CHAPTER 5

GENERAL POPULATION SURVEYS OF DRUG ABUSE[1]

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CONTENTS

1. Introduction

1.1 Background

The population-based survey has been one of the major tools adopted to provide epidemiological information on the use of a wide range of drugs, both licit and illicit (Johnston, 1980, 1989; United Nations Division of Narcotic Drugs [UNDND], 1980) . As the drug epidemic of the last twenty-five years spread around the world, so did many of the epidemiological tools used for understanding it. Surveys dealing with drug use have probably been conducted in most countries of the world; unfortunately the methods of measurement were almost as varied as the populations under study. During the early 1980's WHO and the UN Division of Narcotic Drugs started to develop standardised measures for drug surveys. Since then, considerably more standardisation has emerged so that more findings can be compared and integrated between countries.

There has also been some movement away from surveys of "populations of convenience" (for example, a particular school, college, or village) toward representative samples of major segments of the population. A number of countries have completed at least one nationally representative drug survey of the general population (e.g., Canada, Colombia, Germany, Greece, Ecuador, Jamaica, Mexico, the Netherlands and Sweden) while at least one country has had a long series of such surveys (the United States, beginning in 1971). Representative surveys of countries' urban population have been conducted in the Dominican Republic, Panama, Paraguay, Peru, and Haiti.

There have also been a number of sample surveys of student populations. Representative national surveys of secondary school students have been conducted in Greece, Jamaica, the Netherlands, Peru, the Philippines, and Thailand, while other countries have conducted representative surveys of particular provinces and departments (e.g., Australia, Canada, France, and Mexico). Ongoing national student surveys have been conducted annually in Sweden since 1971 and the United States since 1975. Regular school surveys are also conducted in Belgium, Finland, Greece, The Netherlands, Spain and the United Kingdom.

1.2 Objectives

In this chapter we will review the purposes which can be served with general population surveys, the administrative considerations which should be taken into account in planning such surveys, the methodological issues which need to be considered and addressed, and the cost and benefit considerations which should be taken into account before embarking on such an undertaking.

Within an entire population, whether geographically or politically defined, there are many special populations, therefore a subsequent chapter (chapter 7) is devoted entirely to the subject of surveying special populations. The present chapter will concentrate on survey studies of the general population, although many of the methods and issues discussed here also

apply to studies of special populations, particularly when representative sampling is used. This chapter draws heavily on WHO Offset Publication No. 52, Review of General Populations Surveys of Drug Abuse (Johnston, 1980), which in turn drew upon the experiences of a group of collaborating investigators from eleven countries, all of whom were working in the substance abuse field. The insights offered here are based on a range of experiences in both developed and developing countries.

1.3 Definition of general population survey

Since the main focus of this chapter is the general population survey of drug use and abuse, it seems appropriate at the outset to define these terms. To "survey" is to collect data from or about a number of elements; in this case the elements are the people who comprise some general population. A "general population" refers to the people who inhabit some given area, usually defined in terms of political or geographic boundaries. The area may be quite small in size and population, for example, a village of a hundred people, or quite large, that is, a nation of millions of people.

While a survey may gather data about inhabitants of all ages, the age range may also be restricted for either practical or theoretical reasons. When data are gathered directly from the inhabitants about themselves (as in an interview study) there is usually some lower age limit placed on eligible respondents. Thus, most general population surveys of drug use omit children under a certain age (e.g. 12 years). However, if drug use were considered a problem at lower ages, there is no reason to omit younger children from the domain of individuals about whom data are to be gathered.

Sometimes certain other relatively small segments of the population also are omitted from a survey, often for pragmatic reasons. For example, household surveys usually omit people living in institutions (college dormitories, military camps, jails, hospitals) and people without a regular place of residence (street children, the homeless, etc.). When such groups are omitted, it is important to remember that the results of the survey cannot be generalised to them. While most surveys involve respondents reporting in personal interviews about their own drug use and attitudes, it is also possible to have one respondent provide information on other people; for example, to have one member of the household report on all others in that household. It should be noted that it is possible that there may be some error in reporting if this method is used, therefore, it should be carefully tested in the study population.

The majority of surveys, especially those involving large populations, use a scientifically selected sample of respondents from which generalisations may be made about the larger population from which the sample was drawn. (The larger population we refer to as the "universe"). However, in relatively small populations, where a survey of the entire population may be technically and economically feasible, all eligible respondents may be included in the survey.

A general population survey, then, involves the collection of data which characterises all, or nearly all, people residing in a given area (e.g., village, city, state, country); those data are collected either from all people, or from a representative sample of all people, residing in that area. The data are usually collected by means of a personal interview administered on site, although they could be gathered by self-administered questionnaires, by telephone interviews, or even by mail. The data the respondents provide may be descriptive of themselves and/ or other people in that same population.

In contrast to the general population survey, the "special population survey" focuses on some special subgroup within the general population, often a group defined in terms of its membership in, or contact with, some social institution, although they are sometimes defined in other ways such as by their behaviour (intravenous drug users, the chronic users of a particular drug) or current state (e.g. pregnant). In the drug field, special populations which have received the most systematic study are secondary school students, college students, members of the military forces, drug treatment clientele, and prison populations. By definition, special population surveys miss major segments of the general population, even major segments of the same age groups, e.g., youth not in school or young adults not in military service. The universe from which the sample is drawn, and to which the results can be generalised, is thus restricted to the special population, however it is defined. Special population surveys have been popular for at least two reasons: they may focus on a segment of the population of particular concern (e.g., youth) or importance to the nation (e.g., secondary students or college students), and they may provide the only survey alternative which is economically and technically feasible, particularly for a repeated set of studies (e.g., school surveys).

2. The Value of General Population Surveys

Why is there a need for population surveys of drug abuse? Often government officials and other policy-makers want information which such surveys can provide, or at least they think they can provide. They want to know how many people use some drugs or are dependent on them. They want to know what kinds of people are using drugs. They want to know if there is a problem, or if the problem is getting worse, or if there is a need for new laws, or more treatment programs, or prevention programs, or more strict enforcement of the law. If one of these interventions has been implemented, they may want to know if it worked. These kinds of questions often provide the impetus for such surveys.

The capacity of surveys to answer these questions will be discussed below. Two survey designs will be distinguished here, since their purposes tend to be somewhat different: the single cross-sectional survey and the repeated cross-sectional survey.

2.1 Uses for the single cross-sectional survey

The single cross-sectional survey provides descriptive information about a population

at a given point in time. Usually the data from all respondents are gathered within a relatively short interval from a historical perspective (perhaps three months) and the results of the survey provide a kind of "snapshot" of things as they are at that point in history. Of course, insofar as respondents are able to provide retrospective information about their behaviours, attitudes, etc., in years past, it is also possible to reconstruct characteristics of the population for earlier times (for example, see Johnston, Bachman and O'Malley, 1994). If people can recall in which past years they used a particular drug, for instance, one can reconstruct a general population prevalence rate for that drug for those earlier years. For the most part, however, the emphasis of the single cross-sectional survey is on things as they are now. What, then, are the uses of such a survey design?

2.1.1 Problem identification and quantification

One of the most important uses of single cross-sectional surveys is to identify the existence (or demonstrate the non-existence) of a drug problem in the population. Through survey techniques it not only is possible to determine how large are the numbers of present (and past) users, but also to examine the intensity of their drug use and to measure the extent to which their use seems to be associated with impaired health, impaired social functioning, or antisocial behaviour. Just knowing the magnitude of the potential problem is often very useful to determining whether social interventions (treatment, prevention, media campaigns, legislation, etc.) should be considered and, if so, what level of resources might be considered appropriate.

If a problem, which would otherwise be presumed to exist, is deemed not to exist, then resources which might otherwise have been addressed to it can be more fruitfully allocated elsewhere. If a problem is found to exist, the need to determine how localised it is, and to develop a clearer understanding of the dynamics of the problem before meaningful intervention can be mounted still remains. From these needs derive the next two purposes of such surveys.

2.1.2 Characterisation of the users and abusers

To the extent that problem drug-using behaviour can be localised to certain subgroups in the population, the consumer of the survey results not only gains the ability to target intervention efforts (say on adolescents not in school, if they turned out to be the most frequent abusers) but also to begin understanding the dynamics as well. Many studies have shown major differences in drug abuse associated with such factors as age, sex, social class, region of the country, type of community (e.g., urban-rural), general health, and migratory experience.

Within the same populations different types of drugs may be abused by different segments of the population because of differences in accessibility, differences in the costs of the drugs, social acceptability among peers, and so on. Even legal access to abusable drugs, like tranquillisers, may be identified as a problem.

Since drugs sometimes are used in different degrees for different purposes, it may be the case that use is found among many groups but that intensive use, presumably the most destructive type is relatively concentrated in some small segment of the population. In Mexico, for example, Leal and colleagues (1978) found inhalant abuse to be particularly concentrated among the children who live on the streets of the large cities. Unfortunately, while this example illustrates how drug use may be concentrated in a subgroup, that particular subgroup happens to comprise a segment of the population which would be omitted in a normal household sample survey, since many of those youngsters have no permanent place of residence. Perhaps a more apt example comes from a rural survey in India which distinguished two types of opium users, those who used only during the harvest season each year and then went through withdrawal and those who were habitual users year-round. Presumably the reasons for use by these two groups are different and the nature of any intervention aimed at changing their behaviour would have to take that fact into account.

2.1.3 Assessment of possible causes and consequences

In addition to quantifying and characterising users of various drugs in the population, policy-makers also want to know the extent of deleterious effects on users themselves, and on the larger society, the various types of drug use may have. For the most part, a single cross-sectional survey only permits establishment of the degree of correlation between two factors, for example between opium use and health. When no association is found between the use of a drug and some other state or behaviour, it seems rather unlikely that the drug use causes that state or behaviour. Thus, if opium smokers are found to be fully as healthy and hard-working as similar respondents who do not use opium, it would appear that in this population opium use does not affect health or work performance; that may be a very useful piece of information. Conversely, if opium smoking is found to be associated with poor health and lack of productivity, and there are a substantial number of opium smokers in the population, there seems good reason for official concern.

However, it must be remembered that the existence of an association does not there is a causal connection. For example, in their early study of tribal villages in Thailand, Suwanwela and his colleagues (1978) found that opium smokers generally had a number of physical ailments. They also found that a number of the opium addicts claimed that they initially developed an opium habit because they had physical ailments, i.e., they were self-medicating themselves. Poor health may actually have caused the opium smoking, rather than vice versa (although opium smoking may very well have led to a further deterioration of health); and, therefore, the most effective means of improving health and reducing opium addiction in this particular population might be to provide medication and treatment techniques for the physical ailments. In sum, a single cross-sectional survey may permit ruling out some factors as possible causes or consequences of drug use by showing an absence of any correlation, although this does not provide conclusive proof. However, such a survey usually does not allow the determination of causation from the existence of a correlation, partly because the temporal sequence of events remains to be determined.

Before leaving this subject, it should be mentioned that a survey can gather information on some factors which readily can be presumed to contribute to drug use factors such as availability, direct exposure to use, perceived social norms regarding use, and the respondent's own attitudes and beliefs regarding various drugs. While the addition of such topics proliferates the number of questions which must be asked in the survey, the results can often be very informative and helpful in the formulation of social policy. It is also possible to ask subjects or people close to the subjects what they think the causes and consequences of their drug-taking (or abstention) are, rather than deducing the answers from statistical analysis (e.g., Johnston and O'Malley, 1986). While respondents may not be aware of some reasons and/ or consequences, and be mistaken about others, they may provide helpful insights into these issues.

2.2 Uses for repeated cross-sectional surveys

Because a single survey provides an assessment of conditions at one point in history, it follows that subsequent surveys can provide assessments of conditions at later points; from the results of those surveys in combination, the nature of the changes taking place in the interim may be inferred. Obviously, if the overall purpose of repeated surveys is to assess change, then it is important that they reflect only real change, not changes due to artefacts in the methods of sampling or measurement. Thus, if a repeated cross-sectional survey approach is chosen, it is vital that those designing the second and subsequent surveys match the methodology of the earlier survey(s) as closely as possible. That means matching the definition of the population under study, matching the design and procedures for drawing the sample, matching the field procedures used to collect the data, matching the questionnaire design and question wording, and matching the procedures for cleaning and tabulating the data. To the extent that any of these aspects are not duplicated, the comparability of the data gathered will be diminished.

To date there are relatively few repeated-survey designs in the drug field. One is the ongoing series of surveys of school children in Sweden (Swedish Council on Alcohol and other drugs (CAN), 1994), while there are two other large ones in the United States: The Monitoring the Future surveys of secondary school students (8th, 10th, and 12th grade), colleges students, and young adults (Johnston, O'Malley, and Bachman, 1996); and the National Household Surveys of Drug Abuse (SAMHSA, 1997). In Canada, the Addiction Research Foundation in Toronto has conducted surveys of adults and of students (Adlaf, Smart, & Canale, 1991; Adlaf, Smart, & Walsh, 1993).

It should be remembered that, even if the sponsoring agency or investigator of a cross-sectional survey does not plan any repetitions at the time of the first survey, at a later date an interest may well emerge regarding the degree to which conditions have changed. For that reason, all of the features of the methodology should be accurately and completely documented at the time of the first survey so that accurate replication will be possible at a later time.

2.2.1 Assessing the direction and rate of change in drug use

Presumably one of the most important questions addressed in all surveys subsequent to the first one is whether various types of drug use have changed and, if so, in what direction and at what speed. As discussed at length in section 4, if sampling has been used in the surveys, allowances have to be made in the estimates of drug use from each survey for the possibility that those estimates contain some sampling error. Some portion of the change or difference in drug use between two points in time may also be an artefact of sampling error, however quantified estimates can be made of the possible role of sampling error. If the observed changes in use are large enough and the samples are of reasonable size, there will be little doubt that the changes are real. Further, to the extent that a consistent trend shows up across three or more successive surveys of the same population, one is particularly assured that a real trend is being detected.

Insofar as change in use can be measured and reported, then, those who use the surveys will be able to detect the emergence of new drug problems as well as to detect the worsening or amelioration of existing problems. For example, repeated surveys by Johnston, Bachman, and O'Malley (1977, 1979a, 1979b), detected the rapid emergence of daily marihuana use among late adolescents in the United States. They were able to demonstrate that such use had nearly doubled in the three-year period 1975 to 1978 (going from 6 percent to 11 percent), focusing considerable attention by policy makers and the public on this potentially worrisome problem. In subsequent years, daily use fell dramatically as marijuana came to be seen as dangerous and as peer disapproval grew (Bachman et al., 1981; Johnston, 1981, 1985a; Johnston et al., 1996).

2.2.2 Changes in the characteristics of users

Just as overall usage levels may change, so may the characteristics of the groups using various drugs, and the reasons for their use. Tracking such changes provides the government agencies and other institutions dealing with drug use the information necessary to focus their efforts on the changing segments of the population in need of attention. Of course, there may be other information systems (such as reports from treatment agencies, courts, or youth agencies) which can provide the same information and perhaps provide it faster; but to the extent that a shift in the user groups is taking place in a way which has not yet brought it to the attention of social agencies, the repeated survey technique can prove helpful in detecting and quantifying that shift.

2.2.3 Changes in contributing factors

Not only is it useful to policy-makers to know whether use of various drugs has been changing but also to know something about which factors are likely to influence those changes. While surveys have clear limitations in their ability to measure contributory factors, there are some, already discussed above under 2.1.3, which can be monitored. For example, any of the following might explain a change in the drug using behaviour of the population:

increased availability of the drug, heightened familiarity with a drug, increased exposure to use or users, less social stigmatisation or legal sanctioning for use, less fear of harmful consequences to the user's physical or mental health, or increased belief in the possible benefits of use). By using the same questions dealing with these subjects in the sequential surveys, it is possible to determine whether such factors have been changing and, therefore, may account for observed changes in actual use. Again, it is difficult to separate cause and effect here, since increased use may actually be what caused, say, decreased social stigmatisation or greater familiarity with the drug; or more complex yet, the causation may go in both directions. But such information can be very helpful in painting a more complete and detailed picture of the change which is taking place.

2.2.4 Impact of planned interventions or historical events

Any monitoring system which continuously takes measurements on some dimension like drug use has the capacity to show the status of conditions before and after some event which has a potential impact on a population. For instance, the repeated survey design might intentionally be used to measure drug use before and after some planned intervention for example, a change in drug laws, increased police enforcement, new treatment programs, a concerted media or school-based prevention effort to provide data on that intervention's effectiveness. This, of course, requires some prior planning and lead-time in relation to the intervention effort, which often proves easier to accomplish in principle than in practice. Nevertheless, the very real potential is there. It may be more likely that a survey series is already in place when some planned or unplanned event or program happens, let us say a change in the laws regarding the use of a drug and the surveys serendipitously provide "before" and "after" measures for assessing the impact.

This type of information can be very valuable to policy-makers, for obvious reasons. An intervention may be found to have no effect, or to have compounded the previous problem in which case it might be dropped. Or it may prove an unqualified success in one population perhaps in one city or region and thus be considered for application in others. It might prove successful in abating drug use among some subgroups but not seem to address the problems of others. All such findings can be instructive for future policy decisions.

One cautionary note must be sounded. As with any experiment in which the effect of some event or intervention is to be assessed, some indication is needed of what would have happened in the absence of that event or intervention. This is the obvious logic for having a control group in planned experiments. In the real world, creating such control groups may prove difficult or impossible; thus one must seek reasonable ways to make inferences about what would have happened in the absence of the intervention. Different approaches exist (e.g., Campbell and Stanley, 1964; Cook, 1979), which are too lengthy to be described here. However, a few points may be worth mentioning.

First, if drug use has been rather stable in a population for some time and then a change in use occurs in close time proximity to the intervention, it seems more likely that the

change could be attributed to the intervention than if drug use was already in a state of flux. Similarly, if little else is changing which might also cause a change in drug use around the time of the intervention, there is less possibility that an observed change in use may be due to other factors. Second, if the intervention only affects one city or region in a country for example a change in a region law then perhaps other regions with similar populations and histories of drug use can be used as rough control groups to assess what would have happened in the regions undergoing legal changes had those changes not been instituted (O'Malley and Wagenaar, 1991). Third, if an intervention like changing the law appeared to have similar results in different populations under different historical circumstances, the ability to attribute those results to the intervention is increased substantially.

3. Administrative Considerations for the Planning of Drug Abuse Surveys

Some of the problems to be encountered in general population drug abuse surveys vary from country to country, depending on a variety of factors such as the existence and accessibility of accurate census data for sampling, the availability of experienced survey research organisations to conduct the survey, the literacy of the population, their familiarity with surveys, their distrust of strangers or outsiders, the legal and social status of drug use in the community, and so on. In this section and in Section 4, the major elements involved in planning and conducting a general population survey are described and discussed individually. Part of the material that will be presented is basic information about survey research methodology information which should be known to anyone planning to conduct a survey in any subject area. The other part derives from knowledge gained by investigators in the drug field who have specifically addressed survey research methodology to general population studies of drug abuse. The policy-maker who must decide whether or not to launch such a study should have a general familiarity with the technical issues involved here, while those actually conducting such a survey should be familiar with these technical issues at a more detailed level.

3.1 The purposes and planning of the research

An important requirement for any good research undertaking is that the sponsors and investigators have in mind the purposes they wish to accomplish before making specific decisions about research design and procedures. Most of the studies in the drug field were conducted with international or government sponsorship and for a number, a detailed research proposal had to be submitted before funding was approved. Such a procedure has the clear advantage that the objectives and rationale for the study must be spelled out in writing, and the proposed research design's appropriateness for accomplishing those objectives must be demonstrated convincingly. With or without the mechanism of a formal proposal, however, a detailed listing of the objectives in advance of the research can prove highly valuable. Among other things it provides an opportunity for the interested parties to discuss how realistic and attainable some of the objectives they may have in mind are, and whether the survey being planned has a reasonable chance of accomplishing them.

Having the objectives in mind before designing the study also will influence a number of subsequent decisions about design. Whether to draw a sample, how large a sample to draw, whether to disproportionately sample certain subgroups of particular interest in the population, whether to go into drug usage experiences in depth all of these are decisions which will be affected by the purposes of the study.

3.2 Possible linkage with surveys on other subjects

One important early decision to be made in the planning phase concerns whether to conduct a survey totally addressed to drug abuse or whether to combine a drug portion with portions about other subjects. "Piggybacking", i.e., the drug survey being carried along on the back of another survey, provides one model for gathering information on drug abuse in a general population at relatively low cost. The limitations of this approach are: i. that only a limited segment of the interview can be addressed to drugs, thus limiting the relevant information which may be gathered; ii. the research design, which presumably was created for other purposes, may or may not be ideal for a study of drug abuse; iii. co-ordination between more collaborators is likely to be required; iv. having drug use questions in the same interview with questions on the main subject of the survey may have a detrimental effect on respondents' answers to one or another segment; and v. the control over the quality of the survey rests mostly in the hands of others. There are, however, some clear benefits to piggybacking. It costs considerably less, since adding a drug portion does not add any substantial sampling or field costs to the main survey. Further, the drug investigators do not have to have quite as much technical survey expertise, since others will draw the samples, train the interviewers, and do the field work. If the main study deals with a closely related subject, like alcohol abuse, physical health, AIDS, or mental health, there is greater likelihood for comparability in purposes, design, and content; in fact, there are likely to be some benefits derived by having both types of information on the same persons.

A variation on this theme is to have the survey comprised of equal segments on different subjects. In other words, investigators dealing with two (or more) different research subjects collaborate from the outset in the study design, building data collection instruments, and so on. The major difference here is that the drug segment is now a full partner in instrumentation, design, etc. Most of the limitations listed above for the piggyback approach still pertain, but to a lesser degree.

3.3 Selecting an organisation to conduct the research

Drug use surveys have actually been conducted by a variety of organisations: governmental agencies like the Pakistan Narcotics Control Board (1975) or Mexico's Ministry of Health (Secretaria de Salud, 1990); quasi-governmental agencies like Canada's Addiction Research Foundation; commercial firms like the Gallup organisation in Canada and the US; non-governmental organisations dealing with drug use (such as the Centre for Information and Education for the Prevention of Drug Abuse, also known as CEDRO in Peru); medical teams as in the case of some rural village surveys; academic institutions like the University of

Michigan in the case of the US youth surveys; and commercial firms in collaboration with the government (US National Household Surveys on Drug Abuse). In nearly all cases the financial sponsorship for the research has been governmental in origin, a fact which seems likely to remain true. What has varied is the mechanism by which the government-sponsored project was conducted. It seems worthwhile to review briefly here the issues pertaining to the choice of the best mechanism.

3.3.1 Effects on respondent co-operation

One of the most important concerns to be weighed is whether different types of organisations will have differential success in gaining respondent co-operation and honesty. Clearly the legal and social implications of drug use in the population to be studied are critical to respondents' willingness to be open about such subjects. The more danger of legal retribution or official ostracism the respondent feels, the more likely he or she is to be distrustful of government officials. To the extent such conditions pertain, more benefit is to be derived from using an organisation which is seen as independent from officialdom. Usually, universities or medical units are viewed as relatively independent organisations and their representatives viewed as people who may be trusted with confidences. Quasi-governmental units established for drug research and/ or treatment may or may not evoke as much trust, depending on the specifics of the circumstances. Attaining the trust and honesty of the respondents must be an absolutely central objective if the results of the survey are to be of any use at all; it is possible that in some populations no method can be devised to elicit sufficient honesty about such behaviours to make the survey worthwhile.

Aside from candour, general respondent co-operation is not something which can be assumed. In most of the studies nothing is given to the respondents in return for their co-operation. However, if incentives are required for respondent co-operation, and particularly if they are to be given in the form of services like medical care, this may well have some bearing on the choice of the organisation and/or interviewers used to carry out the survey.

3.3.2 Technical resources

There are, of course, other factors to consider in selecting an appropriate organisation to conduct such a study. The organisation’s research experience and technical resources are certainly among them. If a unit experienced in the conduct of general population surveys already exists, there are clear advantages to making use of that expertise. If they are already experienced in drug research, so much the better, but if not, their general knowledge of the scientific methods of survey research are of obvious value. Such organisations may be private firms, academic units such as research institutes, or government agencies such as the census bureau or the ministry of health. The outside organisation may be used either to conduct the survey in its entirety, if investigators more knowledgeable in the drug field are not available in the sponsoring organisation; or they may be used simply to carry out the sampling and field work to the specifications of researchers located elsewhere, who are responsible for the general research design, instrument development, and interpretation of the results.

If an experienced survey research organisation is not available, or deemed undesirable for some reason, it is possible to build a research team to conduct a general population survey, as was done to conduct the national household and school surveys in Greece. Obviously, if the survey is of a large scale, such as a national survey, this can be a sizeable undertaking. But, if confined to one community or a region of limited size, the number of interviewers needed may be quite limited, and perhaps little travel may be required, even if the interviewers all live in one location. There also will be considerable need for technical expertise and experienced judgement particularly in the areas of research design, sampling, interviewer training, and data analyses but it may be possible to obtain the help of experienced survey scientists at various stages in the research process through inter-agency loan arrangements, private consultation, or international consultation sponsored by one of the international agencies. Other governmental agencies and/or academics working in other subject areas within the same country may have skills and resources which could be of great help in carrying out a general population survey of drug abuse.

3.3.3 Ability to influence policy

In discussing the factors which ought to be taken into account in assigning priorities to research projects in the mental health field, Sartorius (1977) argued that one important consideration should be the likelihood that some action will follow from the research. The organisation chosen to conduct the research, or at least the way that organisation is connected to the relevant agencies of government, may well affect the likelihood that the results will be utilised. At a minimum, channels of communication should be established early between the research unit and the agencies or other policy-makers who should be influenced by the results. A further step would be to involve the latter in the specification of the research questions to be addressed, or even in the design of the research project intended to address them in other words, to increase their early involvement and investment in the research. Another step is to have the relevant government agency itself be responsible for conducting the research, if such a solution makes sense in relation to the other criteria discussed above. In many cases it will not, making one of the other solutions more appropriate. In any case, the productivity of the research is likely to be enhanced considerably by an early consideration of the means by which it will feed into the policy-making process and by an early, purposeful effort to improve the linkages with the relevant policy-makers.

3.4 Sampling resources available

3.4.1 Data available

If the size of the population being studied is large enough that sampling is required in order to conduct a representative survey, then an important first step is to determine the source of the data which will be needed for sampling. Since the technical aspects of sampling are discussed later (see Section 4.1), the topic will not be reviewed here except to point out that particular information about the population to be studied is needed to draw a sample. Information is needed which will permit the creation of a sampling procedure in which all

individuals in the population eligible to be in the survey will have some known probability (greater than zero) of being selected into the sample. The information could be a list of the names and addresses of all of the people in the population, or of all of the households. Another starting point might be summary information on the number of people in various geographically defined segments of the population.

Most surveys use census data which has been gathered by an agency of government for various purposes, and which is sufficiently up-to-date to constitute a fairly accurate inventory of the population. When census data are available, they are likely to be the best resource for a sample survey. However, there may be problems even with census data available. Some census data may be quite old and, therefore, out of date in areas where there is considerable mobility in the population. Or the national census data maps may not prove detailed enough, particularly in sectors where there are dense slums, many squatters, or temporary dwellings.

When census data are not available on the population of interest, alternate sources of information must be sought. It is advantageous to search for adequate data which might already exist before taking the trouble to develop original data on a population for sampling purposes. Government agencies or universities conducting research studies already may have developed a sampling frame for the area perhaps for a fertility survey or a health or nutrition survey. Government agencies and academic institutions dealing with such issues are an obvious first place to make inquiries. It is also possible that local officials in the area would know whether any sample surveys had been carried out there in the past, so they provide yet another source of leads. If no existing information base can be found from which an adequate sampling frame can be developed, then it falls to the researchers to develop the information themselves.

Even if a study were using existing census or other data, an investigator would be wise to seek the advice of a trained sampling statistician before finalising a sampling plan. If a new sample frame must be developed because sufficient data do not exist, such professional help is even more needed.

3.4.2 Technical expertise

An investigative team may have a substantial amount of sampling expertise in its membership or may try to develop that expertise. More often than not, the skills of professional sampling statisticians are needed, as noted above. Not only can competent sampling statisticians help to avoid technical flaws in the sampling design, they also may improve the cost efficiency of the design. For more complex designs, which deal with a large population base and the use of stratified samples, the help of professional sampling statisticians is a virtual necessity; but even for simpler designs, such help can prove invaluable.

People with statistical training may be located in a number of places. In the government, there are likely to be sampling statisticians in agencies dealing with the census,

with federal planning, with fertility or population control, with health (and particularly with epidemiology), with labour, and perhaps even with education. In universities, such skills may be found in the departments of statistics or mathematics, biostatistics or public health, psychology, and population studies or demography, to name a few. Research institutes utilising survey research methodology are also likely to have resident statisticians, as are commercial survey research firms. International consultants may also be considered, if national expertise is inadequate or unavailable.

Once a competent source of statistical expertise is located, however, the job of the primary investigators is not over. They will need to take an active part in communicating the purposes and design of the study to the sampling experts, as well as the financial, staff, technical, and time constraints under which the study must be conducted. They should not accept a sampling design unquestioningly but should understand the logic behind it, be convinced that it will allow them to meet their research objectives, and be sure that it will generate a sample of respondents which can be surveyed in a reasonably economic manner. Sampling statisticians obviously vary in skill, relevant experience, and motivation, so it is ultimately up to the primary investigators to determine whether they are satisfied with the sampling design. If in doubt, they can always solicit additional opinions.

3.5 Field staff resources available

The term "field staff" refers to the team of interviewers or data collectors who will actually gather the data for the study. It also includes any staff charged with supervising them.

3.5.1 Utilising existing systems

In some countries, the largest survey organisations have a permanent staff of trained interviewers, sometimes numbering in the hundreds, who reside in the various communities in which they will be collecting data. They also have field supervisors who help hire, train, and continuously supervise the field interviewers in their regions. Obviously, there are considerable advantages to using such a professional staff when it is available, unless the types of interviewers they hire are considered inappropriate for some reason for the particular survey in question. The interviewers are already screened and trained, saving time and money, and their interviewing experience may well contribute to the quality of the interviews they conduct. Therefore, the first logical step in planning the field operation for a general population survey of much size is to consider whether an existing field staff may be used perhaps one in a government agency, academic research institute, or in a commercial firm.

3.5.2 Selecting and/ or building a field staff

If an outside field staff cannot be located, then an interviewing team must be selected and trained specifically for the survey. First, the number and location of the interviewers who will be needed must be determined. Then a search must be made for individuals possessing the characteristics judged desirable for working on a scientific research project and for

establishing rapport with the respondent population. The technical aspects of the work will require certain levels of education, reading and writing proficiency, ability to follow instructions, work efficiency, general sense of responsibility, and the ability to work independently. Establishing respondent rapport may also depend an such factors as age, sex, racial or tribal affiliation, religion, social class, clothing and grooming habits, and so on. A drug study is likely to have particular need for careful selection of its interviewers because of the particular importance of eliciting co-operation and candour from respondents; so even when working with a pre-existing field staff, such considerations should be taken into account when selecting the particular interviewers for the study. In one developing country, for example, the research team had what they described as a "bad experience" in using the field staff of a market research firm, because the skills and characteristics of the firm's interviewers, who were older women for the most part were not appropriate for effectively conducting a drug survey. Also, organisations which do commercial polling or market research may have considerably lower standards in their hiring, training, and supervisory practices than those needed for a rigorous scientific study. This is not always the case, but the research investigators or planners should not assume that they will get the same quality of work from commercial groups as from academic or government survey groups.

If the survey is large enough to span various regions, and if there is much regional variation in customs, culture, and language, then the use of interviewers who come from these same regions is advisable. In some cultures, particularly Latin and Middle Eastern ones investigators also have found that it is very important to have interviewers of the same sex as the respondent, particularly for female respondents.

Types of people to consider for the interviewing staff include the following: university students (particularly those in the social sciences); health workers (used successfully in Thailand and Pakistan); social workers or social work students (used successfully in Mexico and Pakistan); and perhaps educated people in a volunteer corps, if they exist. Other groups of people who are in close contact with the population and have trusted relationships (e.g., workers in the housing development agency in Thailand) might also be considered, although their being an integral part of the community might be judged more a hindrance than a help, depending on the circumstances.

Sometimes, of course, the most appropriate field personnel will still have some formidable problems to overcome in bridging the cultural and/or language barriers between them and the study population. Carefully planned training of field staff could help to address these issues.

3.6 Cost estimation and timetable

A critical part of the planning process is to develop realistic estimates of the costs and time required to complete the survey. Many investigators involved in such studies underestimate both cost and time, a common experience in survey research generally. One way to try to avoid such difficulties is to be as explicit as possible about the steps needed to

complete the survey and as realistic as possible about the time and resources needed to complete each step.

3.6.1 Timetable

Table 1 presents the major steps likely to be involved in a typical general population survey, and organises them in a way which shows their sequential interdependence. It shows for example, that interview development, field procedures development, and the sampling process all may be proceeding simultaneously, if sufficient research manpower is available. However, the actual data collection may not start until all three of those sequences are complete.

A pilot test of the completed interview and field procedures is usually conducted before the data collection is formally launched. This provides a low-risk way to determine how well the procedures work, by applying them to a limited number of respondents who are not in the main sample. A number of difficulties are likely to be encountered in the pilot test, so time must be allowed for possible revision of the interview and field procedures. Among the problems commonly found are: the interview takes too long to complete, respondents have difficulty understanding some questions or answering others, and the interviewers encounter problems gaining or maintaining the co-operation of respondents. The pilot test has proven to be an important part of the process, even if the interview, or parts of it, have been tried out on a few respondents at the research offices in a "pre-test" phase. It provides a further opportunity to see whether the interviewers can carry out their instructions for contacting households, sampling from among the members of the household (if relevant), and conducting the interview.

Another factor which may influence the survey timetable is the feasibility of carrying out the interviewing process during different parts of the year. In a rural population, for example, the cultivation season and harvest season would probably be bad times for conducting a survey. Season and weather conditions need also to be taken into account. Holiday seasons and vacation times may also be problematic for two reasons: many people leave their place of residence or are simply less willing to be interviewed, and second, their consumption of drugs may be somewhat atypical during vacations and holidays. Obviously, it is important to consider such factors in planning when the survey actually will be conducted.

How long it will take to complete the data collection may also depend on when and how long the optimal periods are for finding respondents at home during the week. In some countries, the non-work hours (early morning, evening, and weekends) are the best times to get respondents. It will be necessary to consider the work and general life patterns of the population before adopting an interviewing plan, and the interviewing timetable may be influenced considerably by these factors. Time must also be allowed for interviewers "calling back", or returning to the home, to get respondents who previously were not at home. The maximum number of call-backs for a single respondent is usually determined in advance and communicated explicitly to the interviewers to prevent their wasting an unreasonable amount

of time trying to locate a single individual. In some remote rural populations it may be necessary to have the interviewers actually live in the village during an intense data-collection period.

In any case, adequate time can be estimated for each of the steps which will comprise the study, making allowances for some unanticipated problems, and then the time to complete the entire chain of events can be calculated by summing across those elements. The total time taken by a survey will depend on its size, but all except very large surveys should be completed within about one year.

3.6.2 Cost factors

There is really no general purpose cost estimate which fits all general population drug abuse studies, not only because the size and complexity of the studies are so varying, but because the costs of such factors as labour, computer time, and sampling fluctuate so much from country to country. To illustrate, the field costs per completed interview are estimated to range from US$300-500 in North America but will be much less in some developing countries.

Usually, personnel costs are the largest single component of the budget. Travel can be a substantial item, too, if much interviewer travel is required to reach the respondents. If consultants or subcontractors are used (for example, in general design, sampling, field, coding, data entry, interview design, or analysis) they also will contribute to costs. Computer costs, printing costs, clerical costs, and office space must be figured in, as well as any costs which might be associated with getting the information needed for sampling. Costs for the core investigators are also an important component, but are sometimes absorbed by their employing organisation, since they would be on staff anyway. Investigators trying to estimate expenses often segregate the field costs (interviewer time and travel costs) from the other costs, since they are often most easily estimated on a per-respondent basis. In fact, having the per-respondent marginal cost is useful in determining the intended sample size for the study, a topic discussed below.

4. Methodological Considerations in Planning Drug Abuse Surveys

In this section the methodological issues of sampling, interview construction, field procedures, the reliability and validity of measurement, and data analysis techniques will all be considered in the light of existing knowledge in the survey research field generally and the experiences of drug researchers specifically. The treatment given here to these complex subjects will be limited. The reader wishing to delve further into these topics is referred to several reference works dealing with general survey research methodology (see for example: Babbie, 1990; Fowler, 1993; Rossi, Wright, and Anderson, 1983; Warwick and Liniger, 1975). Other references dealing with some of the special topics discussed below, will be referenced in the appropriate sections which follow.

4.1 Sampling procedures

Some aspects of sampling have been discussed already in Section 3.4. The central issues are: determining whether sampling is needed; assuming that it is, determining what type of data are available for sampling purposes; and determining how to draw a sample using these data. The sampling plan must be tailored to the objectives of the research.

4.1.1 Representativeness

The major purpose for drawing a sample is efficiency: if a population is large, it is either impractical or impossible to survey everyone in it. Answers from a scientifically selected sample of the people comprising the universe can provide accurate estimates of the answers which would be derived if all members of the universe were included in the survey. Scientific sampling yields samples of people who, on the average, are highly representative of the composition of the entire population. Proportions of the sample having various characteristics (e.g., being male, married, a drug user, etc.) should closely approximate the proportions of the entire population which have those same characteristics. Scientific sampling procedures are designed to achieve such representativeness, and sampling statistics permit the estimation of the sampling accuracy of the statistics generated from a sample. To illustrate, Abelson, Fishburne, and Cisin (1977) used a household sample of 3,300 people representative of a population of 145 million adults living in households in the United States. Sampling statistics indicate that their estimates of lifetime prevalence for use of the various drugs, based on this limited sample, were almost certain to be within two percentage points of the figure they would have obtained, had they surveyed the entire population. For the more rare drugs, they were almost certain (i.e., they should be correct 95 times out of 100) that their estimates were within one percentage point of the population value. In sum, the very small proportion of the population which was drawn in this sample was highly representative of the overall population.

Of course, if the original information or sample frame from which the random sample has been drawn is not complete or accurate, then there may be some systematic error in the samples drawn from that sample frame. (See Section 3.4.1 above). Put another way, a systematic bias could be introduced into the findings emanating from samples drawn from an incomplete or inaccurate sample frame.

If properly drawn, even a very small sample from a complete sampling frame is unbiased, that is, over many occasions of drawing such samples, their estimates of proportions should average out to equal those proportions which actually exist in the entire population. However, any one sample can yield estimates which deviate from the true population value due to chance or random occurrences. The larger the sample, the less the deviation which is likely to occur. But as the sample gets larger and larger, each additional case adds less and less to the accuracy of the estimates. With such diminishing returns, at some point the additional accuracy from a few more respondents is not worth the additional cost of including them.

4.1.2 Definition of the target population or universe

The first step in sampling is to describe explicitly the population of people who are to be investigated and to whom the investigators want to be able to generalise the results of the study, also called the "universe". Surveys might define their universe in the following ways: "all people 18 years of age or older living in a household in the Province of Ontario,"or"all inhabitants of the village 10 years of age or older". The sampling frame should be structured so that (1) all eligible individuals in the target population are included an have a possibility of selection, and (2) individuals can be linked to one and only one element in the frame (e.g., a particular household).

As discussed in the opening section of this chapter, nearly all general population surveys exclude some of the inhabitants of the area under study on the basis of age, institutionalisation, homelessness, or whatever. If the method of sampling most readily available (say the household sample) excludes some segment deemed to be of particular importance, an alternative method (say a birth record sample) may be considered. But it simply may be that, for practical reasons, important segments of the population either have to be missed completely or reached through separate, special studies aimed specifically at them. If certain classes of drug users, e.g., heroin users or youthful inhalant abusers, tend to be without permanent places of residence, they almost certainly will be under represented in a household sample. The importance of such groups to the objectives of the research should be considered explicitly before a decision is made to proceed with a household sample. Perhaps a special study of the missing population should be run in parallel with the general population survey.

It should be noted that, if a household sample is to be drawn, the concept of a "household" or dwelling unit should be defined carefully in advance and used consistently by all interviewers. This has proven a source of difficulty in some studies, particularly in developing countries where dwelling structures are varied and often shared by more than one family. In Mexico, for example, two different approaches have been used: one is to define family units following the criteria of common food supply and preparation, while the other is to randomly select individuals from segments or groups of houses in a block (Medina-Mora, 1979).

4.1.3 Stratification, oversampling, and clustered sampling

The simplest type of sample involves an enumeration of all individuals in the universe and the selection of the required number of cases from the enumeration by means of a random procedure in which every individual has exactly the same probability of being drawn as every other individual. This is called "simple random sampling", and may be used in relatively small populations like a village of less than 1000 people. However, in larger populations (and even in some smaller ones) the population often is segmented or stratified along various dimensions before sampling takes place, and the sampling is then carried out separately for each segment. The population might be stratified (divided into subgroups) on the basis of size

of community, region of the country, and so on. When census data are used, such strata are used to simplify and improve the sample selection process. For instance, if the universe is a national population in which 25 percent of the population is known to live in each of four regions in the country, then the sampling statisticians will draw separate, equal-sized samples for each region. If in one region a third of the population lives in cities of 100,000 or larger, then one-third of the cases in that region will be drawn separately from the population in these larger cities. Thus, the sampling is conducted in such a way that each of the strata defined on the various stratification dimensions (region and community size, in this example) is represented in the resulting sample in exactly the same proportion as it occurs in the actual population. This procedure improves the accuracy or representativeness of the sample.

Stratified sampling can be used for another purpose in addition to that of achieving accurate proportional representation along chosen dimensions. It can be used to select a disproportionately large number of cases in subgroups considered of particular importance and for whom an insufficient number of cases would turn up with normal sampling. The series of National Household Surveys of Drug Abuse in the United States illustrates an example of such disproportionate sampling. Since illicit drug use is known to be concentrated among adolescents and young adults, the investigators substantially oversample those segments of the population. This provides more accurate estimates of drug use for those important age groups and also provides a larger number of active drug users in their total sample of respondents. When calculating the overall drug use estimates for the total population, the investigators give proportionately less weight to the answers of respondents in the oversampled strata to correct for their disproportionate representation. Such procedures have been used in many other large scale surveys for much the same reasons as they were used in this one.

Large scale survey samples usually have one other important feature which distinguishes them from simple random samples. It is the selection of clusters of respondents hat is, groups who are located in geographical proximity to one another. The reason for using this procedure is a pragmatic one: There are considerable cost efficiencies in the final sampling and in the interviewing stages in having respondents clustered by town, city, or school. Without an attempt to assure clustering during sampling, one might end up with one or two respondents in each of 1000 different communities around the country; obviously, it would cost a great deal in travel expense and interviewer time to get interviewers to all of those communities. With clustered sampling, it is possible to limit the sample locations to perhaps 80 or 100 geographical areas of limited size, such as counties, districts, or cities (or, in the case of special population surveys, to 80 or 100 schools, for example). If done correctly, rather little accuracy is lost in the survey estimates for the country as a whole, though this may not be intuitively obvious. A great deal of cost efficiency is gained, however, since now interviewers need only get to (or, more likely, be hired in) 80 or 100 locations. In fact, major survey organisations usually maintain a set of such geographic areas (called Primary Sampling Units or PSUs) in which they conduct all of their nation-wide surveys and in which they have permanent interviewing staffs. Taken as a whole, the population in the set of PSUs should be highly representative of the larger population of the country, even though it may contain only a small fraction of the total population. In a sense, it already is a representative sample,

though still too large for a survey. The PSUs themselves have already been drawn using a stratified sampling technique in which region of the country, size of community, and other important demographic factors have been carefully controlled. When a particular national study is to be done, the specific sample (of perhaps 2000 people) is drawn from within that set of PSUs. Such clustered sampling can increase sampling error slightly in general population surveys, but not enough to outweigh the cost savings. In institution-based samples, such as samples of schools, the effects of clustered samples are greater (and must be corrected for in the final estimates of sampling error), but again, the benefits of cost-saving and ease of administration make it well worth it.

Clustering in survey samples increases the sampling error and requires special consideration in analysing the data. When applied to data from a clustered sample, standard formulas and analysis software, which assume a simple random sample, will underestimate the actual sampling error. Therefore, sampling errors should be calculated using special formulas and computer programs that take clustering into account, such as the ASUDAAN@ statistical software package (Research Triangle Institute, 1989). These software packages also generate "design effect" parameters (the ratio of the variance calculated assuming clustering to the variance calculated assuming simple random sampling), which can be interpreted as measures of the effect of sample clustering on the precision of estimates for a given overall sample size or on the sample sizes required to achieve a given degree of precision. If an estimate from a clustered sample has a design effect of 2.0, for example, that estimate is only as accurate as one derived from a simple random sample one-half the size of the one surveyed. It should be noted that although this discussion has focused on statistical analysis of data derived from cluster sampling, "design effects" must also to be considered in the analysis of data generated from other complex sample designs such as stratification and oversampling. In dealing with clustered samples or other complex sampling designs, the advice of a professional statistician experienced with such work should be sought.

4.1.4. Determination of sample size

There is no one best answer to how many respondents to include in a survey (see Kish, 1965). Accuracy of the survey estimates tend to rise as a function of sample size and the proportion of the population contained in the sample. When the sample is likely to be an insignificant proportion of the population, as in national studies or studies of large cities, from 1 000 to 3 000 cases have typically been included. The more accuracy sought in the estimates derived from the survey, and particularly the more accuracy required in subgroup estimates, the larger the sample that is needed. The assistance of a professional sampling statistician can be of particular help in determining appropriate sample size.

A stratified random sample may give good prevalence estimates for most types of drug use, and it may yield enough users of a number of drugs to permit in-depth analysis. However, certain drugs will have a very low prevalence and will yield too few cases in a probability sample to allow such users to be characterised accurately. One method recommended by some investigators for increasing the number of users in addition to

oversampling strata of the population deemed to be at high risk of is called "snowballing." Snowballing involves asking respondents who say they are users in the main sample to identify other users, who subsequently can be located and given the same interview even though they were not in the original study sample. These additional cases should not be considered part of the random sample and should not be used in population estimates, but they may be useful in more specialised analyses of users. Keep in mind, however, that any biases in the types of users captured in the original sample may still exist in the snowball sample, since users are likely to identify other users similar to themselves. A more detailed description of snowballing technique is given in chapter 4.

4.1.5 Other sources of information on sampling

The following texts provide introductions to sampling: Cochran, 1963; Fink, 1995a; Kalton, 1983; Kish 1965; Sudman, 1976. While these references may help, there is no substitute for having the advice of a well-trained, experienced sampling statistician, when a complex sample is to be drawn.

4.2 Data collection instruments

4.2.1 Alternative types of instruments

Nearly all of the general population studies in the drug field have used the personal interview, in which an interviewer meets face-to-face with the respondent and asks questions from a structured interview schedule. Often, the respondent's oral response is then recorded by the interviewer on the schedule. Since the major alternative to the interview, the self-administered questionnaire, requires reading proficiency on the part of the respondent, it may not be appropriate for some populations. Even countries with the highest literacy rates have some proportion of the population who cannot read, or who do so with great difficulty. Thus the alternatives for the choice of an appropriate data collection instrument are variations on the personal interview procedure.

One variation is to conduct the interview over the phone rather than in person. Such an alternative is only realistic to consider in the most industrialised countries in which widespread and reliable phone systems exist. Phone surveys are carried out regularly in a number of such countries, using random-digit dialling as the sampling technique. However, there are real sampling limitations to the procedure because of bias due to differences between persons in households with and without phones. Also, it is questionable whether a phone interview can establish sufficient co-operation, trust, and privacy to deal with potentially sensitive information like personal drug use.

Another variation on the personal interview was developed because of the sensitivity of the information being collected. For some years, the US National Household Survey on Drug Abuse has used partially self-administered answer sheets on which the respondents record their answers about personal drug use. This procedure allows the respondents privacy

in giving their answers, not only from the interviewer but from anyone else in the household who may be listening. After completing the answer sheets, the respondent seals them in an envelope which can be handed to the interviewer (who promises not to open it) or mailed immediately to the research headquarters. The procedure seems to work rather well, though it must be pointed out that the population being interviewed is on the whole quite literate. Such a procedure may not be successful with less literate respondents; this is unfortunate, since obtaining privacy in the household particularly for youthful respondents often is even more difficult. One way to maximise the benefits of private responding is to use the private answer sheet for those able to understand it (with or without the interviewer reading the questions aloud) and then only use spoken answers from respondents who are unable to read. If this alternate procedure is used, the instrument should provide a place for interviewers to record which method the respondent used, so that potential differences in reporting can be assessed.

If respondents are unable to read an answer sheet, certain other alternatives might be considered for assuring the privacy of their answers to sensitive questions. One technique is to have a second interviewer distract other people in the dwelling by asking them questions at the same time the main interview is being conducted. Another is to have the respondent give non-verbal answers to the questions, such as pointing to one of two coloured cards (say, a green card to indicate a "yes" answer and a red card to indicate a "no"). A third is to try to conduct the actual interview outside the household.

The choice of the method should finally be made based on what is judged to be most suitable for the population being surveyed. However, it needs to be emphasised that the same method should be used in a survey as far as possible, since the method of responding may affect the responses. If this is not feasible, the method should be recorded so that it can be taken into account during data analysis.

4.2.2 The selection of interview content

The proper content for an interview 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 to be found in nearly all general population studies of drug abuse: one being a section on the demographic and family background characteristics of the respondent, and another being a section on the respondent's own use of various drugs. However, even within these common sections, the choice of variables, as well as the specific questions with which to measure them, varies from study to study. Chapter 6 discusses the core variables generally found appropriate for drug abuse surveys.

In addition to demographic, background, and drug use variables, drug use surveys have incorporated a host of other classes of variables. For example, variables relating to one or more of the hypothesised consequences of drug use antisocial behaviour, work performance, academic performance, functioning in family and other social roles, social alienation, physical health, and mental health have been included in various studies. Measures of a wide range of hypothesised social determinants of use have also been included for example, exposure to use,

availability of the drugs, drug using behaviours of family and friends, social norms, and membership in sub-environments (such as work, school, college, and military). Many psychological determinants also have been included: attitudes and beliefs about drug use and drug users, the amount of danger perceived to be associated with use, affective states, lifestyle orientations, and so on. Chapter 6 presents optional measures for a number of such variables; for those of interest, the investigator is advised to use them when there are no compelling reasons to do otherwise.

A clear limitation on content is the total time taken in an interview. Most interviews do not last much over an hour, but for some populations even that may be too long. Given that a number of different drugs are investigated in most studies of drug abuse, the section dealing directly with drug use and related issues (frequency, quantity, route of administration, age at first use) may take a substantial portion of the interview. Thus, items must be carefully selected to meet the objectives of the survey.

4.2.3 Procedures for developing the interview

The proper development of an interview schedule takes a considerable amount of time and care, partly because the exact wording of questions can substantially influence the nature and usefulness of the answers. Each question must be examined to determine (a) whether it asks the question one wants to be asking, (b) whether it will be confusing to the respondent, and (c) whether it will elicit answers of a sort that will be most useful. Sometimes the answer alternatives are built right into the question, such as "Would you say that smoking opium is a good thing to do, a bad thing to do, or neither?" This can help the respondent answer along the correct dimensions and according to any pre-specified alternatives judged to be useful.

The sequence of questions within the interview also can be important to the results. If drug use is a socially disapproved behaviour in the population, investigators usually begin with less sensitive material first to help build rapport with the respondents. If there is one set of questions which, if answered before another set, might influence the answers to the latter, then these two sets probably should be placed in reverse order, or separated. As already has been discussed, it is very important to try out (or pre-test) the instrument during its development to see what actually occurs when the questions are asked of respondents. After respondents answer, they can be questioned about what they thought each question was asking, whether there were terms which were unfamiliar or confusing in the questions, and what they meant to communicate by their answers. A full-dress pilot test on a selected set of respondents (who are not part of the main sample) also is likely to prove very useful for the refinement of the instrument, as well as for the refinement of the field procedures. The answers to open-ended questions can be coded (to see if the answers being elicited are useful and can be meaningfully coded) and the time to complete the entire instrument can be checked. A pilot test quite commonly indicates a need to shorten the interview.

Some formatting alternatives in the layout of the instrument from which the interviewer reads will allow it to be written on fewer pages, which may have the advantage of

not discouraging the respondent with the sheer size of the interview. One such alternative, which has been used with mixed results, is to combine onto a single page the standard set of questions which are repeated for each class of drugs being studied. The series of questions is written only once, with the name of the drug left blank in the question wording: for example, "Have you ever used ?"; "How old were you when you first used ?"; "Have you used any in the last month?"; and so on. The interviewer then goes through these questions for each drug, and the answers to these questions are written sequentially by the interviewer into a single column, one answer column having been assigned to each drug. The questions are only written out once, instead of repeatedly, usually in the left-hand column. Although efficient, this "grid" format is considerably more complex and demanding for interviewers to use; thus, investigators from some developing countries recommend against its use. Before finalising the format for the interview, the investigator also is advised to consider how the answer information will be converted into numerical form for analyses, after the interviews are completed. Is the layout such that coders or data entry personnel can move quickly and with little chance for confusion? Can the machine readable locations assigned to each answer be specified in advance and printed in the questionnaire? If so, this will save time later and reduce the error rate considerably. If some other organisation is going to code (or directly enter) the answers into numerical format, representatives of that organisation should review the interview format before it is finalised to ensure that they can work efficiently with it.

The detailed procedures for designing an interview are dealt with at greater length in Chapter 6 and some additional points are covered in the summary of field testing reports (Annex 3 of the guide). The general principles of instrument design are also contained in some general survey texts, such as Babbie, 1990; Fowler, 1993; Rossi et al., 1983; Warwick and Liniger, 1975.

4.2.4 Honesty in self-reports of drug use

The issue of honesty in reporting drug use has been considered at some length by survey researchers (e.g., Johnston, 1985b). Some investigators question whether it is possible for them to get high levels of honesty in their populations, or in some sub-populations in their countries. The importance of the particular research agency and types of interviewers being used is stressed by many, as are the rigour with which drug laws are being enforced, the severity of the penalties or other consequences of exposure, and the general social stigmatisation attached to drug use. Since many of these factors vary from community to community within a country, levels of honesty may show similar variation within countries.

Probably the most vital issue for respondents is the credibility of the assurances of confidentiality given by the researchers. Investigators from a number of countries believe that medical personnel and, in some cases, local community workers evoke the greatest trust; in other countries academic researchers would be trusted most. It is generally felt that official representatives of a regional or national government are not in the best position to evoke candour from respondents about illegal behaviour.

In some countries, such as the United States, special laws have been enacted permitting drug researchers to protect the confidentiality of the data they gather, even from government agencies and the courts. If feasible and enforceable, enacting such a law in other countries may well facilitate drug research.

4.2.5 Reliability and validity

Two essential characteristics of any measurement procedure are their reliability and validity. Validity refers to the degree to which a procedure (e.g., a question in a particular survey) measures what it is purported to measure. Reliability, a necessary but not sufficient condition for validity, refers to the extent to which the procedure can yield comparable results on repeated occasions of measurement when the real phenomenon being measured has not changed. The measurement procedure must be reliable to be valid, but it can be reliable without being valid in other words, it can be reliably or consistently invalid.

Survey information may be invalid for a number of reasons, including poor understanding of the questions, poor recall on the part of respondents, unintentional distortion caused by the way the questions or answers are presented, or intentional distortions. Because of the legal status of drug use in many countries, the validity issue which has been of most concern to drug investigators has been the deliberate understatement or denial of drug use. Understatement, if it occurs, may also occur differentially for different drugs.

While reviews of the literature on the validity and reliability of self-reported drug use are encouraging (Harrison and Hughes 1997; Biemer and Witt 1997; Johnston, Driessen, and Kokkevi, 1994; Rouse, Kozel, and Richards, 1985; Smart, 1975; Whitehead and Smart, 1972), it is important to remember that most of the studies reviewed were on North American populations. Validity and reliability may be high in one population yet very low in another, using exactly the same measures and procedures. Therefore, it is desirable that these characteristics of the measures be tested out in the population of relevance (see, for example, Litwin, 1995).

Reliability may be tested by checking for logical consistency among multiple measures of the same variable. Sometimes this is done by looking at the "internal consistency" of multiple items in the same questionnaire. However, since drug use questions are seldom repeated in questionnaires, it is more likely to involve re-administering questions to some sample of respondents after enough time has elapsed that they would be unlikely to remember the answers they gave on the first administration. This is called test-retest reliability. Validity may be checked by seeing whether other sources give information about the subjects which is consistent with what they said about themselves. For example, drug use information about a set of interviewees might be gathered from official sources (e.g., police and treatment program records) or from informants likely to be knowledgeable (e.g., friends, acquaintances, family members). It must be remembered, however, that the other sources may not provide completely valid data either.

Other information may be gathered from the respondent by a physical examination (for needle marks, for example) or by the interviewer rating the candour with which the respondent seemed to be answering. Urine samples may also be requested, an important technique discussed separately in the next section. Soon, hair samples may also prove to be a source for good validation information.

Another approach is sometimes suggested to check the validity of the overall population estimates rather than the validity of individual answers. This can be done by using an "intensive case finding" method in a population of limited size, if such a method can be found which would yield a complete enumeration of users of a particular drug. The prevalence rate yielded by the intensive case finding method can then be compared to that yielded by the sample survey. Naturally, the definitions of "drug use" or "drug user" would have to be the same under the two methods for any comparisons to be meaningful. Usually intensive case finding leads to chronic and known users however, whereas general population surveys (which may or may not capture such users) tend to get other types of users as well.

A completely different type of approach to checking for validity is to test for what is called "construct validity." Do the variables in question (in this case, drug use variables) relate in consistent and predicted ways with other variables which are known, or strongly hypothesised, to be related to them? If so, this is evidence of construct validity. For example, if knowledgeable observers believe that males and older people in its population smoke opium more than others, then a confirmation of their hypothesis by the survey results constitutes some evidence of construct validity for the survey.

Another technique which has been used to check on the degree to which respondents may be over reporting drug use is to include in the list of drugs one or two names of fictitious, but plausible sounding drugs. One should be careful not to select a name which is close to, or might be confused with an actual drug name, of course.

Whatever approach may be viable in the particular circumstances, it is deemed highly advisable for investigators in the drug field to attempt to ascertain the validity and reliability of their drug use measures for their particular populations. And the more that drug use is illegal or socially disapproved, the more this holds true. Obviously, every effort should be made in advance to maximise the validity of the measures through: i. thoughtful choice of the survey organisation, ii. careful selection and training of interviewers, iii careful development of the interview procedure and interview structure, iv. careful development of the specific questions on drug use, and v. careful pretesting of the interview format and questions to be sure that the questions are clear and understandable to respondents. But it is still important to test the overall effectiveness of these efforts in some type of validity/reliability study, and preferably before undertaking an expensive, full-scale survey of a large sample. A number of methods for checking reliability and validity, as well as their results for six countries, may be found in a recent report by the Council of Europe (Johnston et al., 1994).

4.2.6 Testing of biological specimens

Still another approach to validating the answers of a respondent concerning his or her current use of drugs is through testing of biological samples for drugs and their metabolites. This approach has been used most frequently in research dealing with opiate use. Technology now exists to detect many drugs or their by-products for some time interval after use in the urine (Hawks and Chiang, 1986). Like most other methods, this one also has its limitations. One is that the identifiable metabolites of most drugs remain in the body for only a limited period of time after administration; another is that laboratories conducting urinalyses vary considerably in the reliability of their own test results. A different type of problem relates to the likely impact on respondents of requesting a urine sample. In some surveys, the urine samples are collected as part of a health component of the survey. Without such a rationale, requesting a urine sample would seem a strange and inappropriate request in most populations. Blood samples may provide more reliable information, but are even more difficult to obtain from survey subjects.

A considerably newer technology has been evolving which involves taking a sample of hairs from the subjects head and then conducting laboratory tests on those hairs to determine whether various drugs have been used by the subject (Cone, Welch, and Babecki, 1995). One clear advantage of this emerging technology over the more traditional use of urine samples is that the time frame over which drug use can be detected is extended considerably. This makes it more appropriate for generating time samples which correspond to the intervals over which people self-report their drug use on questionnaires (e.g., in the prior 30 days).

While hair testing appears to be a promising method, there are still a number of unresolved scientific issues regarding this technology which currently limit hair testing as a means to analyse drug use including: risk of passive contamination; variability across and within drug type in terms of the accuracy of detection; the pharmacological relationship between drug dose and concentration in hair has not been established; and, evidence that cocaine accumulates differentially in hair depending on hair colour (Harrison and Hughes 1997). Finally, as with urine samples, there are questions about whether respondents will find it appropriate or acceptable to be asked for a cutting of their hair. People may refuse to cooperage in supplying a sample and, if they know in advance that it will be requested, may refuse even to give an interview.

4.3 Field procedures

The role of field staff in enumerating households in sampling areas, and in enumerating family members within households, has already been discussed, as has their critical role in the interviewing itself. In Section 3.5.2 we also discussed the selection of the individuals for the role of interviewer. These are important steps, because failure to implement a valid sampling procedure can contribute a third kind of error in addition to the two already discussed (sampling and measurement error), namely, errors in coverage.

Training and supervision of interviewers is also a very important step in the development of the field staff. A discussion of this process would be too detailed for a report such as this; those wishing to learn more about the dynamics of the interviewing process and the importance of interviewer behaviour are referred to Cannell, Miller and Oksenberg, 1981; Fowler, 1993; and Fowler and Mangione, 1990. A general training manual for interviewers is available from the University of Michigan's University Press (Survey Research Center, 1983), although similar manuals may be available from nearby survey research organisations, as well.

Even with careful selection in the hiring of interviewers, it is likely that some will prove unable or unwilling to do a reliable and competent job. Therefore, it is highly advisable to build in quality control checks on the work being done by interviewers at each stage (i.e., enumerating households, enumerating family members, and conducting the interviews) to be certain that the work is actually being completed and is being done correctly. Unfortunately, the possibility exists that a few interviewers among those newly hired will fill out (or "fake") some interviews themselves, rather than actually collecting the data. It is essential to identify such people early and replace them. Other interviewers may simply be making honest mistakes which can be corrected with further training. The most common method of checking the quality of interviewer performance, other than examining the interview protocols they submit, is to have a second person go out into the field to determine if their assigned work was performed correctly. A sample of each interviewer's listing and interviewing assignments can and should be checked in this manner, and interviewers should be told in advance that this will be a standard procedure.

Also, interviewers need explicit instructions on how to handle certain tasks. For example, they usually are given pre-established procedures for selecting a respondent from among the various members of a sampled household, and their sampling procedure will vary depending on the number of people (and perhaps the age of the people) in the household. They also need explicit instructions for determining who is not to be interviewed (i.e., people who are senile, ill, mentally deficient, drunk, or high on drugs); and, as mentioned earlier, they need instructions concerning the maximum amount of effort and/or money to spend trying to locate any one respondent.

4.4 Data preparation, processing, and analysis

Making good use of the data gathered in a survey is critical; and often, an insufficient amount of time is allotted for this stage. Whole books have been written about data analysis, of course, so a complete guide is beyond the scope of this manual. However, a few general guidelines may prove helpful to those responsible for planning and managing this aspect of the research study.

4.4.1 Sources of Survey Error

Surveys are subject to several potential sources of error which may affect the accuracy

of the survey results (Groves, 1989). Researchers need to be aware of these sources or error in the interpretation and analysis of data from drug use surveys.

Survey errors can be classified into four types: coverage, sampling, nonresponse, and measurement (Groves 1987, Gfroerer et al., 1997). Coverage error results from using a sampling frame that does not include all of the target population. In household surveys this type of error primarily occurs because eligible members of the target population (household members) are not reported during screening. In school surveys, eligible schools may not be included in the list from which the sample is drawn. Thus, the entire target population has not been "covered" in the sampling frame. Errors due to coverage, nonresponse and measurement can occur in a census as well as in a sample.

Sampling error, which has been mentioned previously in this chapter, is the result of collecting data from a subset of the sampling frame. There may be some error in the sample measures relative to the true population measures. There are methods which can be used to estimate the magnitude of sampling error when probability based sampling is used.

Non-response errors occur when the study does not obtain data from all of the units that are selected to be in the sample. This can occur because potential respondents cannot be located or because they may be contacted but refuse to participate in the study. The magnitude of this error depends on both the response rate (the percent of the sample from which data are obtained) and the difference between respondents and nonrespondents in the attribute (e.g., use of drugs) being measured. Nonresponse can occur at the household level, person level, and questionnaire item level in household surveys (Gfroerer et al., 1997).

Finally, measurement error occurs when the respondents' true attributes are different than the data obtained about their attributes in the survey This type of error has many sources, including the wording of questions, interviewer behaviour, sensitivity of information requested, respondents' recall, and coding errors (Gfroerer et al., 1997).

These four types of error should be considered in estimating drug use from household surveys. In measuring use of a particular drug, coverage error could be a problem if many of the users of that drug do not reside in households. Sampling error is a problem in household surveys of drug use, because of the low prevalence in the general population of many of the behaviours being measured. Nonresponse error could be a problem if many subjects do not participate, or if more drug users refuse to participate. Sources of measurement error which are of particular concern in drug use surveys: honesty, reliability, and validity of self-reported drug use are discussed in detail in sections 4.2 to 4.6 above.

4.4.2 Data entry

Exactly how the information on the interviews will be put into machine-readable form depends both on the format of the interview and the technology available at the facility. If the answer alternatives for each question have been pre-specified and given numerical

identification right in the interview schedule (i.e., they are "pre-coded"), it may be possible to have people at computer terminals enter the information directly from the interview schedule. If, as is fairly common, the answers have not yet been put into numerically coded categories, then the intermediate step of coding must take place. This means that for each question the researchers must decide upon a set of mutually exclusive answer categories into which they want the answers to that question to be coded (or collapsed). Code numbers must also be assigned for the absence of responses. Once a set of codes is developed and pre-tested, people must be trained to code the answers on each interview schedule into proper numerical coding categories. In essence, the coders must translate verbal information into meaningful numerical information so that it can be manipulated by a computer. To assure accuracy in this important step in the process, researchers routinely have some or all of a coders work "check-coded" by another coder. Differences are then discussed and resolved. (For relevant references on coding and other aspects of survey research methodology, see Fink, 1995b; Miller, 1991, and Rossi, Wright, and Anderson, 1983.)

Entering numerical information into the computer can be accomplished, using direct data entry terminals, either from the code sheets produced by the coders or from the interview schedule if the answers were pre-coded. In some instances the technology for optically scanning the answer sheets using a machine may be available. It has the advantage of cutting labour costs and human error.

4.4.3 Data analysis and extrapolation

A good portion of the published reports from general populations surveys are comprised of rather straightforward descriptive information. Therefore, the analyses associated with such surveys need not be highly complex.

Usually of primary interest is the prevalence and incidence of use in the general population for each of the various drugs under study. Then, usage levels among important subgroups (usually defined in terms of background and demographic variables) are of interest. (A good starting place probably is to examine the reports from several other drug surveys of a similar sort to get ideas for analysis and table layouts, for example see: Johnston et al., 1996; SAMHSA, 1997.) Many reports do not go beyond this point, and these basic univariate and bivariate distributions are among the easiest statistical analysis techniques available. Of slightly greater difficulty is calculating the confidence intervals around any given estimate the intervals which take into account the amount by which the estimates may be off due to sampling error. (See Section 4.1 for a discussion of sampling error). However, the procedures for doing these descriptive statistics are also contained in almost all elementary statistics texts. (See, for example, Cohen and Cohen, 1983; Fink, 1995c; Hays, 1988; Pedhazur, 1982).

Inferential statistics, used to make inferences about causes, effects, and degrees of association are more complex and, therefore, require more statistical sophistication. For this reason one may wish to put these analyses off for a second stage of reporting. A number of texts which deal with these subjects are available (Arminger, Clogg, and Sobel, 1995; Cohen

and Cohen, 1983; Hays, 1988; Johnson and Wichern, 1988; Pedhazur, 1982; and Weisberg, 1985). Analyses involving tests of reliability and validity may also be somewhat complex, so it is advantageous to have either a statistically trained member of the staff or a consultant available to help on these analyses, as well as on the original research design which led to them.

In sum, while surveys of the type discussed in this report certainly may make use of very sophisticated analysis techniques, much of what is of value in them may be derived from rather simple analyses. Even for simple analyses, however, it is helpful to have some formal statistical training represented on the staff, though the level of that training may not need be as great as is first imagined.

5. Deciding Whether to Conduct A Survey

Naturally, the question of whether to undertake a general population survey comes down to weighing the costs likely to be associated with it against the benefits likely to be derived. Some of the factors which influence costs and benefits are enumerated below.

5.1 Factors influencing the costs

If costs are thought of in terms of other programs foregone in order to allocate scarce resources to the survey, then presumably the cost is greater to developing countries than to others. But, if drug abuse is seen as a source of other social problems and in need of concentrated attention, then the cost may be justified. Also, it is likely that in developing countries the cost of one of the major resources needed for the survey, labour, will be much less, although skilled labour of the particular type needed may be in short supply.

Also, the cost of the survey will be more or less depending on the extent to which a new organisation must be built to conduct the work. If an existing survey unit with sampling statisticians and a trained field staff can be utilised, the undertaking is considerably easier at least in the case of a large-scale survey. If the population of interest is large, existing adequate sampling information in the form of census or other data can also make a substantial difference.

The nature of the population to be studied also can affect costs significantly. If the population is remote from the field staff, then travel costs can mount rapidly. Respondents who are difficult to locate, requiring several trips by the interviewer to obtain a successful interview, also contribute to costs. If respondents must be compensated in some way for their co-operation, that can make a sizeable difference. As stated earlier, the cost of doing a drug survey is reduced considerably if there are other paying components. The least expensive alternative is to "piggyback" a set of drug questions onto another survey which is already planned. However, there are also a number of drawbacks, which were covered in the earlier discussion.

5.2 Factors influencing the benefits

The extent and severity of the problem believed to exist is one factor to be considered in calculating potential payoffs. If no problem exists or is likely to emerge in the near future, there is little benefit to be derived from doing a survey on drug use. Conversely, if a problem is emerging or already exists, there is great potential payoff from gaining a better understanding of it. Knowing the size and severity of the problem is useful for mobilising the political will to do something about it, for making decisions about the allocation of resources, and for localising the problem in particular segments of the population. Knowing something about the aetiology of drug use may help in the planning of more effective prevention efforts.

Also to be considered is whether alternate information systems exist or could be developed which would generate much of the needed information at less cost or more usefully. Alternative methods of systematically gathering data on drug abuse in the population include case reporting systems, information systems based on drug-treatment program records, or information systems from social service agencies or health care agencies. Most of those generate data from users who have come to the attention of social agencies, which may leave a substantial portion unidentified; and this is more so in some countries than in others. Still another approach, in settings where drug users are judged to be under represented in a general household sample or to be unlikely to respond honestly if interviewed, is to use intensive case finding techniques, which may utilise third parties as informants.

Another important consideration is whether the survey can be conducted successfully. If the population is unlikely to cooperage with or confide in researchers, no matter who they are or what institution they represent, then valid data probably cannot be obtained through the survey method. And, even if honesty can be obtained, if the information needed to draw a reasonably representative sample is not available and cannot be developed specifically for the study, then it is unlikely that results can be secured which are generalizable to a large population. Finally, even if co-operation is forthcoming and a good sample can be drawn, to the extent that the defined population excludes most of the cases of interest (say, because serious drug users tend to be homeless or in institutions), the value of the overall study is reduced. Finally, it should be remembered that most drug surveys gather information on legal drugs, like alcohol and tobacco as well as illicit drugs. Since these drugs often have dramatic effects on health and other outcomes of concern, their inclusion increases the overall value of a drug survey.

5.3 The comparison of costs and benefits

Certainly a final decision to proceed with a general population survey is a matter which must be judged by those close to the situation. An effort has been made here to enumerate the major factors which should be taken into account. How they should be weighed in any particular instance depends on their relative importance to the interested parties.

One closing point has to do with the ratio between the costs of the survey and the benefits to be derived. Sample surveys of very large populations say an entire nation often are not much more expensive than sample surveys of smaller, but still sizeable populations, such as the population of a large city, state, or region. This is so because, beyond a certain population size (perhaps 5000 inhabitants) the size of the sample needed for a particular level of accuracy in the estimates, remains fairly constant. In other words, the sample size would be about the same for a national survey as for one of a state or region. Usually estimates for the nation as a whole have considerably more social benefit than estimates only for a given state or region. Thus, while the benefits of a survey of a given size may be increased substantially by making it nation-wide in scope, its cost may increase rather little. Before launching a large-scale sample survey, then, policy-makers are well advised to determine whether they could increase their ratio of benefits to costs by having the study encompass a larger population, e.g., a state instead of a city, or a nation instead of a state. It may be, of course, that costs would increase as much or more than benefits, making it inadvisable to enlarge the scope of the study. For example, if it would be necessary to build and maintain a nation-wide staff of interviewers, because none exists, then the costs may be much higher for a national study (not because more total interviewers would be needed, necessarily, but because the costs of hiring, training, and supervising a geographically dispersed set of people may be much greater).

Similarly, if the information needed for sampling is better or more accessible for a smaller population than for a larger one, the sampling costs may be substantially greater for a study of the larger population. But the main point is that the commonly made assumption, that a survey of a larger population will be considerably more expensive than a large-scale survey of a much smaller population, should be examined carefully. It may prove unfounded. Similarly, the assumption that drug abusing problems exist solely or primarily in the very large cities may also prove unfounded.

5.4 Special considerations for developing countries

This section briefly discusses some special problems likely to be encountered more commonly in developing countries, although they can be seen in some regions of developed countries also. Probably the most obvious and important problem in developing countries, and the one which bears most on both the feasibility and desirability of conducting general population surveys, is the scarcity of particular resources. Obviously, in light of the many urgent goals and programs in these countries, the advisability of allocating money and skilled personnel to a survey must be weighted carefully. There may, in fact, simply be an absence or critical shortage of certain necessary skilled professionals such as sampling statisticians, social scientists trained in survey research methodology, people with the appropriate background and motivation to interview, and so on. Certain technical resources may be difficult to access as well things such as printing equipment and computers.

There is also a good chance that certain organisational supports may be lacking, such as an existing system for drawing national samples (or even the census data from which to

draw them) or a standing staff of interviewers (or at least of interviewing supervisors). Without these systems in place, the task will be more formidable.

There are also certain problems in the data collection stage which are more likely to be encountered in developing countries. Where there are very poor or very transient populations, the types of dwellings encountered may make it harder both to define a household and to select a sample of households. Census data may not be available or may be outdated. Lists maintained by other departments (e.g. election, civil supplies) may be useful in these regions.

Crowded and small dwellings also make it harder to establish privacy for the interview, not only from other members of the family, but from others in the neighbourhood. And in some countries it is contrary to cultural norms for women to be interviewed by a man, or perhaps by a stranger of either sex. When such a situation exists, it may be necessary to rely on a single family member to act as a reporter concerning the situation and behaviours of others in the family, even though the validity of the data generated by such a process would be highly suspect. People who are transient or not living in any identifiable household (e.g., living on the street, in vacant buildings, and such) will be missed in any household survey unless supplementary sampling procedures are instituted. To the extent that this is where the drug problems of greatest concern are likely to lie, an important segment of the population will be lost from the study.

In rural areas somewhat different types of problems may pertain. Since many villages are small, there may be not need for sampling within the village, but a sample of villages representative of a large region may be desired. Clearly if the survey is to succeed, the co-operation of the village leaders in such situations will be required, and other special procedures may be needed as well, such as having a local person as a guide and facilitator of rapport with the villagers. It may even prove necessary to have the research team remain among the villagers for a period of time to learn the culture, develop trust, and even provide some services of value to the village.

All of these are concerns which decision makers in developing countries, in particular, should take into account before deciding whether and how to design a study of drug abuse for the general population. Adequate attention to these issues at the initial stage is necessary to ensure that a decision to proceed will be an informed one and that the research design adopted will anticipate some of the problems likely to be encountered.

6. Ethical Considerations

As with virtually all endeavours, there are ethical considerations to be taken into account in the conduct of epidemiological studies of drug use. Those of particular importance relate to dealing with human subjects who will be approached for information, and most of whom will actually provide information.

Because the use of many drugs is illegal and/or socially disapproved in most cultures, respondents who provide information about engaging in such behaviours may put themselves at risk for legal action by authorities and social ostracism by those in their home, school, workplace, or community. Recognition of these potential risks is a first step for those planning to do research. The second step is to develop procedures to minimise those risks, while the third is to provide potential respondents sufficient information about the study and any hazards it may carry for them to be able to make a fully informed decision about whether to participate or not.

Much of the potential risk in drug abuse surveys comes from the possibility that a respondents answers to sensitive questions might be linked specifically to him or her. Quite effective means exist for lowering this risk to a minimal level, but they require some planning and forethought. If questionnaires are to be gathered in a group setting (say, a school) and there is no need for individuals to be identified for further follow-up or to link their individual data to some other information (like school records), then the field procedures can be made to yield virtual anonymity from the start. Respondents can simply be told to place their questionnaires into an envelope or box in whatever order they choose. Assuming that they have not been asked for any uniquely identifying information on the questionnaire, their individual questionnaire would be hard to pick out of a large group of such questionnaires. Still, there is some risk that a person who knows the population in question (maybe the teacher in that classroom) could identify an individuals questionnaire by looking at the pattern of self-descriptive information contained in the questionnaire. For this reason, it is desirable at least to have the envelope or box sealed in front of the group of respondents or, better yet, have someone who does not know the group of respondents take possession of the questionnaires immediately after their completion. Then it is possible to tell the respondents in all honesty, that the information they provide is anonymous.

When data are gathered from one identified individual at a time, however, as in the household survey, it is clear that the individual is not anonymous. Then procedures should be developed to maximise the degree to which that persons identity and answers will be kept confidential from i. other members of the family, ii others in the community, iii. police and others in positions of authority, and iv. even those on the research staff who may be curious. One method is to keep all identifying information on a special “cover sheet” which can be separated from the interview schedule at the earliest possible point and stored separately. (The cover sheet and interview can be connected by a matched number).

The cover sheets can be stored separately under lock and key; shipped out of the country to a professional colleague for safekeeping, if there is concern about authorities demanding the information; and/or destroyed once they are no longer needed for research purposes. Such procedures greatly reduce the risk of exposure. Ethical norms in the scientific community also require that potential respondents be given in advance sufficient accurate information about the study’s purposes, content, and risks that they can make a reasonable informed decision about whether or not to participate. Generally, except in rather extenuating circumstances, most people will agree if careful protections have been put in place and if they

are effectively communicated to potential respondents. The trust they have in the organisation carrying out the survey (a university versus a police agency, for example) also will affect their willingness to participate and/or provide honest answers.

The training of interviewers should contain clear guidelines on the protection of confidentiality and privacy, the right of respondents to refuse to participate, and their right to be informed fully about the nature of the study before their consent is requested. It is not uncommon for interviewers and other study staff to be asked to sign a pledge in advance in which they swear to protect the confidentiality of the subjects in the study under penalty of dismissal, should they break the pledge. This procedure helps to convey the importance of human subjects protection and to increase the likelihood that staff members will behave responsibly and ethically.

Ethical considerations regarding biological specimen analysis from the respondents are complex but need careful attention in any survey intending to use this method. There are guidelines on these issues in many countries and these need to be followed. However, at the minimum, respondents need to be informed that the specimen will be analysed for presence of drugs and a written consent obtained. The respondents should preferably also be asked to indicate whether they would like the results to be communicated to them, while ensuring absolute confidentiality of the information form all others.

Many surveys plan a longitudinal follow-up of the sample, hence require to contact the original respondents after a period of time. In this kind of design, it is extremely important that a consent is obtained from the respondents about they being contacts in future, using specified methods of contact (e.g. mail, telephone, home visits). Failure to obtain consent may create insurmountable ethical problems in the follow-up. If a respondent declines to give consent for follow-up (or for using a particular method e.g. home visit), his or her wish must be respected.

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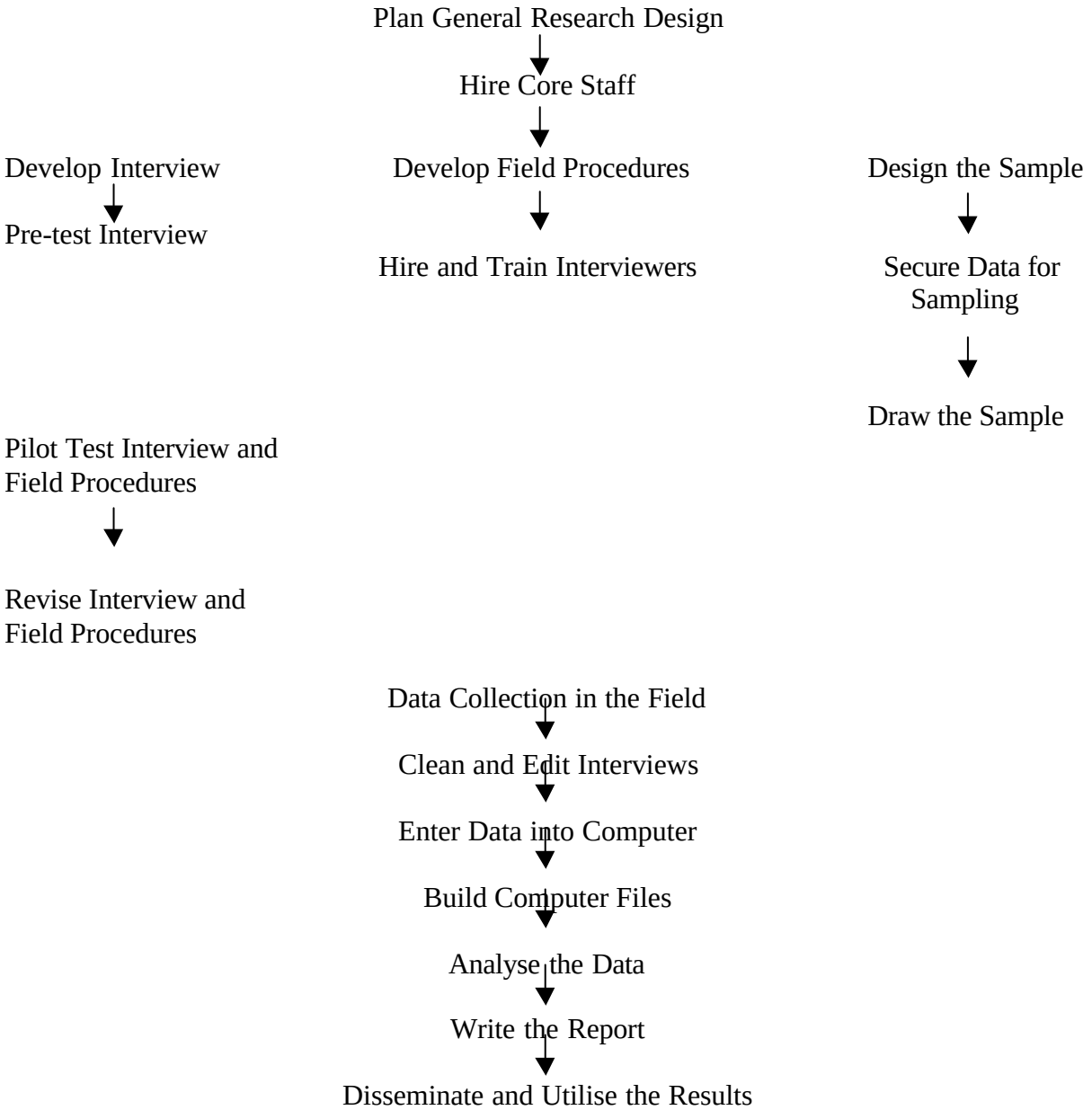
Table 1

Flowchart of a Typical Study



CHAPTER 6

SELECTING VARIABLES AND MEASURES FOR DRUG SURVEYS

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CONTENTS

1. Introduction

This chapter presents the objectives, rationale, and specifics of some standardised measures that should be considered for inclusion in any population-based survey of drug use, whether it is a general population or special population under study. Depending on the age and institutional setting of the respondents being studied, certain sets of questions will be more or less appropriate, of course, but many of the questions reviewed in this chapter would have applicability in any study population.

In Chapters 5 and 7 of this guide the studies discussed, which usually are not aimed at identifying individuals or "cases" in need of drug abuse treatment are often are described as "prevalence and incidence" studies. This label understates the true nature of these studies, because in addition to measuring the prevalence and incidence of various types of drug use, they usually also measure frequency of use; desistance of use; knowledge, attitudes, practices, and perceptions related to use; personal and environmental characteristics relevant to explaining use; and consequences of use. In other words, they not only measure levels and trends in prevalence and incidence, but gather a great deal of information useful for the examination of the correlates, causes, and consequences of those levels and trends.

1.1 Move toward standardised measures

Over the past two decades there has been considerable movement toward standardising epidemiological measures of drug use in these types of studies. Preceding this a great variety of measures existed, differing considerably in quality and yielding results that could seldom be compared or integrated. In the mid-1970s, WHO convened an international group of collaborating investigators who worked toward developing and testing standardised measures of drug use and related factors that could produce comparable, reliable, and valid findings across a range of cultures (Hughes et al., 1980; Johnston, 1980; Rootman and Hughes, 1980; Smart et al., 1980, 1981). The first document to emerge from this dealt with surveying in-school youth (Smart et al., 1980); it drew heavily on the work already underway on the same population in the United States (Johnston, Bachman, and O'Malley, 1979) and Canada (Smart and Fejer, 1974). WHO produced a standardised self-administered questionnaire for use with in-school youth and an adapted version for use with out-of-school youth (Smart et al., 1981). A case-reporting version was also developed for settings where physicians or other professionals dealing with drug users were gathering the data (Hughes et al., 1980; Rootman and Hughes, 1980). Finally, a manual on general population surveys also grew out of this, though it did not contain a standardised instrument (Johnston, 1980).

At about the same time, the United Nations Division of Narcotic Drugs (UNDND) developed a Manual on Drug Abuse Assessment, Part II: Use of General Population Surveys (UNDND, 1980) that provided a standardised interview schedule for face-to-face interviews. The UNDND manual covered many of the same variables as the WHO self-administered questionnaires. Indeed, a specific effort was made to have the UNDND measures as compatible as possible with the WHO measures in order to avoid conflicting or incompatible

recommendations emerging from the two international agencies. The achievement of this goal was facilitated by the fact that the author of the UN Manual, Part II (L. Johnston) was also a collaborator in the WHO efforts. (It should be noted that the instruments developed by both agencies were intentionally designed to be appropriate for use in developing as well as developed countries).

Since the publication of these various WHO and UN manuals, a number of countries have conducted surveys of general and/or special populations using the standardised measures they contained. They, in turn were compatible with the ongoing school surveys in Canada and the United States.

More recently another international organisation, the Council of Europe, developed a standardised drug survey instrument for use primarily with school children in developed countries, and its feasibility, reliability, and validity were demonstrated in pilot studies in eight countries in Western Europe and North America (Johnston, Driessen, and Kokkevi, 1994). The Expert Committee on Drug Epidemiology of the Council of Europe's "Pompidou Group" which developed the instrument, intentionally designed it to be as compatible as possible with the WHO and UNDND instruments discussed above. The major differences were that they gathered more detailed frequency data on drug use than the earlier, more simplified instruments, and they covered more subject content. However, they remained consistent on a number of dimensions of importance:

i. the categorisation of types of drugs;
ii. the prevalence periods (lifetime, past 12 months, past 30 days) of respondents reported use;
iii. and the frequency categories for respondents reported use.

Attaining standardisation on just those three dimensions constituted a major gain for the field of drug epidemiology, and comparisons across studies can now be made for much of the drug research being conducted at the world level. Indeed, in 1995, some 26 countries in Europe undertook a co-ordinated administration of in-school surveys in many cases on national samples sponsored by the Council of Europe and the government of Sweden (Hibbell et al, 1997). These surveys drew heavily on the instruments and procedures developed and tested earlier by the Council of Europe's Pompidou Group Expert Committee and permitted comparison and investigation of results not only in the 26 participating countries, but also with others using comparable instrumentation.

Another development that enhanced the move toward standardisation was the revision of the UNDND country reporting form used to solicit annual reports on drug use in each member country for the International Drug Abuse Assessment System (IDAAS). Those forms now request the information in a format compatible with the three standardised dimensions mentioned above, meaning that those countries that gather data using any of these standardised measures, including the measures contained in the present volume, will have generated data in a form compatible with the UN country reporting system.

1.2 Movement toward standardised psychiatric measures

Also worth mention here is the fact that a somewhat separate line of epidemiological work on drug use has grown out of the psychiatric tradition, with its emphasis on treatment interventions. As self-report methods using standardised instruments for the diagnosis of psychiatric conditions has grown, a component dealing with the diagnosis of drug abuse and drug dependency has emerged. Rigorous efforts have been made to standardise these measures, as well. (See the DSM IV; Livesley, 1995; ICD 10, 1992).

Generally, psychiatric measures have not been administered with measures used in prevalence and incidence studies for two reasons one practical and one relating to the research objectives. From a practical point of view, the instruments emerging from both traditions are long and demanding on respondents; so administering both can place an unrealistic demand on respondents time and patience. Further, the researchers in the two traditions have had somewhat different objectives. Those from the prevalence and incidence tradition look at the spectrum of use from initiation through current and frequent use; those from the psychiatric tradition concentrate on the heavy-use end of the spectrum, specifically abuse and dependence, and often within the context of assessing the full range of psychiatric problems. Therefore, the two traditions have differed in what is to be explained, and with what types of variables. Prevalence and incidence studies emphasise prevention, early intervention, and progression into heavy use, whereas psychiatric studies emphasise the identification and treatment needs of the diagnosable "cases". Nevertheless, both approaches have something of value to add to a country's knowledge about its drug use problems; in fact, the US National Comorbidity Study (Kessler, 1994) included both types of measures in a single household interview study. However, such an ambitious undertaking may not be feasible in many countries for the reasons presented above.

1.3 Continuing to move toward standardisation

To summarise, there has been a strong movement toward the standardisation of the measures used in epidemiological studies of drug use in the general population and in a number of special populations. This guide builds upon that tradition and offers recommended variable sets and question wordings that are highly similar to those developed in those previous efforts. The reasons remain the same. First, better questions are likely to be used in many cases than if questions are written in each study. Second, the results from various countries can be compared and contrasted more easily. And finally, this standardisation will greatly increase the likelihood that the findings generated in countries around the world can be meaningfully integrated; for example, to determine the universality of certain patterns or relationships.

In the remainder of this chapter three types of model instruments will be described, the recommended distinctions among classes of drugs will be reviewed, and recommended core questions will be set forth. Different question formats will be described and sources of information relevant to them given. Finally, a range of optional measures which might be

considered for inclusion in an epidemiological survey on drug use will be presented, and their relevance discussed. These will relate to demographic characteristics of the respondent; the respondents knowledge, attitudes, and perceptions relevant to drugs; other factors which may influence drug use; and some possible consequences of use.

1.4 Model epidemiological instruments

Model instruments have been developed in a number of the undertakings described above in Section 1.1. They are used under different conditions and fall into three general types: i. self-administered questionnaires; ii. interviewer-administered interviews; and iii. physician-administered case report forms. It is possible to use the same variables in any of these formats and thus retain standardisation in the type of data that will emerge from them, but the exact structuring of the question and answer set will need to be adapted for the format. The model questionnaires presented in Chapter 10 of this guide were developed both as self-administered and interview administered questionnaires. However, adaptation to a case report format is possible.

1.4.1 Self-administered questionnaire format

This format requires that the respondents be fairly literate and, therefore, is particularly appropriate in secondary school and university settings. It can also be used in military and other settings. Administration to groups in institutional settings provides a very cost-efficient and anonymous method of administration. Of course, such questionnaires can also be given in person or sent by mail to individual respondents. Usually most or all of the questions have the answer alternatives already spelled out in a “close-ended” format, as opposed to an “open-ended” format in which the respondent gives an answer in their own words.

In addition to the self-administered model core questionnaire provided in Chapter 10 of this guide, the reader will find other self-administered questionnaires in WHO Offset Publication No. 50 on student surveys (Smart et al., 1980, pp. 37-43), the original Pompidou Group, Council of Europe student questionnaire (Johnston et al., 1994), and the U.S. student questionnaire from the Monitoring the Future Study (see Johnston, Bachman, and O’Malley, 1995, for the full set of instruments).

1.4.2 Interviewer-administered format

This format is often used in general population surveys where an interviewer goes to a household and gathers data from one person at a time. Literacy is generally not a problem because the interviewer can read aloud all question and answer alternatives. However, even in this situation it has been found that using an answer sheet on which the respondent can record answers themselves to fairly sensitive questions like drug use, can improve the level of truth-telling. The respondent does not need to be as good a reader as in the self-administered condition, because the interviewer is there to read the questions and the answer set aloud,

while the respondent is following along on his or her own answer sheet. Nevertheless, for respondents with no literacy, the interviewer will have to record the answers, as well, and such respondents will not have the same degree of privacy.

For questions where the respondent does not have an answer sheet spelling out the full set of answer alternatives, those alternatives must be communicated either orally or in writing using a special "cue card" that the interviewer shows to the respondent as the question is being read aloud. If given orally, the answers can be built into the question wording or simply be read aloud after the question has been asked. Part II of the UN Manual on Drug Abuse Assessment (UNDND, 1980, pp 39-49) contains a number of the questions discussed in the chapter in an interview format, as does the U.S. National Household Survey on Drug Abuse (SAMHSA, 1997). The reader may also wish to look at the WHO Offset Publication No. 60 on surveying non-student youth (Smart et al., 1981, pp. 43-49).

1.4.3 Case reporting forms

These forms require the most skilled type of person to administer them, usually physicians or drug treatment personnel. They simply provide a more concentrated or compact form with which to gather information, and they are most often used in hospitals or other treatment settings. Because the full text of each question may not be spelled out in these forms and because a close-ended answer set may not be presented to the respondent, some researchers view them as a weak tool for gathering research information. This is because they are likely to have much greater variability in the way they are administrated, the care and consistency with which the questions are asked, and in the formulation and presentation of each question to the respondent. Nevertheless, a set of forms was developed which are intended to gather data that would be comparable to that gathered in other formats, and the results are available in WHO Offset Publication No. 56 (Hughes et al., 1980, pp. 71-76).

2. Core measures of drug use

Central to all such epidemiological studies, of course, are the measures of actual drug use. The various efforts outlined above have moved toward standardised distinctions among the different classes of drugs for purposes of separate measurement, and toward standardised prevalence periods of use for each of these classes of drugs. These are considered the core measures, meaning that it is recommended that any study dealing with the prevalence and incidence of drug use contain these measures. Later in this chapter a few more recommended core measures will be suggested, as well as many optional measures that the investigator may wish to give serious consideration for inclusion. Of course, the investigators in charge of any particular study must select variables, and the questions used to measure those variables, in accordance with their own research objectives. They must also take into account the situation in which the research is being conducted, and the capabilities, degree of motivation, and cooperativeness of the study population. Nevertheless, a great many drug use studies have very similar research objectives and consider many of the same variables for inclusion.

Therefore, investigators are urged to consider the measures provided here. They have been carefully developed by experienced research groups and have been assessed in a number of different cultural settings (see Chapter 10 of this guide). Still, they certainly should be pre-tested in any new cultural setting to which they are going to be applied, to be sure that respondents understand both the questions and the answer alternatives, and to be sure that the translated questions carry the same meaning in that culture that they carried in the original language in which they were written. Comparability of meaning is certainly more important than how literal the translation is. A process of field assessment to prepare a questionnaire is described in Chapter 10 together with results from the assessment of the model instruments contained in this guide.

2.1 Categories of substances

Table 3.1 lists the major classes of substances which have been distinguished for core measurement. In any given population some of these drug classes may be so uncommon that it does not make sense to ask questions about their use, and it is assumed that they will be deleted from the questionnaire. However, an investigator is advised to check with a number of informants knowledgeable about the "drug scene", before assuming that a class of drugs is not in use. In the qualitative field assessment of the model instruments in this guide a "free listing" exercise was found to be helpful in determining a full list of locally used drugs together with appropriate street names. Chapter 10 describes this process.

Several broad categories of substances are included in this list: i. those that generally are legal to sell and use and are not controlled by international convention (e.g. cigarettes, other tobacco products, alcohol, and inhalants); ii. those that are generally illegal and for which international trafficking is prevented by convention (e.g. cannabis, some hallucinogens, cocaine, heroin); and iii. those for which both national and international sale is somewhat controlled because, although they have legitimate medical uses, their considerable potential for abuse has been recognised (e.g. tranquillisers, sedatives, some amphetamines, and many of the "other opiates" used in cough and diarrhoea medicines, for example). All of these drugs are widely recognised for their potential for abuse and for their adverse consequences in terms of morbidity and mortality. Therefore, they are of concern to the World Health Organisation, as well as most national, regional, and local bodies concerned with health promotion, and disease prevention.

Within a number of the general drug categories listed in Table 3.1 there are sub-categories of drugs that may be of special concern in a particular population and that may be asked about separately. Two approaches are possible when this situation arises. One is to ask about the components (or even one component and then the residual category for example heroin and other opiate type drugs) in separate questions. Another is to ask the questions about the combined category and then a subsequent question about the specific drug of interest, making clear to the respondent that he or she is expected to include the separate drug in the answers to both sets of questions. Either way, a combined prevalence rate for the larger category can be calculated for purposes of international comparison, and for purposes of

analysis, if it is so desired.

A number of abusable substances are not listed as core measures because their use is geographically confined; for example khat, anabolic steroids, and various "designer drugs" that do not fit easily into the categories in Table 3.1. Nevertheless, wherever their use is a matter of concern, their inclusion in the survey should be seriously considered. The basic set of prevalence and frequency questions reviewed in the next section can be used with nearly any additional category of drugs. Clearly, concern about questionnaire length will lead most research investigators to be conservative about how many new categories to add, but they should at least consider whether there are any additional, obvious categories of drugs that should be included in the survey in their cultural setting. A qualitative field assessment involving focus groups and free listing (as described in Chapter 10) is recommended as a method of constructing a list of drugs with recognisable local names appropriate to the local setting.

2.2 Prevalence and frequency measures

Once the list of drugs of interest has been selected, the next step is to craft the questions that will elicit the prevalence and frequency information of greatest usefulness. A prevalence rate is the proportion or percent of a defined population using a drug one or more times in a given time interval. As discussed earlier in this chapter, several prevalence time intervals have emerged as the standard ones recommended for, and being used in, a great many drug use studies (Table 3.2). These distinguish i. use over the entire lifetime, ii. use in the 12-month period immediately preceding the survey, and iii. use in the 30-day period immediately proceeding the survey. (Note that these three time periods are overlapping; that is, the prior 30 days is a portion of the prior 12 months, and the prior 12 months is a portion of the entire lifetime). Having data on these three periods allows the researcher to determine what proportion of the population ever tried a drug ("lifetime prevalence"); what proportion have used it during the past 12-months ("annual prevalence") and therefore might still be active, though perhaps infrequent, users; and what proportion are current, or recent users "30-day prevalence").

If the frequency with which use has occurred within each of these three time intervals is distinguished in the answer set provided to the respondent, then the "period frequency" can also be established for each of the three time periods. (As outlined in Table 3.2, it is assumed that all studies would include as core variables the frequency of use in the prior 30 days; whereas establishing frequency for lifetime or past 12-months is optional). Obtaining frequency of use, using the standard distinctions shown in Table 3.2 and in the model questionnaire provided in this volume, is useful for a number of purposes. For example, those who have used the drug in question only once or twice in their lifetime (sometimes a significant fraction of all of the users) can be distinguished from those who became more deeply involved with the drug. The option of omitting the frequency categories for the lifetime and past 12-month prevalence periods is provided primarily for the use with populations likely to have problems completing a more detailed questionnaire or interview

schedule.

Another core variable listed in Table 3.2 is daily (or near-daily) use in the past 30-days, also referred to as the "current prevalence of daily use". This measure derives from the question on frequency of use in the prior 30 days. The field assessment of the model core questionnaires developed for this guide revealed a preference for a frequency of use measure based on the number of days of use rather than the number of occasions of use (see Chapter 10). A formulation of the question based on number of days of use in the prior 30 days is included in Table 3.2. The use of cigarettes and other forms of tobacco have been the classes of drugs comprising the primary exceptions, because they are usually used on multiple occasions every day. Special questions are proposed that not only measure whether tobacco is consumed daily, but the frequency of use per day during the prior 30 days. Thus, several prevalence rates can be generated from the question, including the current prevalence i. of daily smoking, ii. of smoking a half-pack-per-day, and iii. of smoking a pack-per-day. (A pack of cigarettes is assumed to contain 20 cigarettes).

2.3 Age of first use measures

Age of first use is another dimension of considerable importance that has been defined here as a core variable. Age of initiation varies widely across individuals and across drugs. In many cultures the use of one drug tends to precede the use of certain other ones (Johnston, 1973; Kandel, 1988; Yamaguchi and Kandel, 1984a; 1984b). For these and other reasons, measures of age of first use have been recommended for all studies. Usually, a single set of questions can gather comparable data on age at first use across all drugs. The general question can be given and the set of answer-alternatives provided once after which, the respondent goes down the list of drugs giving the appropriate answer for each. Alternately, the question about age of first use can be asked after the prevalence/ frequency questions for each drug class separately, as in the case for the model core questionnaire provided in Chapter10.

2.4 Mode of administration measures

The last category of questions in Table 3.2 about a respondents actual use of drugs, is "mode of administration", meaning the methods(s) by which a person administers a particular drug. In some cases the answer is obvious and the question need not be asked: for example, cigarettes are virtually always smoked. In other cases, the method of ingestion may be obvious within a particular culture; for example, in North America marijuana is almost always smoked in cigarette form and, until recently, heroin was almost always injected. But for many drugs, the method of administration may vary significantly within a country, and the different methods may carry different degrees of risk for adverse consequences. Injection, to take a particularly important example, has always carried high risk of transmitting serious diseases such as Hepatitis B when the needle was shared. With the advent of Human Immunodeficiency Virus (HIV) the severity of the consequences of injection has greatly increased. For this reason, unless a population is known to be a non-injecting population, it is

recommended that at least one question, and perhaps several, concerning the use of a needle to take drugs non-medically be included. (Sample questions are provided in the model questionnaire appended to this volume). Depending on the population in question and what is known about methods of ingestion, the investigator also may consider asking separately about the mode of ingestion for cannabis, cocaine, heroin, other opiates, and/ or amphetamines.

3. Demographic, family background, and social status measures

3.1 Core variables

There are a host of background and demographic factors which may be used in determining who uses drugs more than others, and by inference, who may be at particular risk because of regional and other demographic factors, family background factors, involvement in certain activities, living in certain environments, etc. While it may seem that a great many such measures could be standardised, this has proven more difficult than initially thought, due to tremendous cultural variations. For this reason, and also in the interest of brevity in the model questionnaires, only a few such variables are set forth here as core measures for inclusion in virtually all studies in a comparable form. These are listed in Table 3.3, along with a much longer list of recommended optional items.

The instruments in the appendices to Chapter 10 of this guide contain the core measures for determining the gender, age, education level, student status, and employment status of the respondent. Gender and age are of particular importance because there usually are large, systematic differences in the use of various drugs as a function of both factors. Males, for example, often are the heavier users of illegal drugs, as well as cigarettes and alcohol, whereas females may be the heavier users of some of the psychotherapeutic drugs like tranquillisers.

Because the use of many of these drugs is initiated in late childhood through adolescence and early adulthood, usage levels likely will vary considerably by age, to the extent that separate prevalence and trend estimates may be routinely reported for various age bands. For example, a number of household surveys report separately for 12 to 17 year olds, 18 to 25 year olds, and those aged 26 and over. In fact, of the various core demographic variables, the two which will probably be used consistently in reporting are age and gender.

Student status is important to determine with respect to planning prevention interventions, those who are students may be influenced through the schools whereas youth not in school must be reached other ways. Level of education can be useful for making rough social class distinctions, because different drugs may be popular in different social classes. Knowing the education level of users may also help to guide the nature and content of various prevention and intervention efforts. Employment status is useful for several purposes: to determine the extent to which drug use is concentrated among the unemployed, to determine how many users might be reached through their work setting, and so on.

3.2 Recommended optional variables

Table 3.3 contains an even longer list of recommended optional variables. A number of these are equivalent in importance to the core variables, but they have not been listed here as "core" because there is not a universal question and answer set which can be used cross-culturally. Region of the country, size of the community, ethnicity, and in some countries, religion, all are very important variables for the task of localising the problem(s). Are certain drugs used only in one part of the country or only in big cities? Are certain ethnic or religious groups particularly those with lower status in the society at greater risk of drug involvement?

Socio-economic status is one of the most difficult dimensions to measure accurately, or for that matter, even to define. One approach is to use one or more of the usual components which contribute to socio-economic status, e.g., education level (or education level of parents), occupation (or occupation of head of household), income (or income level of the parents), or amenities in the home (electricity, running water, plumbing, number of rooms per person, etc.), ownership of an automobile or other property, and so on. Some of these measures may be inappropriate for developing countries. For most purposes, fine distinctions on the underlying dimension of socio-economic status are not very important, so there is a real risk of spending too much of the researchers time and too much of the respondents time trying to measure this variable. Brevity and simplicity should weigh heavily in the selection of measures here.

Of somewhat less importance, but still useful for describing the kinds of people likely to be at risk for using various drugs (and for determining the extent to which other people might be influenced by, or otherwise adversely affected by their use), are such variables as marital status, parental status, pregnancy status, type of housing, and types of people with whom the respondent is living.

Obviously, some of the variables in Table 3.3 must be tailored to the circumstances in the country or, to be more precise, at least the answer alternatives need to be tailored to the country. Such variables include region of the country, ethnicity, and religion. Others can be asked in fairly comparable ways from country to country and when this is so, the usual benefits of using standardised questions are gained. Once again a field assessment of the variables and coding frames prior to commencing the survey is strongly recommended.

3.3 Other sources for survey measures

For those variables for which measurement is provided in this volume, the recommended approach is given. For the others, the reader is referred to several sources which may provide useful measures. These include:

i. WHO Offset Publication No. 52 on Student Surveys, p. 37;
ii. WHO Offset Publication No. 56 for Non-Student Youth, p. 41;
iii. WHO Offset Publication No. 73 for Core Measures, p. 73;
iv. United Nations Division of Narcotic Drugs Manual on Drug Abuse Assessment;

Part II on General Population Surveys, pp. 36-39 Council of Europe "Pompidou Group Report" Surveying Student Drug Misuse:
A Six-Country Pilot Study
The 1995 ESPAD Report: The European School Survey Project on Alcohol and other Drugs

v. The US National Household Survey on Drug Abuse;
vi. The US surveys of students and young adults (Monitoring the Future).

In the reports listed above, the instrumentation is generally included at the end of the report. However, the last two items refer to ongoing studies, and the full instrumentation used in each of those may be found on the world-wide web in the Substance Abuse and Mental Health Data Archive (SAMHDA) at http://www.icpsr.umich.edu/samhda. The instrumentation is contained in the codebook of each study.

4. Additional Characteristics of the Familial and Social Environment

A number of important environmental factors likely to influence drug use already have been presented in Table 3.3. Certain other influences in the environment have been measured in other surveys and may be worth consideration in future ones. Among them are the proportion of the respondents friends who use drugs; for youth, the use of drugs by the respondents parents; and the perceived availability of drugs.

4.1 Parental drug use

The use of various drugs by parents from cigarettes and alcohol to the illegal drugs may have the potential to increase the child's use of those same drugs, and perhaps other ones as well. Asking children to report on parental behaviour which is socially stigmatised and/or illegal may not be ethically acceptable in some cultures; but if data are gathered in a way that the respondent (and, therefore, the parents) are anonymous, there is clearly less risk. Questions would usually be asked separately for the mother and father, and some research

suggests that use by older siblings may be an important influence, as well.

4.2 Friends use of drugs

There generally tends to be a correlation between the individuals use of drugs (or a particular drug) and the proportion of that personas friendship or peer group who uses drugs (or that particular drug). This in part reflects a selection effect in which people seek out others with similar interests, including "deviance" in general and drug use in particular. But, if a person who is a non-user enters a peer group where use is common and accepted, it may increase the likelihood that he or she will begin using. For this reason, studies sometimes include a set of questions asking respondents what proportion of their close friends use each drug, usually differentiating the same drug classes on which respondents were asked to report their own use. If brevity is a consideration, the drug list could be shortened: for example, to separate questions about cigarettes, alcohol, marijuana, and "other illegal or illicit drugs" taken as a group.

One less-than-obvious use of such data is to check the validity of the self-report data on drug use. There should be some logical correspondence between the proportion saying that they personally use a drug and the aggregate proportions saying that they have friends who use. (Presumably people have less motivation to conceal friends use, if those friends are not identified in any way, than their own use; therefore, friends use may be assumed to be quite valid.) Surveys repeated across time also can be checked to see if trends in self-reported use are matched by similar trends in reported friends use. A failure to get parallel results could indicated a change over time in respondents willingness to answer honestly about their own use.

4.3 Perceived availability of drugs

The extent to which people have access to drugs can also influence the likelihood that they will use them, and this important environmental factor can change quite substantially over time. Indeed, when an increasing proportion of the population starts using a drug, they also may provide access to others through their friendship circles. Put another way, a growing proportion of the non-using population will personally know active users, through whom they can get access to the drug. Determining accessibility is not an easy task, but determining perceived accessibility is not so difficult. (Presumably perceived accessibility tracks actual accessibility to a considerable extent). Questions have been used in which all respondents are asked how difficult they think it would be for them to get each drug if they wanted to get some. Generally, the results show that certain drugs, particularly the legal ones, are almost universally available; that some are available to very few; and that others are available to significant proportions of the population. Measuring perceived availability should probably receive a fairly high priority in most drug surveys, although such measures are not categorised as core measures here.

5. Attitudes, Beliefs, And Norms Regarding Drugs

There are a host of characteristics descriptive of the person, other than drug use and demographic characteristics, which might be measured for the purpose of helping to explain drug use. Some of those which have proven most fruitful include the respondents own attitudes and beliefs regarding the various drugs and also the norms among their peer group regarding drug use. All are categorised as optional, though serious consideration should be given to those described in Sections 5.1 and 5.2 below.

5.1 Perceived dangers of drug use

In a theory of drug epidemics offered by Johnston (1991), the degree of danger to the user perceived to be associated with using a given drug is a primary determinant of the propensity to initiate use or to desist use, if it has not yet reached the level of drug dependence or addiction. This theory grows out of a 20-year study of drug use by U.S. adolescents, in which it was found that changes in perceived risk could explain both upturns and downturns in the use of a number of illicit drugs, but in particular marijuana and cocaine (Bachman et al., 1988; Bachman, Johnston, and O'Malley, 1990; Johnston, 1985; Johnston et al., 1996). The strong ability of these beliefs to explain levels of drug use in one country makes them serious candidates for inclusion in other surveys. Indeed, they were contained as core items in the 26-country in-school student survey conducted in Europe (Hibbell, et al, 1997) and in the ongoing national household surveys of drug use in the United States (SAMHSA, 1997).

Because respondents associate very different degrees of risk to different levels of involvement with a drug, the reader will see in the measures presented here (see Annex) that different levels of use are distinguished (e.g., using once or twice vs. occasionally vs. regularly). As with the drug use questions, the questions about perceived risk should contain only the drugs of relevance to the country in which the survey is to be conducted.

5.2 Personal disapproval of drug use

The U.S. school study cited above also found the respondents attitudes about the acceptability of drug use, as well as their perceptions of the attitudes of their peers, have been important factors for explaining increases and decreases in drug use. Johnstons theory (1991) posits that changes in the degree of perceived risk associated with using a drug directly changes a persons propensity to use it, and also indirectly influences the persons propensity to use by reducing the social acceptability of use. For these reasons, social disapproval is now measured in a number of studies, including the U.S. adolescent school surveys (Johnston, et al., 1996), the U.S. National Household Surveys (SAMHA, 1997), and is optional in the Council of Europe Surveys (Johnston et al., 1994; Hibbell, 1995).

The attitudes of individual respondents in the aggregate can be thought of as a rough measure of the social norms regarding use; therefore, often the measurement approach of asking respondents the extent of their own disapproval is used to measure peer norms. However, the norms in each individuals peer group can also be measured separately, as is discussed next.

5.3 Friends disapproval

The question set described above in Section 5.2 to measure the respondents own disapproval of the use of various drugs can be modified slightly to measure the degree of disapproval he or she believes that close friends would have if the respondent were to engage in those same drug using behaviours. The list of drugs and the answer categories would stay the same. The general question, "Individuals differ on whether or not they disapprove of people doing certain things. Do you disapprove of people (who are 18 or over) doing each of the following?" Used to measure the individuals attitude would be replaced with, "how do you think your close friends feel (or would feel) about you...", followed by such statements as "Smoking marijuana once or twice". As stated above, the aggregation of answers about how the respondents themselves feel probably will resemble closely those about how peers feel. Therefore, one probably should choose one question set or the other. (Both are given in the Annex). Unless the investigator wishes to distinguish differences in peer norms for different settings or sub-groups, the personal disapproval questions should suffice.

6. Additional Characteristics of the Person

The demographic, family background, and other characteristics of the social environment discussed earlier constitute one set of factors potentially associated with increased risk of drug use. Attitudes and beliefs about drugs constitute a second. There remain many additional factors which can provide useful information regarding the characteristics of drug users as compared with non-users (See Table 3.4.). While data generated from cross-sectional surveys are limited in their use to determine the causes of drug use, cross-sectional data can be used to assess the correlation between possible risk or protective factors and drug use, and to identify patterns which suggest a need for further more focused studies. Cross-sectional data can also be useful in the generation of hypotheses regarding factors which may influence an individuals risk of drug use. The hypotheses can then be formally tested in additional studies utilising appropriate data collection and analysis methods. For youth, one useful set of factors relates to the degree to which young people have bonded or attached to certain key socialising institutions in the society, namely their family, church, and school. Anyone planning a drug abuse survey will want to be aware of these factors, though few surveys can measure all of them.

6.1 Attachment to family

Among factors of relevance here are:

(a) total absence from the parental home (runaways, street children),
(b) for those still living at home, proportion of time (especially evenings) spent out of the home, and
(c) intactness of the home (whether 0, 1, or 2 parents or stepparents are present).

6.2 Attachment to school

The extent to which a young person thrives at school appears to be a factor which may influence his or her likelihood of drug involvement. Among the variables which have been shown to be important in a number of studies are the following:

(a) permanent absence from school (early leavers)
(b) for those still in school, proportion of time spent out of school (days skipped, classes skipped)
(c) academic performance in school (grades)
(d) liking school.

Sample questions may be found in the appendices to this volume.

6.3 Attachment to religion

The importance of religion, regardless of which religion, has been shown to be a protective factor against involvement with drugs in many studies. Two measures seem to work well in combination:

(a) frequency of attending religious services or ceremonies, and
(b) rated importance of religion in respondents life.

6.4 Use of other drugs

Often, among the strongest factors associated with increased risk of the use of particular classes of drugs is the prior use of other classes of drugs, both licit and illicit. In many countries tobacco, alcohol, and inhalants are among the drugs first tried by young people, and the fact that some or all of these drugs have been used previously has been found to greatly increase the probability that any other class of drugs (including alcohol, tobacco, or inhalants) will be used subsequently. Indeed certain sequential regularities have been identified in more than one culture (Kandel 1988; Johnston, 1973; Yamaguchi and Kandel, 1984a; 1984b) with alcohol and/ or tobacco usually preceding marijuana use, and marijuana use usually preceding the use of any of the other illicit drugs.

The nature of the causal connections which explain these regularities is still open to

debate. Quite clearly much of the association is due to a more general individual propensity toward deviance, which expresses itself in different ways at different ages perhaps starting with the least deviant and/ or risky behaviours and then proceeding to the most deviant or risky ones. It has also been argued, however, that the very high degree of association between certain behaviours cigarette smoking and marijuana smoking, for example may in fact reflect a causal connection. In this case, learning to take smoke into the lungs, and being chemically reinforced for doing so, might make cigarette smokers more likely to move on to smoking marijuana.

Regardless of the underlying causation, there can be little doubt that users of any of these drugs are much more likely to be users of the others in many cultures. Therefore information on age of first use of other drugs will help to identify people most at risk of using particular ones.

6.5 Deviance

Still another set of variables (which may be thought of in terms of the respondents degree of attachment to their community) is their degree of deviation from laws and predominant norms. Of course, drug use is almost always a deviant behaviour itself, but it also is strongly related to other forms of deviance such as interpersonal aggression, property crimes, precocious sexual behaviour, and so on (e.g., Jessor and Jessor, 1977; Johnston, 1973; Kandel, 1986; Osgood et al., 1988). However, the connection may be one more of common causation what predicts one form of deviance (say drug use) also predicts another (say delinquency) unless the individuals drug use has become so compelling that the user must commit crimes in order to be able to buy drugs (Johnston, O'Malley, and Eveland, 1978). Indeed, it was found in one study that a general propensity toward deviance explained much of the variance in the various manifestations of deviance, including drug use (Osgood et al., 1988). Still some variance in drug using behaviours remained to be explained by other factors, even when the general propensity toward deviance was controlled.

Asking respondents about other forms of deviant behaviour might adversely affect respondent Cupertino and candour with the researchers. Therefore, researchers should weigh these considerations carefully and consider whether measuring such variables is sufficiently central to the purposes of the research to risk whatever damage they believe will result from including them. Obviously the extent to which the respondents answers are anonymous, or at least confidential, is likely to influence the degree to which respondents object to such questions.

7. Possible consequences of use

There are many domains in which various kinds of drug use may have adverse consequences: physical health; social functioning in different social settings, such as the family, school, work, or friendship circle; cognitive and emotional functioning and stability;

performance in any number of tasks, including driving vehicles and operating machinery; affiliation with deviant sub-groups; and criminal behaviour. While measurement of the consequences of use would be informative, both the accurate measurement and accurate interpretation of the results are formidable research tasks. That means that the purposes for which such data are needed should be fully considered before committing a great deal of measurement to this subject.

The large number of potential adverse consequences clearly exceeds the measurement capacity of a given survey instrument, and for many of those outcomes established, valid, and reliable self-report measures are not yet available. Further, there are two quite different measurement approaches available for determining what consequences result from various types of drug use. The first is to measure the outcome without any reference to the persons drug use. For example one might ask if the respondent has experienced any of a number of physical symptoms or conditions in the past year; then, the degree of statistical association between the measures of drug use in the past year and these various symptoms and conditions can be examined and reported. Even when a strong association is found, however, it does not prove causation, because the temporal sequence of events has not yet been established and because other factors may be correlated with both variables and actually be the cause of the observed statistical association between them. To take one hypothetical example, marijuana smoking may be associated with frequent coughing but have nothing to do with causing it. Cigarette smoking is often highly correlated with marijuana use, and the cigarette smoking could be the actual cause of the coughing seen more frequently than normal among marijuana users.

The second general approach to measuring consequences is to ask the respondents to make the attribution of causation. The respondents may be asked, for instance, whether their use of alcohol had caused them to have poor health, or drive unsafely, or behave badly toward family members. This approach relies heavily on how accurately the respondent can judge the connection between the substance used and the consequences of its use. Some classes of consequences may be very hard to judge, such as the long term effects of chronic use of some substance. Others might be more straightforward, such as having an automobile accident while intoxicated, or fighting with family about ones drug use. This approach to measuring consequences certainly can be useful to describing what the users themselves see as the consequences of their use. Such results may be helpful in many ways, including the design of prevention messages; but they still fall short of proof of causation.

One set of questions in the appendix deals with self-attributed consequences. It asks separately about the consequences of alcohol, marijuana, and “other drugs” taken as a class. Obviously the number of answers required can proliferate rapidly as the number of different drug classes being distinguished increases; and some respondents may have a problem in a self-administered questionnaire answering about even three drug categories. Nevertheless, this question set has been used successfully in at least one series of national student surveys (Johnston et al., 1996). Of course, the drugs of most relevance in a given culture may differ, which would simply mean that the column headings should be revised appropriately.

If the investigators are developing questions aimed at measuring consequences where the respondent is not being asked for causal attribution, they should consider particularly measures in the following domains:

(a) general health questions;
(b) difficulties in school (or at work);
(c) difficulties in the family;
(d) psychological and emotional functioning;
(e) driving accidents;
(f) criminal behaviour;
(g) HIV risk behaviour.

8. Summary and Conclusions

Quite a large number of variables have been reviewed in this chapter. It is clear that no single questionnaire, or interview schedule could contain the questions necessary to measure all of them. (Some are relevant only to adolescents or to adolescents enrolled in school, so obviously they can be eliminated from surveys of other populations). Therefore, in this chapter we have tried to indicate those variables which should be included with near certainty (core variables) and among the many optional variables, to distinguish those which are highly recommended from the rest. Hopefully, the investigator of a new research study will have enough information on the remaining variables to judge which should be included in that study and which should not; carefully developed and tested question sets are provided for those which are chosen.

Almost certainly the first draft of the instrument will prove too long and the wording of some of the questions too difficult. That is why pretests and pilot tests are recommended. Reducing the original questionnaire to a manageable length will be difficult, but it is an important part of the research process, in which priorities and trade-offs must be carefully considered.

Table 3.1

Classes of Drug Use to be Distinguished

Alcohol/alcoholic beverages: Measured as a class, or measured separately for beer, wine, spirits, or local and traditional drinks.
Tobacco /cigarettes: Measured separately to include manufactured/banned cigarettes and hand rolled cigarettes.
Chewing tobacco and other local forms of tobacco consumption: Measured separately as relevant.
Cannabis: Measured as a class to include marijuana cigarettes and/or hashish as relevant.
Hallucinogens: Measured as a class to include any hallucinogenic drugs used in the culture (e.g. LSD, PCP, peyote, psilocybin, etc.).
Cocaine: Measured as a class or measured separately for powdered cocaine, crack cocaine, coca paste, or coca leaves as relevant.
Heroin: Measured separately from other opiates.
Other opiates/opioids: Measured as a class, to include natural or synthetic opiate-type drugs, like opium, methadone, percodan, morphine, codeine, demerol, paregoric and includes cough and diarrhoea medicines containing codeine, etc.
(Minor) tranquillisers: Measured as a class, to include benzodiazepines (Valium, Librium, Rohypnol), and other minor tranquillisers in use.
Other hypnotics and sedatives (not tranquillisers): Measured as a class to include barbiturates (phenobarbital, Seconal, Rohypnol), and other sedatives (methaqualone A Mandrax).
Amphetamines and amphetamine type stimulants: Measured as a class to include Benzedrine, Dexadrine, Ritalin, MDMA (ecstasy), and other amphetamine type stimulants.
Voltile inhalants: Measured as a class, to include any gases or fumes which are sniffed or breathed for purposes of getting high, such as glues, paint thinners, other solvents, butane, contents of aerosol cans, gasoline, etc. Does not include smoking, sniffing, or inhaling the drugs listed above, like cigarettes, crack, heroin or cannabis.

Table 3.2

Core Variables to be Measured for Each Class of Drug

Lifetime prevalence of use: Measuring frequency of use in lifetime is optional.

Past 12 months prevalence of use: Measuring frequency of use in past 12 months is optional

Past 30 days prevalence *and* frequency of use

Daily (or near daily) use in past 30 days (i.e. current daily-use prevalence): This is derived from the "Past 30-day frequency of use question"

Standard Frequency of Use Distinctions: (Can be used for lifetime, past 12 months, or past 30 days)

0 times (or occasions)
1-2
3-5
6-9
10-19
20-39
40+ times (or occasions)

Age of first use

Mode of administration

Standard frequency of Use Distinction in Past 30 Days

0	None
1	On 1-2 days
2	On 3-5 days
3	On 6-9 days
4	On 10-19 days
5	On 20 or more days

The same questions could also be asked without the coding frame to give a more inclusive measure days (WRITE IN NUMBER OF DAYS USED IN PAST 30 DAYS) 00 no use in the last 30 days.

Table 3.3

Demographic, Family Background, and Social Status Variables

Core Variables (included in model questionnaire field assessment)

- Gender (male or female)
- Age
- Education Level
- Student Status
- Employment Status - source of income
- Occupation

Optional Variables

- Size of Community
- Ethnicity
- Martial Status
- Other Options Variables

Religion

Socioeconomic Status
Region of the Country
Parental Status
Pregnancy Status (for females)
Living with Whom
Fathers' Occupation (for youth)
Literacy (when not obvious)

Table 3.4

Additional Variables:
Characteristics of the Familial and Social Environment and the Person

Optional Variables

Parental Drug Use

Friends' Use of Drugs

Perceived Availability of Drugs

Attitudes, Beliefs, and Norms about Drug Use: Perceived degree of danger from use
Personal disapproval of use
Friends' disapproval of respondent using
Norms
against use in the school or workplace

Attachment to Family: Permanent absence from home
Proportion of free time spent at home
Intactness of family

Attachment to School: Permanent absence from school
Truancy and skipping classing
Academic grades
Liking school

Attachment to Religion: Frequency of attending religious services/ceremonies
Rated importance of religion in person's life

Prior Use of Other Drugs: Tobacco
Alcohol
Inhalants
Illicit drugs

Other Forms of Deviance than Drug Use: Delinquency
- property crimes
- interpersonal aggression

Precocious sexual behaviour
Drunk driving

Knowledge and Attitudes Relevant to HIV Transmission

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ANNEX 1

Monitoring the Future Study Sample Question Sets

Friends Use of Drugs

7. How many of your friends would you estimate…

	None	A Few	Some	Most	All
a. Smoke cigarettes?	1	2	3	4	5
b. Smoke marijuana (pot, weed) or hashis	1	2	3	4	5
c. Take LSD?	1	2	3	4	5
d. Take other psychedelics (mescaline, peyote, PCP, etc.)?	1	2	3	4	5
e. Take amphetamines (uppers, pep pills, bennies, speed)?	1	2	3	4	5
f. Take quaaludes (quads, methaqualone)	1	2	3	4	5
g. Take barbiturates (downers, goofballs, reds, yellow, etc.)?	1	2	3	4	5
h. Take tranquilizers?	1	2	3	4	5
i. Take cocaine?	1	2	3	4	5
j. Take heroin?	1	2	3	4	5
k. Take other narcotics (methadone, opiu codeine, paregoric, etc.)?	1	2	3	4	5
l. Use inhalants (sniff glue, aerosols, laugh gas, etc.)?	1	2	3	4	5
m. Drink alcoholic beverages (liquor, beer	1	2	3	4	5
n. Get drunk at least once a week?	1	2	3	4	5

Monitoring the Future Study Sample Question Sets

Friends' Disapproval

6. How do you think your CLOSE FRIENDS feel (or would feel) about YOU doing each of the following things? (Mark one circle for each line)

	Not Disapprove	Disapprove	Strongly Disapprove
a. Smoke one or more packs of cigarettes per day?	1	2	3
b. Trying marijuana (pot, weed) once or twice?	1	2	3
c. Smoking marijuana occasionally?	1	2	3
d. Smoking marijuana regularly?	1	2	3
e. Trying LSD once or twice?	1	2	3
f. Trying amphetamines (uppers, pep pills, bennies, speed) once or twice?	1	2	3
g. Trying cocaine once or twice?	1	2	3
h. Trying cocaine occasionally?	1	2	3
i. Taking one or two drinks nearly every day?	1	2	3
j. Taking four or five drinks nearly every day?	1	2	3
k. Having five or more drinks once or twice Each weekend?	1	2	3
l. Driving a car after having 1-2 drinks?	1	2	3
m. Driving a car after having 5 or more drinks?	1	2	3

Monitoring the Future Study Sample Question Sets

Perceived Availability

21. How difficult do you think it would be for you to get each of the following types of drugs, if you wanted some?

(Mark one circle for each line)

	Can't say, Drug Unfamiliar	Probably Impossible	Very Difficult	Fairly Difficult	Fairly Easy	Very Easy
a. Marijuana (pot, weed)?	1	1	2	3	4	5
b. Smoke marijuana (pot, weed) or hashish?	1	1	2	3	4	5
c. Take LSD?	1	1	2	3	4	5
d. Amphetamines (uppers, pep pills, bennies, speed)?	1	1	2	3	4	5
e. Barbiturates (downers, reds, yellows, etc.)?	1	1	2	3	4	5
f. Tranquilizers (Librium, Valium, etc.)?	1	1	2	3	4	5
g. "Crack" cocaine?	1	1	2	3	4	5
h. Cocaine in powder form?	1	1	2	3	4	5
i. Heroin	1	1	2	3	4	5
j. Some other narcotic (methadone, opium, Codeine, paregoric, etc.)?	1	1	2	3	4	5
k. Crystal meth ("ice")?	1	1	2	3	4	5
l. Steroids (anabolic steroids)?	1	1	2	3	4	5
m. Cigarettes?	1	1	2	3	4	5
n. Alcohol	1	1	2	3	4	5

Monitoring the Future Study Sample Question Sets

Personal Disapproval

20. Individuals differ in whether or not they disapprove of people doing certain things. Do YOU disapprove of people doing each of the following?

	Not Disapprove	Disapprove	Strongly Disapprove	Can't say. Drug Unfamiliar
a. Smoke one or more packs of cigarettes per day?	1	2	3	4
b. Using smokeless tobacco regularly?	1	2	3	4
c. Trying marijuana (pot, weed) once or twice?	1	2	3	4
d. Smoking marijuana occasionally?	1	2	3	4
e. Smoking marijuana regularly?	1	2	3	4
f. Trying cocaine in powder form once or twice?	1	2	3	4
g. Trying cocaine powder occasionally?	1	2	3	4
h. Trying "crack" cocaine once or twice?	1	2	3	4
i. Taking "crack" cocaine occasionally?	1	2	3	4
j. Trying one or two drinks once or twice of an alcoholic beverage (beer, wine, liquor)?	1	2	3	4
k. Taking one or two drinks nearly every day?	1	2	3	4
l. Having five or more drinks once or twice each weekend?	1	2	3	4
m. Sniffing glue, gases, or sprays once or twice?	1	2	3	4
n. Sniffing glue, gases, or sprays regularly?	1	2	3	4
o. Trying heroin once or twice without a needle?	1	2	3	4
p. Taking heroin occasionally without a needle?	1	2	3	4

Monitoring the Future Study Sample Question Sets

Consequences Attributable to Marijuana Use

6. Has your use of alcohol, marijuana, or other illegal drugs ever caused any of the following problems for you? (For each problem, mark all drugs that have caused you this problem.)

Has your use of these drugs…

	YES	NO
a. Caused you to behave in ways that you later regretted?	1	3
b. Hurt your relationship with your parents?	1	3
c. Hurt your relationship with your spouse, fiancée, or girlfriend/boyfriend?	1	3
d. Hurt your relationship with your friends?	1	3
e. Hurt your relationship with teachers or supervisors?	1	3
f. Involved you with people you think are a bad influence on you?	1	3
g. Hurt your performance in school and/or on The job?	1	3
h. Caused you to be less interested in other activities than you were before?	1	3
i. Caused you to be less stable emotionally?	1	3
j. Caused you to have less energy?	1	3
k. Interfered with your ability to think clearly?	1	3
l. Had other bad psychological effects?	1	3
m. Caused your physical health to be bad?	1	3
n. Caused you to drive unsafely?	1	3
o. Gotten you into trouble with the police?	1	3
p. Caused you none of the above problems?	1	3

q. Never used the drug(s) | 1 | 3

CHAPTER 7

SPECIAL POPULATION STUDIES[2]

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[2] This chapter revises: Smart RG, Hughes PH, Johnston LD, Anumonye A, Khant U, Medina Mora, MA, Navaratnam V, Poshyachinda V, Varma VK and Wadud KA (1980). A methodology for student drug use surveys, WHO Offset Publication No. 50 and Smart RG, Arif A, Hughes P, Medina Mora MA, Navaratnam V, Varma VK and Wadud KA (1981). Drug use among non-student youth, WHO Offset Publication No. 60. Some of the original text from these publications is included in this chapter.

CONTENTS

1. Introduction

1.1 What Are Special Populations?

Epidemiological studies of drug use are not limited to general population surveys (see Chapter 5) to determine prevalence and incidence of drug use, but also include in-depth or targeted studies in specific groups or populations to determine the prevalence and patterns of use in these special population groups. Such studies also provide the means to further understanding behaviours that a general population survey alone is unable to provide, for example: risk factors associated with initiation into drug use, of continuing drug use and of patterns of hazardous or harmful drug use. Although general population surveys can provide estimates of the numbers of people who may have used drugs at some point in their lives, incidence estimations, etiologic or causal studies and studies on the effects of drug use require targeting the risk groups. For instance, our knowledge about the onset or initiation of drug use indicates that children and youth, particularly youth who, because of some characteristic, may be more at risk to use drugs should be the target for more precise incidence rates and for etiologic studies. Studies on health, social and economic consequences of drug use may require targeting groups who: i. may be at particular risk e.g. young people, street children, homeless adults, prisoners and indigenous people or ii. are users of particular drugs, e.g. cocaine users, heroin users and injecting drug users (IDUs).

These groups often present special challenges to the researcher, either because they may not be forthcoming about their drug using behaviours as there may be perceived stigma associated with drug use, or because they may be difficult to reach as they may have some characteristic that marginalizes them from the dominant or conventional society. These latter groups have been defined by Lambert and Wiebel (1990) as those who are:

> *"disadvantaged and disenfranchised: the homeless and transient, chronically mentally ill, high school dropouts, criminal offenders, prostitutes, juvenile delinquents, gang members, runaways and other "street people" - those who we are all aware of to one degree or another, yet know so little about* (Lambert and Wiebel , 1990 page 1).

Many other groups which may be marginalized and may be at greater risk of developing drug related problems, could be added to Lambert and Wiebels list including: refugees, those displaced by natural disasters and civil conflict, itinerant workers, child labourers, those with physical disabilities and homosexual men and women.

Young people in general may be considered a "special" population, with special characteristics and special needs. Adolescents in particular may be at particular risk of developing health and other problems, including drug related problems. Adolescence is a time of experimentation, exploration, curiosity, a search for identity and risk taking. Such risk taking can include the use of alcohol, tobacco and other drugs. Some young people are at particular risk because of their social circumstances, including poverty, family disintegration,

relocation discrimination and lack of accommodation. Early onset and continued use of drugs is more likely to occur among young people who live in especially difficult circumstances. Although a wide range of disparate groups are covered by the term "children and youth who live in especially difficult circumstances" or "especially vulnerable young people", one group -street children - is at particularly high risk of developing substance abuse related problems.

The people who we know the least about are often those most difficult to reach. These so called "hidden" populations may be omitted from general population surveys because they have no fixed address or because they are less likely to be found at home or agree to be interviewed. Those who belong to these special or "hidden" populations are often at greater risk of drug abuse and drug related morbidity than the general population and are those who could benefit the most from prevention and treatment (Lambert and Wiebel, 1990; Farrow, 1995).

The "special" populations that will be the focus of this chapter are young people and adolescents[3], street children; homeless adults; institutionalised populations including prisoners; the elderly, migrants and indigenous people. In addition the chapter will briefly consider special populations determined by their type or pattern of drug use. The examples presented here are of cocaine and heroin users and injecting drug users (IDUs). Students and student surveys will be discussed in more detail in a separate section at the end of this chapter. At the international level, the collection of comparable data on these populations using consistent methods would permit: i. the identification of the differences in the extent, patterns, and trends of drug use in different socio-cultural settings; ii. where demographic and other explanatory variables occur regularly, the possible identification of basic risk factors that are not peculiar to particular settings; and iii. responses to drug use and other risk behaviours which have been initiated.

1.2 Methodological Issues

The unique characteristics of the study population and the societies in which they live, such as: age, legal status and severity of sanctions, literacy and language; degree of marginalization or alienation from the dominant culture; will affect the design of special populations studies. The researcher needs to consider these characteristics at all stages of the design and implementation of the study including: in the selection of data collection methods, securing and ensuring informed consent and confidentiality, sampling, selecting study variables, the use terminology and phraseology in question and questionnaire design, the characteristics of the interviewers and researchers employed, the project implementation and the degree of participation in the study (including the study design) by the target group.

[3] WHO has defined Aadolescents as persons in the 10-19 years age group, while Ayouth has been defined as the 15-24 year age group. The WHO document *The Health of Youth* combines these two overlapping groups into one entity that of Ayoung people covering the age range 10-24 years.

Special population studies are very useful where prevalence rates of drug use are low in the general population. In these cases the sample size required may be so large that the cost surpasses the benefits of the survey. For example, in Mexico, before the decade of the 1960s, use of illicit drugs was restricted to a small group which was generally rejected by society. Similar examples have been described for other countries where use was restricted to small groups before the more widespread use of cannabis in broader society (McGlothin, 1972). In these cases it was more efficient to recruit subjects in the special populations and not through sampling general populations.

When a survey approach is used with a special population, special attention needs to be directed to the sampling design. Usually these groups, particularly those hard to find, represent a challenge for defining the universe and for selecting an unbiased sample (see Chapter 5). For example, in selecting a sample of students, it is necessary to define whether the target group is students enrolled or only those students who actually attend school. While a survey of regular students (who attended school the day the questionnaire was administered), is easier and less expensive, several surveys have demonstrated how drug use is higher among those that do not regularly attend school (Castro, et al., 1986; Johnston et al. 1989; Medina-Mora et al., 1995). In a study of street children, it may be necessary to define the target as those sleeping in the streets versus those using the public places to work. Another factor that distinguishes some of these groups (e.g. street children and the homeless) is the absence of a sampling frame from which to draw a sample.

The self-administered survey has typically been used for studies of students, soldiers, and prisoners, since these groups can be readily convened for survey administration. The method is best used in situations where co-operation may be expected from the participants as a matter of routine. The use of questionnaires for this purpose is well established. For literate populations that may be brought together at one time and place, self-administered questionnaires offer advantages over other methods-chiefly their low cost, ease of administration, and relatively high validity and reliability. Where co-operation is unlikely to be obtained without individually tailored explanations, for less literate subgroups or for distrustful groups such as drug users, personal interview surveys are preferable over the self-administered questionnaire. Personal interview surveys are useful for all the special populations under consideration here, particularly for young people living in difficult circumstances and for drug users. A self-administered questionnaire may be adapted to be used in a face-to-face interview.

Due to the unique characteristics of some special populations, qualitative data collection methods may be more appropriate or may be used to complement a quantitative study. For example, to gain access and trust when a group is suspicious or reluctant, initial participant observation may be required before a survey interview could be administered. Ethnographic research methods are particularly appropriate for topics and target groups about which little is know because by they are exploratory and can prepare the way for quantitative work, by for example offering an understanding of an issue and formulating the questions that could be asked in a survey. Some argue that representative sampling, irrespective of its

scientific merit is not possible in relation to the study of the various behaviours of special or hidden populations (Wiebel, 1990). Such populations have been characterised by the fact that they are a subset of the general population whose membership is not readily distinguished or enumerated based on existing knowledge and/or sampling capabilities (Wiebel, 1990). A survey instrument may, in some cases, not be the most appropriate instrument. Ethnographic and qualitative methods and instruments may be more useful. These can include semi-structured or unstructured interviews, focus groups, participant observation and a range of other techniques. Chapter 4 considers ethnographic and qualitative methods in some detail.

In some groups particularly groups of drug users, street children and other young people in especially difficult circumstances individuals may be difficult to access and, once reached, uncomfortable responding to questionnaires. Particular care needs to be taken when choosing interviewers. Interviewers should be trusted and accepted by the target population. This is particularly true in the case of drug users and young people. Consideration may need to be given to training members of the target population to conduct interviews. Another strategy is to recruit a "Privileged Access Interview" team (Griffiths et al., 1993). Privileged access interviewers are those who have a level of access to a study population that is not available to orthodox researchers (Griffiths et al., 1993). This methodology establishes a team of interviewers who can access a broad sweep of a localised drug using subculture. Such methods are becoming more widely used. In London, UK this method was used for recruiting samples of out of treatment drug injectors to evaluate syringe-exchange programmes and to examine HIV risk behaviour and HIV prevalence (Donoghoe et al., 1993). Also in the UK the method has been used to study transitions from heroin smoking to heroin injection among heroin users not in contact with treatment services (Griffiths et al., 1993) and more recently to compare out of treatment amphetamine, cocaine and heroin users with those in treatment (Robson and Bruce, 1997). Privileged access interviewing provides a method of collecting structured data outside of treatment settings. While the method adopts sampling techniques from qualitative research, it is a method for administering a structured survey instrument to a relatively large number of people from "hidden" populations, within a particular locality, but not necessarily part of the same social network. The methods of selecting, recruiting and managing Privileged Access Interviewers (PAIs) have been described by Griffiths et al. (1993). The selection criteria was as follows: i. they had existing contacts (or could easily develop contacts) with the subculture under investigation; ii. that they had personal attributes/life experiences that made them not threatening to members of the subculture under investigation; iii. that they were socially and educationally equipped to conduct the interview schedule, and that they had a relatively stable lifestyle that allowed them to be reliable enough to be employed as an interviewer and iv. that conducting the interview and making contacts with the study population would not be damaging to them. Ethical issues are of particular importance since many PAIs will be engaged to varying degrees to the drug subcultures. Some will be drug users themselves.

Another approach has been the development of field outreach stations, where the study population is encouraged to come to the researcher in return for a small incentive, sometimes a small payment (see for example Goldstein et al., 1990). Field outreach station

have been successfully used in the United States over many years to, for example, further understand and intervene in neighbourhood outbreaks of heroin use (Hughes, 1977) and to study HIV transmission amongst injecting drug users (Wiebel, 1988).

These methods were given a particular impetus because of the need to access hidden populations of injecting drug users in order to understand the dynamics of drug use and the transmission of the human immunodeficiency virus (HIV). In the following pages we will be reviewing how quantitative and qualitative methodological approaches have been used to study drug use in special populations. The description of research among street children; indigenous peoples; drug injectors and other groups, further in this chapter, illustrates how these approaches may be combined to optimise results.

2. Specific Target Populations: Research Issues and Methodological Considerations

The research literature indicates that special populations have received varying amounts of attention on the part of researchers. School-based student surveys have been undertaken in many countries, providing a strong foundation and experience from which to derive methodological guidelines. There is a considerable amount which has been learned about how to plan and implement school-based surveys. The final section of this chapter will focus on methodological guidelines for conducting surveys in student populations.

Young people, whether in or out of school, in general may be considered a "special" population. Issues with regard to conducting studies of drug use among young people are briefly addressed below. In recent years street children and the problems associated with living and working in the streets have received increased attention. The section on street children in this chapter describes several research projects which have been conducted among this group in different countries, highlighting the unique methodological approaches which were devised to deal with data collection challenges.

Well documented research has also been undertaken on substance use among a range of indigenous populations, particularly in Australia, Canada, New Zealand and the United States (World Health Organization, 1996). To date research on indigenous populations in most other countries has tended to be fairly limited with a particular focus on descriptive anthropology. This chapter will consider issues specific to indigenous populations

Other special populations, such as homeless adults, migrants, and the elderly, have received relatively little attention in the drug field and, consequently, there is considerably less experience from which to derive precise methodological guidelines. This chapter highlights research issues which need to be addressed in these special population groups.

2.1 Young People and Adolescents

Adolescence is a period of risk and vulnerability, as it is this time that young people seek to achieve independence from their parents and to become established as adults. Young people may leave school for a variety of reasons including pregnancy, economic hardships within the family and poor health. Many young people do not have access to education in the first place. Lack of vocational skills and the support of family, as well as illiteracy, vulnerability to exploitation, unemployment and alienation linked to low self-worth, places many young people at high risk for drug use and other risk behaviours. There is a need to learn more about the pathways that lead young people to initiate drug use and to continue that use in such a way that it may compromise their normal health development. Several studies of young people that compare drug use rates between those who stayed in school and those who have dropped out of school show significantly higher rates among the school dropouts. For example, in a study that compared these groups, it was found that cannabis use was two and a half times higher among non-students in Chandigarh, India and 1.4 times higher in Durham, Ontario, Canada (Smart et al., 1981a).

Young people, whether in or out of school, in general may be considered a "special" population. Adolescents in particular may be at risk of developing health and other problems, including drug related problems. Adolescence is a time of experimentation, exploration, curiosity, a search for identity and risk taking. Such risk taking can include the use of alcohol, tobacco and other drugs. Most young people who initiate substance use do not develop significant problems with experimentation, a variable pattern of use and cessation being quite common. However for some young people initial use can lead to an escalation of use and health and social problems. The use of tobacco usually begins in adolescence and few people begin after age 18 years. Half of regular smokers who start smoking in adolescence and continue to smoke all their lives will eventually be killed by tobacco.

Many people begin experimentation with alcohol, tobacco and other drugs (particularly cannabis) at a young age. In the United States by the end of 8th Grade, over a third of American secondary school children have tried an illicit drug or an inhalant. By the 12th Grade over half have done so (Johnston et al., 1997). It should be noted however that secondary school students in the United States have amongst the highest recorded levels of involvement with illicit drugs compared with other countries (Johnston et al., 1997). A small, but significant, number of these "experimenters" will go on to continue that use, to use regularly and heavily and to use a range of substances. Many researchers have tried to understand the many environmental, interpersonal and psychobehavioural causes and attributable outcomes associated with drug use. It is generally accepted that adolescent drug use is influenced by many factors including: attitudes; behaviours; family; school; peers and community norms; and expectations. It is also generally accepted that adolescent drug use does not occur in isolation but is associated with a range of other risk taking and experimental behaviours.

Some stress the importance of identifying specific drug use patterns among young people that predict a later need for treatment if less intensive preventative intervention is not provided early on (Newcomb, 1995).

The use of certain drugs is often higher among older adolescents, than children or adults. In the adolescent years drug use is highly related to age. In the countries of the European Union for example the proportion of students aged 18 years admitting experience with cannabis ranges from under 10 per cent to over 35 per cent (compared with ranges of 5 to 20 percent in the 15 to 16 year old age group). Prevalence of drug use in some of these countries has been shown to multiply by a factor of ten or more, between ages 12 to 18 years (EMCDDA, 1995). Marijuana use amongst young people in the United States is related to age. In 1995 rates of current use in the previous 30 days were at 9.1 per cent among 8th Grade students, increasing to 21.2 per cent among 12th graders and declining to 18.6 per cent among college students. Inhalant use is higher in the younger age groups 6.1 per cent in the previous 30 days among 8th graders, 3.2 per cent among 12 graders and 1.6 among college students (Johnston et al., 1997).

Some young people are at particular risk because of their social circumstances, including: poverty, family disintegration, dysfunctional and abusive families, relocation, discrimination and sexual exploitation. These young people are often the most difficult to reach and will often be excluded from conventional surveys. Non attendance or exclusion from school or formal education is one risk factor among many. Early onset and continued use of drugs is more likely to occur among young people who live in especially difficult circumstances. It is generally understood that young people who are more vulnerable will maintain and escalate their drug use. Such young people also lack internal and external resources and have poorly developed coping strategies and skills to deal with drug related problems. However not all young people who have experienced familial, social or other problems use substances in a dysfunctional or harmful way. The aetiology of problematic substance use by young people is multi-faceted and multi-determined. Individual vulnerability, the environment and the substances available cannot be considered in isolation.

Availability of substances can be a determining factor in type of drug related problems young people will encounter. The cheapest and most readily available substances, for example: glue, solvents and various forms of inhalants are those which are most commonly used by young people in many different countries. Solvent or inhalant use is often the most prevalent form of drug use (other than alcohol or tobacco) among young people in many countries (Kozel et al., 1995). Coca paste is cheap and available in the coca producing regions, as is opium in opium producing regions. Cannabis is often readily available and relatively cheap in many areas of the world as are alcohol, tobacco and pharmaceutical products.

Although a wide range of disparate groups are covered by the term “children and youth who live in especially difficult circumstances” or “especially vulnerable young people”, one group, street children, is at particularly high risk of developing substance abuse related

problems. This group are discussed in more detail below.

In 1981, WHO published a manual aimed at the study of the problems of non-student drug use that was elaborated by bringing together a team of experts to design a questionnaire and a set of methodologies for studying non-students (Smart et al., 1981a). A personal interview format questionnaire was developed and administered to non-student samples by collaborating centres in five countries: Canada (Toronto), India (Chandigarh), Malaysia (Penang), Mexico (Mexico City), and Pakistan (Islamabad) (Smart et al., 1981b).

In reviewing the results of the WHO project, the investigators concluded that the methods selected to study non-student youth depend very much upon the investigator's aims. For example, if the objective is to compare student and non-student youth the methodological approach would be different than if the objective is to understand drug using behaviour among non-students in a particular specific setting where there are high proportions of non-student youth (e.g., street children, factory workers, or rickshaw pullers). In some cases, a survey approach utilising a "snowball" sampling method to identify subjects may be appropriate (see Chapter 4 for details of this method). Ethnographic and other qualitative data collection methods may be more appropriate for other research objectives. The application of some of these methods with specific populations are discussed in more detail below. Investigators should carefully consider their research goals in selecting the most appropriate methodology or methodologies. In some cases the use of both qualitative and quantitative methods may provide the best solution.

2.2 Street Children

The estimated number of street children world-wide ranges from 10 to 100 million, depending on the definition used. The majority of these children are located in major urban areas of developing countries. The presence of difficult economic conditions has forced increasing numbers of children to work in the streets and to become one of the main sources of financial support for their families. By region, estimates suggest that the largest number of street children are found in Latin America, followed by Asia and Africa. Street children have appeared in Central and Eastern Europe, where until recently the problem did not exist. Even affluent countries have street children. In Toronto, Canada (population 3 million) for example the number of street youth is conservatively estimated to be between 3,000 and 5,000. Because of political, economic and other considerations the criteria for defining “street children” vary from country to country and with time. It is therefore difficult to arrive at any precise global estimates. Current WHO estimates suggest that the number of street children is between 10 and 30 million world-wide (WHO, 1997). Boys predominate, but often girls on the streets encounter more difficulties due to sexual exploitation, problems associated with high risk pregnancy, and physical violence. In many cases, children are born on the street to these young girls, creating second and even third generation street children (WHO, 1993).

Ethnographic and survey data indicate that drug and other substance use among street children is extremely common (Carlini, 1988; Medina-Mora, et al., 1982; Gutierez et al., 1992; WHO, 1993). In 1991, the WHO Programme on Substance Abuse (PSA) initiated a project focusing on the issue of substance use among street children in different cultures. The WHO/PSA Street Children Project defined street children as: i. those living in the streets whose immediate concerns are survival and shelter; ii. children who are detached from their families and living in temporary shelters, such as abandoned houses and other buildings, hostels/refuges/shelters or moving about between friends; iii. children who remain in contact with their families, but because of poverty, overcrowding or sexual or physical abuse within the family will spend some nights, or most days, in the streets; iv. children who are in institutional care, who have come from a situation of homelessness and are at risk of returning to a homeless existence.

Because it is difficult to estimate the universe of street children, a variety of approaches have been used to study them and to learn about those factors that differentiate those who are involved with drugs from those who are not. Case studies which collect in-depth information on a small number of children provide a substantial understanding of the lives of these children and the challenges they face each day to survive. Other studies attempt to draw representative samples of the children so that information that is gathered can be projected for the total group of street children. But even case studies use some type of sampling frame, if only a convenience sample, i.e., limiting the study to children who are readily available for interview. There is no single agreed upon sampling frame to be used to study these children and a variety of frames have been used. An example of one type was used by Medina-Mora and her associates (1982) in Mexico City. The development of a methodology for selecting probabilistic samples and for obtaining reliability were two of the objectives of this study in addition to estimating the prevalence of drug use. A busy urban area was chosen, the different types of commerce and the presence of parks and bus and underground terminals provided jobs and shelter for the minors. All children and adolescents who worked in the area, were included; minors who only used the area to access other places were excluded from the study.

The sample design was stratified using as the variable of stratification the zones within the target area. The zones varied in characteristics thought to be relevant to either maximise the probability of obtaining an unbiased sample, or to the variable under study (drug use). While some of the areas were very busy, mainly as a result of working opportunities (for example, a bus terminal where children hired themselves as bag carriers), others were relatively isolated. In the first type of location, police were more likely to be present, thus children preferred the isolated areas for their use of inhalants. In order to develop stratification criteria for sampling, observations of the areas were made and a counting of children was undertaken. The physical area was then divided according to the number of children observed and the type of activity being performed (these areas should also be easily defined and differentiated by research field staff). In order to determine the size of the universe and to evaluate the reliability of the sampling frame, two observers undertook independent registers of the cases they observed. One observer conducted interviews with a

random sample of these cases. The registers of the observers varied by 4 percent (12 persons). The estimated size of the universe was 329. The non-response rate was 9 percent, the confidence limits of the prevalence estimate was + or - 7 percent.

Another relevant study though, not investigating drug use, combined quantitative and qualitative approaches in a Census conducted by the Mexico City government with support from other governmental and non governmental organisations. The main objective of this study was to define the conditions of children whose survival depended of their activity in the streets. Two types of children were differentiated:

1. children from the street that have no family relations, sleep on the streets, undertake marginal economic activities, and are at risk of antisocial and delinquent behaviours and of being abused by the adults that surround them (i.e. prostitution, robbery, among others); and

2. children in the streets that keep family relations, attend school, and work on the street to earn some money to help the family. This second group of children are also at risk of abandoning school, leaving the family and are subject to the aggressions of the environment.

Meeting places used either for work or sleep were identified at an initial stage. They were subdivided into four groups according the type of children found and activity performed there: i. Primary meeting places: both types of minors (in and from the street); these places are used usually during conventional hours (weekdays, day time); ii. Sunday spots: used mainly on Sundays; iii. Night spots: concentrate children that gather, work or sleep; only children from the street are found here; iv. Sleeping places: Children whose main residence is the street, are found in these places; sleeping places include certain streets, bus stops, parking lots, and uninhabited land.

Once the places to be studied were determined, 13 sampling points were defined according to activity and type of children to be found. Special observation routes were determined based on density of minors in each sampling slot; 103 such routes and 515 meeting places were studied. The co-ordinators of the study assume 3% error or duplication in the identification of the children. A total of 11,172 children were identified; 75% were between 12 and 17 years of age with an average age of 13 years; 72% were males and 28% females. Males were between 14 and 17 years, while females were between 13 and 14 years of age.

Mundy et al. (1990), in a sample of 93 adolescents under 17 from both agencies and the streets, found a high degree of drug involvement; 70% of children reporting use of marijuana on more than five occasions and 6% reporting use of heroin. In addition, he found a high prevalence of psychotic symptoms suggesting an urgent need for mental health evaluation and possible intervention.

Robertson et al. (1989), in a secondary analysis of 93 homeless adolescents in Hollywood, USA, found a high degree of co-morbidity of alcohol and drug abuse. Two thirds of their sample met criteria for both alcohol and drug abuse DSM III diagnoses. Few received treatment; 13.3% of those diagnosed with alcohol abuse had received inpatient alcohol treatment and only 17.8% reported receiving help of any sort in the previous year. Compared to results from a national household sample, the street youth reported earlier initiation of alcohol.

Smart and Adlaf (1991), interviewed 145 adolescents in Toronto, Canada, and compared these data to data derived from other adolescent populations. They found that street and homeless youth are clearly a group at high risk for developing drug related problems. Drug use was from 3 to 10 times higher than that for comparable youths. Almost 90% reported a drug problem but very few received treatment, 26% and 15% for drug and alcohol problems, respectively. Alcohol problems were more likely than drug problems to be pre-existing in the family environment. Both alcohol and drug use had increased after the children left home but this was more evident for drug use.

The WHO Street Children Project has developed a range of methodologies for assessing substance use and other risk behaviours among street children and other vulnerable young people in various settings in a wide range of countries. Emphasis has been placed on qualitative methods to gather information to assist in the design of interventions and mobilisation of the local community. Data were collected from populations of street children and “service providers” (individuals in regular contact with street children, such as street vendors, health workers, street children agency staff, police, educators etc.) in over 20 cities in 17 countries. In each city different population groups were targeted, for example: in Rio de Janeiro, Brazil, street children attending a drop-in centre and those utilising three street children shelters; in Tegucigalpa, Honduras, market children from five markets and a group of street children living on the streets; in Asuncion, Paraguay, shoe-shiners from one market, street girls living in a girls shelter, boys living in a shelter for homeless boys, children from an urban poor district attending an informal school and street children attending a drop-in centre; in Mumbai, India, children living and working at a series of train stations and children living in two slum areas; in Cairo, Alexandria, boys in two juvenile detention centres and boys attending a drop in centre and 3 shelters provided by a non-government organisation; in Moscow, the Russian Federation, boys and girls in a detention centre for run-aways and homeless young people (World Health Organization, 1996).

The main assessment method used was focus groups of street children, other especially vulnerable young people and service providers (Ball and Howard, 1995). Broad guidelines on focus group methods were provided to collaborating project sites. "Questions and issues menus" were developed which presented examples of topics and questions which might be raised during focus group discussions. The topics listed fell within eight main domains: demographic and basic information; factors influencing stress; context and normalisation of substance use; patterns, nature and effects of substance use; attachments; coping strategies and skills; community resources; and other risk behaviours, such as sexual

risk behaviour and violence. These "menus" were used as a basis for focus group leaders to develop their own list of questions to guide discussions. Typically, at each project site, different focus groups were conducted, representing different populations of street children, for example, based on age, gender, living conditions (on street, at home, in institution), involvement in substance use (non-users, chronic glue sniffers, etc.), geographic distribution (particular market, railway station, slum community, etc.). Most groups met over a series of sessions to cover all relevant issues. Following data collection, many groups continued in some form and became useful as a means to monitor changes in the particular population being considered.

This project provided extensive new data on the lives of street children and other especially vulnerable young people, particularly with regard to substance use and other risk behaviours. Furthermore, it revealed some methodological difficulties in collecting reliable data from such difficult to reach populations, and in turn helped to inform the development of more effective assessment and monitoring methods.

Street children are marginalized in all communities and in many are exploited and victimised, problems which are usually exacerbated when these young people are also using substances. Therefore, they tend to be suspicious of anyone unknown to them. To maximise reliability of data collected from any assessment or research requires close collaboration with organisations which, and individuals who, are trusted by and have access to the population being considered. Field work is often best undertaken by street educators and others known and respected by the street children, such as market vendors, community volunteers and charity workers. Such individuals may have had minimal formal education, let alone any research experience. Therefore, it may be necessary to provide training on simple assessment and research methods which may be used by such field workers (World Health Organization, 1995a; World Health Organization, 1995b). The use of older street youth and ex-street children, both as outreach workers and field researchers is common practice in many countries. Just as research methods may need to be simple for such field workers, methods for analysing data and translating findings into action also need to be simple and inexpensive. Special consideration needs to be given to ensure that bias is minimised in both data collection and analysis.

Where it may not be feasible to provide training to street educators and others directly in contact with street children, such individuals may facilitate the work of researchers through acting as intermediaries in accessing and communicating with street children. The researchers need to be aware of any risks associated with working with particular populations of street children. There may be the risk of violence for the researcher and/or for the street children involved in certain settings.

Focus group discussions with street children in the WHO project revealed that they often have their own slang language, in some cases very well developed, particularly if they are marginalized from the mainstream community. It is necessary to understand their language and conceptualisation of the world in order to design appropriate research methods and specific questions. For example, in one focus group of street boys, their understanding of "religion" was "a place to sleep", reflecting their experience of finding shelter in churches to sleep. Focus groups can help to identify street children terminology, perceptions and concepts.

An understanding of local street children culture can help to inform the selection of the most appropriate research methods. Whereas focus groups may be valuable in certain settings and with certain populations, they may not be effective in others. For example, hierarchical structures on the street may mean that certain focus group participants may dominate the discussions, there may be a reluctance for certain issues to be discussed in group because of the risk of reprisals or harassment after the session has finished, and the principle of confidentiality within group may not be respected. When sensitive issues are raised in group it may be appropriate to follow up with confidential individual interviews. This reinforces the concept of utilising a range of inductive methods for collecting data.

2.3 Homeless Adults

There are considerable numbers of homeless adults in many countries. This problem has increased even in developed countries such as the United States (Bassuk and Rosenberg, 1988). This special group may be studied through welfare institutions or on the street. One such study was conducted by Bassuk and Rosenberg (1988) in the United States. These authors studied homeless families residing in family shelters in Boston and compared them to a control group of housed poor families living in subsidised housing; both groups were female headed. The frequency of drug, alcohol and serious psychiatric problems was greater among homeless mothers. Many of the children in both groups had serious developmental and emotional problems. Homelessness among the mentally ill is also common and substance abuse may be an additional problem in these individuals (Caton et al., 1995).

In 1991, the National Institute on Drug Abuse (NIDA, 1993) conducted a series of studies to develop methodologies to assess the nature and extent of drug abuse among all types of people residing in a single metropolitan area during the same period of time, with special focus on populations who would generally be under-represented or unrepresented in a household survey. One of these studies, the Homeless and Transient Population study, examined drug use among people living in unconventional dwellings (such as vacant buildings, cars, parks, streets and emergency shelters) or at risk of becoming homeless as indicated by their use of soup kitchens and food banks for homeless people.

The two-tiered definition of homelessness implies the need to include soup kitchens, day programs, and other such institutions as sampling sites. It was found that although shelters and the streets may have sufficed as sampling sites for identifying people who are

literally homeless, they would have missed a large number of people who were potentially at risk of becoming homeless. After a period of observations, it was decided to use four temporal samples of 16 days, each was selected in the months of February, March, April and June at a rate of 4 days per week. One to two samples from each of the four sample frames: two of shelters, one soup kitchen, one of encampment clusters and two samples of streets and blocks; were used to conduct 908 interviews. The response rates across all four frames was 86.1 percent. From these observations it was estimated that on an average day there are between 9,031 and 11,743 homeless or transient people in the Washington, DC and surrounding area. Rates of any illicit drug use among the homeless was 80 percent over their lifetimes with 58 percent reporting use in the prior year and 34 percent, in the prior month.

It is important to note that some studies have found increasing involvement of females in the streets in Latin-America (Gutierrez, et al. 1992). Butrón (1995) explains that on the streets of Cochabamba, Bolivia, some rituals of initiation involve sexual activity and some girls living on the street eventually become involved in prostitution. Pregnancy is a natural consequence of these phenomenon; thus emerge the problem of adolescent mothers and their children living on the streets. Children within these street families are at high risk of poverty, criminal activity and drug use that is sometimes complicated by drug exposure during the prenatal period. Leslie et al., (1992), addressed this population families with adolescent mothers on the street and selected their samples for study from the Children's Aid Society of Metropolitan Toronto and from family service workers. The results document the devastating effects on family life and on child development.

2.4 Institutionalised Populations

Other populations that may be especially at risk for drug abuse are those who become institutionalised. These include prisoners, juveniles in detention, orphans and young people in shelter and other form of institutionalised care, those in medical care, and those who have been hospitalised for psychiatric problems. The association between drug use and crime, with both acute drug reactions and chronic and other drug-related health consequences, and with psychiatric diagnoses suggests that prevalence rates for drug use will be higher in these population groups than in the general public.

Each of these groups presents its own challenge to the epidemiologist. Although prisoners are literally "captive" populations, they may perceive that an admission to drug use, either prior to incarceration or since incarceration, would jeopardise the duration of their sentence or make them more vulnerable in some way to either the guards or fellow prisoners. Access itself may also be difficult depending on the rules of the prisons. Sampling strategies may also vary. One may want to take a random sample of new incarcerations and of those already incarcerated or incarcerated within a specific period of time. One may also want to sample by offence. As indicated earlier, the sampling frame depends on the research question one is studying. Recent studies conducted on individuals involved with crime include Spunt et al. (1994) and Fendrich et al. (1995). Reliability and validity of self-report also may present a problem and studies that assess these issues need to be conducted prior to the full

survey.

Persons coming to the attention of medical professionals in the emergency room/ ward present other challenges. In general, unless obvious because of the presenting complaint, medical professionals do not routinely ask questions about drug use, and often do not include information about drug use in the medical chart. Therefore either research staff need to be on site to collect the information, or emergency room staff need to be provided guidelines for the ascertainment of patients and for asking about drug use and trained to collect the information. Sampling again must be strategic depending on the research question of interest. There is some indication that emergency rooms are utilised differentially by day of the week, by time of day and by season-depending on the climate. For these reasons, initial observations of the flow of patients through emergency rooms and review of logs or other information regarding use patterns should guide the development of a sampling frame. Furthermore, in addition to the problems associated with the desire of the patients for anonymity, the researcher will need to be able to differentiate patients who are not drug users but who may be suffering from adverse reactions to drugs.

Finally, in many communities and countries, substance use as a health problem is under the domain of psychiatry. Thus many of the treatment providers are psychiatrists or psychiatrically-trained personnel and the sites of treatment are psychiatric hospitals or clinics. Co-morbidity or the co-occurrence of a psychiatric problem and drug use is a common phenomena and will present interviewing problems for the researcher. As in the above cases, care must be taken to understand the universe of patients one is studying and the flow of patients through treatment as well as the special needs of the patients given their diagnoses in order to develop both a sampling frame and instrumentation.

2.5 Elderly Persons

The increase in life expectancy brings along an increase of the elderly population, which has special and different needs as compared to the adult population. This group presents higher rates of alcohol and drug abuse particularly of medical drugs (Caracci & Miller, 1991). Gurnack (1989) identifies three reasons why this is group requires special attention that may be applicable for many countries: i. an increase in the use of substances among the younger cohorts that implies an increase of substance use related problems in later life; ii physicians are likely to mistake effects of alcohol related disorders in older patients for consequences of irreversible dementia or senility; and, iii high costs of service delivery. The characteristics of this group may imply a need for the adaptation of questionnaires. Caracci and Miller (1993) suggest, for example, that the DSM-III-R criteria are difficult to apply in the case of the elderly when the diagnostic emphasis in on the consequences of alcohol and other drug use since the elderly are frequently unemployed or do not experience significant legal problems; psychiatric and medical problems being the major consequences.

2.6 Migrants and Ethnic Minorities

Migration from rural to urban areas and international migration is another risk factor

present in many societies. When rural population migrate to large cities they are exposed to a variety of social and health risks-such as long periods of unemployment, psychological stress, poor physical health, and drug related disorders. Because of their migration they do not have the support of family and friends in dealing with these problems. A common problem is the lack of access to mainstream drug prevention and treatment programmes and other health services. Language is likely to be a significant barrier for those migrating to countries where the dominant language is not their own. Migrants and ethnic minorities are often discriminated against; are marginalised from the mainstream or dominant society and suffer social and economic disadvantage. Often migrants are identified as the focus of drug problems, for example are seen as potential drug traffickers. Ethnic tensions in some regions of the world are severe and have resulted in violence, war and displacement of large numbers of refugees. Defining target groups of migrants and ethnic minorities is a difficult task, fraught with many problems. These issues are complex.

Clearly there is a need for studies of substance use and substance related health and social problems amongst migrants and ethnic minorities to inform appropriate responses (Caetano et al., 1988, De la Garza, 1978, Jukic et al., 1997, Lipsedge et al., 1993, Velez et al., 1989,). Such studies need to be sensitively implemented, so as not to further marginalize and discriminate against the target population.

2.7 Indigenous People

There are an estimated 300 million indigenous people world-wide, living on their traditional lands in over 70 countries. There is no universally accepted definition of 'Indigenous people', however, the United Nations Centre for Human Rights (1990) has used the following definition:

"Indigenous or aboriginal peoples are so called because they were living on their lands before settlers came from elsewhere; they are descendants of those who inhabited a country or a geographic region at the time when peoples of different cultures or ethnic origins arrived, the arrivals later becoming dominant through conquest, occupation, settlement or other means."

Indigenous peoples have great cultural, ethnic, linguistic and religious diversity, ranging from hunters and gatherers living in inaccessible rainforests to those integrated with the dominant population within urban communities. Over centuries, indigenous peoples have come to learn about the mind altering properties of many of the naturally occurring substances around them. These substances are often highly valued for their medicinal and nutritional properties and their use in religious and sacred practices. Within these indigenous cultures, strict taboos and restrictions have helped to regulate the use of traditional psychoactive substances.

Whereas many indigenous communities have managed to maintain their traditional practices, largely due to their isolation from the rest of the world, many more have seen the

erosion of their cultures in the face of assimilation and integration policies of dominant ethnic groups. The situation is extremely dynamic, as global economic development occurs, more and more communities are exposed to "outside" attitudes, beliefs and practices. As part of this process, indigenous communities are exposed to non-indigenous psychoactive substances and new ways of using traditional substances. With no tradition of use and social controls the introduction of new substances into communities can be devastating, such as alcohol use among Australian Aborigines, New Zealand Maoris, and North American Indians and Inuits. A change from opium smoking to opium and heroin injecting among the hills-tribes peoples of Southeast and East Asia and indigenous groups in Central Asia has been the major factor in the spread of HIV and other blood-borne infections within these populations. There are few indigenous communities which have not suffered from an epidemic of intentional inhalant use, including the sniffing of petrol, glue and solvents, particularly affecting young people.

There are a range of specific issues that need to be taken into account when considering epidemiological and other research among Indigenous populations, particularly when the issue is as sensitive as substance use. Most research undertaken on such populations is based on traditional, mainstream “Western” research practices and methods. The structure, rationale and concepts of such research may not be easily understood within certain Indigenous cultures, or translated to Indigenous settings. For example, the classification of substance use disorders and the description of patterns of use commonly used in research may not be applicable in different Indigenous communities. Cause and effect relationships explained through “mainstream” science, such as hallucinations after ingestion of a hallucinogen, may have little meaning in those indigenous communities where their culture or religion provides different explanations, such as the hallucinations being attributed to contact with the spiritual world, which may be facilitated through the use of a hallucinogen, rather than through the effects of the hallucinogen itself. In planning for research targeting any Indigenous population, initial research needs to be undertaken to understand some of the basic concepts and perceptions held within that population and terminology used.

Indigenous communities are often suspicious of the intentions of research. It may be feared that results from research may be used by the dominant culture to undermine their own culture. Research may be based on objectives, issues, concepts and indicators which are considered relevant by the dominant population, but not by the Indigenous population. For example, the principles of self-determination and land rights, central to the struggle of many Indigenous peoples and argued as major factors in determining their health (and substance use), are often not considered by non-Indigenous researchers when designing research. Many Indigenous communities have their own methods for research, although they may not be formally recognised within the community as research per se. Indigenous researchers are developing methods which are relevant and feasible for their communities. Appropriate models for undertaking research on Indigenous peoples by Indigenous people are necessary (Gray et al., 1995) and Albany Aboriginal Corporation, Perth.

Certain Indigenous practices, customs and laws within Indigenous communities may place limitations on the types of research that might be undertaken. For example, certain

topics may be taboo to discuss and direct contact of researchers with some members of the community may not be permitted. The involvement of Indigenous people themselves in all aspects of the research, from planning, through field work to interpretation of the data will minimise difficulties due to cultural differences and restrictions. As with many other research populations, participatory approaches in which Indigenous peoples themselves have a sense of ownership of the research is likely to achieve the best results. The WHO Programme on Substance Abuse is implementing a programme of activities on substance use among Indigenous populations in which community assessment and other research methods are being developed in association with Indigenous people, with the overall initiative being managed by Indigenous people themselves (World Health Organization, 1996).

Most research published in the international literature on substance use among Indigenous people focuses on developed countries, such as Australia, Canada, the United States and Scandinavian countries. Such research ranges across quantitative surveys (Commonwealth Department of Human Services and Health, 1994), ethnography (Brady, 1992) and programme evaluation (Nechi Institute on Alcohol and Drug Education and Research Center, 1992).

Although household and school surveys may collect some information on substance use among Indigenous populations (New Zealand Ministry of Health, 1993) they have major limitations. In the general population, the prevalence of Indigenous people in the community may be too low to yield a sufficient sample size to allow for separate analysis. Indigenous populations may be "hidden" when considering the application of general population surveys. For example they may not live in typical households or attend mainstream or formal schools, they may live in remote rural areas, and they may not be able to participate because of language difficulties and illiteracy. It, therefore may be necessary to target Indigenous people separately to complement general population surveys (Commonwealth Department of Human Services and Health, 1994).

Many surveys targeting substance use among Indigenous populations focus on particular Indigenous populations or substance use patterns, for example substance use among Indigenous youth (Gray et al, 1996), injecting drug use (Larson, 1996) and youth solvent use (Kaweionnehta Human Resource Group, 1994). Surveys have also been conducted on community perspectives of substance use (Pauktuutit Inuit Women's Association, 1993). Very few longitudinal cohort studies looking at Indigenous substance use (Kunitz and Levy, 1994) and outcomes of treatment (Westermeyer and Peake, 1983) have been reported.

2.8 Other Target Groups

Other target groups for drug use research, such as “crack” cocaine users, heroin users and injection drug users are sometimes studied through ethnographic approaches such as those described in chapter 4, though a combination of techniques may be suitable for these populations. Drug users may be identified through snowball sampling, participant observation, and meeting places. Questionnaires may be administered to identified cases. Results derived from the questionnaire can be complemented with the information obtained through participant observation. This can provide a description of the scenario in which drug use takes place and therefore, provides a context for the interpretation of the statistical data.

2.9 Cocaine users

It is often useful to conduct studies of users of particular drugs, in order to understand, for example, the health and social consequences of using that drug. The study of cocaine users presents particular methodological difficulties. In most general populations the prevalence of cocaine use is relatively low and the number of dependent cocaine users experiencing health problems lower still. Therefore in order to study the health and social consequences of cocaine use cocaine user must be targeted as a special study population.

Snowball sampling has been extensively used in the study of cocaine users, particularly in Europe. Ingold and Toussirt (1992), combined qualitative and quantitative approaches to study cocaine users in Paris, France. They contacted the users through snowball sampling in three different circles: a "rockers" circle, a well educated circle and a “dope” circle. The field workers profile included a graduate student specially trained for the project, an individual with a doctorate in ethnology and an ethnographer. They were able to identify 103 users who agreed to respond to a questionnaire. In addition, the authors collected: field observations, statements made during conversations which took place before and after the administration of the questionnaire; and, conversations with subjects that were not interviewed and from the network of informers. Using both sources of information, the quantitative data from the questionnaire and the more qualitative data gathered through the parallel approaches mentioned, they were able to describe the characteristics of the cocaine problem in a hard to reach population. Similar studies have been undertaken in Germany, Italy, the Netherlands, Spain and the United States (Avico et al., 1988; Hendriks et al., 1992; and Bieleman et al., 1993; Waldorf et al., 1991).

In 1992 the WHO Programme on Substance Abuse, with support from the United Nations Interregional Crime and Justice Research Institute (UNICRI), initiated research into the global extent, nature and health consequences of cocaine use in nineteen countries. Existing data in each country was reviewed and country reports prepared. New data was collected through key informant studies in each country. In addition depth interviews were conducted with cocaine users in Bolivia, Brazil and Nigeria (WHO, 1992).

2.10 Heroin and other opiate users

As noted above the users of certain drugs, such as heroin, are not readily accessible to general population surveys because of the stigmatised and illegal nature of such use. The low prevalence of use of drugs, such as heroin, in the general population further supports the need for studies which target users of such drugs. Targeted longitudinal cohort studies have been the traditional epidemiological tool for studying the health effects and social consequences of heroin and other opioid use. Whilst such studies are extremely difficult to conduct and are resource intensive, not least because of difficulties in follow-up of participants, the requisite methodologies are available and have been tested over many years. Cohorts have been successfully followed over the longer term by, amongst others, Stimson in the United Kingdom (Stimson and Oppenheimer, 1982), Maddux and Desmond (1981) and Vaillant (1973) in the United States. One of the earliest cohort studies of opioid users was conducted by Prescor in the early 1940s (Prescor, 1943). Methodological difficulties in achieving a good follow-up rate were recognised and overcome by O'Donnell as long ago as 1969. A 95% follow-up rate was achieved. The first documented out-of-treatment follow-up study was conducted by Nurco (1971) between 1952 and 1971. He achieved a 91% follow-up rate. Data collected in such a way should however be treated with great caution. Such studies cannot be generalised to drug injecting populations globally or even to different groups of injectors in the same country. A certain standardisation of definitions and methodologies for collecting health data may allow for improved within and between country comparisons, in much the same way as the World Health Organization (WHO) Multi-City Study on Drug Injecting and Risk of HIV Infection provided cross nationally comparable data on drug injecting behaviour and HIV infection (WHO, 1994) (see below).

Ethnographic methods have been extensively used in the study of heroin and other opiate users. One of the first important “modern” drug ethnographies was conducted in Chicago among opiate users (Dai, 1937). Other “classic” ethnographies of heroin and other opiate users include Lindesmiths work in the 1940s and 1950s (Lindesmith, 1947), and that of Becker and Finestone in the late 1950s and early 1960s (Finestone, 1957; Becker, 1963). Many other ethnographic studies of various groups of heroin and other drug users continued throughout the 1960s, 1970s and 1980s (see Feldman and Aldrich, 1990 for a brief review of these studies). These ethnographies have provided insight into issues such as: street dealing and drug trafficking; out of treatment drug users and female heroin injectors. Biernacki’s (1986) study examines the recovery of heroin users who, without any intervention or treatment, gave up heroin.

2.11 Injecting drug users

Studies of injecting drug users have become particularly important in the past ten years because of the significance of drug injection as a major transmission route for HIV. The shared use of injection equipment and drug preparations has played a critical role in some local, national and regional HIV epidemics (Stimson GV, Des Jarlais DC and Ball A, 1998).

In 1989 an international comparative study of drug injecting behaviour and HIV infection was initiated by the World Health Organization in thirteen cities in both developed and developing countries on five continents. This was the largest international study of its kind ever undertaken, with over 6 000 participants. The study used a standardised methodology and data collection instruments. A notable feature of this study was that it developed methodologies to recruit large numbers of out of treatment injectors, a traditionally difficult group to reach (World Health Organization, 1994; Stimson GV, Des Jarlais DC and Ball A, 1998). Whilst qualitative sampling techniques were sometimes applied (e.g. snowballing and the use of privileged access or peer interviewers) to reach out of treatment injectors, the main research instrument was a standardised questionnaire. This combination of qualitative and quantitative approaches will be developed further in a second phase of the study which will apply both a survey instrument and situation specific assessments using quantitative methods (World Health Organization, 1996).

The United States National Institute on Drug Abuse (NIDA) has, through the National AIDS Demonstration Research (NADR) Program (1987-1992) and the Co-operative Agreement (CA) for AIDS Community-Based Outreach/Intervention Research Program (ongoing since 1990), supported research on: (1) monitoring risk factors, behaviours, and rates of HIV infections among out-of-treatment injection drug users and users of crack cocaine; and, (2) evaluating the effectiveness of interventions designed to prevent, eliminate, or reduce HIV risk behaviours (Brown et, al., 1993; Needle et al., 1995; Stephens et al., 1993).

In the CA Research Program, a targeted sampling strategy utilising ethnographic and quantitative sampling techniques was used to recruit drug injectors and crack users at risk for HIV in 23 study sites, 21 sites located in the United States and one each in Puerto Rico and Brazil. Two major data collection instruments, the Risk Behaviour Assessment (RBA) and the Risk Behaviour Follow-up Assessment (RBFA), were used across all sites and supplemental data collection forms were developed for specific multi-site studies. The pooled CA database includes information on more than 23,700 subjects. Multi-site studies include research on reliability and validity of study instruments and testing of new technologies, needle hygiene, drug use patterns, social networks, models of drug culture, and knowledge and beliefs about AIDS. The NADR Program and the CA Research Project, as well as other NIDA supported HIV research studies, are also discussed in Chapter 4.

The rapid spread of injecting drug use world wide poses a significant threat to public health, not just HIV but other blood-borne infections, such as hepatitis B and C but other complications such as overdose (Donoghoe and Wodak, 1998). Injecting drug users are therefore likely to remain an important "special population" to study.

3. Student Drug Use Surveys

3.1 Why Conduct Student Surveys?

The initiation of drug use often begins in adolescence. The primary reason then, to survey students, particularly annually or biannually, is to assess the incidence, or rate of new cases, that occur in a well-defined geographic area. Once a base-line is established, the incidence of drug use can be monitored periodically to determine significant changes in the problem. Carefully designed and implemented school surveys provide information that is useful in targeting interventions. Therefore it is not sufficient to determine the extent of current drug use practices; studies should also ascertain at what ages drug use began, what specific drugs are used, how they are obtained, and what characteristics or processes differentiate those who initiate drug use from those who do not and those who initiate use but discontinue from those who initiate drug use and continue to progressively become involved with drugs.

Studies of drug using populations help identify the target age group for student surveys. For instance, among adolescents, the average age for initiating marijuana use in the United States is between 13 and 14 years. Student surveys, such as the Monitoring the Future survey in the United States, include eighth graders who are within this age range, students in the 10th grade and in the 12th grade, the last year of high school. Furthermore, as was noted above, rates of drug use among school dropouts tend to be higher than among youngsters who remain in school. In the United States, in general children must attend school until the age of 16. The inclusion of children under this mandatory age assures that most potential dropouts are surveyed and an ascertainment of the relationship between drug use and dropping out of school can be examined. Truants and absentees, particularly frequent absentees, may also be involved with drug use requiring some adjustments in the administration of the student survey to include some extra days to assure that most of these groups are reached. A review of school records also would indicate to what extent truancy and absenteeism is a problem.

In general, studies among students are relatively inexpensive and easy to administer. The most common research approach has been the survey including a self-administered questionnaire. In addition to the Monitoring the Future Study in the United States, which has been conducted annually since 1975, sample surveys of student populations have been undertaken in a number of other countries (Castro et al., 1986, Medina-Mora et al. 1993, Smart, 1981 Climent and Arag\n, 1986; Pompidou Group, 1987). Almost all the fifteen countries of the European Union have conducted student surveys using self-administered questionnaires (EMCDDA, 1997). The European School Survey Project on Alcohol and other Drugs (ESPAD) involves more than twenty-five countries in both western and eastern Europe. It uses a standardized instrument and sampling methodology [4] to examine drug use

[4] (Copies available from the Swedish Council for Information on Alcohol and other Drugs (CAN) Box 27302, S-102 54 Stockholm, Sweden)

patterns among 16 year olds. The study is supported by the Council of Europe's Pompidou Group. Comparisons of responses to self-administered questionnaires in the school setting and in the household indicate more precision in estimations of drug use with the school-based surveys. Reasons for the increased reliability of self-report are the anonymity of the classroom setting not only in that each student becomes a part of a larger group but also as the classroom and the school allows a dissociation from the family environment.

Student surveys are useful for monitoring trends. Drug use patterns change and usually only informal or indirect means are available for examining these changes e.g., hospital records, arrest data, and drug seizures.

Annual or biannual studies of students or other groups permit an examination of how drug use is changing (for example, less illicit use and more drinking), what types of use are becoming more popular and what correlates of use are changing (such as more use by females).

Repeated annual surveys provide opportunities for special studies, for example, focusing on drug education, drinking and driving, or personality variables. Each repeat survey should maintain a core with the same demographic and drug use questions along with separate sections with questions chosen with a view to their timeliness and priority.

Surveys can be used in programme evaluation. They should be considered to examine the impact of educational programmes, policy and certain legal changes. If effective preventive education programmes are introduced, drug-use surveys could detect declining drug use or changing patterns of use. Systematic evaluation studies could be implemented if educational programmes were implemented in some populations but not in others, and if before-and-after surveys were made in both types of populations. In addition, drug-use surveys may be used to monitor the effects of changes in policy and laws regarding penalties for drug use - e.g., the liberalisation of cannabis laws, through which penalties are reduced, may result in an increase in cannabis use.

3.2 Methodological Guidelines

The objective of this section is to provide guidance for the planning and implementation of student surveys. The focus will be on the following key issues: the general plan of the study, sample procedures and designs, instrument development, field procedures, and sources of survey error. Chapter 5 provides extensive descriptions of these issues as they relate to general population surveys; this section will focus on issues related to the planning and implementation of student surveys.

3.2.1 General Plan of the Study

When conducting surveys one must always start by defining how the data will be used in order to ensure that the right questions are being addressed. This procedure may require a

thorough literature review to collect information that will guide the characteristics that would guide the selection of a target population, of the sampling procedure to be used and of the questions to be asked. Once the objectives have been carefully described and the variables to be studied selected, the sample design, size and selection procedure may be determined, the questionnaire developed and the plan of analysis outlined including possible implications for prevention and treatment programmes. It is advisable to include a section on the plan for dissemination of results in order to ensure they will get to the appropriate people.

3.2.2 Sampling with Special Reference to Students

The main task in sampling is to select a group of people who are representative of the total or special population of interest in terms of its chief characteristics. The various ways in which sampling can be done are described in Chapter 5. These guidelines cover only the major considerations directly related to surveys of the use of alcohol and drugs in student populations.

The population of interest Before a decision can be made as to the design or size of the sample, the population to which the study results are to apply must be precisely defined. For example, sampling considerations for all youths between the ages of 12 and 20 years in a country would be quite different from those for youths attending school in a specified city in that country. Unless the population is well specified in advance, the sampling scheme, however excellent, may be applied to the wrong population.

If a population is small enough, it may be more efficient and less expensive to study all of it rather than to sample a part of it. Examples of such a total population survey or census may be all youths attending school in a single community. Studying the total population avoids certain practical and logistical problems involved in selecting a sample, such as the possible need to enumerate a complete population and the need to identify persons selected for inclusion in the sample. A survey of the total population, where feasible, avoids the problem of subjects selected by a sampling scheme to feel "picked on" or discriminated against; it may also be less disruptive of routine in a school or other institution.

If, however, it is decided that a sample is required, the specific population of interest must be defined with the necessary exactitude before an appropriate sampling scheme can be constructed.

Considerations in selection of sample size. The object of the sampling scheme is to yield the most precise estimates of drug use possible within a given budget. In choosing a sampling scheme, several factors need to be considered:

(a) The complexity of the population structure being studied. Some populations may be heterogeneous with respect to variables that influence drug use; for example, they may not be of the same age, gender, or socio-economic status. The scheme must then provide for the selection of study subjects representative of the population of interest with respect to these

variables. This approach to sampling may also be used to obtain separate estimates of drug use for each subgroup for comparative purposes. If the prevalence of use varies between subgroups, it may be desirable to select greater-than-proportional sample sizes in subgroups where the prevalence is low. This will ensure equal precision of prevalence estimates in all subgroups.

(b) The geographical spread of the population is important in choosing the most efficient sampling scheme. If estimates are needed on a national basis or for a population that is spread out geographically, cost considerations may demand some clustering of the persons to be sampled. Also if the geographical spread cuts across administrative boundaries, use of the same sampling scheme for all administrative districts may not be possible. For example, in a school survey the number of students per class may be greater in one state or province than in another, and a sampling scheme by class may therefore over-represent some school systems. For these reasons a geographically dispersed population may require a more complex sample scheme.

(c) Some sampling schemes are more costly and/or time-consuming than others. To ensure that a random selection of persons is made at some stage of the sampling scheme, a sampling frame must be available from which to choose the subjects. A sampling frame is merely a listing of all units or individuals from which a sample is to be selected. If a survey of all students in selected classes is wanted, the sample frame would consist of a listing of all classes. If only certain students are to be selected, the sample frame must be a listing of all students.

If the population is to be divided into subgroups, information is needed on the subgroup status for each person on the list. Such lists may be very costly or impossible to obtain, however, and very often the information needed to assign a person to a subgroup is not available. If, for example, the population of interest is high-school youth in a certain city, and no subgroups of students are to be studied, a listing may be available or compiled relatively quickly and cheaply. If, on the other hand, separate estimates were required for differences in drug use according to sex, age, and socio-economic status, information on the first two variables may be routinely available; information on the third would generally become known only by a special inquiry and compilation.

If the information needed on subgroup status is not available, there is a way to avoid the costly process of gathering it from all persons in the population. This is the use of "multistage sampling" which obtains the necessary information from a limited number of smaller units. For example, the information could be obtained from all students in only 10 or 15 classrooms in a large city. A study using this approach would be described as using a cluster sample of classrooms.

In practice the study design is tied to an existing sampling frame or to a sampling frame that can be quickly and cheaply compiled. A caution against using lists of persons compiled for other purposes is needed here. Unless these lists have been very carefully checked, they are usually found to be incomplete or to contain many duplicates. They may also be out of date, partially illegible, or inappropriate for the population of interest. The use of such lists may cause biases of unknown magnitude in the estimates of drug use.

(d) Sample design is also affected by administrative considerations. The sponsor of the study may give ready access to some groups of youths, but not to others. Study, work, or training schedules of the respondents may dictate the selection of administratively defined groups such as school classes rather than a selection of persons cutting across this administrative boundary.

Types of sampling design. The basic concept underlying all forms of scientific sampling is that of the probability sample. A probability sample is one in which every person in the population of interest has a known probability or chance of being selected for the sample. This requirement is sometimes difficult to achieve when studying some student populations, for example, university students can usually take courses at different levels, or may be studying the fifth semester and being enrolled at the same time in a subject from the first semester, in these cases students will have different probabilities of being selected if the unit of selection is school group. In this example, irregular students have a greater chance of being in the sample. If drug use is related to this variable, then the prevalence estimates will be artificially increased. Some researchers have solved this problem by identifying compulsory courses, and using them as the sampling frame. An alternative is to select individuals on the basis of lists of students which increases the cost and time of the survey.

All of the sampling designs mentioned here involve probability sampling. Other forms of sampling not involving probability sampling also exist, such as haphazard sampling, where persons are chosen by other than random means. There is also purposive or quota sampling where "representative" individuals are sought out according to some definition of what is representative. These non-probability sampling methods will not be dealt with here since they do not allow estimates of bias or precision to be made.

Sampling Procedures/Designs

This section covers only the major considerations directly related to school based surveys of the use of alcohol and drugs. For examples of school based surveys in which the sampling approaches are described in detail, the reader is referred to Johnston (1996).

Even the simplest sampling design exercise will benefit from the participation of an experienced survey statistician. If the intent is to utilise a multi-stage cluster sample design, a decision as to the complexity and extent of the multi-stage sampling is a difficult one that depends upon the various cost components of sampling at each level, the ability to compile the appropriate sampling frame at each level, and the needs of precision for the estimates of

drug use. Stratification can also be superimposed at any stage of sampling to produce a hybrid sampling design of even greater complexity. In summary, multi-stage sample design demands the solution of a set of complex statistical questions; it should therefore not be attempted without appropriate assistance.

The size of the sample needed for a drug-use survey depends upon the following factors:

1. the rarity of the trait (in this case, drug use) being estimated for the population of interest
2. the relative (percentage) or absolute precision desired for the estimate;
3. the subgroups in the population for which separate estimates are required;
4. the comparisons between subgroups in the population.

Regardless of the population size, sampling experts should be consulted in the determination of the appropriate sample size.

3.2.3 Types of Instruments Used in Student Drug Use Surveys

The format or physical layout of the questionnaire is extremely important for purposes of data processing. In self administered surveys of drug use there are three general types of instruments that have been used.

The fill-in form - the subject marks his answer directly on the questionnaire. The model questionnaire self administered format included in this volume is of this type. The answers are usually "coded" for computer entry. This method requires the least from the respondent: he merely has to read the question and mark his answer with a tick or cross, or in any other obvious way. This method works best with children below the age of 13, who often have difficulty with separate answer sheets. The disadvantage of the method is that it tends to be labour-intensive, since assistants are required to do the coding and data entry. These tasks are manual and rather tedious, so that errors are likely. Careful checking of coding and of data entry are necessary.

The answer sheet format is one in which the questionnaire and answer sheet are separate. The answer sheet is numbered in the same way as the questionnaire, with a numbered box for each answer. In some cases both the answers and the boxes for them may be on the answer sheet, but usually the answers are only on the questionnaire. At the end of the survey, the answer sheets are collected and the data may be directly entered into the computer. This method avoids the additional task of coding the answers, and allows questionnaires to be reused. Hence, it is somewhat cheaper than the fill-in form.

The most modern method involves machine-readable forms. No personnel are required to code the answers or enter the data since the "reader" machine (or "scanner") will scan the answer sheet visually and automatically store the data in the computer. In some

studies, answer sheets have been made machine-readable and in other studies questionnaires have been made machine-readable. Both methods are relatively costly in terms of materials and equipment, but are extremely labour-efficient. A further problem is that students must mark their answers carefully and distinctly. Since stray marks on the page may be read as answers, subjects must constantly be careful where they put their answers especially if the leave blanks.

Usually, machine-readable answer sheets must be specially designed for each study, thus incurring a cost for each study. Machine-readable questionnaires are even more expensive, and a separate one is required for each subject. They are not reusable as is the case with the answer-sheet method. Investigators would also need to factor in the cost of acquiring the necessary scanning equipment if it is not already available. This method is the most suitable where the number of respondents is very large - e.g. over 5000.

3.2.4 Types of Questions Used in Student Drug Use Surveys

What questions should be included in a drug use survey is largely related to the goals of the survey, the time available, and the respondents' capacities. Detailed discussion of variables which have been used successfully in school based surveys of drug use in several countries is provided in Chapter 6.

Investigators should include only what is essential in the questionnaire. One method of increasing the number of variables is to have more than one version of the questionnaire. Certain core items may be common to all forms, but other variables may be included in only one form. Of course, this method will work only if there is a sufficient number of respondents to provide adequate samples for each form; use of multiple questionnaires will also increase the sample size needed.

When surveys are conducted in classrooms, they must be completed in one class period (30 - 45 minutes). This includes time for giving instructions, answering questions, and collecting answer sheets. The actual time spent will be dictated by the reading and answering speed of the slowest child in the sample being tested. Thus samples that include a wide range of ages will require different lengths of survey time. Usually students age 12-13 years will take twice as long to answer a questionnaire as those aged 17-18 years. Reading levels may also vary among samples of the same age, and students receiving special education for the retarded or "slow progress" classes will often take considerably longer to complete questionnaires. Care should be taken to pretest the questionnaire on the slowest-working as well a the fastest-working subjects of the sample. Sometimes investigators draw up two questionnaires: one for younger students, containing only demographic and drug-use items, and another for older students, with the same items plus additional attitude and personality items. This allows everyone to finish at about the same time and also allows the collection of some data on the correlates of drug use.

The general format and wording of questionnaires are important. There is a

distinction between open-ended style -i.e., where the subject writes in the answer and closed style where the possible answers are specified and the respondent marks one of them. Theoretically, open-ended questions allow more specificity and may be more sensitive to changes over time. However, respondents frequently have difficulty in specifying certain information such as the exact number of times a drug was used and are able to make only rough estimates. Specified answer categories take this limitation into account and the resulting data may be processed and analysed. Many open-ended questions, on the other hand, have to be coded eventually if they are to be computer-processed, and this adds enormously to the duration and cost of the survey research. Un-coded or open-ended questions are best left for small pilot studies. Closed style questionnaires offering multiple choice responses should be used for student drug use surveys.

Another aspect regarding format concerns "skip" directions, these are instructions to respondents not to answer particular questions if they have answered an earlier one in a certain way. For example, "if you have no father, do not answer the questions on father's occupation or education". In general, "skip" directions are best avoided for studies of youths, since many respondents fail to read the carefully. This is particularly the case with children aged 14 years or below. If such directions are absolutely necessary, they should be explained to respondents orally

3.2.5 Reliability and Validity

The general concepts of reliability and validity in survey research are described in Chapter 5. The preceding discussions for each special population briefly discussed cautions about these issues and suggested some measures to increase both reliability and validity of reporting.

3.2.6 Procedures for Administering the Survey

One of the most important steps in organising a survey is the pilot study. All questionnaires should be tried out on a small number of subjects of the type to be studied in the actual survey. This allows a test of the questionnaire and the development of answer categories. It also indicates whether the subjects understand the questions and can reply to them in the time available. The pilot study may also identify difficulties in obtaining co-operation from subjects, so that procedures for selecting the sample and administering the survey may need to be modified. It also provides an opportunity to train interviewers and test their abilities. Administrative approaches for surveys of student populations will probably vary from one country to another. In most school surveys, it is essential to gain the co-operation of at least four groups: the authorities responsible for the school district, the principal or head master of each school, the teachers, and, finally, the students themselves. The best way is to state the reasons for the survey clearly and honestly to all concerned and to enlist their co-operation. Coercion at any level is likely to produce disturbing side-effects.

Schools and teachers may require active or passive parental consent for the

participation of students. Active consent requires disclosure to the parent of the purpose and content of the questionnaire and requires a signed consent form for the child's participation. Passive consent requires full disclosure but requires only those parents who do NOT want their children to participate to notify the researchers. Some schools may not require any notification of the parents. With the stigmatised nature of drug abuse, active consent and potentially even passive consent could lead to under-reporting.

Large studies may use specially trained assistants to administer the surveys and answer questions about the meanings of the questions. If teachers are present in the class at the time of the survey, they must not be allowed to wander about and see students answers. Since teachers are often required to maintain order in large unruly classes, they cannot always be excluded. However, they should not collect or look at the questionnaires at any time. Students should be made aware that the survey is being conducted by outsiders, not by the school authorities or teachers, and that teachers will not see the results. The provision of boxes in the classroom in which the students can leave their questionnaires also provides additional anonymity.

In general, it is a good practice to ensure that respondent do not sign their names to drug-use questionnaires. Most investigators feel that subjects will be more honest if they do not sign their names. This permits them to respond honestly, without fear of punishment. Certainly there is less probability of legal difficulties, and respondents seem to prefer anonymity, especially if the are older.

Studies may also be carried out with a randomised response model in which the respondent answers a question without revealing his own behaviour. For example, he is given several questions from which he may choose one to answer. The questions may include a drug-use question and a more innocuous one say, about what he had for breakfast. Statistical techniques are then used to estimate the numbers of drug users. In general, anonymous methods are superior to those in which respondents are identified.

Anonymous administration is to be preferred unless there is a compelling reason for gathering identifying information. Johnston et al. (1996), have used an interesting alternative to identifying students for follow up studies while keeping the anonymity of students and thus providing the required confidence to answer. All questionnaires are numbered, the last page of the questionnaire has a removable section with a different number and the name of the student, this section is removed upon completion of the questionnaire, both sections are give separately to the administrators of the questionnaires, the relation between the two numbers is kept only by the researcher who guarantees no other use than to assess trends of drug use.

In any survey, a varying proportion of incomplete questionnaires will be returned. Some are totally unusable, either because the respondent did not follow instructions or because he did not take the survey seriously. Questionnaires that have a significant number of incomplete and/ or inconsistent responses from an intermediate group. For these, the investigator must decide on specific criteria for determining what questionnaires are to be included in the analysis. For example, in the WHO collaborative study (Smart, 1980), questionnaires were excluded if they had four or more incomplete or inconsistent answers. The advantages of liberal criteria for inclusion are that more questionnaires can be analysed and that the sample will be larger and more representative of the population surveyed. The disadvantages are that the data are not as reliable and that the number of answers for each questionnaire item will vary. If rather strict criteria are adopted, the data analysis will be performed on questionnaires that are for the most part properly completed-hence the data will be more reliable. The disadvantage is that more questionnaires are rejected, so the results are less representative of the population surveyed. Investigators who have considerable experience in self-administered questionnaire surveys generally expect to omit 5-10% of questionnaires from the analysis for reasons of incompleteness or inconsistency. The proportion of inconsistent and incomplete questionnaires is greatest when the sample contains young students (e.g. below the age of 14) and least with older students.

3.3 Other Methodological Considerations

This section presents the strengths and limitations of the different methods and discusses requirements of confidentiality versus need to identify subjects for follow-up studies.

3.3.1 Strengths and Limitations of Student Surveys

Like any other method, the self-administered survey has advantages and disadvantages. Its overwhelming advantage is surely its relatively low cost. The method may be used with populations of 10,000 or more, at a fraction of the field cost of an interview study, depending, of course, on the salaries paid to interviewers and the geographical dispersion of the population. The method is well accepted in many parts of the world and refusal rates are often below 1%. In contrast, refusal rates in household surveys are frequently 20-30% and in postal surveys noncompletion rates are typically 50-60%.

Many researchers would argue that the self-administered survey is the best way to obtain information about private behaviour because the information may be obtained anonymously. The method may also take advantage of the efficient technology available for data processing, such as machine-readable and other easily processed forms. This expedites data handling at every stage, tends to reduce costs and labour, and makes surveys of large populations more manageable.

The limitations of the approach include the considerable technical skills, personnel and equipment required for large scale studies, e.g., of 3000 or more subjects, which may not be available regularly in some countries. The skills involved are those required for sampling, questionnaire administration, coding, and data analysis. Data processing and handling are greatly facilitated if a computer is available for studies with more than about 500 subjects and 30 or more questions. In addition, there are some unsolved problems with reliability an validity, which will be discussed in detail later.

3.3.2 Confidentiality Versus Need to Identify Subjects

The legal and ethical issues created by drug-use surveys vary from country to country depending on local laws and customs. In some countries such concerns are minimal; in others, respondents' rights are protected through the legal and professional guidelines for research. In some countries, signed questionnaires stating that a given student has used illicit drugs are considered as "hearsay evidence" and cannot be used against the subject in court. However, it is possible that they may be used in investigations. Beyond these legal questions, respondents would not wish their questionnaires to be used for purposes beyond research. In general, respondents have the right to confidentiality and to freedom from harm if they participate in drug use surveys.

For the type of research under discussion, there are only three situations in which it is necessary to have names or identifying marks: where test-retest reliability studies are planned; where questionnaire data are being compared with data from other sources, such as school records; and where follow-up studies are planned. In a sense all of these are "follow-up" studies, since the investigator wishes to match questionnaire responses with other data about the individual. The individuals right to privacy has to be measured against the need of the investigator and of society at large to know the results of follow-up studies.

A number of methods for protecting the rights of subjects have been developed. In some cases, a code has been developed whereby each subject is given a unique number, which is placed on the questionnaire. For the persons conducting the survey or handling the survey questionnaires the data are identified only by number. A third party keeps the list of numbers with the identifying names, but does not have the questionnaire data. In some cases the name-number list will have been sent out of the county to a distant third party.

Other methods have been developed for the assessment of test-retest reliability, in which respondents are asked to fill in identical questionnaires on two occasions. one method is to prepare labels with the name and unique number of each respondent. Two questionnaires with the same name and number are prepared for each respondent. At the time of the first test respondents tear off their names and hand in the questionnaire that has only a number on it. At the re-test, it is necessary to make sure that each respondent receives the right questionnaire.

In follow-up studies, the most usual method of protecting the identity of respondents is to use self-generated codes. These may be useful in follow-up and test-retest studies, but less so in studies associating questionnaire data with other case material. Various possibilities exist. Swisher (unpublished observations, 1977) tried using the student's telephone number, but found that many numbers were wrong at the second testing. Annis and Kohn (unpublished observations, 1977) conducted a follow-up study using 4 items: the first letter of the respondent's mother's first name, the day of the month in which the respondent was born, the first letter of his first name, and the street number of his house at the time of the first test. This 4-item code does not tax the memory and should not change with time. Students should be able to use such a system without difficulty. In practice, however, some cases are lost to analysis because earlier and later data cannot be matched. Therefore, other techniques are preferable.

Johnston et al., (1992) for the "Monitoring the Future" study developed a technique that enables the identification of students for longitudinal surveys which uses a pair of codes, one of them removed from the questionnaire by the student before turning in the answered questionnaire.

In conclusion, reliability and follow-up studies create certain ethical and confidentiality problems. However, such studies are valuable and methods of carrying them out are improving.

4. Conclusion

Substance abuse epidemiological studies on special or "hidden" populations and provide information and in-sights that general population studies usually do not. Hence they are useful in assessing the overall substance abuse situation in a community and for investigating particular issues and problems, for example HIV transmission. The selection of the target groups, the appropriate methods and interpretation of the results require careful planning. While the methods for student population studies have traditionally been better developed, there has been much innovation and development of methodologies and studies which target other more "hidden" populations. These studies can provide information that is crucial for prevention and treatment programmes and other interventions.

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ANNEX

GUIDE FOR PLANNING AND ADMINISTERING STUDENT SURVEYS

Planning of the survey

Investigators will need to plan the implementation of any survey carefully. The actual time required for any survey depends on its size and the familiarity of the organizers in conducting such studies. Time for each element in the plan must be more than adequate to allow for some elements to be late. The major elements of planning are listed in the accompanying table, along with a sample time-table for implementing the various stages of a hypothetical survey to be completed in 15 months.

TIME-TABLE FOR SURVEY IMPLEMENTATION

Activities	Duration (months) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Planning	---	---	---												
Questionnaire design	---	---	---	---	---										
Sampling plan			---	---	---	---									
Pilot test questionnaire and procedures			---	---	---	---	---	---	---						
Arrangements with school			---	---	---	---	---	---	---	---	---				
Training of supervisors						---	---	---							
Administration of survey							---	---	---	---					
Data analysis									---	---	---	---	---	---	---
Writing of report										---	---	---	---	---	---

Sampling

Some form of randomized sampling is recommended in student surveys. In order to do this, it is necessary to have a list of classes and schools from which to sample. Usually, classes and not students are the sampling unit in these studies. An alternative is to use the entire school population of a given area or to use all classes of a certain type of student.

Adaptation of the Model questionnaire

Much of the model questionnaire consists of a standard set of questions about drug use, which is repeated for each drug. Therefore, it is important to examine the questions in this set to be sure that they will work well in the study being planned. Each investigator can then adapt the questionnaire to fit the research needs and local situation. The Annotated Guide to Translation and Adaptation of the Model Questionnaire (in Chapter 10) should be consulted for this purpose. If necessary (perhaps for younger respondents), instructions may be expanded to provide more detailed directions and examples of how to complete the questionnaire. Additional questions may be added, depending on the objectives of the study and the ability of respondents to handle a longer questionnaire. The reader is referred to Chapter 3 for a discussion of variables which have been used in student surveys. Investigators may underestimate the time it will take to complete the questionnaire, therefore they should keep track of the time required for survey administration in the pretest.

Questionnaire administration

Most data collection will be carried out in group administration settings such as classrooms or auditoria. It is strongly recommended that administration of the survey be directed by the research team and not by teachers or other institutional staff, since researchers can present the study more effectively and give more reassuring promises of confidentiality. Some investigators may wish teachers to be present, if they are important for maintaining order.

The standard procedure calls for research staff to i. briefly introduce the study to the respondents, ii. remain available to answer questions while the questionnaires are being completed, iii. collect the questionnaires upon completion and, if desired iv. informally discuss the questionnaire with some or all of the respondents after the survey administration is finished. It is suggested that teachers should not participate in these activities.

It is strongly recommended that the questionnaire should be administered anonymously, and that no names or identifying marks should be placed on it, except where required for purposes of follow-up or reliability and validity studies.

It is also recommended that reliability and validity studies should be conducted that are appropriate for the groups on which the questionnaires would be used.