the morphine content of the prepared opium ranges from 4 to 10%.

Opium smoking is more common than pellet swallowing in Singapore. The addicts usually smoke in opium dens and the amount they smoke per day varies. For those consumers who have no time to smoke in the dens, they buy the pellets and then swallow the number needed to control symptoms. Generally the opium eaters swallow 1-2 pellets per day.

Heroin - Heroin is the most widely abused opiate drug in Singapore. About 92% of those admitted to the Drug Rehabilitation Centres are heroin addicts and the majority of them are in the 20-29 age group. The heroin found locally is the South East Asian No. 3 and the purity is about 35% diamorphine. South East Asian No. 4 is practically non-existent.

Heroin is popularly consumed by the "chasing-the-dragon" method followed by spiking cigarettes. Few practise the intravenous method. Heroin is commonly sold in the illicit retail market at S$20.00 per 3 cm. length plastic drinking straw, each straw containing approximately 0.06 g. "cut" heroin. This amounts to about 21 mg. of pure heroin based on an average content of 35% diamorphine. It is estimated that the average heroin addict smokes about 1 straw per day and hence, the daily expenditure is S$20.00. The average daily consumption of pure heroin per addict is 21 mg. and his average aggregate annual heroin consumption is about 7.67 g.

For those new users who account for about 25% of the drug abuser population, the amount they smoke per day is much less, that is ¼ to ½ the normal length of a 3 cm. straw. Thus their average annual heroin consumption of 1.92 to 3.84 g.

The drug dependent persons in Singapore are estimated at 10,000 as at 1 September 1981, of which approximately 3,000 are either in the prisons or drug rehabilitation centres and another 2,900 are undergoing 2-year supervision by the Central Narcotics Bureau. The active abuser population would be about 4,100 (assuming that all those not in detention are daily drug users). Among these people, only 92% are heroin addicts and thus, the

amount of heroin consumed by active heroin addicts in Singapore would be about 23.50 - 47.0 kg. pure per year.

In actual fact, the total amount of heroin consumed should be much less since not all addicts are able to use their drug of choice for a full 365 days each year. Also, the actual inflow of SEA No. 3 of heroin into Singapore is still minimal as indicated by the scarcity of heroin in the streets. Many have thus resorted to substitutes like flunitrazepam, cannabis and alcohol to satisfy their craving for heroin while some may have to go into temporary abstinence. Other heroin addicts, being relatively new users, normally use irregularly throughout the year.

Morphine - Little is known about illicit morphine base consumption patterns as it is very rarely used in Singapore. Morphine addicts normally use the injection method to satisfy their needs.

The Drug Scene - Its Changing Patterns in Singapore

Since the beginning of 1979, the drug scene in Singapore has undergone several changes. The poor opium harvest in the Golden Triangle in 1978/80 reduced the flow of narcotic drugs. This together with vigorous law enforcement action, caused a serious shortage of opiates in Singapore. As a result of this scarcity of opiate drugs, the price of heroin soared unprecedentedly at the street level. A straw of No. 3 heroin (with its approximate weight of 0.06 g.) costing S$7.00 in February 1979 was sold at S$20.00 in 1981.

As a result of the lacuna created by a shortage of heroin, there was a noticeable increase in cannabis pushing amongst addicts who switched to that drug as a substitute. There was also a noticeable switch by some heroin addicts to the tranquiliser flunitrazepam which is consumed together with alcohol for a potentiating effect.

The major drug distribution network in the Republic was thus broken by vigorous enforcement action. In its place, the "ant-traffickers" emerged. These ant-traffickers were persons who returned to Singapore from Johore Bahru carrying a few straws of heroin concealed in their bodies or inside articles in their possession. There was a marked increase in the number of persons arrested at the Woodlands Checkpoint for attempting to smuggle such small quantities in 1980, being 442 compared with 114 in 1979.

Many hard-core drug addicts are also leaving Singapore by crossing the Singapore-Johore Causeway every now and then for the drug. Pushing of heroin is still done but only on a small scale. The persons involved are mainly hard-core addicts who carry on illicit trade to support their own consumption.

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OPIATE DRUG CONSUMPTION IN THE PHILIPPINES

BY

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Narcotic abuse in the Philippines by Filipinos is quite recent. Opium use, however, began in the 17th century among immigrant Chinese residents. The Spanish authorities in the Philippines imported opium and sold it to the Chinese residents in Manila and other urban places in the country.

When the Americans occupied the country at the beginning of the 20th century, a systematic study of the drug problem was conducted. The American civil government banned the non-medical use of opium in March 1908. This ban was put into effect seven years before the U.S. Harrison Narcotic Art was signed into Law.

Since the Philippine Commonwealth period (1935 to the outbreak of World War II), the Americans had continually prevented any attempt to plant the opium poppy in the Philippines for drug extraction. When the Japanese occupied the Philippines from January 1942 up to the early part of 1945, the country had been cut off from the Indian and Chinese opium supply. For the period 1950 up to 1955, the number of opiate addicts in the Philippines was most probably the lowest in the entire Asian region.

DEVELOPMENT OF THE HEROIN PROBLEM

1960-1971 - The Philippines had been relatively heroin-free until Lim Seng began operating a clandestine heroin laboratory in 1964. The fledging laboratory produced poor quality heroin to cater for Manila's small but growing addict population. By 1969, Lim Seng developed the know-how to produce good quality heroin and had foreign contacts, principally from Thailand, who supplied morphine base for his heroin laboratory. A total of 529 heroin addicts had been registered and the list kept on increasing. By 1971, Lim Seng was producing multi kilos of good quality heroin primarily for export to the United States, and secondarily, for domestic consumption. Heroin was being sold for P13,000 (US460.00 dollars) per 700 grams. At the distributor's level, the price of heroin per five-gram envelope was P150.00. The street price of heroin peddled in Manila was P1.00-P1.50 per deck (0.07 grams) and of low purity (3% - 5%).

* Paper read by Attorney Pio A. Abarro

Incidence of heroin addiction had grown alarmingly in Metro Manila and in Olongapo City and Angeles City affecting all socio-economic levels of society, primarily the youth. In the latter two cities, the principal market consisted of American servicemen. Although Lim Seng was the principal source of heroin, the distribution network was loosely linked, each group relying on another for its supply of heroin.

1972-1975 - The seriousness of the heroin problem prompted the Government to enact the Dangerous Drugs Act of 1972 on 31 March 1972. The principal elements of heroin trafficking were present: manufacturing, distribution, and importation. Official estimates put the number of heroin addicts at 10,000. The declaration of Martial Law on 21 September 1972 enhanced drug law enforcement efforts and resulted in the arrest of Lim Seng and his henchmen, seizure of three sets of heroin laboratory equipment and fifty-three kilos of heroin. Availability of heroin in the street abruptly diminished. The price suddenly rose from P30.00 per gram to P180.00 per gram and higher without abating. Lim Seng and his henchmen were tried and convicted for conspiracy to manufacture and distribute heroin. Lim Seng and two others were meted the death penalty, three others were meted prison sentences ranging from 12 years to life with corresponding fines as setforth under the law. Consequently, the entire domestic heroin distribution system eventually collapsed with the arrest and neutralization or the distributors and pushers (Filipinos and foreigners alike) and for want of a ready supply for heroin. The foreigners, consisting mainly of American and Australian tourists, were deported. By 1974-1975, the number of heroin abusers detected dropped to almost zero.

1976-1980 - The period was characterized by sporadic availability of foreign-origin heroin for domestic consumption, a very low incidence of heroin abuse among Filipinos, and kilo-level transhipments of heroin through Manila.

The broad spectrum of the illicit traffic into and through the country was present: from independent and petty but loose groupings of pushers (Filipinos and tourists) who catered to a small and selected group of addicts, to foreign organized crime that used Manila as a transhipment point for international heroin traffic. The price of heroin for domestic use continued to rise. In 1978, a heroin trafficker was arrested, convicted by a competent court and meted a penalty of 46 years imprisonment and a fine of P46,000. The price of heroin for local consumption was P1,500.00 - P2,000.00 per gram. By 1980, the price rose to P2,500.00 - P3,000.00 per gram. One gram of heroin 33% purity was further subdivided into twelve equal parts and sold for P200 per "deck".

Table 1

Number of Heroin Cases Reported (1976 - 1980)

Year	1976	1977	1978	1979	1980
No. of Heroin Users	4	1	2	6	5

1981 - There are twenty-seven (27) reported cases of heroin abusers for the current year. However, their average daily consumption and aggregate annual consumption cannot be estimated because of the sporadic availability of heroin in the country. Interviews with the heroin abusers reveal that their heroin intake is only twice a week or even less depending on availability. They spend P200 per tray or injection.

OPIATE DRUG CONSUMPTION PATTERNS IN JAKARTA

by

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Indonesia, one of the ASEAN countries, has an estimated population of 150 million, is located in the most southern part of South East Asia, and is the largest archipelago in the world. Jakarta, its capital, is the largest city (6.5 million) and centre of business, industry, culture and tourism in the country. The sex and age distribution of Jakarta are shown in Tables 1 and 2.

Table 1

Population of Jakarta: Distribution by Sex (1980)*

Sex	Total
Male	3,297,185
Female	3,206,264
Both Sexes	6,503,449

Table 2

Population of Jakarta: Distribution by Age Group (1980)*

Age Group	Total
0 - 4	923,121
5 - 9	823,203
10 - 14	743,510
15 - 24	1,604,950
25 - 49	1,939,419
50	446,360
All Age Groups	6,480,654

* Based on Population Census 1980

Drug Abuse

The phenomenon of drug abuse in Indonesia was actually known long before the Second World War. Indonesian society was already acquainted with traditional opium smoking especially among the Chinese. They obtained their supply legally until the end of the war when the narcotics law against the use of opium was passed (Brisbane Ordinance). Unfortunately, neither the Dutch Colonial rule nor the Indonesian Government had taken serious steps to follow-up with the change in the narcotics law because more important and pressing problems like the struggle for independence and post-independence problems had to be solved.

During the last decade, the use of dependence producing drugs by young Indonesians in the cities has been on the increase. The use of marihuana, which grows wild in Indonesia, is very popular. Marihuana smoking is widespread and young people usually start at a relatively early age. The abuse of morphine-type drugs and psychotropics has started and multi-drug abuse is also common.

Since 1969, state and private mental hospitals in Jakarta have been admitting patients who were abusing drugs of the morphine and marihuana type. These were mainly addicts who came voluntarily for treatment. The first group of young drug abusers were offered a detoxification regime and preliminary rehabilitation. A substantial number of drug dependents were also detoxified as out-patients and subsequently treated for underlying medical and psychiatric conditions.

Hallucinogens and amphetamines were also abused, but not in such alarming numbers compared to marihuana, morphine, alcohol and barbiturates. No case of cocaine abuse has been reported. Alcohol beverages are easily obtainable even in small villages and are used by adults in a casual and recreational manner. Since 1960, the use of alcohol beverages has become more common. However, at present, one rarely sees drunk people on the streets, except in the coastal areas of the Irian Jaya, where the use of such beverages is widespread and also in excessive amounts.

It was thought at one time that Bali, the famous paradise island would never have a drug problem. Hinduism is the main religion, and from it a philosophy and way of life was derived which shaped the society into a highly structured one. But the advent of tourism has brought many changes and this influence can be felt all over the island. Many young people are attracted to the tourist centres and some even marry foreigners. These mixed marriages, commonly referred as 'kopi-susu' relationships helped spread the drug habit to the local youths.

On the other hand, opium smoking among the Chinese population in the last 2 or 3 decades, has decreased. On the east coast of Sumatra, par-

ticularly the town of Bagansiapi-api where opium smoking is still common, the number of opium smokers is also decreasing.

Facilities for Treatment and Rehabilitation

Since 1972, many treatment and rehabilitation centres have been set up in Jakarta; (i) the Drug Dependence Hospital which was established in 1972, under the management of the Ministry of Health (ii) Wisma Pamandi Siwi, a correction centre under the management of the National Police, established in 1975 (iii) Wisma Chusnul Chetimah, a Social Welfare Rehabilitation Centre, established in 1974, under the management of the Ministry of Social Welfare. In 1976, another drug treatment and rehabilitation centre was established in Surabaya (East Java). It is located near the psychiatric unit of Dr. Sutomo General Hospital.

In addition, the Directorate of Mental Health, has also issued a standing instruction to all mental hospitals throughout Indonesia requesting them to make available up to 10% of their bed capacity for treatment and rehabilitation of drug abusers who wish to be admitted to these facilities. Most of the larger cities in Indonesia have a mental health facility. There are at present in the country 24 government mental hospitals, 12 university departments of psychiatry, and a number of psychiatric clinics attached to the armed forces hospitals, private hospitals and government general hospitals.

The Profile of Drug Abusers in Jakarta

Most of the patients admitted to the Drug Dependence Hospital are males (93%). In age they range between 16-25 years (91.5%). Those involved in drugs are mostly Javanese, Sudanese, Minangkabau, Minahasa and Indonesia Chinese (10.2% of each race). They have different religious backgrounds (Muslim, Protestant, Catholic and Buddhist). Most are single (83%), and about 50% were dropouts from schools.

In the early stage, most started with smoking ganja (74.6%) but some started with morphine/heroin (22%). Most prefer to be in groups when taking drugs, though some prefer to do it alone.

Pattern of Drug Use

Generally, the drug abusers can be grouped into different categories: (i) experimental users, (ii) recreational users and (iii) situational users. Those who use drugs more often, in higher dosages and on a regular basis are classified as (iv) intensive users or compulsive users.

Statistics on the numbers of patients admitted (and re-admitted) to the Drug Dependence Hospital, Jakarta (capacity: 30 beds) are as follows:

Table 3

Number of newly admitted and re-admitted patients according to the sex

Year	First Admittance		Re-Admittance	
	Male	Female	Male	Female
1973	149	17	33	3
1974	113	11	64	5
1975	149	11	108	10
1976	71	8	51	8
1977	99	2	31	1
1978	33	2	18	0
1979	52	3	21	2
1980	59	2	20	0
1981(Sept.)	58	4	40	2
Total	784	60	366	31

Table 4

Percentage of opiate drug users among total drug abuse patients

Year	Total Number of New and Repeat Admissions	Opiate Drug Users
1973	202	180 (89%)
1974	193	159 (82%)
1975	278	246 (88%)
1976	138	80 (58%)
1977	133	29 (13%)
1978	53	11 (21%)
1979	78	25 (32%)
1980	111	55 (50%)
1981(Sept.)	104	72(69%)
All years	1,290	857 (66.4%)

Table 3 shows a substantial decrease in the number of drug abuse patients from 1976 to 1978. In 1979 the number increased again but not as high as prior to 1976. Table 4 shows the fluctuations in the number of opiate drug users. From 1973 to 1975, more than 80% were opiate drug users. From 1976 to 1980, there was a constant decrease in the percentage until it reached 13% in 1977. Since then another peak is apparently building up. Speculations on the fluctuating pattern are many and are obviously related to the supply and demand situation at any point of time.

Pattern of Opiate Use

The patient register and other data collection procedures carried out at the Drug Dependence Hospital, Jakarta, gave the following pattern of drug (Table 5, 6 and 7) use.

Table 5

Number of patients according to type of drug used

Year	Multiple	Sedative Alcohol	Opiate	Total
Jan. 1981	5	3	7	15
Feb. 1981	3	0	8	11
Mar. 1981	4	1	9	14
Apr. 1981	1	2	7	10
May 1981	1	2	2	10
June 1981	2	1	8	11
July 1981	2	1	7	10
Aug. 1981	1	2	6	9
Sep. 1981	1	0	13	14
Total	20	12	72	104

Table 6

Patient consumption patterns and average daily expenditure

Average Daily Expenditures	Episodic	Continuous	Unspecified
Rp. 5,000,-	—	—	2
7,500,-	8	—	2
10,000,-	18	—	—
15,000,-	10	9	—
20,000,-	2	13	—
25,000,-	—	—	—
30,000,-	—	1	—
35,000,-	—	3	—
40,000,-	—	4	—
Total	38	30	4

Table 7

Average expenditure for opiates by patients, daily and annually (July - September 1981)

Case	No. of Drug Use Days	Total Rp./Day	Total Rp./Year
1.	240	15,000	3,600,000
2.	240	20,000	4,800,000
3.	180	15,000	2,700,000
4.	300	30,000	9,000,000
5.	360	40,000	14,400,000
6.	90	20,000	1,800,000
7.	150	15,000	2,250,000
8.	180	15,000	2,750,000
9.	270	10,000	2,700,000
10.	3	5,000	15,000
11.	90	10,000	900,000
12.	9	15,000	135,000
13.	180	20,000	3,600,000
14.	150	15,000	2,250,000
15.	210	20,000	4,200,000
16.	180	20,000	3,600,000
17.	180	40,000	7,300,000
18.	150	15,000	2,250,000
19.	360	40,000	14,400,000
20.	360	35,000	12,600,000
21.	270	15,000	4,050,000
22.	300	35,000	10,500,000
23.	180	20,000	3,600,000
24.	80	15,000	2,250,000
25.	210	20,000	4,200,000
26.	330	35,000	11,550,000

The above data were collected by interviewing patients after a stable and secure doctor-patient relationship was established. The information for some terms used in the report is as follows:

Price - The average price of heroin for one "cekak" (package) ranges between Rp. 1,500 and Rp. 2,500 (US$1 = Rp. 637.75).

Contents - Police analysis reveals each "cekak" contains an average of about 3 mg. heroin.

Purity - No specific information on this matter was available.

Daily expenditure on drugs - On the average, about Rp. 5,000 to 40,000 is spent by the patients to "satisfy" their daily needs.

Raw Opium - This is usually used by the older Chinese (age 50 - 60 +) who are very rarely seen nowadays. During this clinical assessment, not a single elderly Chinese opium user was treated in the Drug Dependence Hospital.

In this effort to gather data, many difficulties were faced. It was difficult to ascertain accurate information for the following questions:

i. How many days per year an opiate drug user actively uses the drug? The experimental users and the casual users were usually able to provide rather accurate information on this issue. But the episodic and continuous users were unable to recall the exact number of days they consumed the drug during the previous year.

ii. How much the abuser spent on drugs for the previous year? Since this question is closely related to the former question, the following estimates were made:

Episodic Users - The average daily expenditure was about Rp. 11,500 for the purchase of 5-8 "cekak" (about 17.3 mg. heroin).

Continuous Users - The average daily expenditure was about Rp. 22,000 for the purchase of 11 "cekak" (about 33 mg. heroin).

Others - These include the experimental and casual users. The average daily expenditure was about Rp. 6,250 for the purchase of 3.1 "cekak" (about 9.4 mg. heroin).

Summary

The paper described the drug consumption patterns in Jakarta, Indonesia. The information was based on interviews with drug dependents admitted to the Drug Dependence Hospital, Jakarta, Indonesia.

While the amount of the daily habit varied considerably within the study group, those who were daily users during the past year tended to report similarly high daily expenditures. The lower daily expenditures reported by the episodic users may possibly be due to their lower tolerance levels. This suggests that it might be useful to differentiate between the type of drug users in future consumption studies.

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OPIATE DRUG CONSUMPTION IN HONG KONG - EVALUATION

by

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Drug trafficking and abuse have been facts of life in Hong Kong for over a century, since the First Opium War of 1841. But organised efforts to deal with the drug addiction problem in the Territory did not start until twenty years ago. However, due to a lack of reliable information and a systematic data collection system, the magnitude of the problem remained virtually unknown. The only information available came from the Prisons Department, the Society for the Aid and Rehabilitation of Drug Abusers (S.A.R.D.A.), a voluntary agency set up in 1960 for treatment of drug addicts; and from data concerning the arrests, prosecution and conviction of drug offenders. A Hong Kong Government White Paper published in 1959 estimated the addict population to be in the region of 150,000 to 250,000 based on "the estimates of those most closely connected with anti-narcotics work, whether in an official or unofficial capacity." Another report in June 1966, estimated the number of narcotic addicts at the time to be about 70,000.

As the growth in drug trafficking and abuse appeared to be assuming alarming proportions in the late 1960's, public attitudes towards this long standing scourge began to harden. In the continued absence of hard data, public concern was aggravated by speculation in the media about the numbers involved and the possible trends and characteristics of the addict.

Against this background, the Secretary for Home Affairs began an exhaustive examination of all aspects of Hong Kong's drug problem in 1971, and a year later produced a report containing a number of recommendations. One of these recommendations called for the establishment of a Central Registry of Drug Addicts (CRDA) to provide more accurate information on the addict population and to develop reliable ways for assessing the effectiveness of drug addiction treatment.

The first Central Registry was set up in 1972, but was closed three years later due to technical deficiencies. It was succeeded by a new Registry in 1976, developed with overseas expert assistance, with the following revised objectives:

i. to identify trends in the nature of addiction and the addict population in Hong Kong over time;
ii. to describe certain characteristics of the reported addict population and to contrast these characteristics among addicts reported from specific sources;
iii. to provide information regarding the association of contact with certain reporting sources with subsequent as well as preceeding history of addicts.

Since 1978, when the first results were published, the Registry has been the source of a constant flow of data on addict trends and characteristics. These and subsequent reports produced by the Registry together with complementary data from other sources, have enabled both the Government and voluntary agencies to have a better understanding of the dimensions of the drug problem and to facilitate the formulation of realistic policies and counter measures.

Size of the Hong Kong Drug Addict Population

In the period between 1 September 1976 to 30 June 1981, the Central Registry received 138,700 reports on 37,000 individuals. Reporting sources included Government Departments (law enforcement, medical and social welfare), and a variety of voluntary agencies, private hospitals etc. involved in anti-narcotics works. Although this reporting net is not completely embracing, all the major agencies are included in the CRDA reporting system. Government general clinics and private medical practitioners are the only exceptions so the findings are therefore highly representative. Allowing for minor discrepancies and a small percentage of addicts remaining unknown to the Registry, coupled with other statistical studies on the prevalence of drug addiction in Hong Kong, we can say with some confidence that Hong Kong's total drug addiction population is at present in the region of 40,000. The ability to make an estimate of the addict population with some degree of certainty is of considerable importance in any study on drug consumption.

Common Drugs of Abuse and Method of Administration

In Hong Kong during the 1970's, heroin replaced opium as the primary drug of abuse. To illustrate from Registry data, during the first half of 1981, heroin was the primary drug for 96% of reported individuals with only 2% reporting opium and 2% other drugs.

The three common methods for consuming heroin in Hong Kong are smoking, fume inhaling and injection. Of all the individuals reported to CRDA for the first time between September 1976 and June 1981, nearly half (49.6%) inhaled fumes, about one-third (34.6%) injected and 15% smoked the drug.

It has also been observed that the popularity of different methods of taking heroin is closely associated with drug prices, availability and purity. In the second half of 1979 and early 1980, during a period of severe heroin scarcity in Hong Kong, a large proportion of addicts changed from the traditional method of fume inhaling to injection in order to avoid wasting their limited and expensive supply. The heroin shortage began to abate in the first half of 1980 with a decline in street prices and an increase in purity level. Many addicts switched back to fume inhaling and smoking.

Estimation of the "Active" Opiate Addict Population in Hong Kong

Many surveys and studies have been conducted in other countries in an attempt to estimate the prevalence of drug addiction in various communities at given times. But it is generally conceded by researchers in the drug field that no single method of estimating prevalence is without flaws. In Hong Kong, the attempt to quantify the active addict population, is based on the findings of the Central Registry and other statistical indicators available.

The formula used to determine the number of addicts using opiate drugs at any one time any year is:

$$A - B - C = D$$

where, A = the number of addicts in Hong Kong at any one time.
B = the number of addicts under treatment, rehabilitation and aftercare services at any one time, who are thereby completely free from drug use;
C = the number of addicts in the remainder of the total drug addict populations who are abstinent from drug use;
and
D = the estimated number of active drug addicts.

For A, it was earlier estimated the total drug addict population in Hong Kong in 1981 was around 40,000 with the great majority (over 90%) of the abusing heroin.

For B, it was observed on 31 October 1981 that there were 8,900 drug addicts receiving treatment and 4,600 receiving rehabilitation and aftercare services in the various drug addiction treatment modalities in Hong Kong. Of the 8,900 addicts under treatment, it is believed that all of the 1,900 addicts in facilities for inpatient care are not using any drugs. However, there is evidence that about 50% of the 7,000 methadone out-patients continue to take at least some drugs; whilst the other half (or 3,500) are considered to be drug free. Of the 4,600 rehabilitation and aftercare cases, it was observed that 60% relapse to drug use in the first year after discharge whilst the other 40% (or 1,840) presumably do not. The number of abstinent drug abusers in treatment is therefore estimated to be 7,240 (B = 1,900 + 3,500 + 1,840).

For C, it was observed for the 54 month period from September 1976 to June 1981, 20% of the Registry's 37,000 known individuals or 7,400 had not been subsequently reported again after a previous contact with the Registry. We therefore regard these 7,400 as inactive addicts or as C.

By applying the formula we find that:

A – B – C = D
40,000 – 7,240 – 7,400 = D
Therefore D = 25,360

We then conclude that there are 25,360 addicts in Hong Kong using some form of drugs at any one time.

Heroin Consumption Patterns in Hong Kong

The "Golden Triangle" continues to be the main source of Hong Kong heroin, transported mostly via Bangkok. The majority of illicit drug imports continue to arrive by air, carried by individual couriers or in air cargo, principally in relatively small consignments of heroin base. Traffickers favour this method because of its high value/low weight ratio and ease of converting it to No. 3 heroin by the fairly simple process of adding hydrochloric acid, caffeine and other additives. This reduces the risk of detection associated with the lengthy and odorous acetylation process necessary to convert morphine into heroin. At street levels, No. 3 heroin is peddled in small coloured packets, clear plastic phials, polythene bags and lengths of plastic drinking straws heat-sealed at each end. The use of short lengths of plastic drinking straws is becoming increasingly popular as the drugs are not only water-proof, but are easier to conceal and examine.

In estimating the frequency of use and amount consumed by drug addicts in Hong Kong, it should be borne in mind that drug abusers in Hong Kong, as in countries elsewhere, range from occasional to continuous users, from light to heavy users and every variation in between; it is therefore hardly possible to have data that can be said to be scientifically based. In the circumstances, our estimates are made largely on intelligence information supplied by law enforcement agencies and on evidence given by drug addicts on admission to various treatment programmes. Admittedly, we are aware that those who give evidence of their habit-patterns might give a distorted, biased and self-interested view, representative only of hard-core heroin users. Despite the limitations involved, this form of crude analysis, built on a series of hypotheses, can be refiend as more data become available.

Based on the information obtained from various sources in the anti-narcotics field, a Hong Kong addict would normally require two or three packets/units daily to maintain his drug habit. According to territory-wide surveys conducted by law enforcement agencies, mainly through the channels of street-buys, the street price of a packet/unit of No. 3 heroin weighing 0.17 g. with 29.6% purity cost about HK$32.50 (HK$5 = US$1). This amounts to about HK$645,900 per kilogram of pure heroin as at the end of October 1981. Although the street value of heroin obtained in this way can be regarded as reasonably accurate, there may be minor price differences at various different locations and with fluctuations in drug availability, so that not every consumer purchases his heroin at the same price. It is likely, as suggested by studies in other countries, that some drug users are themselves involved in drug selling or associated activities and are able to obtain their supply at prices below that of street level.

In Table 1, we observed that there has been a considerable decline in the wholesale price of heroin since the beginning of 1981. But the current street price of No. 3 heroin is still 40% higher than that of early 1979 when a kilogram of pure heroin cost about HK$464,100.

Table 1

Wholesale Prices Per 100g. of No. 3 Heroin
(January 1979 – October 1981)

Year	Month	No. 3 Heroin in HK$ (% Purity)
1979	January	4,600 (27)
	June	4,600 (27)
	September	22,900 (18)
1980	January	22,900 (20)
	March	22,900 (20)
	June	18,200 (25)
	September	13,800 (25)
1981	January	12,700 (31)
	March	12,100 (29)
	June	11,500 (30)
	September	6,800 (30)
	October	8,400 (30)

Source: Royal Hong Kong Police (1981)

To obtain additional and up-to-date data on consumption patterns of drug addicts in Hong Kong, surveys have been undertaken regularly concerning the daily expenditure on drugs of patients prior to their admission to the Shek Kwu Chau Treatment and Rehabilitation Centre of SARDA, the largest voluntary in-patient treatment centre in Hong Kong. Studies over the past three years reveal that all the admitted patients abused heroin as their primary drug with the majority adopting the intravenous method of administration. This was especially true in the heroin shortage situation prevailing in Hong Kong from the last half of 1979 to the first half of 1980, when it was reported that over 90% of the Shek Kwu Chau admissions injected heroin. Currently, in Shek Kwu Chau, an average addict who injects heroin was reported spending approximately HK$100 a day for 2-3 packets/units of No. 3 heroin which in turn will be sufficient for several injections within the 24-hour period. Older addicts (40 years and over), spend comparatively less on heroin than the younger ones and tend to inhale the drug.

Estimated Opium Consumption in Hong Kong

As briefly outlined in the preceeding paragraphs, the use of opium, which was the main drug of abuse in Hong Kong in the 1950's, has continued to decline since the early 1970s. This was due to a combination of factors such as its high selling price, the very effective law enforcement efforts which curtailed the supply of opium, and its cumbersome and complicated method of ingestion (by using a pipe and a lamp). Evidence suggests that opium abuse is now mainly a preserve of an ageing and dwindling generation, and represents only a very small percentage of the total known addict population in Hong Kong. Latest findings of the CRDA indicate that, of all the individuals reported to the Registry in the first six months of 1981, only 2% abused opium as their primary drug. This proportion is seen to decline steadily since September 1976. At the same time, the total annual opium seizures by the Royal Hong Kong Police and Customs & Excise also showed a very substantial decrease, dropping from 4,700 kg. in 1974 to 200 kg. in 1978 and a meagre 86 kg. in 1980. Only 5 kg. of opium were seized by law enforcement agencies in the first six months of 1981 indicative of the ever-decreasing popularity of opium among Hong Kong addicts.

As regards the consumption patterns of the opium addicts in Hong Kong, the Police and Customs intelligence reveals that most of the opium addicts are opium smokers and use prepared opium. An average opium addict in Hong Kong nowadays consumes 1-2 mace of prepared opium a day (1 mace = 3.78 g.) which costs about HK$100-200 a day (the retail price of prepared opium at the moment is about HK$27,500 per kg.).

Other Major Drug Indicators

Drug abuse is a multi-faceted problem and is tackled in Hong Kong through the co-ordinated efforts of four inter-related programmes – law enforcement, treatment and rehabilitation, preventive education and publicity, and international co-operation. It is therefore necessary to monitor the policies approved by the Government and by ACAN, the advisory body on all matters relating to drug trafficking and abuse. For this purpose, statistics from various sources such as the Police, the Customs and Excise, the Medical, Health and Prisons Departments and SARDA are regularly supplied to, and examined by the Narcotics Division, for example:

(a) Drug Arrests and Seizures

The Royal Hong Kong Police Force and the Customs & Excise Service provide information on drug prices, seizures, prosecutions and convictions of major and minor drug offenders. It is generally assumed that as drug-related activity increases, public concern also increases, resulting in more law enforcement activity and a greater number of drug-related arrests and seizures.

Before examining these statistics, we should recall the major policy changes introduced in 1972-74 which involved, inter alia, the reorganisation and strengthening of the Narcotics Bureau of the Royal Hong Kong Police Force and the establishment of the Independent Commission Against Corruption. The latter has undoubtedly played an important part in curbing official corruption which had been one of the sustaining factors of the illicit drug trade in Hong Kong. Tables 2 and 3 suggest the impact of these policies by showing a gradual decline in prosecutions and convictions of drug offenders and in drug seizures since the 1974-76 period. All these are inter-related.

Table 2

Prosecutions and Convictions of Major and Minor Drug Offenders in Hong Kong (1974-1980)

	Major Drug Offences*			Minor Drug Offences**		
Year	No. of Cases	No. of Persons Prosecuted	No. of Persons Convicted	No. of Cases	No. of Persons Prosecuted	No. of Persons Convicted
1974	1,460	1,780	1,600	8,240	16,650	16,200
1976	2,720	3,130	2,060	10,800	9,430	9,110
1978	700	2,160	1,090	8,370	6,540	5,530
1979	1,380	1,860	990	5,560	190	3,610
1980	1,440	1,890	610	4,710	3,720	284

* Major offences include trafficking in dangerous drugs; possession of dangerous drugs for the purpose of unlawful trafficking and manufacturing dangerous drugs

** Minor offences include simple possession of dangerous drugs or equipment and consumption of dangerous drugs

Source: Royal Hong Kong Police (1981)

Table 3

Yearly Drug Seizures in Kilograms by the Royal Hong Kong Police and the Customs & Excise Service (1974-1980)

Year	Opium	Heroin (Including Heroin Base)	Morphine	Cannabis
1974	4,735	95	285	6
1975	422	186	143	54
1976	3,553	164	291	87
1977	147	179	98	19
1978	205	333	47	1
1979	125	148	12	12
1980	86	115	2	39

Source: Royal Hong Kong Police (RHKP) and Hong Kong Customs & Excise Service

(b) Drug Price and Treatment Statistics

A major expansion of the Government's methadone treatment programme, from 4 clinics to 21, took place in 1976. In the past 4 to 5 years, it has been noted that there is a close correlation between the street level price of No. 3 heroin and attendance at treatment institutions, notably the methadone clinics (see Table 4). The higher the drug price, reflecting a decrease in the availability of heroin, the greater the number of addicts coming forward for treatment.

For example, in January 1979, when the No. 3 heroin wholesale price was HK$4,600 per 100 g., we recorded a total of 6,400 addicts receiving treatment of which 4,500 were attending the methadone clinics. In July, 1979 when the No. 3 heroin price soared to HK$22,900 per 100 g. or nearly four times the price of January 1979, we had the highest ever recorded figure of 9,400 addicts under treatment, 7,700 for these attending methadone clinics. The most recent data shows that, at the end of October 1981, with the price of No. 3 heroin falling, there were 8,500 addicts under various forms of treatment, 7,000 of these attending methadone clinics.

Table 4

Relationship Between Wholesale Heroin Price and Number of Addicts in Treatment (January 1976 — October 1981)

Month/Year	HK$ per 100g. No. 3 Heroin	No. of Addicts in Methadone Treatment	No. of Addicts in Other Treatment	Total Addicts Under Treatment
January 1976	1,900	1,850	1,900	3,150
January 1977	3,700	4,624	1,946	6,570
January 1978	4,900	5,106	2,034	7,140
January 1979	4,600	4,432	1,948	6,390
June	5,600	5,771	1,969	7,740
January 1980	22,900	7,137	1,513	8,650
June	18,200	6,915	1,655	8,570
January 1981	12,700	6,354	1,386	7,740
March	12,100	6,657	1,503	8,160
June	10,600	6,818	1,512	8,330
September	6,800	6,810	1,480	8,290
October	8,400	7,000	1,500	8,500

Source: Central Registry of Drug Abuse (CRDA)

Table 5

Individuals First Reported to the Central Registry of Drug Abuse (CRDA) by Method of Taking Heroin (September 1976 — June 1981)

Method	Total %	1976 (2) %	1977 %	1978 %	1979 (1) %	1979 (2) %	1980 (1) %	1980 (2) %	1981 (1) %
Overall	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Fume Inhaling	49.6	57.1	47.8	48.3	51.4	36.0	34.7	36.7	42.0
Injection	34.6	28.2	36.4	34.8	26.4	54.6	53.3	49.1	43.7
Smoking	15.2	14.4	15.1	16.5	21.7	9.1	10.8	13.6	13.9
Others	0.6	0.3	0.7	0.4	0.5	0.3	1.2	0.6	0.4
No. of Individuals*	21,470	5,414	8,284	3,694	1,232	902	583	613	648

* Individuals for whom a method of taking heroin was not reported were excluded.

(1) denotes first half of the year
(2) denotes second half of the year except 1976 which includes only the last 4 months.

Source: Central Registry of Drug Abuse (CRDA)

(c) Drug Price and Method of Administering Heroin

Three major methods are adopted by the Hong Kong addicts to administer heroin, i.e. fume inhaling, injection and smoking, and there is a close relationship between drug prices and the mode of administration. In the second half of 1979 when the drug price reached an all-time high of HK$22,900 per 100 g., and the purity level was down to as low as 5%, injection suddenly gained popularity. Of all the individuals newly reported to the Registry who claimed heroin as their primary drug during this period, over half (55%) injected, 36% fume-inhaled and 9% smoked. Injection continued to be the most commonly used method in 1980 when the price remained at a relatively high level, compared to that of the previous year. In the first half of 1981, however, when there was a rapid fall-off in street prices, indicative of a plentiful supply and rising purity levels, there were indications that the proportion of heroin-takers using the injection method declined while those who use fume-inhaling steadily increased. Of the new heroin abusers in the first six months of 1981, 44% injected, 42% inhaled and 14% smoked. Table 5 shows the methods of heroin administration among individuals first reported to CRDA from September 1976 to June 1981.

(d) Employment and Wage Statistics

The great majority of Hong Kong's addicts come from the lower income groups, and the calculation of their disposable income can be made from figures of daily wage rates for casual labourers published by the Census and Statistics Department and from the Government's own wage-scales for its lowest paid workers (see Table 6 and 7). The CRDA supplies us with data on the number of addicts on the Register who are lawfully employed. Many of the remainder are unlawfully employed as drug pushers etc. where the rewards can be quite considerable.

Table 6

Daily Wage Rates for Casual Labourers

	Present $	Revised $
Workman II	56.00	66.00
Workman I	57.00	68.00
Artisan	68.00	81.00
Senior Artisan	83.00	98.00

Source: Census & Statistics Department, Hong Government

Conclusion

We are aware that a 100% reliable methodology for evaluating the consumption of drugs in a country is an unattainable goal. In constructing the methodology for the evaluation of drug consumption, factors such as the number of addicts, the production, consumption and availability of illicit drugs are always hard to define, much less observe and measure. It is therefore necessary sometimes to be arbitrary in the selection of information to be used in any formula for evaluation, and the hypotheses built on such data are necessarily speculative. The main objective of this work in Hong Kong is to present the law enforcement agencies with a gauge against which they can measure their own success in seizing imports of illicit drugs. Crude though our current methods are, we believe that they will, in time, evolve into a better yardstick than the present "10%" rule-of-thumb still widely used in many countries.

Table 7

Hong Kong Government — Salary & Wage Scales

Model Scale I

	Point (MOD)	Present	Revised
Senior Artisan	20	2,205	2,610
	19	2,145	2,540
	18	2,085	2,475
Artisan	17	2,030	2,410
	16	1,975	2,345
	15	1,920	2,280
	14	1,865	2,215
	13	1,810	2,150
	12	1,765	2,090
	11	1,725	2,040
Workman I	10	1,685	1,995
	9	1,645	1,950
	8	1,605	1,905
	7	1,575	1,860
	6	1,545	1,825
	5	1,515	1,790
Workman II	4	1,485	1,755
	3	1,455	1,720
	2	1,430	1,690
	1	1,405	1,660

Source: Estimates of Revenue & Expenditure 1981/82, Hong Kong Government

PATTERN OF OPIATE DRUG CONSUMPTION IN PAKISTAN

by

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Pakistan is a new country; it came into existence only 34 years ago with the partition of the Indian subcontinent. The use of opium in this Indian subcontinent goes back centuries. Besides its use as a drug for pleasure, it is also used extensively in the local system of medicine and as a household remedy.

The role played by the the British during the colonial period to increase the opium production for local consumption as well as for export is well known. They were quite indifferent to the problems it created for the local population. Their sole interest was to increase Government revenue.

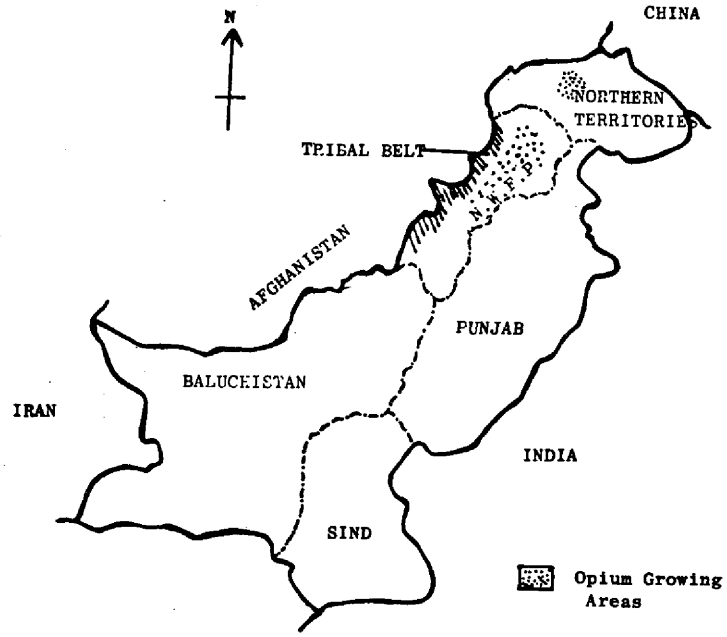
When Pakistan became independent three decades ago, there was little poppy cultivation. Most of the areas which cultivated poppy under licence were located in the Indian part of the subcontinent. As there were legitimate requirements for opium both for local use and for export, some acreage was placed under poppy cultivation in the 1950's, mainly in the Northwest Frontier Province (NWFP). Later when local farmers and landowners learned that large profits could be made from this crop, the acreage grew enormously and it was introduced to new areas. Figure 1 shows the areas where poppy cultivation is concentrated. It is mainly cultivated in NWFP and Northern Territories.

There are strict laws governing poppy cultivation and growers have to turn to the government all the raw opium produced. The raw opium is refined to "cooked" opium at the Lahore factory and distributed through official channels while some is exported. This arrangement worked well for the settled areas but not along the frontier region bordering Afghanistan called the Tribal Area. This area, though part of Pakistan, is outside the administrative control of the government. The opium cultivated in this areas is mainly fed into the illegal local market or smuggled out of the country. The government has had difficulty controlling the opium traffic as most of it is smuggled through Afghanistan and Iran.

Opium use was legal in Pakistan until February 1979. It was openly sold by Government licensed shops called "vends" and anybody could buy it. The last available statistics about official opium sales reported that there were 332 vends throughout the country and the total opium sold through these vends was about 6 tons per year. It was common knowledge that the licit opium supplied to the vends was much less than the demand and these vends indulged in the sale of contraband opium to meet the demand. This illicit opium came mainly from the large unregulated poppy cultivation in the Tribal Area.

When the sale of opium was prohibited in February 1979, large numbers of addicts accepted the government's offer of registration. But soon the number of registrations declined as most of the addicts managed to get supplies from illicit sources. The government later made a slight amendment in the law and allowed the sale of opium to those addicts who were issued permits by authorised medical persons. The rationale for issuing permits was that abrupt stoppage of opium intake for these persons might be hazardous to their health. After the initial rush, the demand for permits diminished. The reasons were that the Government opium was too expensive and involved too much red tape. Besides, the addicts were apprehensive about dealing with the Government. Furthermore, opium in the illicit market was much cheaper than the Government-supplied opium.

Figure 1: Map of Pakistan Showing Opium Producing Areas



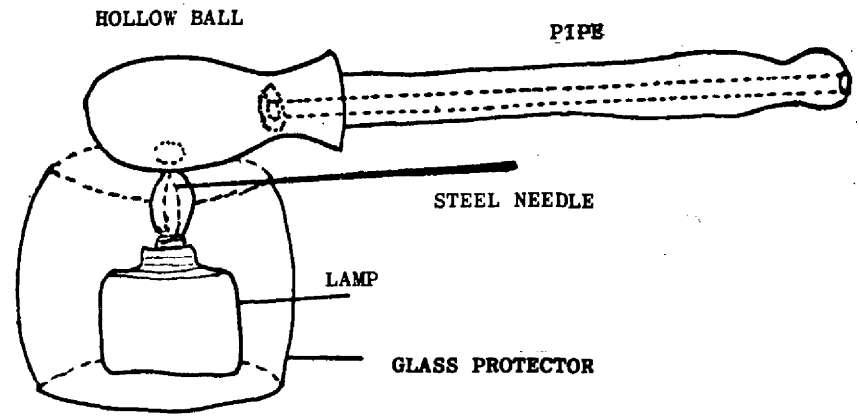
Methods of Opium Administration

Opium use in Pakistan is confined mainly to eating and/or smoking. Opium can be eaten either in its raw or cooked form. Raw opium comes mainly from illicit sources while cooked opium was formerly supplied by the government. Presently the government is supplying opium tablets each containing 5000 mg. Opium eating was legal until 1979.

Unlike opium eating which is usually done alone and at home, opium smoking is traditionally a group activity. For this purpose, "chandu Khanas" or dens have been established in areas where smoking is common. Opium smoking is mainly confined to NWFP and Karachi. The immigrants from NWFP introduced it into Karachi but now all ethnic groups smoke opium regularly.

There are two preparations of opium commonly used for smoking in Pakistan. Chandu is a thick paste prepared by boiling opium in water. During boiling, burned opium residue scraped from smoking pipes is added. The paraphernalia used for chandu smoking are: (i) a wooden pipe with a hollow ball at one end (the ball has a small aperture on one side) (ii) a specially built steel oil lamp with a stand to hold the pipe; and (iii) a long steel needle to hold the "chandu" at the ball aperture during smoking.

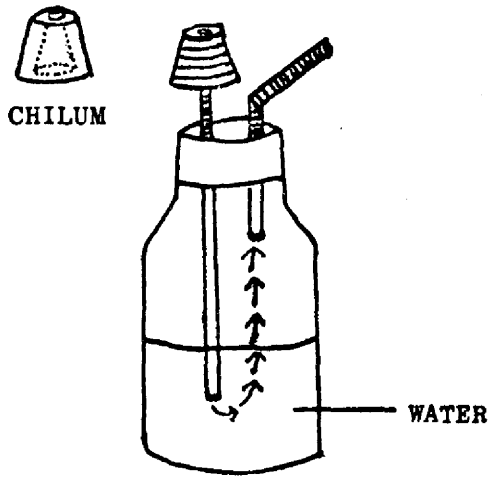
Figure 2: Apparatus for "Chandu" Smoking



During smoking, a smoker lies on the floor and holds the pipe which is held over a burning lamp in such a position that the flame just touches the aperture where a small amount of "chandu" is held with the needle. The smoke thus produced is sucked into the hollow of the ball and inhaled by the smoker through the pipe.

Madak is prepared like chandu, but charred barley husk is mixed in it and it is prepared into pills – madak pills. The apparatus required to smoke madak pills is a specially made water pipe. Madak is a milder opiate as compared to chandu.

Figure 3: Apparatus for "Madak" Smoking



Abuse of Other Opiates

Besides opium, other opiates were not abused to any extent because of unavailability. There were no facilities for extracting morphine or codeine from opium in Pakistan so these drugs are only imported by the Government for medical purposes and sold to hospitals, medical professionals and chemists under licence. Although some pilferage does occur, the abuse of such drugs never became widespread.

Morphine and Pethidine – Both the drugs are available only in ampoules and are used for intramuscular or intravenous injection. As these drugs are not manufactured in Pakistan, and have to be smuggled from outside, their abuse is limited. The usual source is pilferage from legal supplies of hospitals and chemists. Due to their relatively high cost, their abuse is confined mainly to the upper socio-economic classes in urban areas.

Codeine – The abuse of codeine was fairly common among urban youths is the late 1960's and early seventies. Codeine was an ingredient of most cough syrups and abusers would drink daily, 2 to 3 bottles of these cough syrups. The habit spread rapidly, until the government having realised the danger, banned its use in cough syrups. Today its abuse has virtually been eradicated.

Heroin – The abuse of heroin in Pakistan is a very recent phenomenon. There was no heroin addiction reported in Pakistan until 1981, when occasional cases were noted. Since July 1981, heroin abuse has spread rapidly in Quetta, Peshawar and Karachi. This is caused by its illegal production in the country. The traffickers until recently were exporting opium, but due to its bulkiness and the difficulty in smuggling it out, clandestine factories to produce heroin have been established. Most of the heroin is smuggled out, but some is also fed into the local illicit market. If we are to judge from the large amount of heroin seized, the factories are producing large amounts of the drug. Before 1981, almost no heroin was seized, but in the first eleven months of 1981, about 100 kg. of heroin were seized.

The ban on legal sale of opium did not precipitate the recent spread of heroin as opium is still freely available in the illicit market. In Karachi, heroin abuse was introduced by immigrants from Iran. The main reason for the spread of heroin abuse is its local production and its availability at low cost.

The route of heroin administration reported in Pakistan is only the method called "chasing the dragon". In this method, a small amount of heroin is placed on a tin foil and heated from below. The smoke produced is then inhaled through a small tube made of paper.

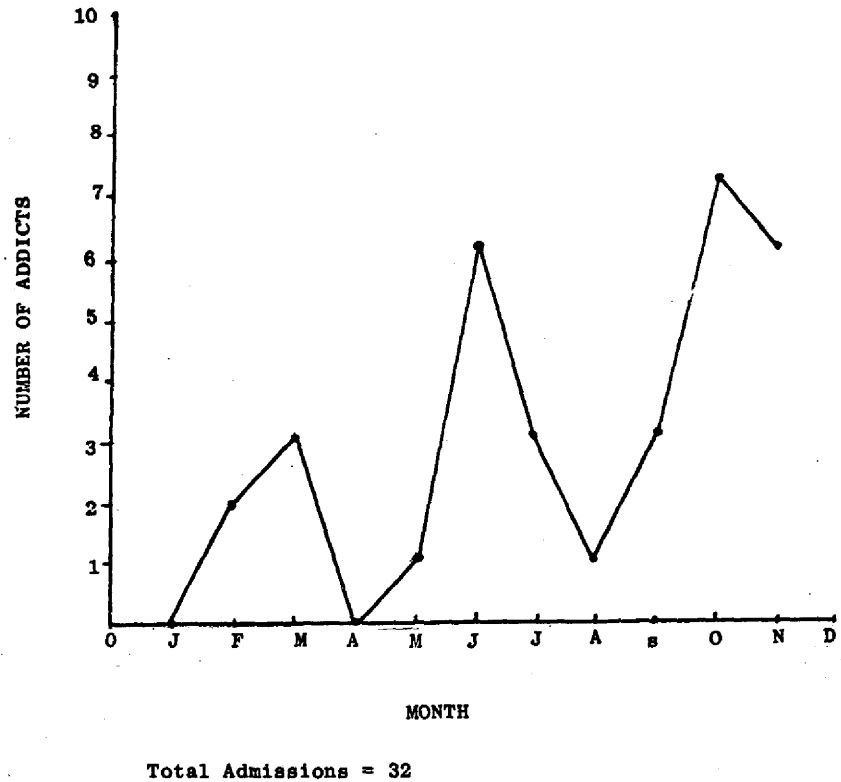
Level of Opiate Consumption and the Consuming Population

There has been no proper scientific survey of opiate abuse in Pakistan. A few attempts have been made in selected areas but the results cannot be extrapolated to represent the general situation in the country because of the differences in cultural patterns. However, there are two fairly reliable data sources from which rough estimates of drug consumption can be calculated.

Prior to February 1979, the total amount of opium released to licensed shops was 6000 kg. per year for the whole country. However, it was common knowledge that the demand was far more than this and that they actually sold 3 times this much supplemented by illicit opium. Hence, the yearly sale of opium then was about 18 tons for the country. The average opium eater is estimated to consume about 3 g. of opium per day or an equivalent of 1 kg. per year. Based on this mean annual consumption estimate, the annual sale of 18 tons from these shops would account for a total of 18,000 opium users in the country. However, this estimate does not

take into account the large amount of opium sold in the producing areas and in places other than the licensed shops. Thus the actual number of opium users must be more than 18,000. The national estimate of 100,000 opium users by Khan in 1977 may be correct though it is purely a guesstimate.

Figure 4: Heroin Admissions at Karachi (1981)



The other data which may be useful are from records at the Detoxification Centres set up by the Government throughout the country. At present, there are seven such centres. Though the number of opium addicts attending these centres is small, variations in regional patterns of opiate abuse can be identified. However, it is not possible to make any national estimate of total opiate use from this data.

For 1980 a total of 1923 patients were treated at these centres. Out of this, 56.2% reported using opium as the primary drug, 0.16% morphine and 0.02% pethidine. The remaining 43.4% were using non-opiates such as cannabis, methaqualone, barbiturates, methedrine and ritalin. No case of heroin abuse was reported. All the cases reported from Rawalpindi, Lahore, Quetta and Hyderabad centres were opium eaters while opium smoking was more common in Buner, Peshawar and Karachi. The average amount of raw opium consumed by the average opium eater is about 3 g. daily. Opium smokers consume much larger quantities, the mean daily opium consumption is about 7 grams.

As for heroin, no addiction was known until 1981 when the three detoxification centres - Peshawar, Quetta and Karachi reported admitting heroin abusers. Between January to November 1981, a total of 83 heroin abusers were treated - 32 at Karachi, 17 at Quetta and 34 at Peshawar. Figure 4 shows the increasing number of heroin addicts in the later part of the year at Karachi.

The average heroin addict in Pakistan consumes about 1 g. of heroin per day. In all the cases reported, heroin was smoked by "chasing the dragon". No case of injection heroin has been reported.

The heroin commonly used is light brown in colour with a purity varying from 20 to 50%. However, white heroin with a purity of 86% has also been seized from traffickers. None of the addicts has reported using white heroin although it is available (and at a much higher price - 150 rupees per gram). The average price of brown heroin is 60 rupees per gram (10 rupees = US$1). Brown heroin is packed in polythene, each package weighing about 250 mg. The average addict consumed about 4 such bags (a total of 1 g.) of heroin per day. Based on a purity of 20 to 50% this estimate would range between 200 to 500 mg. pure heroin per day.

It is at present not possible to estimate the total number of heroin abusers in the country because of the lack of complete and up-to-date information. However, it is quite clear that the abuse of heroin is spreading quite rapidly.

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VARIABILITY IN OPIUM DOSAGE: OBSERVATIONS FROM LAOS, 1965-75

by

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Introduction

Opium use patterns vary widely from place to place, among different addicts, and even by the same addict over time. These data are based on three year's field work in Laos during the period 1965-75. Other publications on studies from which these data were derived are listed in the bibliography.[1-24]

Findings

Route of Administration

Opium Eating - Ingestion of opium — whether as a solid, a tincture or a solution — allows most of the active alkaloid compounds to be absorbed and to become biologically active. Not only does this method conserve the drug, but it produces a more gradual onset of action with less acute intoxicating effects. It also does not produce the characteristic odour which pervades the smoker's breath, clothes and smoking place.

Non-addicts employ opium eating as a means of medication (e.g. for cough, diarrhea, pain), but they do not ordinarily eat opium in a social context. Some addicts prefer to eat opium in the morning before work, so as to stave off withdrawal but avoid the lethargy often induced by smoking. On a trip away from home, addicts sometimes ingest rather then smoke opium since less opium needs be carried and the smoking paraphernalia could be left at home.

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* Circulated to participants. Not presented at Workshop.

When an opium crop has been poor, or the price of opium is high, or an addict is destitute, a shift is often made from the preferred smoking to the eating route of administration. During the early 1970's in Laos, when many refugee poppy farmers were unable to produce opium, there was an increase in the proportion of opium eating relative to smoking,[16] While expatriate Asians from Pakistan and India were said generally to eat opium in their home countries, in Laos they usually smoked it.

Particularly poor addicts may chew on the filtration materials used to prepare smoking opium or *Chandu* from raw opium. Cotton, cheesecloth or paper filters contain dirt, plant fibres and some alkaloid remnants after the filtration process. The filters are usually thrown away, but may be given away or sold at a cheap price. Addicts eating off these filters become known by the same name as the material on the filter — *khee dyafeen* (opium excrement).

Opium Smoking - This is a wasteful method, since considerable opium is lost as a volatile gas to the atmosphere. Yet is produces the sudden onset of intoxicating effects (the rush) so highly valued by addicts. The user may become lethargic or even stuporous if a sufficient amount is taken and thus be unable to work (or even walk) for a period. Addicts dependent on large doses may require 20 or 30 minutes to consume their opium.

Smoking is the usual means for taking opium in a social context. It may also be smoked for medicinal purposes. Administration of opium to a sick infant is done by smoking. A blanket is arranged over the infant like a tent, while an adult exhales opium vapours under the blanket for the infant to inhale.

Unlike ingestion, opium smoking requires considerable paraphernalia as well as time. Equipment includes the pipe (both the stem and a removable bowl), a lamp to volatilize the opium (although a piece of firewood with embers at one end will also serve), and a metal piece like a knitting needle to heat the opium wad and nudge it into the small orifice in the pipe.

Smoking also involves a degree of skill. The smoker must inhale at the precise moment that the opium begins to volatilize or the dose will be lost to the air. It also requires the ability to inhale strong fumes into the lungs and contract the chest and abdominal muscles against a closed glottis (the Val Salva manuever of physiologists). This must be accomplished while stifling the cough reflex — a difficult task for many non-smokers.[1,3]

Snuffing Opium - A few city women snuffed opium. This had the advantage of giving a rush (from rapid absorption, producing suddenly increased blood levels) while also conserving opium. Further, it did not leave the telltale odour of volatilized opium. Of course, it did cause considerable irritation and inflammation to the nasal mucosa. Opium for snuffing was

prepared by spreading it into small granules under a hot sun, so it would dry to a powder.

Cost - At the National Narcotic Detoxification Center (NNDC) in Vientiane, 445 opium addicts were asked about their current route of administration prior to admission. Opium smokers comprised 53%, eaters 33%, and combined eating and smoking 15%. On the average, opium eaters spent the least amount per day on opium: US$1.07. People who smoked all of their opium spent the most: a mean of US$1.84 per day. Those who ate and smoked their opium consumed an intermediate amount: US$1.35 per day.

Ethnicity - Among 321 Lao patient-addicts studied at the NNDC in 1971-72, 40% were eating their opium and another 17% were combining the smoking and eating methods. Forth-three percent of them smoked. By contrast, 20% of 81 Hmong (many of whom continued to grow their opium) were eating their opium and 6% were using the combined smoking-eating method. Seventy-four percent of the Hmong smoked. Chinese and Vietnamese addicts, who as merchants and artisans had larger incomes than Lao farmers, could afford the higher prices. Only 2% of these latter 43 addicts were eating their opium while 12% were using the combined smoking and eating method. Eighty-six percent of this group smoked.

Dosage and Frequency

Daily Dose - It is difficult in Laos to ascertain daily dose using the weight of opium consumed. Poppy farmers smoking their own cash crop may not weigh their doses. Dehydration leads to further variance by weight. The amount of active opiate alkaloids is poorly related to weight due to adulterants (called *paum*) or natural variation in poppy crops. Most addicts are better able to estimate their daily dose in money value than in weight.

The amount spend daily by the 431 addicts described above varied tremendously. One addict consumed only US$0.25 worth of opium per day, while at the other extreme one man was spending $9.25 per day — a factor difference of 37 times. Of course, most addicts were within a more narrow range. Almost 80% of them (78.7% to be exact) spend between US$0.50 and $2.50 per day — still a factor difference of 5 times. On the average, men spent slightly more per day than did women (this difference was statistically significant at $P < .005$).

Daily expenditures on opium were also strong and directly correlated with the daily dose frequency ($r = +.42298$, $P < .00001$). Similarly, expenditures were directly correlated with the initial dose of methadone during the first 24 hours of detoxification ($r = +.44871$, $P < .00001$). These data indicate that, as one would expect, those spending more on

opium used more frequently during the day and had a higher toleration to the opiate drugs.

Daily cost also bore some interesting and unexpected relationships to the history of drug use. First, those spending the most on opium were addicted between 5 and 30 years, with earlier and later addicts not reporting the largest expenditures. There was no statistical correlation, however, between daily cost and duration of addiction ($r = +.00131$, $P < .49$). On the contrary, there was a significant negative correlation between daily cost and duration of opium use prior to addiction ($r = -.12846$, $P < .004$). This is probably due in part to the Hmong subjects, who tended to become addicted relatively sooner and spend relatively more on opium.

Daily Frequency - Most opium addicts take opium two or three times a day. Addicts at the NNDC taking more doses per day required slightly increasing doses of methadone in the first 24 hours following admission in order to relieve their withdrawal. However, the methadone doses levelled off at three doses per day. Specific data were as follows:

Daily Doses	Number of Subjects	Average Daily Cost (US$)	Average Methadone Dose in First 24 hrs.
1	14	$0.43	22.9 mg.
2	265	$1.20	28.0 mg.
3	141	$2.05	31.0 mg.
4 or 5	11	$2.93	31.1 mg.

As one might expect from the data on daily cost above, there was no significant correlation between frequency and duration of addiction ($r = +.02747$, $P < .28$). However, all of the addicts using 4 or 5 times a day had been addicted more than 4 years but less than 35 years. Longer term addicts were using twice a day. The once-a-day users were mostly addicted for five years or less (although with some exceptions up to as long as 22 years).

Those with more brief pre-addictive use tended to be using more times per day ($r = -.09896$, $P < .02$). All of those using 4 or 5 times a day became addicted within their first year of beginning opium. (The mean duration of pre-addictive use in this sample was 1.25 years, with a standard deviation of 2.52 years, and a strong skew to the right).

Patterns of Use

Variations Among and Within Addicts – As indicated above, addicts varied widely in the amounts being consumed. There were also differences in patterns among them. Some addicts used extremely stable doses over many years — the titer pattern. These addicts sometimes said they liked specific effects of the drug (e.g. relief of pain or insomnia or sadness), but they did not like to feel intoxicated (*mow*) by which they meant dizzy, nauseated, weak or uncoordinated. Other addicts went on opium binges, consuming all they could manage for days or weeks on end. During these opium binges their lives alternated between deep draughts on the pipe and slumber. Most addicts showed variations between these extremes. They took less opium in the morning, or before work, or on a trip, or when feeling well. They took more opium in the evening before sleep, during holidays or times of slack work, or when feeling poorly.

In the early years of addiction, there was a trend for addicts to gradually increase their daily dose. After a few decades of addiction, particularly the older addicts tended to cut down on their dose. These mild trends had many exceptions, however. Overall there was a trend for less opiate use beyond the initial years of addiction. This is reflected in the finding that the duration of addiction was inversely correlated with the initial dose of methadone during the first 24 hours of detoxification ($r = -.10138$, $P < .02$). That is, those addicted for longer periods tended to show less opiate tolerance. There were many exceptions to this trend, however.

Concomitant Use of Other Drugs – Some addicts smoke tobacco, either along with their opium or after their opium. They believe that tobacco could heighten or prolong the effect. It is difficult to explain this pharmacologically, since there is no cross tolerance between the two drugs. Perhaps some addicts just like the combined effect of the two drugs. The mild stimulation from nicotine could counter some of the depressant effects from opium.

Especially in the lowland towns, some addicts have been heavy users of cannabis and/or alcohol. This usually occurred before they became addicted to opium, or during an attempt to discontinue opium. During times of regular, heavy opium consumption, cannabis and alcohol use tend to be minimal. Heavy drinkers infrequently use alcohol in which opium (and other herbal medications) is dissolved.

Decreasing Dosage – Forth addicts in a field survey were asked if they had ever tried to stop their addiction on their own or had ever sought treatment.[2,3] Twenty-nine of them reported having done so. These 29 had been addicted for a longer time (i.e. mean duration of 18 years) as compared to the 11 who had not made major efforts at self-treatment or had received assistance from their families. Others had gone to healers or traditional institutions which provided treatment specifically for opium addiction. All of these 40 addicts interviewed during 1971-72 were using less opium than they had previously. Most of them were refugee farmers who could raise only small poppy crops on poor soil in refugee relocation areas. Others who purchased their opium, such as the Lao and Chinese, found that increasing cost prevented their purchasing the large amounts to which they had been accustomed.

Like alcoholics who have learned to drink themselves off of a binge by gradually reducing their intake, both titer and binge opium smokers know that they could increase or decrease dosage with predictable effects. Increasing dosage suddenly would cause them to become intoxicated (*mow* in Lao). Decreasing dosage in small increments allowed them to titrate their withdrawal effects. For example, a five or ten percent daily decrease in dosage might produce some malaise, insomnia and loss of appetite, but would not produce the days of agony, diarrhea and vomitting produced by sudden "cold turkey" withdrawal. Relatively few addicts ever decreased their dosage gradually down to nothing. Knowledge of this reality (i.e. that they could withdraw themselves) and the ability to implement it were two different things. As addicts reduced their doses to minimal levels, they often experienced fears of death, panic attacks, and overwhelming dysphoria.

Environmental Influences of Dosage

Life Change, Seasonal Change – The individual's use of opium might wax and wane with illness, loss or stress. Some occasional users became addicts when their occupations exposed them to frequent opportunities for opium smoking — such as merchant, village chief or district chief. Depression of loss of a spouse could lead to heavier use. Financial success could lead to increased expenditures on opium. The need to engage in seasonal work or financial reverses motivated some addicts to reduce their habit.[3]

Social Factors – The Indo-Chinese War caused a decrease in opium availability and an increase in price when many poppy farmers became refugees.[16] At that time many addicts changed from smoking to eating and reduced the number of doses per day. Several thousand addicts undertook treatment for their addiction at a government sponsored medical centre and at a Thai monastery.[14,19,20]

Subsequently, an anti-opium law in Laos, promulgated in late 1972, further exaggerated these changes in Vientiane Prefecture[5]. It was in this area that police pressure was most intense and effective. Opium availability fell, and price rose. Within weeks another change occurred: heroin became widely available for the first time in Laos.[6] Due to its smaller bulk per dose, the lack of a characteristic odour, and the ease with which it could be packaged in various shapes and amounts, heroin could be more readily smuggled as compared to opium.

Cultural Factors - Various ethnic groups do demonstrate differences in their patterns of use These appear related to two factors: (1) differential availability of opium and (2) socio-economic considerations. Cultural factors *per se* do not appear directly influential.

For example, the Hmong — as a poppy raising people — have high availability to opium. They also demonstrate the following: relatively brief pre-addictive use (under 6 months on the average, as compared to over a year for other groups); the relatively high doses of opium (as measured by daily cost and initial detoxification doses of methadone).

Groups with high incomes tend to smoke rather than eat opium and to consume high doses of opium. These include the expatriate Asians in Laos and the Hmong. Perhaps one might argue that the ambition and material acquisitiveness of these groups, which are related to cultural norms, might indirectly play a role in predisposing a group to higher doses. However, this argument is more related to psycho-economic relationships rather than to psycho-pharmacological relationships among the various cultural groups.

Comment

Economists, politicians, and others unfamiliar with addicts' behaviour often assume that addicts consume a specific, stable dose of opium over years or decades. This perspective is based on a narrow pharmacological model of addiction, which ascribes most of all of the addiction related phenomena to the drug and its effects on the central nervous system. To be sure, pharmacological effects are major elements in addiction. Stable titer use of opium can and does occur, but it is not the rule. Most addicts are accustomed to varying their own dose over time as a result of fluctuations in their mood, work load, duration of addiction, financial resources and so forth. Sex and possibly age also play a role. Environmental events influencing the supply, the cost of opium are another factor with which addicts much contend. In sum, we must consider not only pharmacological effects in the study of opium use, but also gender, age, life change events, duration of addiction, socio-economic and socio-political factors.

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CONSUMPTION OF ILLICIT OPIATES IN ASIAN COUNTRIES

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To calculate national consumption rates for illicit opiates, one requires valid data on the number of abusers, their average daily dose and any corrective factors such as the percent of time that abusers are active during a given period. To calculate consumption levels for Asian countries, the authors based their review on published international data on the extent of drug abuse for the years 1975-1979. In this paper, data on the extent of opium and heroin abuse for Middle East and Asian countries were selected. The national consumption rates of heroin and opium abusers were then calculated using hypothetical average daily doses for each country.

Because of inherent limitations in the data used in the study, the authors do not consider their calculated rates to describe accurately opium consumption in the countries studied. Rather, they present the paper as an exercise to examine the feasibility and the value of eventually gathering sound international data on illicit opiate consumption.

Methods

The authors reviewed the scientific literature, published reports of international organisations and non-confidential reports of governments available to international organisations on the extent of drug abuse for the years 1975-1979. The most comprehensive source of information was found to be the Annual Reports of Governments to the United Nations on the extent of drug abuse. They are available as published reports of the United Nations Commission on Narcotic Drugs. While only heroin and opium abuse in Asia are examined in the paper, the major drug types and other parts of the world are reviewed in the full study.

Several limitations in the data are briefly noted. The paper refers to numbers of "drug abusers", but there are unfortunately no internationally agreed operational criteria for determining who is and is not a drug abuser. The paper accepted the criteria used by reporting governments, authors of published surveys, etc., and these showed great variability. Abusers therefore include arrested, treated, registered, surveyed or estimated number of users of heroin and opium, but almost always referred to regular or heavy users of these drugs or to individuals who were sufficiently involved in drug use to be arrested, treated, registered etc. They are rarely occasional users.

The data were not comparable across countries and often even within countries. Generally there was little evidence of whether the data had been checked for reliability, validity or duplicate reporting of cases. Finally the authors made no effort to make estimates from the diversity of data available for countries. For the tables in this paper we followed the principle of choosing the most recent number or estimate of drug abusers available for each country unless an earlier rate seemed more reasonable, based upon supporting data.

Calculations for national consumption were made by multiplying the number of opium abusers by two hypothetical average annual doses i.e. 0.333 kg. and 1.0 kg. These would correspond to slightly less than 1.0 and 3.0 g. per day for opium abusers in all countries. For heroin abusers the average annual dose of 16.7 g. and 33.3 g. were used, which correspond to slightly less than 50 mg. per day and 100 mg. per day pure heroin for 365 days.

Results

The data were arranged in Table 1 to show each country with data on opium abusers in the Middle East, Asia and Western Pacific. We see for example, the first country, Afghanistan, has an estimate for 40,000 to 50,000 opium abusers in 1976 for a rate of 2.0 abusers per thousand population. By using the 1 gram per day average dose, we find an estimated annual opium consumption of about 17 tons. If we use the 3 g. per day dose, we find an estimated annual consumption of about 50 tons for the country.

In reviewing the other countries we observe Thailand had the largest estimated number of opium abusers at 400,000 followed next by Iran at 350,000 Pakistan at 100,000, Burma at 94,238, India with 55,000 and Laos with 50,000.

The total number of opium abusers estimated for countries in the table is 1,145,228. At 1 kg. per year dose this would amount to 1.145.2 tons consumed in one year. If we used the 1 g. per day or ⅓ kg. per year dose we would find 381.7 tons opium consumed.

We observed the data for heroin consumption arranged in a similar fashion in Table 2. Only one country reports heroin abuse in the Middle East (i.e. Iran) with 30,000 abusers estimated in 1979 for an annual consumption of 1,000 kg. pure heroin using the 100 mg. per day average dose. Vietnam reported a similar number in 1975. Singapore is next with 29,000 total arrests reported in 1979, Hong Kong and Thailand follow closely with registered and treated cases respectively. The total number of heroin abusers reported from these countries is 144,568 requiring annually a total of 5,278 kg. of heroin at 100 mg. per day and half that amount at 50 mg. per day dose.

Finally we might wish to note that there are about eight times as many opium abusers as there are estimated heroin abusers in these countries, and if the 5,278 kg. heroin consumed were corrected to the amount of opium required to produce it (10 x wt) we find this to be about one twenty-fifth of that required to maintain the opium users.

These figures are complicated however, by the 71,000 opium abusers who are said to be maintained by their governments on licit opium i.e. Bangladesh and India. It might be preferable therefore, to examine the data for illicit abusers only. The total demand for illicit opium production would then be (1,074.228 + 52,780 kg.), about 1,127.0 tons per year or most of the 1.5 to 2 thousand tons sometimes used as the annual world illicit opium production.

Discussion

From this exercise we can conclude that it might be useful to periodically quantify the demand for illicit opiates. The exercise might contribute to a better overall undrstanding of market forces operating within this system. The hypothetical data presented in this paper might suggest for example that much of the illicit opium produced in the Golden Triangle and Golden Cresent is remaining in the region and that the regional demand is sufficient to stimulate high levels of production, even if the developed countries outside the region were dramatically successful in reducing their demand. The inclusion of registered opiate abusers who are maintained on licit opium should also be included in any equation as well, because they represent a significant demand for licit opium. These large populations of licit opium abusers would still represent a significant demand for illicit opiates, if, for example, their government's policy were to terminate their maintenance.

But would the data on the number of abusers in so many countries be adequate for such an exercise on an international scale? The authors, think possibly yes, provided that one could accept data derived from quite disparate systems in the different countries, often with no reliability or validity checks; if one could accept the lack of comparability, the lack of internationally agreed criteria for operational definitions for drug abuser, the

Table 1

EXTENT OF OPIUM ABUSE AND ILLICIT CONSUMPTION

COUNTRY Population	SAMPLE Year, Reference	COMMENTS	RAW OPIUM Number of Abusers	RAW OPIUM No. 1,000	ANNUAL CONSUMPTION in kgs. (licit) 1 g./day ½ kg./day	ANNUAL CONSUMPTION in kgs. (licit) 3 g./day 1 kg./year
MIDDLE EAST						
Afghanistan	Estimated 1976[10]		40,000/ 50,000	/2.5	/16,667	/50,000
Bahrain 259,000	Estimated 1976[6]		200	0.7	67	200
Egypt 37,765,000	Treated 1975[8]		280	.01	93	280
Iran 34,712,000	Estimated 1979[1]		350,000	10.1	116,667	350,000
Pakistan 75,280,000	Estimated 1979[1]		100,000	1.3	33,333	100,000
ASIA AND WESTERN PACIFIC						
Australia 14,062,000						
Bangladesh 74,000,000	Registered 1979[1]	"Quasi Medical Use" Receive govt. opium	16,000	.22	(5,333)	(16,000)
(cont.)						
Brunei 177,000	Estimated 1975[8]		30	.2	10	30
Burma 32,413,000	Estimated 1975[9]		94,238	3.1	31,413	94,238
Hong Kong 4,557,000	Estimated 1979[1]	Addicts	3,480	77	1,160	3,480
India 633,744,000	Registered 1979[1]	Received govt. opium	55,000	.09	(18,333)	(55,000)
Indonesia 139,636,000	Estimated 1976[6]		7,000/ 10,000	.05/ .08	/3,333	/10,000
Japan 114,436,000	Treatment 1978[3]		200	.06	67	200
Laos 3,398,000	Estimated 1976[2]		50,000	14	16,667	50,000
Macau 280,000	Registered 1975[8]		800	3	267	800
Sri Lanka 14,068,000	Estimated 1979[1]		15,000	1.1	5,000	15,000
Thailand 15,814,000	Estimated 1979[1]		400,000	8.7	133,333	400,000
Sub-totals		Licit Illicit			(23,667) 358,077	71,000 1,074,228
TOTAL			1,145,228		381,747	1,145,228

Table 2

EXTENT OF HEROIN ABUSE AND ILLICIT CONSUMPTION

COUNTRY Census	SAMPLE Year, Reference	COMMENTS	HEROIN Number of Abusers	HEROIN No. / 1,000	ANNUAL CONSUMPTION in kgs. (50 mg./day)	ANNUAL CONSUMPTION in kgs. (100 mg./day)
MIDDLE EAST						
Iran 34,712,000	Estimated 1979		30,000	.86	500	1,000
ASIA AND WESTERN PACIFIC						
Burma 32,413,000	Registered 1974[4]		3,000	.09	50	100
Hong Kong 4,557,000	Registered 1979[1]	Addicts	24,360		406	812
Indonesia 139,616,000	Estimated 1976[6]		2,000/ 4,000	.01/	/67	/133
Japan 114,436	Reported 1977[4]		250	.01	4	8
Macau 280,000	Registered 1979[1]	Heroin & Morphine	60	.21	1	2
(cont.)						
Malaysia 12,960,000	Arrests 1978[3]		4,800	.3	80	160
Philippines 43,731,000	Treated 1976[6]		98	.01	1.5	3
Republic of Vietnam 13,666,000	Estimated 1975[2]		30,000	.69	500	1,000
Singapore 8,345,000	Arrests 1979[1]		29,000	12	483	967
Thailand 15,814,000	Treated 1979[1]		19,000	.41	317	633
TOTAL			144,568		2,409 kg.	4,818 kg.

lack of guidelines to help governments makes reasonable national estimates from data on an unknown proportion of the total drug using population. One would have to accept gaps in data for some countries for periods of years or even decades, as a few would inevitably suffer political and other crises. Even if one were to accept these limitations, we doubt, based upon past performance that more than half the countries would report relevent data in any single year so that hypothetical dose and previously reported extent data might have to be used for many countries in order to develop an inclusive picture. We also observe the unmistakable trend of improved data systems in many countries of the region, so that most of the current problems regarding data should ameliorate somewhat with time.

As the UNDND/CND appears to serve as the best overall, channel for international reporting of data on the extent of drug abuse, dose and national consumption data would most logically be directed there. The Commission on Narcotic Drugs would also be the appropriate international body to examine and act on such data.

Whatever would be attempted, however, must not be highly sophisticated as a number of the countries concerned are among the least developed. It would also be advisable to develop and test a relatively simple methodology for arriving at reliable consumption data in at least a few countries where there is interest.

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MONITORING THE ILLEGAL DRUG MARKET - SOME SYSTEMS DESIGN CONSIDERATIONS -

by

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Introduction

The production, marketing, and consumption of illegal drugs constitute an economic system. There are producers, middlemen and consumers. That this market is believed to obey classical economic laws is evidenced by the drug control policies of many governments which are formulated in terms of drug "supply" and "demand" reduction programs.

The nature of the illegal drug market is poorly understood, especially at the retail level. To fill our information gaps a market analysis is needed. If we follow the practices of the business world, this analysis would include information about consumer preferences, consumption levels, elasticity of demand, and so forth. Moreover, the marketing system would be monitored closely to determine short-and long-term trends. In the case of illegal drugs, very little of this sort of information is available.

In a normal commercial enterprise, market analysis and sales monitoring would be done by the producer and/or middlemen for the obvious reason that they wish to increase their sales. Those who wish to *decrease* the sales of a particular commodity should be equally interested in market trends and dynamics. Only when an illegal market is understood can it be controlled.

Our concern in drug abuse control is with minimizing the harmful effects of drug *consumption*. Consumption tends to correlate positively with availability, and availability can be assessed through market analysis. An ability to monitor availability is, in effect, an indirect way to monitor drug consumption trends and the success of efforts to reduce consumption.

Assuming there is agreement about the desirability of monitoring the illegal drug market, the question becomes one of methodology: *how* do we monitor the market? The remainder of this paper will address some methodological issues relating to this question and will outline a possible

model for monitoring retail heroin marketing systems. While heroin marketing is only a limited portion of the total illegal drug economy, it is one that accounts for a substantial portion of the profits in that economy and is directly relevant to the topic of this Workshop. Much of what will be proposed will be relevent to the study of other illegal opiate and non-opiate drug markets.

The Retail Market - What is it?

In attempting to study drug consumption by analyzing retail market trends, we purpose a working definition of the "retail level" of the market. *The retail level of the illegal drug market is the last transaction level before consumption.* In other words, we are studying the market dynamics at the *end* of the distribution system.

Although this definition of retail seems relatively straightforward - the last transaction before consumption - in practice it poses some problems. The objective of studying the true retail level is to know what the actual price paid by the consumer was and to determine what he got for his money. Unfortunately, in the illegal drug marketplace, not all drugs that are consumed are paid for in money. Low-level heroin dealers may, for example, offer an addict six packets for the price of five. The five are for resale by the addict; the sixth is for the addict's own consumption and is the payment for his services as a salesman. A similar phenomenon occurs among hilltribe opium producers. It is not uncommon for addict labourers to be paid in opium, the currency of greatest import to the addict. Thus, in certain instances, the monetarizing of in-kind services provided in payment for drugs may be required. While this poses some quantification problems, it does not invalidate the basic principle that what we want to monitor is the last transaction before consumption.

A Retail Drug Market Monitoring System

To monitor the illegal retail drug market as operationally defined, we need to design a monitoring system. Several features of that system deserve special attention.

First, at the risk of tautology; the system must be *systematic*. Since a major product of the system would be market trend information, the procedures for locating the market, for buying samples, for analyzing them, and for reporting results *must* be done in a consistent manner over time. All necessary developmental work should be done well in advance of system initiation. After the full scale system is initiated, only *necessary* modifications should be made, and these only after a thorough assessment of their impact on the longitudinal integrity of the data base.

Second, before attempting to sample from the market, the major retail marketing centers should be located. For a representative analysis of what is

happening in the market, one must know where the transactions occur. In effect, a sampling frame for quantifying total market activity is needed. It would be misleading, for example, to measure Bangkok vegetable prices by shopping exclusively in large, western-style supermarkets, since the bulk of Bangkok's population shops for vegetables in large, open-air, central markets. The same holds true for the illegal drug marketplace. Before we can sample the market we must know where it is.

There are at least two ways to locate market sites. One is to interview drug abuse patients entering treatment. As long as the interviewer is trusted and is not perceived as trying to obtain information for use in law enforcement activities, patients are often willing to describe the general area in which they buy drugs, the size of the container they usually purchase, and the price they pay. The Bangkok Metropolitan Health Department currently asks this information of the more than 1,000 patients admitted to outpatient detoxification each month. A cursory review of the data suggests that the major heroin marketplaces of the city number no more than 10 to 15. If a monitoring system sampled these marketplaces in direct proportion to their representation in the patient reports, a reasonably accurate picture of the retail heroin market in Bangkok would likely result.

A second method of assessing the market structure is to use field workers who are known to and accepted by the addict community. By using their contacts, they can develop an overall picture of the marketplace and by quantifying the responses of a cross-section of addict contacts, can provide the data needed to construct a sampling frame. This approach obviously has problems of biases that might be introduced by the small sample size involved when a limited number of field workers each contact a limited number of respondents. What this approach would lack in breadth of information, however, it would compensate for in depth.

Best of all would be to combine the two approaches. One could periodically update the sampling frame from treatment data while corroborating and "correcting" it from field interviews.

Purchase of Drug Samples

After locating the market and designing a sampling frame, a systematic program of street drug purchases can be structured. This is the most critical phase in design of the entire monitoring system. Obviously, the necessary legal protections and arrangements need to be made well in advance to insure that the field workers who make the purchases are immune from prosecution if they should inadvertently be present when the police are making arrests. Just as obviously, extremely detailed accounting and vouchering procedures must be used to insure that there is no temptation for the field worker to divert street drug samples out of the monitoring system. For this reason, it would be wise to keep the number of field workers involved in the purchase of drug samples to an essential minimum.

A pre-determined number of samples would be purchased at the retail level according to a plan reflecting the market sampling frame discussed above. If the analysis indicated that 70 percent of the addict respondents bought their drugs in area A, 20 percent in area B, and 5 percent each in areas C and D, then 70 percent of the purchases should be made in A, 20 percent in B, and so on. The objective would be to obtain as random and representative a sample of the retail market as possible.

Purchases would have to be made in retail level quantities. In general, what is purchased will be a quantity which is packaged for consumption, not for further subdivision and resale. Note that further *subdivision and resale*, not simply further *resale* is the criterion. As noted earlier, it is relatively common practice for addicts in some countries to finance part or all of their own consumption by acting as street-level salesmen. They sell consumption-size quantities and are clearly operating at the retail level as defined operationally above.

The rationale for purchasing retail level quantities is two-fold. First our interest is in *consumption-level* market factors. We want to purchase quantities of drug that are commonly consumed. These will allow analysis of the range of opiate purities and the diluent agents to which addicts are commonly exposed. Second, purchase of retail level quantities will allow calculation of estimated opiate consumption levels and unbiased drug cost estimates. There are both public health and epidemiological reasons for monitoring the retail level market.

The number of samples to be purchased is a matter best determined after analysis of volatility in the data base. In general, the number of samples should be large enough to yield a clear understanding of both the *range* in opiate content of retail level samples and the *variability* of such opiate content. A limiting factor in sample acquisition may be the availability of budget funds for the purchase of illegal drugs. In general however, the cost of *retail* level samples should not be a major expense since such samples represent the cheapest *packaged lot* of drug material in the distribution chain (not, of course, the lowest cost per unit of drug).

Data Analysis and Manipulation

Once a representative set of samples has been obtained, they should be analyzed in terms of the objectives outlined earlier – to determine the percent purity of the target drug or drugs in the total sample and to identify harmful diluents that might result in medical emergencies.

Other participants in this Workshop are better qualified to comment on the appropriate methods of pharmacological analysis that might be employed. I will make only two general points. First, the methodology employed should be described clearly so that users of the data will know ex-

actly what they represent. For example, if heroin samples are being analyzed it seems most appropriate to express the percentage purity in terms of the percent of heroin rather than of the morphine base equivalent of that heroin. Second, the analytical technology involved in testing street drug samples can be very sophisticated and any country planning to implement a street drug monitoring system should ensure the long-term availability of appropriate equipment *prior* to initiating the system so that longitudinal trends will not be obscured by system modifications.

The system should have yielded at least the following information about each sample:

- Date and location where purchased
- Total weight of sample
- Percent of target drug or drugs
- Cost of sample
- Specification of diluent agents, their relative quantities, and potential toxicity

These data, by themselves, are not adequate to monitor retail market trends as there are many ways to change the cost and purity of the street level drugs. One is to keep the drug/diluent ratio the same and change the total substance quantity. A second is to change the drug/diluent ratio and hold the total quantity of the substance constant. A third is to change the price of the standard drug/diluent mixture while leaving the product unchanged. Each of these approaches changes the effective price per unit of drug; each introduces bias into the retail-cost analysis unless a standardization procedure is used.

The simplest standardization is to convert to a *cost per unit of pure drug*. It is the *drug* that the user is trying to acquire, not the diluents. It makes sense to factor out the diluent cost by using a standardized calculation to determine cost per mg. or g. pure drug.

Longitudinal Analysis

Data can be grouped into time segments and analyzed longitudinally to assess long-term trends. In studying such trends, the variable of immediate interest is usually some measure of central tendency such as the mean or the median. But longitudinal analysis should not stop there. One should also track some measure of drug *variability* at the retail level.

One can argue that the risk of acute medical emergency from overdose is greater when drug supplies at the retail level are *unstable and highly volatile*. Average tolerance levels among opiate users should correlate with average consumption levels. When these average tolerance levels are relatively low and when the purity of retail level drug supplies is highly volatile, the probability that an individual with low tolerance will encounter a sample of high potency is increased. For this reason, it is useful to monitor retail level drug variability by tracking monthly drug potency ranges and variances. These can be studied in connection with data on drug overdoses (fatal and non-fatal) to assess local relationships between the two and possibly to develop predictive models.

Other Measures of Illegal Drug Availability

Throughout this discussion it has been implied that drug price can be used as an indicator of drug availability. While drug price, after correction to price of pure drug equivalent, may be the most useful and quantifiable measure of drug availability, it is not the *only* measure. Indeed, it can be argued whether it is even theoretically the best measure.

Those of us from the United States have been aware, periodically and painfully since October 1973, that changes in the availability of gasoline have not always been reflected by changes in price. The most critical periods of shortage were best indicated by the presence of long lines of customers awaiting a chance to buy very limited supplies at relatively stable prices. To the customer, the aggravation and hassle of having to search for and wait to buy gas was a greater disincentive to indiscriminate consumption than was the steady inflation of gasoline prices themselves.

In much the same way, increased difficulty in locating constant sources of supply and in buying illegal drugs may be a much greater limitation on actual availability of these drugs than are price changes. The retail market monitoring system might usefully incorporate other measures of the market availability of illegal drugs. For example, when setting out to make a sample purchase, field agents might record the length of time that it takes to make a purchase or the number of attempts or contacts required before a purchase is successfully accomplished. Such measures might provide a rough indication of the changing levels to ease with which one can buy illegal drugs. With increasing field experience, other measures could undoubtedly be identified.

Conversion to Consumption Estimates

With representative prices per pure drug unit available, it is possible to compute estimated drug consumption levels. To do this, however, an additional data set is required.

It is impossible to obtain reliable estimates from addicts about the level of their daily drug consumption. At best, they can tell one how many retail units (bags, straws, tubes, caps, etc.) they consumed, but this does not tell the researcher very much. Somewhat better is information on the amount of money spent on illegal drugs. Usually the question is asked in terms of the average amount spent during the previous week or month. While the responses cannot be taken at face value – they will probably tend to reflect maximum consumption rather than average – any inflationary bias should be reasonably constant over time.

With average daily expenditure data in hand (from treatment program admissions interviews, for example), it is a simple matter to compute average consumption estimates. One simply divides the average daily expenditures by the price per unit of pure drug. The result is the estimated number of pure drug units consumed each day on average. These data can be tracked to determine how addict consumption patterns change in the face of fluctuating prices, increased treatment availability, and so forth.

Conclusion

The retail drug market monitoring system outlined above is relatively simple, but one concluding cautionary note should be sounded. A system to monitor the retail heroin market or any other illegal drug market should not be attempted as a low cost "add on" to systems designed to yield evidence for law enforcement purposes. While such an approach is relatively convenient, it is riddled with practical and theoretical problems, The illegal drug market needs to be monitored on its own for both public health and epidemiological reasons. The system to monitor it should be designed with these ends in mind. It should stand on its own.

ESTIMATING PREVALENCE OF OPIATE ABUSE

by

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There are several methods for estimating the prevalence of opiate abuse: population surveys, registries and indirect estimations.

While the use of population surveys or a complete registry is certainly optimal in terms of scientific criteria of accuracy, these methods cannot always be applied either for economic, technical or political reasons. In addition, a population survey to be useful under-represents the hardcore users and must be repeated to be useful over time. With registries, one somtimes has difficulty estimating the number of individuals who have not been identified.

For these reasons, a variety of indirect estimation procedures have been considered by drug researchers. But indirect estimation methods will be of value only if they meet the following criteria:

Use of available data – It would be an advantage if a method depended on data that are the byproduct of treatment, medical or law enforcement agencies already operating.

Simplicity – The design, data collection procedures and computations required by the method should be simple since methods requiring massive computer files, advanced programme development, and complicated mathematics would not be widely applicable.

Flexibility – An indirect method should have a variety of forms that allow its application to be tailored to specific local conditions.

Confidence interval – The margin of error should be known for any estimate yielded by an indirect method.

Broad applicability – An indirect method should be applicable in a variety of geographical areas and at regular time intervals.

Robustness – It should be possible to demonstrate that minor violations in necessary assumptions do not cause major changes in results.

Accuracy - It must be demonstrated through research that the accuracy of the indirect method is satisfactory for its proposed use. Any method must be *validated* for specific application.

When a variety of indirect methods were evaluated against these criteria, one method was found to stand out in that it met almost all of the seven criteria mentioned above. The *capture-recapture* method (or indicator dilution method) was found to meet the first six criteria and research has been conducted in an attempt to evaluate its accuracy, the seventh criterion. Circumstantial evidence to date (Woodward, Retka & Lin, 1981) indicate a surprising accuracy. It should be stressed that a final validation study must be carried out in a setting where the actual number of abusers is known through another method such as a complete registry. Such a definitive validation has never been carried out, and is seen as a requirement before widespread use of the method can be recommended.

Description of the Capture-Recapture Method

In its general form, the capture-recapture method can be described as follows:

Sample 3

Sample 1 \ Sample 2	captured Sample 2: cap.	captured Sample 2: not cap.
cap.	f_{111}	f_{121}
not cap.	f_{211}	f_{221}

Sample 1 \ Sample 2	captured Sample 2: cap.	captured Sample 2: not cap.
cap	f_{112}	f_{122}
not cap	f_{212}	(f_{222})

In application to opiate abuse, the samples noted in the above figure can be interpreted in different ways. For example, Sample 1 can be interpreted as all opiate abusers entering treatment during a two-month period. Sample 2 can be all opiate abusers entering treatment during a later two-month period, and Sample 3 could refer to opiate abusers entering treatment in a final two-month period. The cross-tabulation of these samplings is shown in the figure. The term f_{111} is the number of abusers seen in all three samples, f_{121} is the number of abusers seen in the first sample, not in the second and then seen again in the third. The other cells in the table are interpreted anlagously. The frequency f_{222} is the number of abusers not seen in any sample. It is enclosed in parentheses to indicate that it is not observed.

Assuming that all samples are dependent, the following simple function of the cell frequences is the maximum likelihood estimator of the total population size (N) of opiate users.

$$= n + \frac{f_{111}\, f_{221}\, f_{122}\, f_{212}}{f_{121}\, f_{211}\, f_{122}}$$

and with a known standard deviation. The term n is the sum of the observed frequencies in the table. Other patterns of dependence among samples also are possible but have different formulae for computing the estimate N.

If independence among samples can be proven in advance, then a simple two-sample design can be used.

Assumptions

It is critical that the assumptions of the method be met, or at least that research demonstrate that the violation of the assumption does not create grossly incorrect results. The following assumptions and requirements are critical.

Closed population - during the period of application it must be assumed that there are not large changes in the size of the population;

Potential for mixture - it must be true that persons seen in the first sample are eligible for readmission into all subsequent samples;

Representativeness of the naturalistic sampling - it must be assumed that all members of the population of abusers have the same probability of entering the samples;

Recognition of readmission - it must be possible to identify the readmission of clients with a high level of accuracy.

Since it is clear that no real world application ever will meet all of these assumptions, it is essential that some kind of validation research be carried out to verify the robustness of the method under local conditions where application is planned.

Conclusion and Recommendations

It is concluded that the capture-recapture method has a number of very desirable characteristics. If the accuracy of the method could be established through a validation study, then it would appear that the method could be tailored to meet the conditions of a variety of Asian nations. It is recommended that a final validation study (or studies) be carried out to establish the accuracy of the method under real-world conditions.

MONEY, MYTHS, AND MODELS: OPIUM, ECONOMICS, AND HISTORY ON THE THAI-BURMA FRONTIER*

by

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In 1977, the Select Committee on Narcotics Abuse and Control of the United States Congress pointed out that the opium trade had two sets of victims: the impoverished farmers at one end of the trade and the heroin addicts at the other. In 1981, nothing has happened to alter this estimate. By any measure, international narcotics control policies have, to date, failed to address effectively the needs of both groups; unfortunately, there is little to indicate that significant inroads will be made in the near future. In part, these failures stem from a reluctance on the part of governmental personnel to recognize that opium production in traditional growing regions is essentially a noxious symptom ancillary to political and economic trauma, rather than a root cause of distress. Much of the difficulty stems from the tendency (understandable in terms of the experience of the U.S.) to emphasize law enforcement approaches to what is, at base, a developmental problem. Police, despite manifold virtues, have not proven themselves to be very successful agents of legal economic development. However, this is not the forum for a detailed critique of international narcotics control strategies; rather, the aim of this paper is to provide an introduction to understanding the role of opium in the highland economy of mainland S.E. Asia, as well as the historical continuities and discontinuities in production and trade patterns. The late 19th and early 20th centuries saw an upsurge in opium production in the Shan States, as well as an increase in the importance of opium as a trade item and currency in the highland trade network that stretched from Southern China across Shan States, Northern Thailand, Laos and Vietnam.

Since 1948, the Shan States of Burma have been the source of the bulk of the world's illicit heroin supply, currently producing between 200 and 600 metric tons of opium per year depending upon weather conditions. The present patterns and distribution of production and trade closely parallel those established in the twenty-five years following British annexation.

* An earlier version of this paper was presented to the NIDA-supported Conference on the Historial Context of Opium Use, June 1 through 5, 1981; Philadelphia, PA, USA.

For the first nearly three thousand years of its domesticated existence, the poppy earned a sedate place for itself as a rather obscure, but highly useful medicinal plant of limited distribution. When the Portugese imported opium from the Coromandel Coast to China, Pegu, and Siam in the sixteenth century, they were still engaged in an essentially medicinal drug trade. Poppy by this time was established as a significant crop in parts of India, but through the first quarter or the eighteenth century, the estimated total imports to China by sea did not exceed 200 cases per year, or about 30,000 pounds (Holmes 1911:130). Some additional opium came overland into the country from Burma, but the amounts involved were probably small.

By 1776, however, the annual export from India reached 1,000 chests, or about 149,300 pounds. In the next decade and a half, the output to China had again increased 500 per cent. During the next three to four decades, the amount imported to China from India again tripled to 2,520,243 pounds per year and grew to 12,911,544 pounds in 1880. (Figures based on Holmes 1911 and Indian Trade statistics).

The Poppy Revolution

The expansion of opium cultivation in China almost kept pace with the expanding market. From a relatively localized crop in the 1730's, poppy spread to virtually every province in China by the end of the next century. Much land that had been under cultivation for food crops was converted to poppy. The regions into which poppy culture expanded as the paramount crop experienced a major agricultural reorientation, not only in terms of the farming techniques peculiar to poppy, but in the organization and scheduling of labour.

The patterns of opium expansion in China coincided with similar trends around the world. Throughout the nineteenth century, opium production was expanded throughout the Middle East. Just as the British needed "opium" as a currency ..... and as an instrument of trade" (Hyde 1973:53) to acquire highly valued Chinese goods, so the Ottomans needed opium as one means of paying for large imports of British piece goods. Virtually all of the opium imported into Britain in nineteenth century — an amount that increased steadily throughout the period — came from Turkey and Persia (Kerner and Parssinen 1976). The nineteenth century produced an agricultural revolution for the Anatolian peasant, the effects of which have influenced the politics and economics of opiates down to the present day. The central government of the Ottoman Empire offered tax benefits, free seed, and planting instruction to induce peasants to expand acreage under poppy and improve output. (Kerner 1978; Poroy 1980). Turkey was not alone in such measures.

The Society of Arts of Great Britain offered cash rewards or medals to those who could grow opium of the highest yield and quality in the United

Kingdom. In 1830, an Edinburgh surgeon managed a yield of 62.87 kg./ha. *The American Journal of Pharmacy* reported in 1961 that "..... the cultivation of the opium poppy for the purpose of obtaining opium, and for its seeds, is now exciting much attention in France ....." (Am. J. of Pharm. 1961 (Vol. 9):52). In 1857, in one department of France alone (La Somme), 12,702 ha. were under poppy, and yielded opium of unusually high morphine content (16-20%) (*ibid.*:52-53). Opium was planted in Vermont, New Jersey, Scotland, Virginia, and Arizona. In Arizona, quite startling yields of 134.78 kg./ha. were reported (cited in Terry and Pellens 1928:2). (By way of contrast, my own field studies of Akha opium production showed an average yield of 3.675 kg./ha. in measured fields).

Many of these early attempts to develop opium as a cash crop failed in the long term. In some areas, such as Mozambique, the reasons were primarily ecological and climatic. In many others, such as England and Austria, the shortage of sufficient cheap labour, coupled with short growing seasons, precluded the successful commercial production of opium, even higher yields than were obtainable with traditional cultivation techniques in the parts of the Near East and Asia where opium was widely produced.

In other areas, however, the nineteenth century expansion of poppy cultivation proved to be extremely successful, and made important contributions to faltering local economies. This was certainly the case in parts of the Balkans where opium, like tobacco, represented a crop particularly well suited to local needs. Moreover, the nineteenth century saw a massive acceleration of the processes by which peripheral agricultural production regions were integrated into the world economy. Fewer and fewer areas remained so remote that some of their products did not find their way into international trade. This produced a transformation in hitherto localized economies, making them increasingly responsive to and reflective of worldwide economic trends. *The Chemical News* (London) of September 1, 1860 carried a "Note on Persian Opium", abridged from a French journal of August of that year:

> Persian opium, which for many years has been but seldom met with in commerce, is now becoming more abundant; it is important therefore to decide on its value as a medicine, and the place which is ought to occupy in therapeutics, as well as the uses which may be made of it in pharmacy.

Such decisions, taking place far removed from the sites of agricultural production, and of which the producers are generally unaware, carry with them major implications for both the economic and social conditions of the producing regions. We can see the effects of similar processes at work on the highland peoples of Southeast Asia today.

During the last century and a half, the highlands of Southeast Asia have seen a massive explosion of poppy cultivation. By the middle of the nineteenth century, Dr. Clement Williams, who resided at the Court of mandalay for the period 1860-1865, cites opium as one of the main trade products between China and Burma. Sir Charles Crossthwaite, Chief Commissioner of Burma for 1887-1890, writes of those years,

> Opium is perhaps as easy, and in Burma as profitable, to smuggle as any article in the world ..... To prevent overland smuggling into Burma would require a very large expenditure and a numerous establishment. (Crossthwaite 1912:12).

The smuggling, to which Sir Charles referred, came from three sources: the Shan States; Yunnan; and Siam and the Straits. The Southern Shan States produced little opium.

> "In 1891 the Superintendent reported that in only 4 out of 16 states visited was opium cultivated, and that in these there was little of it." (Fryer, (Appendix XLI), R.O.C. 1895:500).

> "The small amount of opium produced appears to be consumed entirely in the Southern Shan States, and there is no export to Burma." (*ibid.*:500).

In contrast, the Northern Shan States were major opium producers. Superintendent Daly reported that for 1890-1891, "the quantity of opium produced in Theinni and in the Trans-Salween tracts .... is enormous." (Cited by Fryer, *ibid.*:500). The cost of this opium in the field was between 15 and 20 rupees per viss, or between (approximately) US$4.57 and $6.10 per viss.

Hillier, the Superintendent of the Lashio Experimental Farm, reported that for the harvest season of 1891-1892 in the Maungyon Circle, Kachins and Palaungs grew large amounts of opium. This sold for Rs.14-Rs.16 ($4.27-$4.88) per viss.

In the 1890's, the patterns of opium cultivation showed marked geographical demarcations. West of the Salween River, only small patches of poppy were grown, mostly by Kachin, Paulaung, or Chinese, rather than people who designated themselves as Shan. This opium was for personal use, and was generally consumed within the area. Across the Salween to the East, however, the situation was quite different; opium was the paramount crop grown to be sold. Sir George Scott wrote in 1892,

> East of the Salween in many places nothing but opium grown, and the rice on which the people live is obtained in exchange for it ..... looking at the Trans-Salween country broadly, the area under poppy is equal to that of ..... even rice. (Scott (Appendix XLIV) R.O.C. 1895:523).

Hillier estimated that "at least 75,000 acres must be under poppy per annum" in Kokang Circle (Fryer (Appendix XLI) R.O.C. 1895:500), and Scott noted that while the average price in 1891-1892 was Rs. 10 per viss, the price dropped to Rs. 7 or Rs. 6 at the harvest season. The bulk of this production was transported out of the region, either to China, or to Burma. The "opium industry" was thought by Scott to be "..... not inferior to any other in terms of quantity, and ..... probably first in money value." (Appendix XLIV, R.O.C. 1895:23) throughout the Shan States.

The figures that are available require some interpretation. Hillier's acreage estimates are probably high. Scott estimates the average return per acre at 1 and ⅓ viss, or about 2.6 kg./ha. This is a conservative figure, and although lower than my own yield-average for Akha production (3.675 kg./ha., it is certainly not incommensurate with my own measures for a poor harvest (2.1 kg.ha.). Nevertheless, Shan opium figures for this area today would indicate that perhaps Scott's estimate have been low. However, if we use Scott's yield figure and Hillier's acreage estimate, we get a total production for Kokang of 78.9 metric tons. In 1975, the best Shan estimates placed the production of Kokang at between 80 and 96 metric tons, depending on the year. We know that cultivation increased substantially in the past eighty years, so it appears unlikely that Kokang was producing nearly 79 tons of opium in 1892. Scott's own calculation was that in the 1891-92 season, the Kokang District of North Hsenwi State produced seventeen tons of opium (*ibid.*:523); it is probable that the correct figure is nearer to the lower than the higher estimate.

What is, perhaps, more significant than the increase in production over the years is the continuity of regional specialization. In the nineteenth century, the Wa States and Kokang produced the vast bulk of the opium grown in what is Burma today. This year these same two regions produce about forty-five per cent of the total illicit opium production. In the nineteenth century, Loi Maw was known to be a major opium growing region:

> In Kokang and the Wa States the out-turn (of opium) runs to tons. West of the Salween, Loimaw is the only place where opium is systematically grown for profit. (Scott 1906: 268-269).

At present, the Loi Maw area is still a focal point for both growing and trading activities. By December 1893, Sir George Scott, the Superintendent of the Northern Shan Hills, sent a deposition to the Royal Opium Commission then holding hearings in Rangoon. It concludes:

> "To deprive the Shan and the hill man of opium would be to put him to death. To forbid him to grow the poppy would be to court defiance and revolt."

The same could well be said today.

It is in this century, however, that opium has assumed its preminent importance. Opium is the medium through which the local economies of the upland regions articulate with national and worldwide economic systems. Among the crops grown by hill peoples, only opium has a significant international demand, and only opium is grown in sufficient quantity to influence the world market.

To the growers, opium has both political benefits and costs. On the one hand, it is their primary source of economic leverage vis-a-vis the lowlanders. It is the only crop which gives the mountains a significant comparative advantage over the valleys. Moreover, the involvement of various high level government officials in the opium trade has facilitated the extension of patron-client networks into the hills.

On the other hand, the growing of opium has placed the highland cultivators in a category of defined cultural criminality, making them vulnerable to extortion and reprisal from local authorities. The world narcotics problem has also been used as an excuse to develop plans to exercise greater control over the highland areas, and to seek foreign aid to this end.

The importance of opium in the economic structure of the hill regions, however, extends beyond its preeminent position as an internationally-linked cash-crop commodity. It plays another related, but locally more significant role — that of a trans-ethnic, trans-national consumable currency, acceptable throughout the area.

Consumable currencies have been relatively rare throughout the world, but have included, for example, coca in Peru, salt in New Guinea, grey shirting in 19th Century Brunei and dried fish in 15th Century Iceland, as well as opium in highland Southeast Asia. In China, "the use of salt as money was noted in several districts in Yunnan and Kweichow as late as the seventeenth century" (Yang), and in remote parts of Yunnan, political unreast and the shortage of reliable coinage allowed the use of salt bar money to persist well into the 19th Century.

By their very nature, *consumable currencies* are buffered against substantial inflation by possessing both an expendable use value and a semi-permanent exchange value within a local system. Fernand Braudal (1974:332), however, has pointed out that the fate of local monies "... after the European impact proves identical in every case where it can be investigated — monsterous and catastrophic inflation, caused by an increase in reserves, an accelerated ..... circulation, and a concomitant devaluation in relation to the dominant European money." Opium, as a currency, has obviously not suffered a similar fate.

By the term "currency" (money), I mean that opium functions as a *general* medium of exchange in this region. In this regard, I do not wish to involve myself in the extended (and sometimes tedious), theoretical debate

in anthropology and economics over the nature of 'money', or otherwise. This question has been the subject of exhaustive inquiry, both scholarly and scholastic, elsewhere (for example, Menger 1892; Armstrong 1924; Firth 1929; Einzig 1948; Quiggin 1949; Dalton 1965; Douglas 1967). However, in terms of what Polanyi (1956:264-267) has defined as the three "money uses" which individually and/or collectively define *money* ("payment, standard and exchange"), opium may be seen to be put to two of these uses.

Among both the Akha and the other hill peoples of the region, opium may be used for the settlement of commercial obligations. I specify commercial obligations, because certain ritual obligations may not be settled directly in opium. Among the Akha, for example, the payment of certain traditional fines must be made up of specific combinations of lowland money or silver and livestock; payment in opium is *not* an acceptable substitute. In other cases, however, opium may not be debarred from even ritual payments. In a footnote to his discussion of bride price payments among the Kachin, Leach (1954:151) makes the following observation:

> The agreed bride price for marriage B was 2 cattle, one viss of silver, one viss of opium, 2 guns; actually according to my informant, the whole transaction was carried out in terms of opium.

Opium is utilized as a conversion medium between different spheres of exchange. For example, among the Akha, corn is not regularly exchange for livestock. There is no ritual proscription against such a trade; but while the possibility of such a transaction is comprehensible, its probability is low.

However, while opium is used as a medium of payment and of exchange it is not used as a standard of value. If one asked the value of a large pig in 1968, one would not be told that the pig was worth one viss of opium, although quite possible that was what the owner had paid for it. Instead, the value of the animal would be expressed in terms of Thai baht or silver rupees.

Ideally, any currency should have dependable and stable exchange value, universal acceptance, low energy transfer requirements, no danger of value loss through physical deterioration and be easily divisible. Opium meets most of these requirements, although there are fairly wide fluctuations in the value of the drug. It is acceptable over a wide area of the hills than either Thai, Burmese, or Lao money, and less susceptible to devaluation than the latter two in particular. It has little weight per unit of value, though obviously considerable more than paper currency. It is almost infinitely divisible, and under the proper conditions, probably does not deteriorate significantly after the first month of storage.

This question of deterioration is an interesting one. Generally speaking, among the Akha, 'old' opium (more than a year old) will command a higher price than "new opium at any given time. A similar situation exists among

at least some Yao, and may, in fact, be quite widespread. Old opium is believed to be "better" (i.e., more effective, more potent) than new opium. Western scientific evidence to either support or refute this contention is both meagre and confusing. Abraham and Rae (1923) observed the loss of morphine from powdered opium, through storage. The fact that the opium was powdered is significant however, since the oxidation that they observed is dependent on an abundant air supply. Annett and Singh (1922) showed that while powdered opium lost 3% of its morphine content in four years of storage, moist opium did not show such a loss. Counter-evidence showed that an opium sample checked at monthly intervals for a year demonstrated no loss of morphine, and, moreover, that drying opium at 100 degrees centigrade did not affect the amount of morphine present (Dott 1924).

More recently, Schenk (1970) has pointed out that loss of morphine during opium storage is the result of oxidation by phenoloxidase plus a carrier which bonds the morphine to the oxidation products, thereby rendering it unusable as an analgesic. It is clear, however, that the physical state (powdered or brick) and extent of protection (type of wrapping) of the opium determines the extent of exposure to air, and consequently the rate of morphine oxidation. Furthermore, any morphine loss which occurs, appears to take place within the first month after harvesting.

Harvested opium is carefully wrapped in banana leaves or plastic sheeting as soon as it is collected from the poppy pods. This acts to minimize any possible morphine loss. From the farmers' point of view, however, it preserves the moisture content of the opium, which adds to its weight. This is important, as opium is always exchanged by weight, never by volume.

The problem of liquidity in traditional economies has rarely been examined by anthropologists. In a systematic sense, liquidity may be defined as the total of all assets (accepted as currency) available for exchange at a given moment in time (Muller Personal Communication). Liquidity preference is the degree to which an individual actor prefers to hold general exchange tokens (i.e., currency), rather than restricted exchange tokens (i.e., products, commodities, etc.). Liquid assets allow a maximal range of options; the actor can avoid commitment to an economic strategy which will severely constrain future choices. This desire for freedom of action is most pronounced during those periods when future events appear least predictable.

The need for liquidity does not necessarily imply the need for markets. The highland peoples inhabiting the region from southwestern China, across northern Burma, Thailand, and Laos have, historically, been peripheral to the pattern of rural lowland markets. Yet, the cultural discontinuities between 'hill' and 'valley', swidden and paddi field, tribesman and

peasant, so often noted in Southeast Asia, have never been as sharply contrastive as their symbolic representations. The products of upland economies have always moved into the lowland trade. Trade relationships require the exchange of *both* goods and information across both groups in the region and category boundaries. Traditionally, trade patterns have developed along routes controlled by hill peoples, and this has given various groups (e.g., the Wa) leverage in their dealings with the lowlands. Since control of trade has been a primary political objective of the central states of the region, networks of relationships have had to extend into the highlands, and not merely across them. Similarly, highlanders also projected their influence into the plains through military alliances and trade networks.

Virtually all traditional peasant trading economies or those economies which articulate with trading economies must face the problem of "change-making". Younghusband (1888), in his 1887 expedition through the Trans-Salween Shan States, observed that "In the small villages, where change is scarce, one often would have to pay a rupee for an article which was only valued at two annas, and which the villager would gladly sell at that price, but he has no change, or does not care to part with it." (Younghusband 1888:79).

Any anthropologist who has worked for any length of time in a rural area has confronted much the same problems created by the shortage of 'small money' and the distaste for large bills or their equivalent.

Long distance trade makes 'change' more important. Within the context of a single village, or where trade only takes place within the context of established relationships, there is less need for transactions to be completed at the time an agreement is reached. Debts can be more easily kept track of, and the principles of reciprocity are more strongly adhered to (or felt). Market transactions are generally ephemeral; they must be concluded close to the time that they are initiated. In periods of high political and economic uncertainty, there are great demands placed upon any exchange medium, as more transactions take on the ephemeral quality of the market. In fact, it may be stated as a general principle that the greater the degree of uncertainty, the greater the strain on the liquidity of the system.

The period at the end of World War II in the Thai-Burma region was one of great political and economic uncertainty, and as we have noted, uncertainty in economic terms is a source of preference for liquidity (Schackle 1952:75). Silver was in short supply; other currencies were absent or useless. Abo Aya, an Akha who came to Thailand from northern Kengtung 31 years ago, put it this way: "When we came here, everyone was very poor. We had no rice in Burma. When the fighting stopped, things were still very bad. Many people were sick, and the Djwe ma ('Village Founder') and 'Old Men' decided that we should move the village. Before we moved and after we came to the old Ba Kwe, we grew more opium than before."

In fact, there was a dramatic increase in opium production *throughout* the Burma frontier areas at this time. Although a precise quantitative assessment of this expansion is impossible, it is clear that the amount of land under poppy increased by several orders of magnitude. There were three basic reasons for the increase in opium production during this period:

First, opium had a sure market; both because the spread of dysentery, typhoid, and tuberculosis following the war had created an increased local demand for opium as a medicine; and because Chinese and Indian opium smokers in Burma and Thailand had no other sources for their drug.

Secondly, opium could be used as currency, and, in fact, was the only reliable currency available in many areas. It was widely used during the guerrilla operations against the Japanese, particularly to pay Kachin and other irregulars engaged in OSS and similar British-controlled operations. In the chaos which immediately preceeded and followed the Japanese surrender, a severe liquidity crisis developed in the local economies.

We have noted that there was a shortage of a reliable exchange medium; those currencies which where reliable and acceptable were not available, and those currencies which were available were neither acceptable nor reliable. The liquidity pattern of the local economies had been severely impaired.

The strong desire for wealth that could be carried, further exacerbated this situation. The early post-war years produced massive local population shifts to evade fighting in China and Burma. This was the third stimulus to expanded opium production: opium was easily transportable; it maintained its value, and often was worth more at the destination of the carriers than it was it its point of origin.

The need for liquidity does not imply a need for markets. Historically, the hill peoples have been peripheral to the pattern of markets in rural China, Thailand, Burma and Laos. But, the products of their economies have always moved into the lowland trade. Trade patterns have passed through routes controlled by tribal peoples, and this has given various groups (e.g., Wa) leverage in their dealings with the lowlands.

The extension of the nation-state into the hill regions has reduced this leverage; in general without offering compensatory benefits in terms of either social services or protection. In fairness, however, it must be noted that the presence of national authority has probably diminished levels of violence, but this is not at all sure. The extension of colonial authority in Shan States, for example, took place at a time of inordinate unrest, but it is unclear the extent to which this was characteristic of other periods. On the other hand, it is clear that in Burma and Laos, state authority has been accompanied by extensive military force.

The intrusion of the modern state into the hill areas has had the effect of creating 'minorities', and hence, a 'minority problem'. This has tended towards a process of increasing 'tribalization' with a concomitant hardening of ethnic category boundaries, often imposed from the outside. The process has varied in the different countries of the region, and under the various regimes within them. However, the pattern has considerable consistency.

For the past decade, the terms of trade have been moving against the hill peoples in favour of the lowlands. Hill people have come to depend more and more on products available only through lowland markets (kerosene, clothing, dyes, pharmaceuticals, radios, etc.), while having diminished control over forest products. In contrast to the lowland farmer, the hill farmer cannot readily increase productivity through the use of new technology. Therefore, it has not been possible to increase agricultural yields and incomes to meet these new demands for cash. Moreover, the nature of integration into the national market economy has meant that these market products must be paid for in *cash*, not credit.

Only opium (and to a lesser extent cattle) has acted to redress the balance. Opium is the sole product that has given a comparative advantage to the hills vis-a-vis the lowlands.

To date, the opium economy has provided a livelihood not only to those villages which specialize in opium production, but those who specialize in rice production as well. Any control program which does not take these linkages into account is doomed to failure from the start. Unless we are prepared to take account of the needs of the hill minorities; to give those needs budgetary weight equivalent to enforcement concerns; there is little hope of achieving any real impact, short of unacceptable social cost. The Thai Government has been more forward thinking in this regard than many others. However, resources have been relatively small, and Thailand (as a net importer narcotics) is not really the main source of the problem. International meetings are general occasions for 'viewing with alarm', combined with self-congratulation, and 'facing the future with optimism'. Regrettably, the present 600 ton opium crop in Burma makes the self-congratulation sound hollow and the optimism hard to come by.

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THE ILLICIT SUPPLY OF AND DEMAND FOR OPIATES: THE 10% PHENOMENON

by

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Winston Churchill said, in the context of an attempt to decide policy on the basis of figures, "there are lies, damned lies, and then statistics". There is no better way of describing our present problems in respect of illicit supply of, and demand for, opiates. Data either do not exist or are not used. If in doubt, and we are frequently in doubt, we fall back on a comfortable "10%" - a figure that is seldom challenged. "10%" has acquired a kind of magical quality: "We seized 10% of drugs from the traffic"; "We discover 10% of addicted persons"; and "The National Institute on Drug Abuse estimates that only one in ten heroin users is "addicted"". This is after more than 70 years of international co-operation against illicit supply and the traffic. It is over 600 years since the first recorded drug legislation in Thailand in 1360 and 250 years after the first such legislation in China in 1729 to prohibit illicit supply and demand at the national level; it is 180 years after a first attempt - a decree in China in 1799 - to cope with illicit supply at the international level.

Clausewitz would not have approved: we are trying to conduct a campaign - to fight a war - with no firm base: we have no reliable facts. We are concerned here with the traffic in illicit opiates. The situation is no better so far as other drugs controlled by the Single Covention on Narcotic Drugs, 1961, are concerned.

It is worth noting in passing that the situation is even worse so far as many psychotropic substances are concerned. We at least know, within reasonable limits, the legitimate requirements of the worth community for the (so-called) narcotic drugs. We do not know, within any reasonable limits, the requirements of the world community in respect of many psychotropic substances. The sooner this particular gap can be filled, the happier we shall be, at least so far as the majority of psychotropic substances which now appear in the traffic are concerned. The major sources now appear, at some original stage, to have been legitimate manufacture. The entry into the traffic is by diversion from such manufac-

* The opinions expressed in this presentation are those of the author and should in no way be considered as indicative of any position on the part of the United Nations or of any of its organs.

ture or supply. If we know how much was needed for legal medical and scientific purposes, we might achieve some respite – at least until clandestine manufacture begins to creep up further to meet illicit demand. Meanwhile the urgency of this problem, in addition to so many others in the drug abuse field, may be gauged from the seizures of stimulants in 1979. 700 kilos and 15 million tablets were seized in that year: certainly a very small proportion of the amounts being traded for non-medical purposes. These stimulants alone, however, could have produced approximately 200 million illegal doses.

Reverting to opiates, there will be clear advantages for policy makers at both national and international level if we can determine the likely relationship between overall illicit supply and demand on a world basis. It seems logical to attack this equation first from a regional perspective, although this perspective will not give the true picture even if and when all the answers are available, because inter-regional traffic is now becoming so common. (One trafficker has already been arrested, trying to move heroin from Karachi to Bangkok!).

So far as the illicit supply of opiates is concerned, there are numerous questions to be asked and an equal number of answers to be sought. The first obvious question, especially if one believes in the "supply-side" theory of economics*, is what total area is planted to illicit opium? The answer is that we do not know. A first priority, at national and international level, should be to find out. Technically this is not difficult. It can be done by satellite. It can be done with a number of variations of aerial multi-spectral photography and the application of relatively straightforward computer technology. Results can achieve accuracy to within 5%.

This method must be complemented by selective ground surveys, for the reasons set out below, if the aim is to find out the likely total opium crop.

The total area planted to illicit opium poppy can also be discovered (probably with less accuracy) through labour-intensive and laborious measurement by ground surveys. All methods have been shown to be feasible. The expense varies: the experience of Mexico, Turkey and Australia indicates that over large tracts of difficult country the most reliable technique is overflying and multi-spectral photography.

While technically feasible, this overflying technique can be politically difficult. It is a fact that major areas of illicit opium poppy cultivation, at present, emerge in parts of the Middle East (or South West Asia) and of South East Asia where close administrative control, routine maintenance of public safety and public order, and sometimes even the application of national laws, are inhibited. The reasons for these inhibitions are well known and it is not necessary to describe them. Because they exist, however, the areas concerned are more than usually sensitive. The difficulties of

overflying are often, at least in the initial stages with foreign expertise to train national personnel in the use of unaccustomed equipment, rather difficult to overcome. From the point of view of international drug control it is a sad reflection that it may require the mounting spin-off of instability, crime, lawlessness, and social and economic cost from growing illicit drug traffic to force us to overcome these sensitivities and to seek more accurate knowledge of the real size of the threat facing us in respect of illicit supply of opiates.

Having discovered the extent of illicit cultivation and assuming that detection does not lead to destruction, the next calculation necessary is the amount of opium likely to be produced per unit area. Here some guidelines exist. However, there is variation between regions and countries and considerable differences depending on weather conditions in any growing season. It is possible to reach approximate conclusions, which will suffice for some purposes, without the selective back-up ground surveys mentioned above, but these surveys are essential for accuracy in estimating the total illicit crop.

It is perhaps somewhat easier in parts of South West Asia than it is in South East Asia to work out the parameters within which the illicit opium harvest is likely to fall. In South West Asia we have the advantage of known yields in respect of licit cultivation. There is no reason to believe that "illicit" farmers, under comparable conditions, provide less opium per unit area than their counterparts working legitimately with a Government license, but even under legal circumstances opium yield shows much variation. A conference at New Delhi in 1967 produced the following figures of average opium yield per hectare: India: 33-36 kgs. at 70% consistency; Turkey: 5.9-6.0 kgs.; USSR: 20-30 kgs. with average 25% moisture content; Japan: 20-21 kgs.; Yugoslavia: 4-15 kgs. with 25 to 35% moisture content. (It should be noted that other sources place opium production in Turkey, depending on weather, soil and other variables as capable of ranging from 2 kgs./hectare to 50 kgs./hectare.)

Many of the above countries have now decided to give up opium production. India, however, has remained as the world's only source of licit opium for scientific and medical needs. Here, again, we have reasonable figures on the yield potential per unit area. Reported yields have averaged 24 kgs. per hectare over the last 16 years at 90% consistency. Controlled research indicates that under optimum conditions the yield of *fresh* opium can reach 75.6 kgs. per hectare, with an average out-turn of 50 kgs. In Pakistan some research has been possible into illicit opium yields in Buner – a pilot project area in the North West Frontier Province. This has indicated that in one year – assessed as "normal" – average yield on unirrigated land was 14.9 kgs./hectare; on irrigated land 46.39 kgs./hectare, with an overall average of some 34 kgs./hectare – of unreported consistency. In a later year yields ranged from 7.5 kgs./hectare to 12.7 kgs./hectare – in the same general areas.

So far as other yields from illicit production are concerned, those in Mexico are reported at 7 to 10 kgs. per hectare; in parts of South East Asia the yield is generally estimated at around 9 kgs. per hectare. This seems low compared with figures from South West Asia. The highest yields certainly come from poppy fields which are thickly planted: planting in South East Asia is normally sparse compared with that in Afghanistan or in the North West Frontier Province of Paksitan.

The literature does not abound in accurate figures of illicit opium yield per unit area in South East Asia. In the 1960's researchers reported a range of from 3.19 kgs. to 29.94 kgs. per hectare depending on the season, location and ethnic group cultivating the crop. A limited survey in 1973 reported an average of 4.76 kgs. per hectare in eight disparate villages – with many farmers stating that their 1972 yield was almost twice as good. In 1974, one village, at least, reported average yield of 7.16 kgs./hectare. Averages reported in various additional surveys included: 1966: 8.12 kgs./hectare; 1967: from a low of 5.19 to a high of 10.93 kg./hectare; 1974: 8.96 kg./hectare; 1976: 3.702 kgs./hectare, and 1977: 3.56 kg./hectare. The subject appears to be under-researched.

Having found total areas of production and thereafter the amount of opium likely to be produced, a third variable is the amount of water in the drug. Opium produced for sale to the traffickers and middle men at the "illicit" farmers gate is unlikely to be at the standard 10% moisture content normally used to calculate licit yield. This fact, too, needs to be taken into consideration when trying to work out how much opium is available for conversion into morphine and heroin.

Some experiments in Pakistan a few years ago indicated that the weight immediately after harvesting included at least 50% moisture. Weight loss thereafter may be up to an overall 30% to 40% over a period of three months. By the time the opium has been moved into the hands of the major traffickers and has reached a clandestine laboratory, for instance, it may be down to a 10% moisture content. Thus, one kilo of opium in the fields may weigh no more than 600 grams by the time it has really moved into the traffic. The traffickers themselves naturally prefer to deal in dry opium gum. Thus, the gross weight of opium produced on the farm must be adjusted considerably in order to reach the likely weight of opium reaching either the opium eater or smoker or the clandestine morphine or heroin laboratory.

The next question is the morphine content of the opium which reaches the clandestine laboratory. We tend generally to settle for a comfortable 10%: possibly with more justification than usual. Setting aside factors like deliberate adulteration by farmers or intermediate traffickers (and even they have been known to buy a "look-alike" product that contains no trace of opium), variations in the morphine content can be considerable. The "normal" range appears to be between 6% and 13%, with claims of 14%

being made for opium produced in parts of Badakhshan in Afghanistan. However, in this instance, at least, 10% is a sound working hypothesis.

Another "10%" which is frequently used is, however, far from proven. This is the claim that 10% of illicit opium production is consumed – for therapeutic, quasi-medical or pleasurable purposes – by those who produce it. The literature is, indeed, replete with references to the percentages of segments of various populations which are dependent on opium – Westermeyer's work has been particularly detailed and impressive. On the basis of such work it is possible to speculate that in some parts of some opium-producing and trading societies an average of about 10% of the population may be dependent on opium.

This is a long way from proving the claim that 10% of the opium produced is locally consumed, although this assertion is made with some frequency. One study, for instance, estimated the hill tribe population of Thailand at 350,000; the mean rate of opium dependence was 12%; the daily consumption per head varied between 1.5 and 9.0 grams. Taking a low average of 3 grams per individual opium-dependent per day, the opium consumption would be 42 tons a year. So far, happily, no-one has gone on to draw the conclusion – based on the "10% local consumption" theory, that Thailand produces 420 tons of illicit opium per year.

So much for some of the pit-falls which can entrap those who wish to achieve reasonable statistics on illicit opium production and morphine and heroin manufacture.

Despite these difficulties, it is still desirable to attempt to calculate the amount of illicit opium produced nationally, regionally and internationally so that we may have some idea of the size of the supply problem. Such attempts, because of shortcomings in our basic data, must be largely subjective. There is no doubt that they are frequently erroneous. It is a mistake to accept even the evidence of one's own eyes: areas have been cleared of opium poppy cultivation and everyone sits back satisfied, ignoring the notorious "ballon effect" which switched cultivation to the other side of the mountain. It is clear that one can reduce identified illicit opium cultivation to 10% of its former level and still have just as much morphine, heroin and opium coming out of the same general area; the only possible source is the other side of the same mountain range or the unexamined tops of hills.

These essentially subjective approaches lead, in December 1981, to the following overall picture.

Illicit opium poppy cultivation in Lebanon appears to be negligible and it is claimed that it has been consistently destroyed. The small amount of illicit opium produced in Egypt is consumed within the country. Iran possibly produces sufficient opium for consumption by its estimated 600,000 opium addicts. However, all opium production is now illegal and much has

been seized and a great deal of illicit cultivation destroyed. Afghanistan had an estimated 350 tons of opium production before 1979, but current production is probably down to 200 tons. Pakistan reported a record crop of 800 tons of illicit opium in the 1979 season, but following aggressive enforcement activity, recent illicit production estimates are down to 80 to 120 tons per year. However, there may be residual stock-piles of up to 400 tons. In the "Golden Triangle" area of South East Asia, a 600 ton illicit opium crop has been estimated for 1981. Availability, purity and seizures of illicit opiates from this area are certainly increasing in the region in the region and elsewhere. In Mexico, illicit opium cultivation is now limited to very inaccessible areas.

A total worldwide illicit opium crop approaching 1,600 tons may thus be assumed for 1981. Total illicit opium availability may be higher - at around 2,000 tons, because of the presence of stock-piles along the Afghan/Pakistan frontier. (The same "stock-pile phenomenon" may apply to morphine and heroin along parts of some trafficking routes in the Near and Middle East, but that is another issue.)

Let us now look at this estimate from the point of view of total reported seizures from the illicit traffic. The 1980 seizure figures are the most recent: 52 tons of opium; 1.5 tons of morphine (very roughly equivalent to 15 tons of opium); 2.5 tons of heroin (again very roughly equivalent to 25 tons of opium).

Thus, in 1980, an equivalent of 92 tons of opium was seized from the illicit traffic. If we take the popular attitude that "10% of drugs are seized from the traffic", we reach a total illicit opium availability of 920 tons in 1980. The conclusion must be that either our "10% seizure" assumption is wildly inaccurate or that our assessment of opium availability is unduly pessimistic. (It is true that most estimates of illicit opium availability in 1980 would have placed the figure at about 400 tons lower than in 1981, because of a much smaller crop in the "Golden Triangle". The range would have been between 1,200 and 1,600 tons in that year.

These evident discrepancies should not, however, lead us to decry the value of seizure figures. They are often late; they are probably incomplete; they could certainly be further refined - it would be valuable, for instance, to have more regular accurate data on the purity of seized morphine and heroin. Nevertheless, the seizure figures are the only facts we possess in this field; we should, in the words of the peoples of some parts of Africa "cherish them like a new young wife".

Having spent time casting doubt on the "10% seizure" figure, let us assume, for the sake of argument, that it may be approximately accurate in respect of morphine and heroin. Most drug law enforcement agencies expend more effort against these drugs than against any others - and in

some countries 10% may be a not unrealistic seizure record. Let us also assume (accepting that it is impossible) that the morphine and heroin seized was of 100% purity and that is was converted at a constant 10% from the original opium. This would give us the following over the past few years:

	Combined total of morphine and heroin seized: kgs.	Assumed total unseized: kgs.	Assumed total of opium converted: kgs.
1975	2,187	19,683	218,700
1976	3,281	29,529	328,100
1977	2,941	26,469	294,100
1978	2,962	26,469	296,200
1979	2,674	24,066	267,400
1980	3,998	35,982	399,800

Throughout this period estimated availability of illicit opium was never less than 1,000 tons annually, and frequently higher. If these estimates are accurate, opium abuse in many parts of the world may be much higher than has recently been perceived. Alternatively we are seizing substantially less than 10% of morphine and heroin from the traffic. The latter is probably, and unfortunately, the case. Typical reports include the following statements: "the accused admitted making 16 previous successful journeys with the same quantity of heroin"; "25 grams of heroin were seized, but the person arrested was responsible for smuggling 3 kilos in the last six months". Material of this kind is not in short supply: we often lack the means and resources to use it.

The above and other information which already exists in respect of the illicit drug traffic could certainly be exploited through the use of computer technology to provide more accurate knowledge of the actual size of the problems faced at national, regional and international levels. This would enable us at least to solve a number of unanswered questions, including, for instance, the likely number of opiates addicts in any country - a matter of

some importance to policy-makers. Let us assume, for example, use by a heroin abuser of 35 mg. of pure heroin per day. This has been reasonably researched in the United States and is probably applicable to the new major consumption area represented by much of Western Europe. Let us assume also, although we have seen how dangerous this assumption is, that the heroin seized from the traffic moving to Western Europe in 1980 was indeed 10% of the total being moved in the traffic. 1.2 tons was seized; therefore presumably 10.8 tons was not seized. Much of this was around 75% pure, so perhaps 8 tons of pure heroin, having been heavily adulterated, reached the streets of Western Europe. At an assumed intake of 35 mg. pure heroin a day, this was about enough to keep 700,000 addicts going for much of the year. It would be very difficult to find even half that number from the statistics on drug demand available from Western Europe. Total estimated heroin addicts, reported by Government for 1980, amounted to fewer than 80,000. This might indicate that we do, in fact, identify only 10% of our drug addict population! It would be useful to know which parts of present equations are faulty.

We have mentioned a figure of 35 mgs. of pure heroin per addict per day as a generally accepted result of the United States experience. One should be cautions in pressing an extrapolation from this figure too far in other cultural contexts. Some research in the United States has produced results ranging from 20 mgs. per day for a "small" abuser, through 50 mgs. per day for "medium" intake, to reach a level of 180 mgs. per day. In Thailand research has shown that some addicts may achieve an average intake of 250 to 300 mgs. of heroin per day, at 95% purity.

There are recent indications from Pakistan of an astonishing intake of 1 gram per day by heroin smokers; the purity has not been researched in depth.

There seems less variation in respect of an individual's opium consumption, whether ingested or smoked. In general, an eater will absorb half of the amount of opium burned up by a smoker. So far as individual amounts are concerned, the international community has long settled on an average intake of around 2.5 to 3.0 grams per day for an eater, and countries have in the past based their opium maintenance policies on this assumption, that is on an annual intake of 1 kilo of opium per eater per year. Research, which has been plentiful, appears to support this policy with the proviso that in some cases, at least, an amount of 2.5 grams per day would be over-generous.

Variation in amounts of opium used by smokers are somewhat wider. Past reports from Iran indicated one Misghal (4.7 grams) per day; reports from Pakistan have estimated up to 11 grams per day; studies in Thailand have specified 1.5 to 15.0 grams per day. Once more, the material is available; it needs to be pulled together.

All of these details are interesting, and doubtless useful in dealing with the problems of individual opiate users once they have been identified and persuaded to undergo treatment. They are, however, virtually useless for communities, societies or nations that are trying to prevent or reduce abuse of drugs. They need to be supplemented by accurate estimates of the size of the abuser population. Here, again, "10%" will not do. It is inconceivable that we cannot learn from, and apply, sampling techniques that are now a normal part of legitimate business activity. We hear a great deal about the mobilisation of community resources to counter growing drug abuse. In many countries the business community knows a great deal more about monitoring and even changing public attitudes and opinions that we, as civil servants or academics, are ever likely to learn. This is a vast and underused community resource which should have every interest in countering drug abuse, even for the most selfish motives. If legitimate businesses do not help they will increasingly be confronted with take-over bids from drug traffickers and their financial backers. This phenomenon, at least, is so well-documented that the assertion can be made with absolute certainty.

Thus, the conclusion that may be reached is (in approximately the words of an old English saying) that we know a great deal about individual trees, but we have no clear view of the size or shape of the forest. We know, amongst other things: how much opium is produced per capsule; which method of lancing will produce the most opium; the approximate sources of heroin seized from the traffic; the average amount of opium used daily by Hmong villagers, and a host of other details.

We now need systematically to: gather this knowledge; separate the facts from the hearsay and the myth; research any traditional facts that are needed to complete our knowledge; and then present policy-makers with a firm base on which to plan their drug control strategy. The progression in countering drug abuse does not differ from any other endeavour. First we identify the intial problem; then we attempt a trial solution; thereafter we eliminate errors, and then, on the basis of the resulting situation, identify new problems for solution. In the field of supply of, and demand for, illicit opiates, we have yet to identify satisfactorily the extent of the initial problem.

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