EPIDEMIOLOGY OF SUBSTANCE ABUSE IN INDIA: METHODOLOGICAL ISSUES AND FUTURE PERSPECTIVES

DEBASISH BASU & SURENDRA K. MATTOO

ABSTRACT

Substance abuse is an important medico-social problem. Comprehensive management of substance use disorders is of necessity linked to the study of epidemiology. In India we have a reasonable epidemiological data on substance abuse. However, this data base suffers from a number of methodological lacunae. The present paper discusses these lacunae and makes appropriate recommendations for future generation of epidemiological data on substance abuse in India.

Key words: Substance abuse, epidemiology, prevalence, India

The chequered history of drug abuse in India provides an important example of a developing country's problems and responses. There are certain features which are different from those of the developed western countries, because all the principal drugs of abuse and dependence, including opium, cannabis and alcohol have been used historically (Chopra & Chopra, 1965). Another distinctive feature of drug use in India is its association with social rituals, religious beliefs and socio-economic conditions (Expert Committee on Drug Abuse in India, 1977). The third feature is the rapid change in patterns and trends of drug use with socio-economic and lifestyle changes in both rural and urban India, through the process of westernization (Mohan, 1980).

Epidemiology, the scientific study of extent, distribution and determinants of disease in a defined geographic area, holds the key to documenting, understanding, controlling and finally preventing such diseases of which drug abuse is an important one. The present paper will discuss the methodological issues and formulate future perspectives for epidemiological studies of drug abuse in India. In doing so, more emphasis will be laid on illicit and socially non-sanctioned drugs, since use of various newer drugs like buprenorphine, carisoprodol and codeine-containing cough syrups has recently been documented in drug addicts (Basu et al., 1990; Singh et al., 1992; Sikdar et al., 1993; Mattoo et al., 1997; Mattoo et al., 1999; Sharma & Mattoo, 1999-in press).

HISTORICAL PERSPECTIVE

The intoxicating properties of certain cannabis preparations were known to Indians more than 2000 years ago. The earliest reference to them is in Atharva Veda, a religious text believed to date from 2000-1400 BC. Cannabis in the form of drinks is offered in some Hindu temples. Large quantities of cannabis are consumed in some of the holy cities in India and also used with a degree of limited cultural sanction at festive occasions of Holi and Shivaratri.

Habitual use of opium became popular during the Moghul period. Later, opium-eating replaced smoking as a habit, seen in some parts of the country e.g. U.P., M.P. and Rajasthan (Ganguly et al., 1995). Opium, as a drug, has been a Central Government monopoly since, 1857. India's independence brought total
prohibition of the open sale of opium. Illicit market, however, continued as usual.

Most of the earlier reports on drug abuse have been generally impressionistic and based on indirect data (Overbeck-Wright, 1921; Dhunjibhoy, 1930). For example, Chopra (1940) deduced that one percent of the Indian population was addicted to cannabis. Another study reported 1611 opium smokers from all over the country (Chopra & Chopra, 1965).

The first important epidemiological studies were on general mental illness wherein drug abuse and alcoholism were also reported. A study from Agra (Dube, 1972) found an overall prevalence rate of 2.27 percent and another from West Bengal (Elnagar, 1971) found the rate to be 1.3 percent in a rural population. Both these were household surveys of the entire population.

REVIEW OF EPIDEMIOLOGICAL STUDIES

The majority of the epidemiological studies specifically focusing on drug abuse were conducted in the 1970s especially in the latter half of the decade and some major projects in the late 1980s and early 1990s (Channabasavanna et al., 1990; Singh et al., 1992a & b; Mohan et al., 1993; Mohan and Desai, 1993). The impetus for this was increased awareness about drug abuse at professional, academic and policy-making level, as well as availability of funded projects from sponsoring agencies such as the World Health Organization, the Indian Council of Medical Research, and various ministries of Government of India.

The studies done targeted either the student population (as a particular high-risk priority group) or the non-student youth and general population. Some studies also attempted to find out the prevalence of drug abuse in mentally ill patients. These studies are excellently summarized elsewhere (Channabasavanna, 1989; Ray, 1995a & b) and hence will not be taken up further to avoid duplication. As a summary statement of the general population studies it may be mentioned that the lifetime prevalence of alcohol use (not abuse/dependence) ranges from 34% to 42%, and of other drugs (excluding tobacco) 7-12%; the current (1 month) prevalence of opiate use: 0.7-1.6%, cannabis: 0.4-1.7% and minor tranquilizers: 0.1-0.2% (Country Profile - India, 1998). In contrast, Reddy & Chandrashekhar, (1998) in their meta-analytic review of 13 epidemiological studies concluded the prevalence rates (per thousand) for alcohol and drug addiction to be 7.3 in rural populations and 5.8 in urban populations. However, if one looks carefully into the methodology and main findings of individual studies, one is immediately struck by the large variation in prevalence of drug use. In each of the categories studied, this remarkably wide variation of prevalence of drug abuse can be explained by the following factors:

1. Varying definitions of ‘drug’ and inclusion/exclusion of socioculturally acceptable drugs like tobacco and/or alcohol.
2. Varying definitions of drug use categories e.g., lifetime use, current use, occasional use, regular use, heavy use, ‘ever used’, abuse, etc.
3. Varying definitions of even a particular drug use category, e.g. current use (1 year vs 1 month), abuse, etc. Many studies have not operationally defined their drug use category, making comparability more difficult.
4. Varying level of representativeness of the samples, due to differences in sampling procedures and study designs.
5. Varying sources from which the samples were drawn.
6. Varying methods of data collection, e.g., open-ended interview, structured interview, and self-administered questionnaires, etc.
7. Actual differences in the populations studied with regard to drug abuse extent and patterns.

It is evident from the above that methodological issues and considerations are important in planning a worthwhile epidemiological study not only to make results meaningful and valid but also to guide policy-
makers to formulate effectively interventive and preventive strategies.

METHODOLOGICAL ISSUES

The various methodological aspects of drug abuse epidemiological studies have been discussed earlier (Sundaram, 1981). A number of surveys with excellent methodology on drug abuse epidemiology is available from the developed countries (Abelson et al., 1977; Alemi & Naraghi, 1978; Johnston et al., 1977; Rootman, 1979). Because planners in developing countries like India are becoming increasingly interested in obtaining information on the use of drugs by people, there is a need for a practical methodology that could be adapted to most sociocultural settings and applied at a relatively low cost.

An internationally acceptable methodology would also help in meeting the need of comparability of epidemiological information on drug abuse. Until recent years, it has been the tendency for each investigator to develop and use his own instrument and methods for assessing drug abuse. For this reason alone, it has not been possible to compare results of studies from different countries, and it is rarely possible to compare the results of studies for investigators within the same country. Such comparisons are important for planners and policy-makers, who must examine trends overtime in order to assess the effectiveness of legal, educational, and treatment programmes. Herein lies the relevance of discussing methodological issues. These will now be elaborated under three major headings: sampling considerations, data collection considerations & administrative considerations.

SAMPLING CONSIDERATIONS

Representativeness

The major purpose for drawing a sample is efficiency. If a population is large enough, it is not pragmatic to survey everyone in it. The main task in sampling is to select a group of people who are representative of the total population of interest (the 'universe') in terms of its chief characteristics. Sampling is frequently not well done in drug abuse studies, and more often the procedures used for sample selection are not included in study reports (Smart et al., 1980).

The population of interest

Before a decision can be made as to the design or size of the sample or even as to whether a sampling procedure will be used instead for a total population survey, the population to which the study results are to apply must be precisely defined.

Unless the population is well specified in advance, the sampling scheme, however excellent, might be applied to the wrong population.

Sample size

The size of the sample needed for a drug-use survey depends upon the following factors (Johnston, 1980; Smart et al., 1980):

- the rarity of the characteristic (in this case, the use) being estimated for the population of interest;
- the relative (percentage-wise) or absolute precision desired for the estimate of the characteristic;
- the sub-groups in the population for which separate estimates are required; and
- the comparisons to be made between sub-groups in the population. For most large-scale surveys it is wise to consult a sampling expert or biostatistician for appropriate sample size based upon above consideration.

Types of sampling design

The basic concept underlying all forms of scientific sampling is that of the probability sample, one in which every person in the population of interest has a known probability or chance of being selected for the sample. Random samples represent conceptually the simplest form of probability sample. Each individual in the population has an equal probability of being selected for the sample, usually on the basis of a table of (or computer-
generated) random numbers.

a) Simple random sampling is usually employed only when the population of interest is neither too large nor too heterogeneous. Since simple random sampling requires a complete listing of the population to be sampled, it may be very difficult or expensive to obtain the list for large populations.

b) Stratified random sampling may be used if the population of interest is thought to be heterogeneous with respect to drug use or if special estimates of drug use are to be made for certain subgroups. It is a way of ensuring the representativeness of a heterogenous sample and of increasing the precision of rare estimates. The basis for stratification of the population may vary (e.g. geographical region, school) or may be based upon characteristics of the individuals, such as age, sex, race or socioeconomic status; but each individual in the population must be associated with one and only one stratum. If feasible, this very good sampling design may be adopted for drug abuse epidemiological studies (Varma & Dang, 1979) but it may be technically difficult and resourcewise expensive.

c) Cluster sampling: rather than selecting individuals at random throughout the population, it may be more efficient to select compact clusters of individuals and to survey all individuals making up the cluster. Clusters of individuals may be defined according to their natural groupings, such as a school, a classroom or a factory. It is often operationally more efficient and administratively more convenient for a survey to use such clusters and cluster sampling has been used in a few multicentre studies from India (Mohan, 1981; Mohan et al, 1993).

d) Multi-stage sampling may be used if the population of interest is distributed over a large geographical area such as an entire province or country, because a sample frame is often not available for the total population. It is essentially cluster sampling done in multiple stages, so that progressively smaller subclusters are reached at every stage. This is especially suitable for national-level surveys of drug abuse.

Although all the above methods of probability sampling are more acceptable than non-probability sampling (incidental; purposive; quota; systematic sampling etc.), at times one has to rely on these latter methods only. This is when investigators wish to study special high-risk groups for drug use, e.g. in religious mendicants of India in whom cannabis use is widely prevalent. Surveys are an inefficient method for doing this as so few high-risk people will be found and also characterization of the population is difficult if not impossible. The ways, in such cases, consist of:

- choosing every 3rd, 5th, 10th, or nth person in the available group (i.e. systematic sampling);
- using a "snowball" method, i.e., starting with a few known users and asking them to suggest friends or associates with the desired characteristics;
- starting with a geographic area where the desired group is known to live or which it frequents; after becoming known and trusted, the researchers ask for interviews. This method was used in a study from Chandigarh on drug abuse in rickshaw-pullers and other non-student youth (Varma & Dang, 1980).

In practice, then, the ultimate choice of the sampling design will be governed by the following factors:

- complexity or heterogeneity of the population;
- size of the total population of interest;
- geographical spread of the population;
- available resources to characterise the population on one or more parameters; and last but not the least,
- administrative, fiscal and logistic considerations.

DATA COLLECTION PROCEDURES

Alternative types of data collection procedures

Many studies of general population in drug abuse field have used personal interview, in which an interviewer meets face-to-face with the respondent and asks questions from a
structured interview schedule. The alternatives to the direct personal interview are: a) telephonic interview, which is realistic only in countries or places where widespread and reliable phone systems exist, and b) letting the respondent note down the answers on a structured answer sheet separately, after the questions and possible answers have been read aloud by the interviewer. This allows some degree of privacy and confidentiality. The problems with the interview format of whatever nature or cost, lack of ease on the part of the respondent in facing the interviewer, and socially desirable rather than honest responses.

The other major alternative to interview for data collection is the self-administered questionnaire. The obvious advantages are: it is quite cheap compared to interviews; it requires much less manpower; it can be distributed quickly to large groups of literate persons; and the data it yields may be processed relatively inexpensively and efficiently because the questions asked are usually straightforward and the answers easily interpretable. Further more, refusal and non-completion rates are low compared to household and postal surveys respectively. In fact, many researchers would argue that a self-administered survey is the best way to obtain information about private behaviour because the information may be obtained anonymously.

The major disadvantage is that it requires a literate population for filling up the forms. Picking up only the literate persons in the sample may obviously bias conclusions. Other limitations include considerable technical skills, personnel and equipment required for large-scale studies which may not readily be available in some developing countries. The skills involved are those required for sampling, questionnaire construction, standardization, administration, coding and data analysis. In addition, there are some unsolved problems with reliability and validity of the instruments.

Content
The proper content for both obviously derives from the objectives of the research as well as the types of drug use and social conditions known to exist in the population under study. Certain general components are a section on the socio-demographic characteristics and a section on the respondent's own use of various drugs. In addition to these basic sections, drug use surveys have incorporated a host of other classes of variables, e.g., consequences of drug use; (hypothesized) antecedents of drug use; stated reasons for drug use; attitudes, orientations and belief systems of the respondent; etc. etc.

In these, a clear limitation on content is the total time to take the interview or fill up the questionnaire(s). Thus an investigator must usually be rather selective in choosing additional variables having to do with causes, correlates, and consequences.

The proper development of an interview schedule or questionnaire format takes considerable time and expertise. This is partly true because the exact wording of questions can substantially influence the nature and usefulness of answers. Each question must be examined to determine (a) whether it asks the question one wants to be asking, (b) whether it will elicit answers of a sort that will be most useful.

Pilot study
One of the most important steps in organizing a successful survey is the pilot study. All data collection instruments must be tried out on a small number of subjects of the type to be studied in the actual survey. This allows a testing of the instrument and development of proper response categories.

Administrative Considerations
The various administrative considerations include (Johnston, 1980; Rootman & Hughes, 1980):

- a) The purpose and planning of the research
- b) Possible linkage with survey on other subjects,
- c) Selecting an organisation to conduct the research, and choice of which will depend upon
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effects on respondent cooperation, technical resources and ability to influence existing policy related to drug abuse. Government, semi-government and private organizations, all have their quota of advantages and disadvantages.

d) Sampling resources available.
e) Field staff resources available.
f) Cost estimation.
g) Timetable of study.

All these are important and may often influence the methodological aspects of sampling scheme, data collection and analysis.

FUTURE PERSPECTIVE

The obvious fact that stands out from the review of epidemiological studies on drug abuse conducted in India is the sheer paucity of studies in the current decade. This is all the more surprising because clinical and anecdotal experience have documented a significant change in pattern of drug abuse reported to the drug deaddiction facilities in India. A review paper in 1980 noted that "The last point and one which deserves careful consideration is the absence of large-scale heroin or related substance abuse in India" (Mohan, 1980). The 1980s, however, witnessed a rapid rise in heroin (in its impure form commonly known as "brown sugar" or "smack") addicts presenting at the deaddiction or psychiatry clinics of India (Mohan et al., 1985; Saxena & Mohan, 1984). Towards the late 1980s, buprenorphine, a semisynthetic opioid, became available in India in injectable and sublingual forms. The injectable form soon became a favourite amongst drug abusers (Basu et al., 1990; Chowdhury & Chowdhury, 1990; Singh et al., 1992b; Sharma & Mattoo, 1999-in press). There is now evidence to suggest that codeine-containing cough syrup preparations are commonly being abused lately by young persons, especially students of schools and colleges (Mattoo et al., 1997 & 1999; Wairagkar et al., 1994). This new generation of injectable and other opioid abusers are at a high risk to develop Human Immuno-deficiency Virus (HIV) infection (Malhotra et al., 1993) as well as various potentially fatal complications (Basu et al., 1994).

By all accounts, then, it is imperative to have a current, updated, large, and reliable data base on the drug abuse scenario in India. We thus urgently need to conduct large-scale multicentre epidemiological studies with appropriate design and methodology preferably on a regular periodic basis.

Such studies need to focus on three different kinds of population for different purposes and utilizing different designs and methodology. These are:

1. General population surveys: The purpose here would be to collect current annual (or 6 monthly) prevalence data on drug abuse - its extent and pattern as also possible determinants - using a large, multicentred, single cross-sectional study design. The appropriate sampling scheme should be multistage cluster sampling with additional stratified random sampling in each of the second-stage or third-stage clusters if feasible. The mode of data collection should be personal interview using a structured schedule. The age range of the population should be adolescents, young adults and middle-aged persons (e.g. 14-45 years of age). It is essential to run pilot trials before launching the actual study. Such a scheme would require significant technical and fiscal support, and probably is impossible without central monitoring and coordination.

2. High-risk population surveys: Some of the known high-risk groups consist of the students, the lower socioeconomic people living in adverse environmental circumstances, the mendicants, the prison inmates, factory workers etc. It may be difficult to conduct a strictly randomized sample based study on them. Rather more appropriate techniques would be systematic sampling, purposive sampling or using the "snowball" technique. There is an alternative methodology developed recently, i.e., the Rapid Assessment Survey. In this, qualitative data are obtained from drug users using the "snowball" technique to identify a population. Trained
workers then construct drug use history using ethnographic methods. Another useful strategy may be to oversample some of them - e.g. the student stratum - with the framework of the general population survey mentioned above.

3. Clinical population surveys: Finally, respondents can be recruited from various de-addiction clinics, psychiatric institution, general hospital psychiatric units etc. Such a sample of necessity, cannot be probability-based and cannot be claimed to be representative of the general or even the other high-risk populations mentioned above. The purpose of conducting studies in this population, however, would be quite different. The main purpose here would be to document changes in pattern of drug abuse rather than pattern of drug abuse per se. Necessarily, however these studies have to be either longitudinal (cohort studies) or repeated cross-sectional and the sampling has to be incidental or consecutive. These data although not giving any idea about the true prevalence of drug abuse in the country, can nevertheless document major shifts and differential trends in pattern of drug abuse in the country.

We have reviewed the historical perspective, studies conducted, methodological considerations and future perspectives related to epidemiology of drug abuse in India. In conclusion, it is high time to start proper and large-scale national-level epidemiological studies in India in this important area with proper methodology, central coordination and adequate funding. Never was the time so ripe for this as now.

REFERENCES

Abelson, H.I., Fishburne, P.M. & Cisin, I. (1977) National survey on drug abuse: 1977, a nationwide study of youth, young adults, and older adults (vol.1). Rockville, Md.: National Institute on Drug Abuse.

Alemi, A.A. & Naraghi, M.M. (1978) The iceberg of opium addiction: an epidemiological survey of opium addiction in a rural community. Drug and Alcohol Dependence, 3, 107-112

Basu, D., Malhotra, A. & Varma, V.K., (1990) Buprenorphine dependence: a new addiction in India. Disabilities and Impairments, 3, 142-146.

Basu, D., Mattoo, S.K., Arora, A., Malhotra, A. & Varma, V.K. (1994) Pseudoaneurysms in injecting drug abusers: cases from India. Addiction, 89, 1697-1699.

Channabasavanna, S.M. (1989) Epidemiology of drug abuse in India: an overview. In: Proceedings of the Indo-US Symposium on Alcohol and Drug Abuse (Eds.) Ray, R. & Pickens, R.W., Bangalore: NIMHANS.

Channabasavanna, S.M., Ray, R. & Kaliaperumal, V.G. (1990) Patterns and problems of non-alcoholic drug dependence in Karnataka. Department of Health and Family Welfare, Govt. of Karnataka.

Chopra, R.N. (1940) Use of hemp drugs in India. Indian Medical Gazette, 75, 356-367

Chopra, R.N. & Chopra, I.C. (1965) Drug Addiction with Special Reference to India. New Delhi: Council on Scientific and Industrial Research.

Chowdhury, A.N. & Chowdhury, S. (1990) Buprenorphine abuse: report from India. British Journal of Addiction, 85, 1349-1350.

Country profile India (1998) In: South East Asia Drug Demand Reduction Report (Ed.) Ray, R., New Delhi: UNDCP Regional Office for South Asia, 259-261.

Dhunjibhoy, J.E. (1930) A brief resume on the types of insanity commonly met within India, with a full description of Indian hemp
Insanity peculiar to the country. *Journal of Mental Sciences*, 76, 256-284.

Dube, K.C. (1972) Drug abuse in northern India. Observations concerning the Delhi and Agra regions. *Bulletin Narcotics*, 24, 49-53.

Einagar, M.L., Maitra, P. & Rao, M.N. (1971) Mental health in an Indian rural community. *British Journal of Psychiatry*, 118, 499-503.

Expert committee on Drug abuse in India (1977) Drug Abuse in India. Report of the Committee. New Delhi: Ministry of Health and Family Welfare.

Ganguly, K.K., Sharma, H.K. & Krishnamachari, K.A.V.R. (1995) An ethnographic account of opium consumers of Rajasthan (India) socio-medical perspective. *Addiction*, 90, 9-12.

Johnston, L.D., Bachman, J.G. & O'Malley P.M. (1977) Drug use among American high-school students 1975-1977. Rockville, MD: National Institute on Drug Abuse.

Johnston, L.D. (1980) Review of general population surveys of drug abuse WHO Offset Publication No. 52, Geneva: WHO.

Malhotra, A., Balaji, M., Basu, D., Varma, V.K., Mattoo, S.K. & Sehgal, S. (1993) HIV Screening and risk behaviour in psychoactive substance users. *Indian Journal of Medical Research*, 97(A), 231-233.

Mattoo, S.K., Basu, D., Sharma, A., Balaji, M., & Malhotra, A. (1997) Abuse of codeine-containing cough syrups: a report from India. *Addiction*, 92, 1783-1787.

Mattoo, S.K., Basu, D., Balaji, M., Sharma, A. & Malhotra, A. (1999) Subtypes of codeine cough syrup abusers. *Indian Journal of Medical Sciences*, 53, 97-102.

Mohan, D. (1980) India: Socioeconomic development and changes in drug use. In: *Drug Problems in the Sociocultural Context: A Basis for Policies and Programme Planning* (Eds.) Edwards, G. & Anf, A., Public Health Papers, No. 73. Geneva: World Health Organization, 4.

Mohan, D. (1981) A note on multicentered studies. In: *Current Research in Drug Abuse in India* (Eds.) Mohan, D., Sethi, H.S. & Tongue, E., New Delhi: D. Mohan & H.S. Sethi, 1-4.

Mohan, D., Sethi, H.S. & Tongue, E. (1985) Current research in drug abuse in India, Series 11. New Delhi: Jay Pee Brothers.

Mohan, D. & Desai, N.G. (1993) A survey on drug dependence in the community, urban megapolis Delhi. Report submitted to the Indian Council of Medical Research.

Mohan, D., Ray, R., Sharma, H.K., Desai, N.G., Tripathi, B.M., Purohit, D.R., Sharma, D.K., Sethi, B.B., Sitholey, P. & Tewary, S.C. (1993) Collaborative study on narcotic drugs and psychotropic substances. Report submitted to the Indian Council of Medical Research.

Overbeck-Wright, A.W. & Co. (1921) Lunacy in India. London: Balliere Tindall.

Ray, R. (1998a) Current extent and pattern of drug abuse. In: *South East Asia Drug Demand Reduction Report* (Ed.) Ray, R., New Delhi: UNDCP Regional Office for South Asia, 6-36.

Ray, R. (1998b) Earlier era. In: *South East Asia Drug Demand Reduction Report* (Ed.) Ray, R., New Delhi: UNDCP Regional Office for South Asia, 38-55.

Reddy, M.V. & Chandrashekhar, C.R. (1998) Prevalence of mental and behavioural
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Disorders in India: a meta-analysis. Indian Journal of Psychiatry, 40, 149-157.

Rootman, I. (1979) Recent trends in cannabis use in Canada. Drug and Alcohol Dependence, 4, 425-434.

Rootman, I. & Hughes, P.H. (1980) Drug-abuse reporting systems. WHO Offset Publication No. 55, Geneva: WHO.

Saxena, S. & Mohan, D. (1984) Rapid increase of heroin dependence in Delhi: some initial observations. Indian Journal of Psychiatry, 26, 41-45.

Sharma, Y. & Mattoo, S.K. (1999) Buprenorphine abuse in India: an update. Indian Journal of Psychiatry, 41, 2, 154-159.

Sikdar, S., Basu, D., Mathotra, A., Varma, V. & Mattoo S.K. (1993) Carisoprodol abuse: cases from India. Acta Psychiatric Scandinavica, 88, 302-303.

Singh, A.D., Kaul, R.K., Sharma, S.G., Singh, M.A., Singh, K.C., Singh, Y.M., Singh, T.B., Singh, R.K.H. Singh, N.T., Singh, N.H., Singh, E.Y. & Singh, R.K.N. (1992) Survey of drug abuse in Manipur state. Report submitted to the Department of Science, Technology and Environment, Govt. of Manipur.

Singh, R.A., Mattoo, S.K., Malhotra, A. & Varma, V.K. (1992) Cases of buprenorphine dependence from India. Acta Psychiatric Scandinavica, 86, 46-48.

Smart, R.G., Hughes, P.H. & Johnston, L.D. (1980) A methodology for student drug-use surveys. WHO Offset Publication No. 50, Geneva: WHO.

Sundaram, K.R. (1981) Epidemiological techniques in drug abuse. In: Current Research in Drug Abuse in India (Eds.) Mohan, D., Sethi, H.S. & Tongue, E., New Delhi: D Mohan & H.S. Sethi, 8-17.

Varma, V.K. & Dang, R. (1979) Non-medical use of drugs among school and college students. Indian Journal of Psychiatry, 21, 228-234.

Varma, V.K. & Dang, R. (1980) Non-medical drug use amongst non-student youth in India. Drug and Alcohol Dependence, 5, 457-465.

Wairagkar, N.S., Das, J., Kumar, S., Mahanta, J., Satyanarayana, K., Phukan, P.K., Chetia, M. & Goswami, S.K. (1994) Codeine containing cough syrup addiction in Assam and Nagaland. Indian Journal of Psychiatry, 36, 129-132.

DEBASISH BASU*, MD, DNB, Assistant Professor, SURENDRA K. MATTOO, Associate Professor, Drug De-addiction & Treatment Centre, Department of Psychiatry, Postgraduate Institute of Medical Education and Research, Chandigarh-160 012.

*Correspondence