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The practice of drug abuse epidemiology

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The practice of drug abuse epidemiology

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PREFACE

The *Bulletin on Narcotics* is a United Nations journal that has been in continuous publication since 1949. It is printed in all six official languages of the United Nations—Arabic, Chinese, English, French, Russian and Spanish.

The *Bulletin* provides information on developments in drug control at the local, national, regional and international levels that would benefit the international community.

The present double issue of the *Bulletin* (vol. LV, Nos. 1 and 2) is devoted to the practice of drug abuse epidemiology. It follows the previous issue (vol. LIV, Nos. 1 and 2), which dealt with the science of drug abuse epidemiology. The United Nations Office on Drugs and Crime wishes to thank Zili Sloboda, who acted as guest editor for these two volumes of the *Bulletin.* Particular thanks also go to Paul Griffiths and Rebecca McKetin, who planned these two volumes while they were working in the United Nations Office on Drugs and Crime (UNODC).

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Developing a global perspective on drug consumption patterns and trends—the challenge for drug epidemiology

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ABSTRACT

The purpose of the present paper is to review progress made towards improving drug consumption information at a global level. The paper reviews methodological developments achieved through the collaboration of international experts and organizations in the field of drug use epidemiology at two global meetings. The first was held in January 2000 to develop a consensus on the principles, structures and indicators underpinning drug information systems, and the second in December 2001 to review methods used by regional epidemiological networks and identify opportunities for methodological development, future collaboration and improved working practices. Discussions at these meetings were successful in developing a framework for improved data collection practices at the global level, and showed considerable progress had been made in the coverage and quality of data collected. The use of drug information networks has played a key role in this developmental process by fostering the systematic collection and interpretation of data and providing a forum for the sharing of information and experiences across disciplines and geographic regions. Remaining challenges for data collection at the global level centre on the development of robust low-cost methods of collection that can be adapted to all regions of the world, as well as on the need for ongoing interregional collaboration to foster this process.

Keywords: drug information systems; drug trends; drug abuse; epidemiology; methods; data collection; networks; global.

Introduction

Although there are countries that can claim successes in controlling the demand for illicit drugs, abuse throughout the world continues to grow. In particular, illicit drug abuse in some developing countries has increased dramatically. However, knowledge of the scale of illicit drug use is still inadequate, and understanding of the patterns and trends is limited. To provide effective policies to reduce drug abuse, Governments need data about when, where and why people use illicit drugs. Patterns of drug use transcend national borders, as users in all regions of the world obtain access to a greater variety of drugs, and as social trends, particularly

among young people, spread more rapidly than before through better communications. The globalization of drug use means that policies for the reduction of demand must also be global, as must the information system on which they rely.

It is not easy to obtain a comprehensive picture of the global patterns and trends in illicit drug consumption. At the global level, one mechanism exists that is designed to assemble an overview of the world drug use situation, namely, part II, entitled "Extent, patterns and trends of drug use" of the annual reports questionnaire [1]. The questionnaire is used by Member States of the United Nations to meet their obligations under the drug control treaties to report on various aspects of the illicit drug problem to the Commission on Narcotic Drugs. The questionnaire provides for global data collection on an agreed set of core drug consumption indicators using three levels of reporting: summary expert opinion, unstandardized or partial quantitative data and standardized quantitative data. While the questionnaire is only intended as a summary data set, it does provide a useful vehicle for encouraging the adoption of multi-source data collection methods and harmonized core indicators, and can provide a basic structure for data collection efforts. Countries that adopt the core measures found in the form also ensure that data collection exercises result in information that is compatible with international standards. The current picture of the global drug situation is built upon questionnaire data in conjunction with other published material on drug consumption, and relies heavily on data provided by national and regional drug information systems [2]. Even so, information on the global drug situation is sketchy, with poor quality data in many regions and lack of comparable reporting standards. Harmonization of global data collection methods and activities, the adoption of sound methods of data collection and development of capacity for data collection are key to improving the global drug information base. This paper reviews the progress made to date in achieving these aims.

Guiding principles of data collection

Integral to efforts to improve international data on drug consumption is harmonization of data collection methods and activities. An important first step towards achieving harmonization was taken in January 2000 with a joint meeting of representatives of international bodies, and regional drug information networks, as well as other technical experts, to discuss the principles, structures and indicators necessary for effective drug information systems [3]. The meeting was hosted by the European Monitoring Centre on Drugs and Drug Addiction in Lisbon and was supported by the United Nations International Drug Control Programme under the Global Assessment Programme on Drug Abuse. Particular consideration was given by the international expert panel to the development of a set of core epidemiological demand indicators for assessing drug consumption at a global level. Consensus on the following core indicators of drug demand was obtained:

    (a)   Drug consumption among the general population;

    (b)   Drug consumption among youth;

    (c)   High-risk drug abuse;

    (d)   Utilization of services for drug problems;

    (e)   Drug-related morbidity;

    (f)   Drug-related mortality.

The indicators were chosen as they address areas in which routine data collection was considered possible, at least for some countries, and are not intended to represent a comprehensive information base required to address all information needs at a regional or national level.

In addition to gaining consensus on the core indicators of drug consumption, there was agreement on the principles that should underpin data-collection activities. The collection of meaningful data on drug consumption should be guided by the following broad principles:

    (a)   Data should be timely and relevant to the needs of policy makers and service providers;

    (b)   While not sufficient in themselves for a comprehensive understanding of patterns of drug consumption, efforts to improve the comparability and quality of data at the international level should focus on a limited number of indicators and a manageable priority core data set;

    (c)   Simple indicators of drug consumption must be subject to appropriate analysis before strategic conclusions can be drawn. Analysis and interpretation of basic statistical data is greatly enhanced when combined with research, both qualitative and quantitative, and with broader information on context;

    (d)   Multi-method and multi-source approaches are of particular benefit in the collection and analysis of data on drug consumption and its consequences;

    (e)   Data should be collected in accordance with sound scientific methodological principles to ensure reliability and validity;

    (f)   Methods need to be adaptable and sensitive to the different cultures and contexts in which they are to be employed;

    (g)   Data collection, analysis and reporting should be as consistent and comparable as possible in order to facilitate meaningful discussions of changes, similarities and differences in the drug phenomenon;

    (h)   Methods and sources of information should be clearly stated and open to review;

    (i)   Data collection and reporting should be in accordance with recognized standards of research ethics;

    (j)   Data collection should be feasible and cost-effective in terms of the national context where it occurs.

It was recognized that the identification of good methods alone is not sufficient for improving data collection capacity. It is also necessary to develop appropriate networks and organizational structures to provide the infrastructure

necessary to support data collection. There is therefore a need for improved capacity to analyse and interpret information on drug consumption, and this depends on a combination of good methods, human expertise and the availability of appropriate resources. It also requires training and technical support, ongoing political support and investment to ensure sustainability and success of data-collection systems. While expenditure on data collection must be cost-effective in terms of the resources available within a country, it should also be accepted that investment in data collection activities is both necessary and resource-efficient, in that it improves the development, targeting and evaluation of other investments in demand reduction.

Global situation on drug information

Principles for collecting data on drug consumption identified during the Lisbon meeting were forwarded to the Global Workshop on Drug Information Systems: Activities, Methods and Future Opportunities, a workshop of technical experts representing drug information systems and relevant international bodies, held in Vienna from 3 to 5 December 2001. The workshop provided a collaborative forum for updating important developments in drug consumption trends; reviewing the range of methods used by regional epidemiological networks; and identifying opportunities for methodological developments, future collaboration and improved working practices [4]. The following assessment of the data collection situation is based on the outcome of that meeting, combined with a review of other relevant recent reports.

In recent years, considerable progress has been made in developing drug information systems and networks. Governments in both developed and developing countries have become more convinced of the value of this type of work and their investment in activities have correspondingly increased. New regional networks have been established and existing networks have expanded their activities. Furthermore, there has been a move towards adopting broadly similar approaches, often incorporating multi-indicator methods. To some extent, the similarity of the approaches adopted simply reflects a growing consensus on what constitutes good practice in this area. In addition, there has been a move towards adopting common reporting categories, allowing data to be more internationally comparable. These activities have improved both the quality and quantity of drug consumption information gathered.

One feature common in the development of most regional networks is the use of technical expert groups and focal points for information collection, combined with the use of standardized indicators. Regional networks have brought together countries with similar experiences and problems, which has facilitated the sharing of knowledge and development of methods sensitive to local cultures and conditions. Improvements in regional data collection capacity have been achieved through a developmental process that recognizes the need to configure data collection approaches to suit national circumstances, while appreciating the benefits of adopting harmonized measures and proven methodological principles.

Considerable opportunity remains for further collaboration between regions to share technical resources and experiences, improve the coordination of work in areas of joint interest and further support the progress made in developing common approaches and standardized measures. The development of networks also facilitates dialogue between scientists and policy makers that can help ensure that data collection meets the needs of policy formation. In many countries we now find recognition by policy makers of the value of sound information, as well as an appreciation of the infrastructure needed to provide this information.

While progress is evident, considerable challenges remain. In particular, developing low-cost surveillance methods for developing countries remains a pressing need. Although general population surveys are often used to measure the extent of drug use, these types of large-scale surveys are not viable options for many developing countries owing to the cost and logistics involved in conducting them. Moreover, such techniques do not provide accurate estimates of the low-prevalence problematic drug use more common among marginalized groups, such as injecting drug users. Other statistical estimation techniques are increasingly being utilized to estimate prevalence among marginalized populations, such as heroin users or drug injectors. These techniques are also likely to be more appropriate in countries where a mistrust of taking part in public attitude surveys may result in under-reporting of drug use. There is a need to share the experiences of countries that have used indirect statistical measures for estimating prevalence and to develop guidelines for the application of these techniques in developing regions.

One area where considerable progress has been made is in the development and implementation of school surveys. Improved global coverage and comparability of school survey methods means that this data source is already providing considerable insight into global drug use patterns. For example, the Inter-American Drug Abuse Control Commission has made school surveys one of its priority data collection areas for the Americas and expects to have data collected using a common format from all participating countries [5]. The European School Survey Project on Alcohol and Other Drugs involved 30 European countries in their last data collection round [6]. The Caribbean Drug Information Network is planning to coordinate school surveys in at least 10 countries during 2002-2003 [7], and school survey data is also available from a number of countries in Asia [8]. There is considerable potential for increasing the coverage and comparability of school survey data in the medium term, and this data source is therefore likely to play an increasingly important role as an indicator of population exposure for the purposes of international comparisons and trend analysis. It should be noted, however, that school survey data perform poorly with respect to problematic and chronic drug use (for example, heroin injecting), as these patterns of drug use are often not initiated until after children leave school and are also more likely to occur among out-of-school youth (for example, street children or persistent truants). A further challenge to improving coverage of school survey data is that in many developing countries school attendance is not universal or may end at an early age. A need therefore exists to develop strategies to improve the coverage and performance of school and youth surveys in developing countries, where the

organization of educational services places particular demands on the methodological approach.

The reporting of attendance at drug treatment remains a core element of most drug information systems. The comparability and coverage of this data is complicated by the heterogeneous nature of drug treatment provision among countries. Opportunistic inclusion of medical/psychiatric services in data collection has improved coverage in many regions, and data quality and comparability have been enhanced by the routine collection of this data and use of standard diagnostic criteria. Considerable potential exists for the development of treatment data collection through consensus on common definitions and methodological good practice, together with the adaptation of collection methods to non-specialized treatment settings providing treatment for drug-dependent individuals. Another area of potential development is the integration of epidemiological surveillance methods with clinical case management tools. Many countries are improving their information collection in both these areas. In terms of resources, it may therefore be efficient, for developing countries in particular, to look at models that provide summary data for surveillance purposes and also serve the information needs of clinicians for monitoring patients within services.

With the exception of registers of specialist drug treatment attendance, very few regions have comprehensive data on drug-related morbidity and mortality. Particular attention is being paid to the monitoring of human immunodeficiency virus (HIV) and other viral infections among injecting drug users; however, data coverage is varied and there is a critical need to improve data collection capacity in developing regions. Robust low-cost methods for estimating the prevalence of drug injecting must be further developed and adapted to developing regions. This process would facilitate estimation of the potential and achieved coverage of interventions targeting injecting drug use. In addition, mechanisms should be developed to improve the sensitivity of drug information systems to the emergence of new injecting populations. Risk-taking behaviour for the transmission of HIV should also be monitored.

The inclusion of the results of drug testing of arrestees into drug information systems is another development. This represents a relatively new indicator, but it is in an area important to policy, namely, the relationship between drug use patterns and criminal behaviour. Developments in the European Union also suggest that considerable benefit could accrue from combining epidemiological data with forensic data on the nature and composition of substances available on the illicit market. To date, this area has been poorly developed and where this information is collected it is not usually placed in the context of the epidemiological surveillance information. However, some progress is being made in using this type of information to monitor trends in new synthetic drugs across Europe. An overarching priority area in the development of data collection activities is the establishment of ethical standards in the field, in particular with regard to the use of drug registers and biological testing and in regions where procedures for ensuring ethical standards are not institutionalized. This process needs to be supported by the development of ethical guidelines for collecting information on illicit drug use.

Several measures have been identified to meet the outstanding challenges facing global data collection and to further progress already made in the field. These centre on improved interregional collaboration, in particular the sharing of methods and resources among regions in order to improve consensus on sound drug use epidemiology practices. The sharing of experiences in dealing with ethical issues in drug use epidemiology would also assist in the establishment of ethical standards for collecting data on drug use, in particular in developing regions, where such standards are not institutionalized. Generally speaking, systems should incorporate a broader range of information sources, notably information from non-institutional populations and supply-side information, to improve their sensitivity to emerging drug trends. Finally, data collection activities should be linked to policy and the implementation of demand reduction activities through an ongoing dialogue between policy makers and drug use epidemiologists.

Summary

There has been much progress made recently towards improving data collection, not only in terms of the coverage of data collection activities, but also in terms of the quality of data collected and its utility in formulating policy. The use of drug information networks has played a key role in this developmental process, providing an opportunity for dialogue among different sectors of the community and among different countries and regions. Progress towards improving coverage of specific core indicators of drug use has been achieved in developing regions through the adaptation of cost-effective data collection methods, in particular school surveys and indirect procedures for estimating the extent of problematic drug use. In this regard, networks have been crucial in encouraging the systematic collection and interpretation of data from drug treatment services, as well as other data on drug-related events. Challenges remain to further improve coverage of the data collection activities and expand drug information systems to foster the development of drug-related data collection activities. Improved interregional collaboration and related sharing of technical resources will facilitate the harmonization of data collection efforts and development of methods that will allow the cost-effective monitoring of drug trends in all regions of the world.

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The influence of epidemiology on drug control policy

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ABSTRACT

The changing face of drug abuse in the United States of America and elsewhere in the world over the past century presages what is to come in the fields of drug abuse prevention and treatment in the twenty-first century and in the new millennium. For the first time, professionals involved in those fields are prepared to address the challenge. Professionals of today are no longer dependent on ideology to drive research efforts. A vast knowledge base is now available that has its foundations in science. Although research is derived from projects supported and undertaken in the United States, a growing research infrastructure and a number of interactive networks enable research from other countries to be incorporated into that knowledge base. Such research and interconnected networks will enable those committed to protect future generations from the devastating psychological, social and physical consequences that arise from drug abuse and drug dependency, with particular reference to illicit drugs. In order to understand the current state of science relating to epidemiological research in the field of drug abuse, it is important to review the grounds for designating drug abuse as dangerous and illegal. Attempts to study drug abuse by establishing an infrastructure to support epidemiological and other research, in particular that related to marijuana and heroin use (both of which dominated the research agenda in the United States for several decades), grew out of concerns about the negative effects of drug use. Such research informed those interested in developing policies concerned with interdiction and demand reduction. In the present article, an overview of the historical development of epidemiological data systems in the United States is given. The discussion focuses on means by which to continue and improve the influence of epidemiology on policy.

Keywords: history of drug abuse and policy in the United States; epidemiologic research and policy (roles and training).

Historical overview

Policy makers used statistics, often epidemiological, to buttress their policies throughout the twentieth century [1]. They launched surveys in order to quantify a problem or to obtain a broad view of a national problem. Such surveys were on a small scale compared with contemporary surveys. In the first quarter of the twentieth century, the pharmaceutical profession and the Public Health Service of the United States of America made reasonable and cautious studies of drug users. An alternative approach to the drug issue, however, was the manipulation or creation of "statistics" to justify policies already adopted or to raise the public's consciousness so that strict drug control laws could be enacted. The battle over the legitimacy and interpretation of epidemiological data has been dramatic and increasingly successful from the point of view of professional epidemiologists.

In the late nineteenth century, there was growing concern in the United States about the effect of drugs on society, after decades of easy access to drugs such as morphine and cocaine. The temperance movement of the early twentieth century achieved national prohibition through an amendment to the United States Constitution in 1919. A similar attitude of rejection prevailed in the case of narcotics. The Government of the United States promoted the view that non-medical drug use should be prohibited and it worked to persuade other countries to adopt that view. Two problems arose. The first was that other countries would bear the greater burden of controlling drug production because the drugs of most concern to the United States Government were not grown to a significant extent within the United States. The second problem was to persuade the United States Congress to enact legislation controlling the local availability of drugs when many lawmakers believed that the Government had no constitutional right to do so. It was evident that a campaign needed to be launched that would convince Congress and the public that legislation must be passed to control the availability of drugs to individual citizens.

In the United States, misrepresentation of statistical data came early through the efforts of Hamilton Wright, appointed Opium Commissioner of the United States. In 1908, Wright was offered the opportunity to become a member of the delegation representing the United States at the first international conference to consider the control of opiates. After that conference, which became known as the International Opium Commission, Wright sought to frame a national anti-drug law. Based in the United States Department of State, Wright had to work around the Constitution, which left police powers, such as the control of health professions, to the discretion of individual states. There was especially strong opposition from southern states to any scheme that encroached on the rights of states. Wright went so far as to contact newspapers published in southern states, urging them to publicize fears that African-Americans were using cocaine, which might cause them to run amok [2]. In addition, Wright misrepresented the extent to which opium was being imported into the United States. In reality, opium imports on a per capita basis had been falling since the mid-1890s. By manipulating import

figures, however, Wright gave the impression in his report to the President of the United States and to Congress that opium use was increasing [3].

Eventually, the Harrison Narcotics Tax Act, which Wright had negotiated with pharmaceutical interests, became law in December 1914. In 1916, the Supreme Court of the United States decided that, according to the Constitution, the Harrison Act could not set limits on the prescription of opiates and cocaine by physicians [4]. To the proponents of the Harrison Act, that decision weakened the law and made curbing opiate maintenance extremely difficult. A campaign was launched to reverse that legal interpretation: within the United States Department of the Treasury (which administered the Harrison Act), the Special Committee of Investigation was formed to estimate the number of addicts in the United States. The Committee concluded that there were about one million addicts in the country and that the use of narcotic drugs was leading drug users to commit criminal acts [5]. Compared with other more carefully conducted studies, the Committee overestimated the number of addicts by a factor of about five. The goal was to present drug use as an urgent national problem that demanded strong central action. It is not clear whether the Supreme Court was affected by such claims. Nevertheless, in March 1919, the Supreme Court in effect reversed its position and declared that simple opiate maintenance, that is, addiction unrelated to a medical disease such as cancer, was illegal [6]. That formally established the drug policy of the United States as one that opposed the use of drugs except for medical purposes, a position that the United States had taken at the international opium conference held in Shanghai in 1909 and at a second international opium conference held at The Hague in 1912, where the first international treaty to control the traffic in opiates and cocaine had been formulated.

Once the anti-maintenance stance had been officially adopted, the government enforcement agency known as the Field Force of the Bureau of Narcotics minimized the extent of the drug problem; the estimate made by the Special Committee of Investigation of the numbers of addicts was reduced from about one million to about 100,000 [7]. Following that, however, private anti-drug entrepreneurs such as Richmond Pearson Hobson raised the estimate to more than one million [8]. Hobson, a former member of Congress and a hero of the Spanish-American War, created national and international drug control committees that sought severe penalties against drug users, mandatory drug abuse prevention lessons in schools and a heightened awareness of the drug-related danger facing the public. In contrast to assertions made by Hobson, the Public Health Service surveyed available evidence and concluded that the national prevalence of addiction was 110,000 [9]. Such research, careful and undramatic as it was, received less attention than the extreme claims that addicts numbered more than one million.

In 1930, the Federal Bureau of Narcotics of the Department of the Treasury was established, succeeding the Field Force of the Bureau of Narcotics, which had had responsibility for the Harrison Act since 1919. The issue of how many addicts lived in the United States continued to be a debated and contentious topic. In an interview in 1970, Harry J. Anslinger, Commissioner of the Bureau of Narcotics

from 1930 to 1962, discussed informally the problems surrounding the number of addicts. He said that he would never let an independent party determine the official estimate: the Federal Bureau of Narcotics had to keep that function to itself. He felt that the number of addicts itself was "dynamite" and that if the number increased, the Federal Bureau of Narcotics was not doing its job, and, if the number decreased, the budget would be cut. The estimate of the Federal Bureau of Narcotics ranged between 60,000 and 80,000 [10]. The casual comments of Anslinger illustrate the political power of epidemiological data and interpretation. The possibility of an epidemiological surprise that may undercut carefully matured plans or refute claims of an improvement in the drug problem presents some awkward issues to policy makers. How such antipathy to an independent epidemiology was overcome signifies an important change in the policy-making process.

In 1968, the United States Administration made a number of changes, one of which involved moving the Bureau of Narcotics from the Department of the Treasury to the Department of Justice. In part, the move was in response to the sudden growth of drug use in the United States in the second half of the 1960s. In the lull between two drug "epidemics", from 1920 to the mid-1960s, there had been a sense of relative calm about the number of addicts; subsequently, however, there was a dramatic upsurge in drug use. The public demanded that the apparent increase in the use of drugs, including heroin, cannabis and lysergic acid diethylamide (LSD), be addressed. The public alarm and signs of widespread drug use called into question the traditionally low figure for addicts. Statisticians of the new agency, called the Bureau of Narcotics and Dangerous Drugs, concluded that there were about 300,000 serious drug users in the country. It was pointed out that that did not mean the drug problem had suddenly increased, but that the old figures were too low [11]. Government officials sought a more reliable way of estimating drug use.

Another important development was the rise to power of long-standing critics of the Federal Bureau of Narcotics, in particular members of the legal and medical professions who disagreed with what they saw as an inappropriate punitive approach. They favoured conceptualizing the drug problem as medical and wanted to offer treatment, perhaps even provide the drugs themselves [12]. In such a context, there was no traditional policy to defend. Further, the critics had long asserted that the Federal Bureau of Narcotics underestimated the number of addicts. With great public concern over drugs and a new start in the agencies involved, modern survey methods seemed to be an improvement.

Included in the Comprehensive Drug Abuse and Control Act of 1970 was the requirement that a National Commission on Marihuana and Drug Abuse be established, with the goal of reporting on marijuana in 1972 and on drugs in general in 1973 [13]. The Commission was designed to obtain an informed, independent evaluation of the drug problem. Instead of a government agency with its backlog of policies, controversies and personalities, an outside group could review the whole of the drug problem and give a fresh appraisal. The Commission recognized at the outset that reliable statistics on the extent of drug use were not available. As a result, the National Household Survey on Drug Abuse was put in place. The

survey revealed growing use of marijuana among youth and signs of rising heroin use. The level of cocaine use was low in the early 1970s. More important than the levels of drug use was the fact that a more reliable means of evaluating drug use had been established. Since its establishment in 1974, the National Institute on Drug Abuse has conducted the survey, in which approximately 98 per cent of households in the United States are represented.

The Monitoring the Future survey, which complements the National Household Survey, has been conducted by the University of Michigan under a grant from the National Institute on Drug Abuse since 1975. That survey is used to monitor, over a number of years, drug use among students in grades 8, 10 and 12 (ages 17-18) at a representative sample of both public and private secondary schools in the United States.

The reports of the National Commission on Marihuana and Drug Use appeared as "Marihuana: a signal of misunderstanding" (1972) and "Drug use in America: problem in perspective" (1973). The recommendation of the report on marijuana that the drug be decriminalized met with strong opposition from President Richard Nixon, but the analysis of the National Commission stands as a thoughtful review of the drug problem in an atmosphere of extreme agitation over drugs and drug users.

Other surveillance systems that were put in place in the 1970s include the Drug Abuse Warning Network (DAWN), which reports on drug use occurring among persons admitted to sentinel hospital emergency rooms, and what is now called the Community Epidemiology Work Group, a group of researchers who report semi-annually on patterns of drug use using existing data sets on treatment and arrests, as well as medical and other data sets, from many cities across the United States. The establishment of the National Household Survey on Drug Abuse and the Monitoring the Future survey, in addition to DAWN and the Community Epidemiology Work Group, have provided the best information on emerging drug abuse trends and problems for over two decades.

Owing to confidence in contemporary epidemiological investigation, Congress mandated that the national strategy formulated by the Office of National Drug Control Policy [14], in the Act that established that office, include criteria of progress that would be measured by such instruments as the National Household Survey on Drug Abuse. Specifically, the law required the National Drug Control Strategy to include comprehensive, research-based, long-range goals for reducing drug abuse in the United States and short-term, measurable objectives that the Director determines may be realistically achieved. The assumptions underlying those mandates, that drug use can be reasonably well determined and that policies can have their effectiveness measured, are far different from the early years of the anti-drug campaign. The manipulation and manufacturing of statistics early in the twentieth century contrast sharply with the current circumstance where independent surveys provide a check on the expectations of policy makers. The change in approach represents enormous progress for scientific and impartial research. It is a credit to those researchers whose careful work has won the confidence of the nation's lawmakers.

Improving the influence of epidemiological research on drug control policy

Despite efforts by policy makers to base strategies for combating drug abuse on existing information and knowledge and the availability of well-grounded epidemiological findings, the different perspectives represented by policy makers and epidemiologists in dealing with drug abuse sometimes makes the exchange of ideas difficult. In the long term, a successful agenda that focuses on the reduction of drug abuse is hindered by those differences.

Facilitating such an exchange between the policy maker and the drug abuse epidemiologist requires identifying where lines of communication can be established and understanding can be developed. The orientation of each professional group, however, may impede that exchange. The role of the policy maker is to set an agenda for solving a problem of public interest. The policy maker may have a strong appreciation of science but feel compelled to solve or ameliorate problems in a short period of time. In contrast, the epidemiologist is interested in seeking knowledge and does not have the same political and time constraints as the policy maker. To a large extent, those role differences influence the way each group views the phenomenon of drug abuse, the methods used to gather information to assess the phenomenon and the interpretation of the results of the information-gathering process.

Defining the phenomenon of drug abuse

Differences between the professional orientation of the policy maker and that of the epidemiologist may create conflicting premises that lead to disagreements and misunderstandings. The policy maker projects the viewpoints and values of his or her constituents. In many cases, the policy maker must juggle the views of multiple constituent groups. An epidemiologist is looked to for guidance in the development of a definition of the phenomenon or problem being addressed. The policy maker, however, needs to place such a definition in a framework that reflects the values of his or her constituents. Defining a phenomenon such as drug abuse involves two main dimensions: *(a)* aetiology or cause; and *(b)* individual responsibility. Definitions of problems are important as they guide society's solutions to those problems. For the problem of drug abuse, the aetiology is multifactorial. Current research indicates that drug abuse is a behaviour resulting from incomplete or maladaptive development processes at the physiological, psychological and social levels. Without the research knowledge base that is currently available, drug abuse was for years considered to be a moral or criminal problem or a medical disorder. Considering drug abuse a moral or criminal problem has led to the imprisonment of drug abusers, while considering it a medical disorder has led to the treatment of drug abusers.

The other dimension of the definition of drug abuse, individual responsibility, assesses the degree to which the behaviours that involve drug abuse are volitional.

Common questions include whether drug abusers are victims and whether they are in control. Again, society responds differently in each case. The emphases of interventions vary depending on which way society or the policy maker views drug abuse. Ideally, scientifically based research, by its nature, is value-free and neutral, neither blaming nor excusing drug abusers for their behaviour. The primary constituent base is the research community itself. "Good" science is the motivating influence on the epidemiologist. Phenomena such as the behaviours involving drug abuse are defined by what the epidemiologist observes, that is, those behaviours and their relationship to other life factors. In that way, the epidemiologist presents an unbiased, broad and comprehensive picture of the nature and extent of behaviours involving drug use. By examining the extent of such behaviours in a general population, the epidemiologist is able to show where they cluster, what factors are associated with them and what consequences follow from them. An epidemiologist is likely to view drug abuse as evidence of multidimensional, dynamic behaviours that have divergent aetiologies and consequences. The epidemiologist, ideally, is guided by scientific principles and the discipline associated with specialist field. Making use of the research and the exchange of research findings, an epidemiologist tends to view drug abuse not as a static, homogeneous phenomenon, but as one that changes over time, that manifests itself in a variety of forms, with multiple aetiologic pathways, which may also vary over the course of an individual's life.

Research methodologies

Given the divergent needs and constraints discussed above, it is not surprising that a major potential source of tension between the policy maker and the epidemiologist relates to research methodology. Policy makers need information in order to plan actions around both specific phenomena and measurements which reflect the effectiveness of the strategies being implemented. For political reasons, strong and significant short-term effects are needed. For example, policy makers are interested in using prevalence rates to assess the impact of the implementation of demand and supply reduction strategies; however, they may be impatient with the time needed for the extensive "cleaning" required of large databases in order to ensure accuracy—time that is often not available to policy makers. Furthermore, with a phenomenon such as drug abuse, which is highly stigmatized and often hidden, it is important to have many data systems in order to "capture" the hard-to-reach drug abuser. Such systems are expensive and difficult to integrate. Again, time-consuming methodologies do not always satisfy the needs of the policy maker.

The epidemiologist is concerned with the scientific dimension associated with addressing an issue. To develop valid measurements of an observation or variable, the epidemiologist strives to define all pertinent parameters or dimensions of that variable. For some variables, the measurement is a simple matter; for others, the process of measurement development may be complex. For example, it is important to specify several dimensions involved in the measurement of the behaviours

that relate to drug use. At a minimum, those dimensions should include the type of drug and the frequency of use within a specified period of time.

Methodologies to collect information on drug abuse include the following:

(a) Secondary analyses of data abstracted from records, such as arrest files, admissions to medical facilities, admissions to drug abuse treatment programmes;

(b) Data collected through laboratory studies, ethnographic studies and focus groups;

(c) Personal interviews with drug abusers, as well as with individuals who do not abuse drugs but have background characteristics similar to those who do;

(d) Household or school surveys.

An epidemiologist will use one or more of those techniques depending on several factors: the question being addressed; the availability of existing information that would guide the development of an approach, sample selection criteria and instrumentation; and time and funding constraints. The epidemiologist weighs the advantages and disadvantages of the various approaches and the level of accuracy that is reasonable to achieve within given resources. There are often trade-offs. Studies, for example, that are longitudinal in design and include sequential cohorts may represent the ideal approach for studying the aetiology of behaviours involving drug use; however, they are expensive and take years to complete. Instead of such a study, the epidemiologist may opt for a cross-sectional or case-control approach that would require the careful selection of control subjects, comprehensive measurements and diverse statistical techniques to ensure that the sequencing of events is structured to parallel the temporal relationship among variables.

In the United States, several national data systems have been developed to assess the extent of behaviours involving drug abuse in various population groups. "True" prevalence data have been based on the National Household Survey on Drug Abuse and on the Monitoring the Future survey.

Other major data systems that provide valuable information on the consequences of drug abuse in the United States include the following:*

(a) DAWN;

(b) National Drug and Alcoholism Treatment Unit Survey and Client Data System;

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*DAWN currently assesses drug-related emergency room visits among a representative sample of hospitals in the United States. That network also includes a voluntary reporting programme of drug-related mortality, based on information from medical examiners in over 20 cities. The National Drug and Alcoholism Treatment Unit Survey and the Client Data System include data on drug abuse and alcohol abuse treatment facilities and admissions. Both systems were under the auspices of the National Institute on Drug Abuse until October 1992, when they were transferred to the Substance Abuse and Mental Health Services Administration. Finally, the Arrestee Drug Abuse Monitoring programme assesses drug use through self-report and urinalysis among representative samples of arrestees in several booking facilities in the United States. That data system is supported by the National Institute of Justice of the United States Department of Justice.

(c) Arrestee Drug Abuse Monitoring programme (previously known as the Drug Use Forecasting study).

Descriptions of those data systems are provided to enhance information about the range of data being collected and to emphasize the different nature of the populations being surveyed. Data from arrestees, as well as individuals seeking medical care and treatment, do not represent prevalence but consequences of drug abuse in society. Policy makers, however, often confuse the two, and it is not infrequent for trends in consequence data to be used, such as emergency room admissions, to show changing trends in drug abuse. In the late 1980s and early 1990s, for example, drug-related emergency room rates in the United States increased while prevalence rates, as shown in the National Household Survey on Drug Abuse and Monitoring the Future survey, declined. Several policy makers challenged the general population survey results, using the emergency room rates to support their challenges. It was up to the epidemiologists to demonstrate the differences in those systems.

Policy makers need immediate answers and may use compromised research methodologies to obtain those answers. It is not surprising, then, given the perspective of epidemiologists, that there is a hesitation on their part to provide quick answers to policy makers without being sure of the question being asked and without adding caveats to the information they render. In the case of the emergency room reporting system, for example, there is often a delay of 3-6 months in reports. At a time when emergency visits related to the use of cocaine and heroin were increasing, policy makers monitored the system frequently. In their need for immediate answers, policy makers may use alternative, but possibly less scientifically valid, approaches to address a question. In one case, policy makers sponsored a telephone survey of a number of emergency rooms to ask if visits relating to drug use were increasing, rather than wait for reports. The telephone survey revealed more about the perceptions of the person surveyed than the objective data from medical charts. The findings showed discrepancies that were difficult for the policy makers to resolve.

There is a need for epidemiologists to develop rapid methodologies in the collection of valid information for policy makers. Such methodologies should include statistical procedures for analysing already existing archival as well as survey data. Although the data items may not be the most exact measurements, they may approximate or assess indirectly the desired information. Furthermore, alternative approaches to analysing several data sets or a comprehensive review of a number of studies would assist the policy maker. In addition, the use of focus groups and other tested, but not necessarily conventional, approaches need to be used by epidemiologists to assist policy makers.

Interpreting information

Drawing conclusions from research data and interpreting them in terms that have implications for policy require a clear understanding of the language of research

and the statistically defined boundaries that exist for any data set. Interpretation becomes the "hazard zone" for epidemiologists and policy makers. Important questions arise about what the data mean and whether the results are significant for policy. Significance tests, trends, directions of trends and distributions are interpreted within two different frameworks. The epidemiologist ties research results to specific, carefully crafted research questions. Elements that include sample selection, construction of variables and methodology for data collection and analysis are incorporated with a view to addressing such questions. Some leeway may be allowed but the epidemiologist's training imposes a discipline that has its own constraints.

The policy maker, not having an epidemiological perspective, may not understand the limits imposed by science and, owing to pressures of time, may extend findings to meet immediate needs. Common breaches committed by policy makers include generalizing the findings from one group to dissimilar populations, using levels of statistical significance beyond the conventional one of 95 per cent and broadening the definition of a variable or the relationship between variables.

Whereas an epidemiologist will be more concerned with the statistical significance of differences in prevalence rates between time periods, a policy maker will focus on differences in absolute numbers of users. That poses a problem when such data are derived from population samples, including survey data that require imputation and weighting procedures. Conflicts may occur over the interpretation of a policy maker with reference to differences observed over time when such differences are found not to have statistical significance by the epidemiologist. The policy maker may observe that a trend of some kind is occurring, while the epidemiologist has found that no statistically significant change has occurred.

The issue of statistical significance is fraught with problems, for there are no hard rules about the establishment of significance. In general, conventional wisdom prevails. In establishing levels of significance, epidemiologists consider many factors, including question or hypothesis being assessed, the size of the sample and the type of measurement being used. Epidemiologists, in testing a hypothesis or relationship among measurements, may impose stringent criteria for an accepted level of significance. Associations among measurements that the epidemiologist tests statistically and finds not to be significant may be viewed by the policy maker as having importance. For example, in assessing the effectiveness of an intervention programme, the epidemiologist may consider a programme unsuccessful if the differences in outcome, such as drug use, for the control and experimental conditions has a significance level greater than 95 per cent. The policy maker, on the other hand, may regard the programme as successful because the percentage difference between the two conditions represent lives being saved or reductions in instances of hospitalization or imprisonment. In that case, the discrepancy in interpretation of such findings by the epidemiologist and the policy maker will lead to conflicts. It is important to remember that the level of statistical significance is a man-made decision and consideration must be given to the importance of any research finding in the real world.

Recommendations for research-informed policy

The solution to such conflicts is difficult to achieve without mutual regard and trust. The most important factors are communication, a clear understanding of what the policy maker needs and an understanding of how best the research can help the policy maker achieve those goals. Recommendations for the epidemiologist who wishes to influence policy fall into the following areas: communication, education and collaboration. Paramount to the process, however, is obtaining and retaining respect. The epidemiological researcher must always be cognizant of scientific integrity. There are many grey areas associated with the transition from research to policy. The way the researcher handles those particular areas can reinforce or undermine relationships, both with policy makers and with scientific peers. Scientific principles should always guide the process.

Communication

Some of the most important actions that epidemiologists should take when discussing issues with policy makers include listening, asking questions and providing feedback, that is, repeating their understanding of the issue in order to ensure that there is two-way communication. At times in their discussions, epidemiologists may use a vocabulary or make reference to a context without realizing that the concepts or expressions have other meanings to policy makers. Policy makers may use terms that have a precise meaning in the research context but mean something else in the vernacular. Epidemiologists, responding solely within the context of science, may frustrate policy makers and themselves by not addressing the needs of policy makers, without fully understanding the cause of the miscommunication. Such crossed communications may make the epidemiologist appear unresponsive to the policy maker and widen the gap between the two. It is therefore important for both the epidemiologist and the policy maker to try to use everyday language for concepts rather than research terminology.

Education

It is important for the policy maker and the epidemiologist to create a learning atmosphere when they are discussing issues. They need to learn from each other about the content and boundaries of the contexts in which each functions. In other words, it is not enough for the policy maker to have an appreciation of scientific methods. It is also important to understand on what basis and how far the epidemiologist will extrapolate the results of the research. The epidemiologist should be able to speak openly to the policy maker about the issue being discussed, given the characteristics of the study population and the measurements of interest. The epidemiologist needs to assist the policy maker in reviewing the findings of studies and in drawing conclusions about results. It is important to explain what impact varying methodologies, sample selection and measurements may have on results. By going through such a process, the epidemiologist educates the

policy maker about the importance of research design on findings and the policy maker educates the epidemiologist on the specific needs of policy formulation. It is through such give and take that the epidemiologist will become more aware of the objectives and requirements of the policy maker and be able to be more responsive and informative. In addition, the policy maker will become more aware of the ongoing nature of the accumulation of knowledge and be more open to changes in research findings and revisions that may take place as the epidemiologist continues to refine research questions and data analyses. That means that the policy maker must be more cautious about interpreting certain types of research findings and be prepared for alternative explanations of the results if the findings are revised. The epidemiologist can be helpful in assisting the policy maker identify potential problems with studies and exploring alternative interpretations.

Collaboration

The term collaboration is used to refer to joint ownership. Through the processes of communication and education, it is hoped that mutual and compatible objectives are developed and that research is designed to address those aims. The collaboration between policy maker and epidemiologist should produce research and policy which both are prepared to support, as both have helped to shape the processes and the outcomes.

In the present article, several suggestions are given with regard to where research methodologies could be improved or modified to address the needs of the policy maker as well as the epidemiologist. Those suggestions include reassessment of the meaning of various levels of statistical significance; validation of alternative methodological approaches, such as focus groups, mall or intercept surveys and telephone surveys; improvement of statistical approaches for conducting secondary analyses; and development of statistical approaches for integrating archival data concerning arrests, hospital admissions and drug abuse treatment admissions, as well as acceptable techniques for the use of population data, including data from the census. Such collaboration, however, requires involvement and commitment. In addition, formal infrastructure for collaboration needs to be developed. Simply meeting to share mutual needs and objectives and to develop strategies for finding answers with ongoing work sessions to implement such strategies will go a long way towards creating a collaborative atmosphere for both policy maker and epidemiologist. Such meetings should be openly supported institutionally as well as professionally.

Conclusion

The history of the relationship between epidemiological research and policy in the United States indicates that it is possible to form a relationship that is satisfactory for both the research and political communities. Researchers in epidemiology are readily available to policy makers. They hold posts in government, in universities

and in research institutes and agencies. Furthermore, such researchers have access to policy makers through their agencies in the case of government, but also through their professional associations. Every effort should be made for the two groups to reach out to each other. Barriers to communications between the two groups need to be identified and overcome. The barriers vary, but perhaps the greatest barrier is language. Fortunately, there are both epidemiologists and policy makers who are "bilingual" and can bridge the communication gap. Those individuals need to be encouraged to bring their colleagues together. The twenty-first century presents new challenges to both groups. The globalization of drug abuse, the emergent new and, in some cases, more dangerous drugs of abuse will require international collaborations between both researchers and policy makers.

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Supporting evidence-based policy-making: a case study of the Illicit Drug Reporting System in Australia*

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ABSTRACT

Australia's Illicit Drug Reporting System (IDRS) was developed in 1996 to provide a cost-effective strategic early warning system for emergent trends in problematic drug use. Through the use of specific case-scenarios, the present article demonstrates the manner in which information obtained from drug information systems such as IDRS can broaden the knowledge base from which evidence-based policy decisions and drug control strategies can be developed. IDRS has achieved this through the wide dissemination of its findings, the establishment of mechanisms for intersectoral collaboration and the provision of a context within which to understand drug trends and appreciate their role in policy formation. The present case analysis also illustrates the high level of demand for the in-depth information provided by sentinel surveys of problematic drug users and by qualitative interviews with experts in the field of illicit drugs. This type of information is particularly useful at a policy level when it can be collected on a routine basis using comparable methods, to enable the early detection of trends in problematic drug use. When such information is provided to policy makers in a timely fashion and in a usable format, it can be used to inform the development of policies and strategies. The potential policy utility of data from IDRS will be realized through ongoing dialogue between researchers, officials from the health and law enforcement sectors and policy makers, a process that will be greatly facilitated by the communication channels and intersectoral relations established through the System.

Keywords: drug trends; policy; early warning; Australia.

Introduction

The Illicit Drug Reporting System (IDRS) was commissioned in 1996 by the Commonwealth Department of Health and Ageing of the Government of Australia to provide a cost-effective strategic early warning system for emergent trends in the use of opioids, amphetamine, cocaine and cannabis. Thus, the main recipient of the information provided by the System is a national-level body that is involved in drug-related policy and strategy decisions. This bears on both the focus of the System, which is national in coverage and uses sentinel monitoring, and reporting time lines, which aim to inform policy strategies rather than tactical responses.

The design of the current System took into account the lessons learned from previous attempts at monitoring the drug situation in Australia, which demonstrated the need for drug information systems to triangulate multiple data sources in order to increase the confidence in the reported drug trends and the consequent credibility of the information arising from those systems [1, 2]. To that end, IDRS regularly collates data from three sources:

(a) A standardized quantitative survey of injecting drug users, who constitute a sentinel population among which to detect emerging trends in illicit drug use. Surveys are carried out in the main city within each jurisdiction in Australia and yield a total annual survey sample of more than 900 injecting drug users;

(b) A standardized qualitative survey of key informants or experts in the field of illicit drugs within the main city of each jurisdiction, which yields a total annual national sample of between 250 and 300 key informants;

(c) A synthesis of current indicator data sources such as overdose data, the purity of drugs seized, arrest data, toxicology data, treatment and hospital admissions, data from needle and syringe programmes, school and household survey data and other relevant specialized research. The extent and nature of such data vary by jurisdiction and some data sets are considered at the national level only (for example, those from Australia's triennial national household surveys of illicit drug use and from the Australian Customs Service). Some data sets are analysed quarterly and others annually, depending on the nature of the data and the number of cases.

These data are collected from each of the eight jurisdictions in Australia to provide national coverage and are presented on an annual basis. The findings are disseminated through an annual national drug trends conference, annual detailed national and jurisdictional reports and brief quarterly updates. Formal reporting is supplemented by regular meetings and informal communications with key stakeholders. For further information on IDRS findings and methodology, see Topp and others [3].

Case analysis: providing the basis for evidence-based policy

Presented below are examples of the contribution made by the findings of IDRS to the formation of a sound information base for policy development and the

implementation of drug control strategies. These examples include situations in which the findings were associated with a shift in policy or strategy. Also included are several situations outside the realm of policy, but in which IDRS made an indirect contribution to improving information on drug consumption and drug trends (for example, by providing a background context for in-depth research). The case scenarios do not cover the full scope of the way in which IDRS findings did or could affect policy, nor do they suggest that information from IDRS alone was responsible for any associated policy shift. They do, however, clearly demonstrate that information from IDRS has been instrumental in providing an evidence base for policy. This impact was apparent at the national level and, in particular, at the jurisdictional level, where the most detailed data collection takes place.

Highlighting new forms of drug use as a priority

IDRS findings indicating an increase in the availability and use of potent forms of methamphetamine across Australia have made the identification of new forms of drug use a priority area for the Ministerial Committee for Drug Strategy and the Commonwealth Government. Although other monitoring mechanisms, such as urinalysis among arrestees, would have suggested this as an area for concern, IDRS provided specific information on methamphetamine use, collected from a non-institutional population of methamphetamine users, that could not be provided by other systems. IDRS provided information on the characteristics of the different types of methamphetamine available at the street level, the terminology used to describe them, their frequency of use, routes of administration, price, purity and purchase quantities.

Formation of policies and strategies appropriate to local conditions

IDRS has been able to provide detailed information on recent patterns and trends in drug use at the jurisdictional level, for which there is considerable demand from policy makers in the health and law enforcement sectors. In the State of Tasmania, the Alcohol and Drugs Service of the Department of Health and Human Services has been requested to produce a biannual report on the status of injecting drug use in Tasmania for the State Government Cabinet Subcommittee on Drugs. The reports rely heavily on IDRS data and have influenced Tasmanian state policies in a number of areas, including policy on methadone and policies relating to needle availability. Prior to the implementation of IDRS in Tasmania, policy decisions there were usually based on data collected from other, larger jurisdictions that had the funding and dedicated bodies to conduct specialist drug research. In 2000, IDRS demonstrated that the smaller jurisdictions such as Tasmania had patterns of illicit drug use that were substantially different from those of the larger jurisdictions. IDRS thus substantially improved the information base for drug policy in Tasmania by providing locally relevant information.

Developing governmental strategic drug control plans

IDRS data have informed strategic drug control plans in several of the jurisdictions in Australia. In the Northern Territory, IDRS data formed the basis of the development of the Government's three-point plan on drug use and abuse. In Western Australia, two of the papers on drug issues at the recent Western Australia Community Drug Summit incorporated information from the 2000 IDRS: paper No. 7 on drugs and law enforcement, which dealt with an appropriate legal framework for illicit drugs, diverting drug users into treatment and treating the most serious offenders in prisons; and paper No. 8 on reducing the harm done to the community and individuals by continued drug use. In New South Wales, one of the primary background documents for the New South Wales Drug Summit, held at Sydney, Australia from 17 to 21 May 1999, consisted of the findings from IDRS. The findings of the Victoria IDRS have also informed the policy development activities of the Drug Policy Expert Committee of the Government of Victoria.

Developing interventions for patterns of problematic drug use

National IDRS data were used by policy makers at the February 2001 meeting of the Australian Pharmaceutical Advisory Council Subcommittee on the Intentional Misuse of Pharmaceuticals, where the issue of intravenous benzodiazepine use was the subject of considerable discussion. At a jurisdictional level, IDRS data were used by the Victoria Department of Human Services to develop a benzodiazepine injection education and prevention strategy to address the diversion, misuse and injection of the gel-like contents of temazepam capsules. IDRS results in Victoria were also instrumental in signalling the need for the development of the Victoria Department of Human Services cocaine preparedness and training package for alcohol and drug workers.

Identifying needs for access to treatment

The findings of IDRS in the Australian Capital Territory have provided information and recommendations that have influenced policy decisions on service provision in the Territory. In 2000, an Australian Capital Territory report on drug trends recommended an examination of the apparent acceleration in heroin use among indigenous people that had first been identified by the Australian Capital Territory IDRS in 1998-1999 and the determination of the factors that had contributed to their failure to access treatment services. In 2001, more services for indigenous people were made available and the opposition Australian Labour Party expressed a commitment to providing culturally appropriate treatment services. The ability to identify gaps in access to service provision is one clear benefit of monitoring patterns of problematic drug use among non-institutionalized populations.

Acting as an early warning and validation tool for drug trends

The Health Department of the Australian Capital Territory regards IDRS data as a good validation tool. It regularly uses IDRS data to make comparisons between national drug use and the situation in the Territory, thereby obtaining an early warning of future trends in drug use. It also finds IDRS useful for determining where to focus service purchasing priorities and for cross-checking anecdotal advice on drug and alcohol issues and service provider reports.

Providing a context for investigating the reduced availability of heroin

In 2001, Australia experienced a marked and sustained reduction in the availability of heroin that was associated with a decrease in heroin use and related adverse consequences. IDRS findings from the previous five years provided meaningful, reliable and valid baseline data on the price, purity and availability of heroin, the frequency of heroin use along with the frequency of use of other drugs, criminal activity, overdose risk and other health-related problems that could be used to interpret the data from a specialist investigation of the characteristics and impact of the heroin shortage. In 2002, IDRS will document the state of the illicit drug market following the height of the shortage. IDRS data can thus greatly increase the interpretability of data collected in the context of other studies.

Incorporation of local information into tertiary education systems in the Northern Territory

IDRS has provided drug trend information specific to the Northern Territory that has enabled the inclusion of local drug trend data into tertiary courses at the Northern Territory University. Courses in drug and alcohol studies, human and community services, social work and psychology now include locally relevant information on patterns of and trends in drug consumption. Prior to the implementation of IDRS in the Northern Territory, those courses relied on national data relating to the use of illicit drugs, health, risk-taking and criminal activity. IDRS revealed the disparate nature of illicit drug markets in Australia and the theory and practical aspects of the courses are now enhanced by relevant local data.

The audience for IDRS findings

The breadth of the interest in IDRS findings was illustrated in South Australia, where the demand for information was met through a series of special seminars presented to national-level law enforcement organizations such as the National Crime Authority, the Australian Bureau of Criminal Intelligence, the Australian Customs Service and the Australian Federal Police, as well as to the Department of Immigration and Multicultural Affairs and the Australian Taxation Office. At the state level, the audience for IDRS findings has included the South Australian Police, the Australian Guidance and Counselling Association South Australia, the

City Homelessness Assessment and Support Team, the Statewide Nurses Action Group, the Douglas Mawson Institute of Technical and Further Education and the South Australian Forensic Health Service. The seminars were provided by the South Australian IDRS coordinator and demonstrate the demand for information on drug trends and the diversity of the audience for that information.

Discussion

The case analysis above demonstrates that information from a drug information system such as IDRS can make a valuable contribution to an evidence base for policy-making. Although IDRS findings often informed policy indirectly and were rarely the sole influencing factor in policy formation, they were one of several information sources that contributed to a broader knowledge base from which evidence-based policies could be developed. It is not always possible to assess the impact of information provided by IDRS, but the demand for that information and the target organizations provide some insight into the utility of IDRS data in developing policies and implementation strategies.

The detailed information provided by IDRS is well received by policy makers. It has been used in the formation of drug strategies at both the national and the jurisdictional levels and meets the operational needs of many organizations. In particular, IDRS provides detailed and timely information on specific patterns of problematic drug use such as routes of administration and the context of use, the nature and availability of new drug forms and the health and criminal problems associated with drug use that is not provided by more established data collection methods such as household surveys and routine monitoring of drug-related indicators. Much of this detailed information is obtained from key informant surveys and specialized surveys of injecting drug users. This demonstrates the policy utility of information provided by in-depth surveys on problematic drug use.

Organizations that have sought information from IDRS represent a range of disciplines and, notably, both the health and the law enforcement sectors. Increased interest from the law enforcement sector reflects the focus of IDRS on monitoring drug price and availability through non-law enforcement sources, thus providing information that supplements existing law enforcement data, which demonstrates that information from IDRS is relevant to both health and law enforcement drug control strategies. IDRS has thus provided a mechanism for collaboration between health and law enforcement in terms of understanding how drug control strategies affect drug markets, patterns of drug use and associated problems.

Data from IDRS have made a valuable contribution to developing and improving other sources of information on drug trends on the basis of which policies were developed. Guiding the further investigation of new drug trends, providing a context to evaluate the impact of interventions or changes in the drug market, such as the heroin shortage, assisting the development of academic curricula around drug abuse epidemiology and supplementing other drug trend reports

have been some of the ways in which IDRS has improved the overall knowledge base used by policy makers for decision-making.

The System has also played a developmental role by instigating collaboration between researchers and non-research organizations that deal with drug-related issues. The need to exchange data between organizations has provided a platform for collaboration and dialogue about the interpretation of drug trend data and the policy and strategy utility of data for non-research organizations. In many instances, this has involved an educative dialogue between researchers and policy makers to ensure that IDRS met the information needs of policy makers and that policy makers appreciated the purpose and utility of IDRS data. This two-way educative process has greatly enhanced the mutual appreciation of the way in which IDRS findings could be utilized at a policy level and has also broadened the capacity of IDRS to collect and understand drug-related data.

Despite the obvious utility of data from IDRS for policy development, challenges remain in improving the interpretation of trends identified by IDRS and their policy implications. In particular, there is a need for an increased appreciation among both researchers and policy makers of how this type of information complements more established mechanisms for monitoring drug consumption such as general population surveys and treatment utilization data and the reasons for discrepancies between the different sources of data. Continuing dialogue between researchers and policy makers is needed in order to establish such a level of shared understanding; drug information systems such as IDRS can provide a crucial forum for that dialogue.

Further, it should be recognized that the benefits accruing from IDRS were only apparent after data collection had been ongoing for several years and that considerable investment was required, both financially and in terms of developing human resource capacity, to collect, analyse and report on drug trend data. That investment has been proved worthwhile by the benefits of routine data collection that are now becoming apparent. The improvements in the efficiency of collecting, analysing and reporting on data that have been made over the years that IDRS has been in operation have also substantially enhanced the cost-effectiveness of the system. In the Australian context, the operation of IDRS has been facilitated by the availability of tertiary institutions and appropriate human resources, political will and the subsequent provision of financial resources. In contexts where routine active data collection is not a feasible way to monitor problematic drug use owing to infrastructure or resource constraints, one-off, in-depth case studies would still provide a valuable adjunct to ongoing surveillance systems. In such situations, it is important that in-depth studies be guided by and feed back into ongoing monitoring mechanisms.

Conclusion

The case analysis above demonstrates that IDRS has played a valuable role in broadening the knowledge base on which policy decisions are made. This has been achieved by disseminating findings widely, establishing mechanisms for

intersectoral collaboration and providing a context within which both to under-stand drug trends and to appreciate their role in policy formulation. It further illustrates the considerable demand that exists for the type of in-depth informa-tion on patterns of drug consumption and related factors that can be provided by sentinel surveys of problematic drug users and qualitative interviews with experts in the field of illicit drugs. This information is particularly useful at the policy level when it can be collected on a routine basis using comparable methods, as this allows the early detection of new trends in problematic drug use. The analysis also demonstrates that, when such information is provided to policy makers in a timely fashion and in a usable format, it can be used in the development of policies and strategies. Encouraging an ongoing dialogue among researchers, officials from the health and law enforcement sectors and policy makers is essential in developing the utility of information from IDRS at the policy level and the communication channels and intersectoral relations established through that dialogue will be critical to the further development of the policy utility of drug trend data.

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Experiences of the multi-city network of the Pompidou Group, 1983-2002

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ABSTRACT

Epidemiology is one of the four fields of activity pursued by the Pompidou Group of the Council of Europe in the combat of drug abuse. Its activities in the field of epidemiology have focused on the development by the group of experts in epidemiology, a standing committee of experts from almost all European countries, of indicators and analytical instruments for monitoring drug abuse patterns and trends. The group of experts, which was established in 1983, has adopted a city-based approach that has become known as the multi-city study of the Pompidou Group. In the present article, the author describes the scope and working methods of the multi-city network and the multi-city monitoring system. He concludes that, although the multi-city study has been successful as a laboratory for the development of indicators and instruments, the consistent monitoring of drug abuse patterns and trends at the city level with those indicators and instruments requires a different organization and infrastructure.

Keywords: epidemiology; indicators; patterns and trends in drug use; city network; Europe.

Introduction

The Pompidou Group of the Council of Europe, set up in 1971, was the first European body to discuss and examine from a multidisciplinary perspective national drug policies and the problems linked to drug abuse and drug trafficking. In 1982, the Ministerial Conference of the Pompidou Group agreed that a group of experts in epidemiology should develop monitoring systems to evaluate the nature and magnitude of drug abuse and related problems.

The experts are appointed by the national permanent correspondents of the Pompidou Group on the basis of their expertise in the field of epidemiology. Over the past 20 years, several hundred experts from over 40 European countries have, at one time or another, been engaged in the activities of the group of experts.

In implementing its mandate, the group of experts has followed a city-based approach. One reason was that, in the 1980s, drug problems in Europe were mainly concentrated in urban areas and relevant data were not readily available at the national level. More important, however, was the argument that the smaller

scale of cities would make it easier to interpret indicator data in their context. The activities to develop monitoring systems became known as the multi-city study of the Pompidou Group and over the years this has remained the focus of the group of experts. Most other projects initiated by the group of experts in the past decades have either started from the multi-city study or have also followed a city-based approach.

Objectives of the multi-city study

As monitoring is the observation of changes in objects under surveillance in order to deploy interventions or to evaluate the effects of interventions, the objectives of the multi-city study following the mandate of the group of experts are defined as follows:

  (a) To identify indicators to describe changes in drug use and drug problems;

  (b) To develop methods to collect and report data on those indicators;

  (c) To assess drug use patterns and trends across Europe;

  (d) To develop models for the analysis and interpretation of indicator data;

  (e) To promote the implementation of indicators, data collection methods, report formats and interpretation models among policy makers and intervention professionals.

The objectives are pursued within a general conceptual framework that links drug use and drug problems with interventions and data sources (see figure).

Pursuing the objectives of the multi-city study
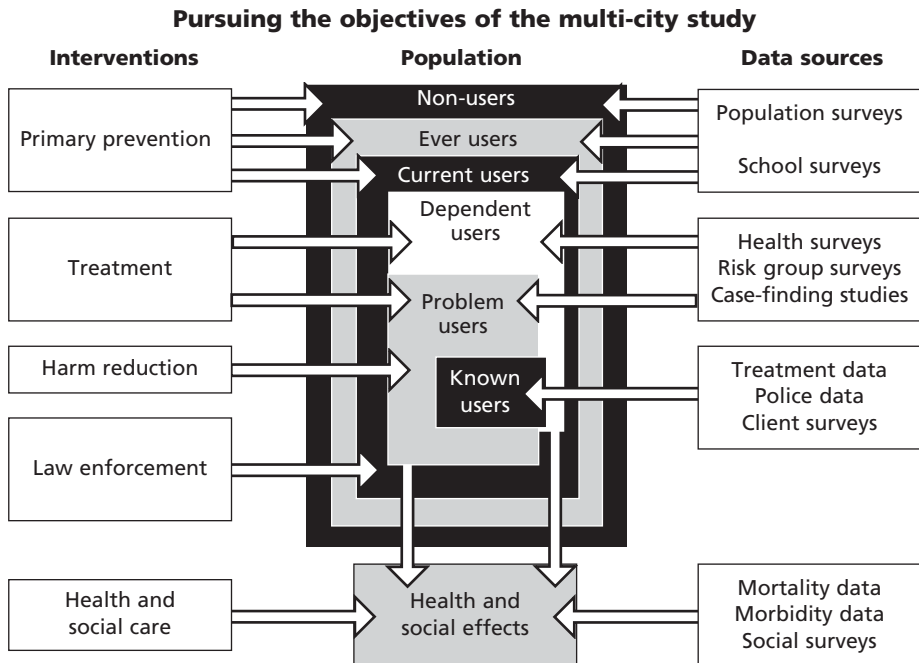
In the first few years, the focus of the group of experts was mainly on indicators and data collection methodology. At the end of the 1980s, the inspection of patterns and trends became a core activity. Until 1996, trends were followed both at the city level and at the country level, partly because the country situation is a relevant context for any city and partly because, in several cases, the required indicator data were, contrary to initial expectations, only available or accessible at the national level. In the late 1990s, the focus shifted to analysis and interpretation with greater emphasis on the local context. The work programme for the period 2000-2003 prioritizes the dissemination of monitoring systems and the building of capacities at the local level to implement those systems.

Multi-city network

Although the experts participating in the multi-city study do not represent cities in a formal sense, it has become common practice to talk about a city network and about participating cities instead of participating experts. In that sense, in the past two decades, 42 cities in 23 countries have participated in the multi-city study at some time. It should be noted, however, that only a few cities participated for more than 10 years and some cities were only active in the network for one or two years.

The number of participating cities has increased, in particular in the mid-1990s, when many Eastern European States joined the Pompidou Group. Although the growth of the network made the maintenance of the city network more complicated, it also resulted in improved data quality and comparability: many of the new cities applied from the start the data collection protocols of the multi-city study, whereas many of the old participants still had to compromise with existing local monitoring systems. At the same time that the multi-city network was being extended to include Eastern Europe, there was a decrease in commitment in Western Europe following the establishment of the European Monitoring Centre for Drugs and Drug Addiction and the related orientation in Western Europe towards national monitoring systems. Since then, several Western European cities have stopped participating in the network.

Working methods

The multi-city study is based not on a network of cities but on cooperation within a network of interested experts. The appointment of the members of the group of experts does not imply an obligation to participate in the multi-city study, and participants in the study are not accountable to the authorities of the cities on which they report. Within this context of voluntary cooperation, the support and maintenance of the network of experts are the key working principles of the multi-city study.

The exchange of information and experiences in the multi-city network takes place in plenary meetings, project work groups and seminars relating to specific

topics and the publication of reports. All activities are facilitated by the secretariat of the Pompidou Group and coordinated by a technical adviser.

Plenary meetings

The multi-city study is a key topic in the annual meetings of the group of experts, which are generally held twice a year. In the annual meetings, the participants present, in round-table discussions, the state of affairs in their cities: trends in indicator data, problems encountered in data collection, new developments in drug use and drug policy, results of recent local research, and so forth. The reports published on behalf of the group of experts are also discussed in the plenary meetings. In addition, the secretariat of the Pompidou Group is advised on the implementation of specific projects and the appointment of project teams. The plenary meetings of the Group of experts are also attended by representatives of the European Monitoring Centre for Drugs and Drug Addiction, the European Commission, the United Nations International Drug Control Programme (UNDCP), the World Health Organization and the National Institute on Drug Abuse of the United States of America.

Project workgroups

Many aspects of the monitoring system are addressed in dedicated projects. The topics of the projects range from the feasibility or validity of indicators, report formats and data collection methods to data analysis. In recent years, there have been more and more projects focusing on qualitative methods, specific target groups and models for analysis. Projects usually run for a couple of years, but some projects have evolved into continued activities parallel to the multi-city study, either within the group of experts (for example, the treatment demand indicator project) or in cooperation with the group of experts (for example, the European School Survey Project on Alcohol and Other Drugs (ESPAD), which is managed by the Swedish Council for Information on Alcohol and Other Drugs).

Usually projects are coordinated by a contracted consultant. Project work groups meet on demand and may include experts from other organizations. Results of the projects are incorporated in the multi-city monitoring system and, in several cases, have also led international organizations to use common standards on drug indicators.

Seminars and conferences

The Pompidou Group regularly organizes seminars at which researchers, policy makers and other professionals exchange experiences. Several seminars have dealt with issues related to the multi-city monitoring system. The seminars have proven to be a useful instrument for achieving wider and more general consensus about the indicator standards of the monitoring system and the use of monitoring in policy and interventions.

In 2003, the Pompidou Group will organize a strategic conference on the state of affairs in drug epidemiology in order to choose new pathways of its future activities in the field of epidemiology and the further development of local monitoring systems.

Publications

An overview of the available reports of the Pompidou Group can be found at the web site of the Pompidou Group, accessible via the portal of the Council of Europe (www.coe.int/T/E/Social_cohesion/Pompidou_Group/).

Apart from the reports of project teams on specific topics, the multi-city study itself has a three-step reporting system.

Annual reports on individual cities

Annual reports on individual cities used to be concise monographs depicting the facts, trends and context of the local drug situation, but in the 1990s many of the reports were reduced to basic data reports when the growing information and reporting demands went beyond the resources that the participants could allocate to their efforts. The extension of the network to over 30 reporting cities each year, which took place in the second half of the 1990s, also made it difficult to distribute the city reports. In 1998, it was decided that the annual city reports should be replaced by questionnaire-like forms for the collection of indicator data and context information.

Annual synthesis reports of trends in the network

Key indicator data from the city reports are summarized each year in short reports on the major trends observed. Until 1997, the trends were mainly reported as changes observed in the reporting year compared with the preceding year. Since 1998, the annual synthesis reports present updates of long-term trends as far as the availability of data allows.

In order to make possible comparisons between cities, the indicator data are presented in the synthesis reports as percentages or figures relative to the population size of the cities concerned.

Multi-city study reports

Periodic multi-city study reports summarize and integrate trends and developments in the network over a time span of 5-10 years. The first multi-city study report, published in 1987, covered seven capital cities in Europe and examined the validity, relevance and comparability of a number of indicators used to evaluate trends in drug use. The second report, published in 1994, reported on

trends up to 1991 in 13 cities. The third report, published in 2000, dealt with the period 1991-1998 and covered 42 cities and took into account the expansion of the network to Eastern Europe in the 1990s; it gave special attention to differences between Western and Eastern Europe.

Multi-city monitoring system

The monitoring system of the multi-city network is built around a set of common indicators on drug use and drug problems for which data are collected on an annual basis. The collection of indicator data is supplemented by information about the nature and origin of local data and about the environmental context of drug use and drug problems. The monitoring system is facilitated by guidelines and standard report formats. Since 2002, it has been possible to complete the report forms electronically; the collected information is stored in a multi-city database.

Indicators

The indicators on drug use and drug problems are the core of the multi-city reporting system. The basic indicators have remained consistent over the years; they cover the following domains:

(a) *Prevalence*: prevalence of drug use based on both general population and school surveys;

(b) *Problem drug use*: injecting drug use; estimates of problem drug use;

(c) *Treatment*: first and all treatment demand; opiate substitution (since 1997); drug-related non-fatal emergencies; and admissions to general and psychiatric hospitals (until 1996);

(d) *Drug-related morbidity and mortality*: drug-related hepatitis B, hepatitis C (since 1998), human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS); and drug-related deaths;

(e) *Drug law offences*: arrests for drug law offences; convictions for drug law offences; and drug use in prison (until 1996);

(f) *Drug market*: drug seizures; and prices and purity of drugs at the street level.

Terminology, concepts and report formats pertaining to the indicators are specified in the guidelines of the multi-city study, which are updated on a regular basis. In the third revision of the guidelines, definitions and report formats have been made consistent with those applied by the European Monitoring Centre for Drugs and Drug Addiction for national reporting systems.

Although the set of indicators of the multi-city study corresponds to what is perceived worldwide as the basic requirement of drug monitoring systems (for example, as expressed by the experts attending the Consensus Meeting on Drug

Information Systems: Principles, Structures and Indicators, held in Lisbon on 20 and 21 January 2000, it should be noted that the definitions and reporting formats of several indicators are still under discussion. The relevance of some indicators for local monitoring systems is also still under discussion. Finally, consensus about indicators among the experts of the multi-city network does not necessarily imply that the indicators are implemented or being implemented at the city level. In reality, most participating cities can still only provide data on a subset of the indicators.

Ideally, indicator data are quantitative scientific estimates for the city reported. In the case of prevalence among the general or school population, this would imply that reported survey data are weighted to statistical estimates of population values; in the case of arrests, administrative statistics, by definition, represent the real situation, as only the police arrest people for drug law offences. But in other cases, for example treatment data, the figures reported are often just quantitative administrative data, which may or may not represent the real situation.

Data sources, coverage and collection methods

In accordance with their mandate, the experts of the multi-city study have always been concerned about methodological aspects of the indicator data. Accounting for sources, coverage and collection methods of the data reported is considered an intrinsic part of any indicator reporting, as such accounts are indispensable for the evaluation of data reliability and comparability. It makes quite a difference if, for example, reported treatment data cover only specialized abstinence-oriented facilities or include low-threshold services and treatments provided by local general practitioners. Since 1998, information about data methodology has been gathered on the basis of standard reporting formats, but the question of how to deal with differences in data methodology in trend assessment is still under discussion.

Expert opinions

Since the establishment of the monitoring system, most experts have expressed their views on drug use and drug problems in the cities involved, even if they have not had sufficient quantitative data to back up their situation assessments or perceived trends. Also, when quantitative data on indicators and context are available, the data are often incomplete or their validity or reliability is questionable, whereas sound scientific exploration of the local data available is, in many cases, beyond the possibilities of the reporting experts. As a consequence, there have always been some "guessed estimates" about local situations and developments. Discussing and challenging such "guesstimates" has been an important function of the round-table discussions at the annual meetings of the group of experts.

In recent years, the multi-city study and other projects of the group of experts have experimented with the systematic collection of expert opinions on trends and developments, addressing professionals not only as scientific researchers but

also as informed experts on the objects under surveillance. The initial results have been promising and expert opinions on some trend aspects have been included in the multi-city monitoring system in the third revision of the guidelines of the multi-city study.

The inclusion of expert opinions can compensate for the lack of quantitative estimates of indicator data or when quantitative data cannot be taken as valid and reliable estimates of population values. Although the main focus of the multi-city study is on the development and implementation of scientifically based quantitative indicators, no information at all, which implies that epidemiological trends cannot be tracked, is not a good basis for the implementation of drug policies and interventions. The systematic collection of expert opinions was accepted as an integral part of the global monitoring system of UNDCP based on the annual reports questionnaire. In 2002, the multi-city study also adopted standard report formats for the collection of expert opinions in addition to the formats for the collection of quantitative indicator data. It should be acknowledged, however, that an appropriate and practical methodology for the assessment of expert opinions still needs to be developed.

Context

Indicator data reflect to some extent the environment in which they have been collected. That is important in understanding data and in interpreting trends, in particular when comparing indicator data across cities. Relevant context information may include demographic, socio-economic and socio-cultural characteristics of the city, local history of drug use, organization and resources of intervention structures, developments in drug policy and drug laws, and public responses and attitudes to drug use.

Although the need for context information is commonly acknowledged, it remains difficult to decide which context information adds to a better understanding and comparability of indicator data. Comparative studies of drug use patterns that take into account the context of the patterns are still quite rare. Until 1998, context information in the multi-city study was, where it was reported at all, mostly, reported in free format. While that gave the reporting expert considerable flexibility in addressing aspects that might be relevant to his or her city, it limited comparative analysis, as each expert might focus on different items. In 1998, the multi-city study introduced initiatives to improve the scope and comparability of context information by adding standard report formats on city profiles and by organizing structured "interpretation" workshops during the plenary meetings of the group of experts.

As the collection of relevant context information can be quite complex and time-consuming and context is not often subject to major changes in a short period of time, such information is only collected in the multi-city monitoring system every four or five years, preceding the publication of the periodic multi-city study report.

Facilitating instruments

Report forms

In 1998, in the third revision of the multi-city monitoring system, electronic formats for data collection were introduced for the first time. Although welcomed as an improvement for city reporting, in practice the formats used (Microsoft Word and Excel templates) created more problems than they solved because of their dependency on computer platforms, operating systems and software versions. In the 2002 revision, which took into account developments in the annual reports questionnaire of UNDCP, the multi-city annual report questionnaire was transferred to a dedicated software format in order to solve the problems encountered earlier and to automatically build up a manageable multi-city database. The distributed report forms included a content-related automatic link to the guidelines of the multi-city study.

The current report format can be viewed on the multi-city project page at the web site of the coordinator of the multi-city study (www.quinx.nl).

Database

In the framework of the multi-city study of 2000, a database was constructed of all indicator data reported since 1991. In the near future, the new electronic annual report forms of the multi-city network will be linked to the database, allowing the city experts to compare new data with previously reported information or with data on other cities.

Subsets of key indicator data from the database are, in principle, accessible by any interested researcher. Details can be found at www.quinx.nl

Lessons learned

Twenty years of experience with the Pompidou Group multi-city study allows some conclusions to be drawn about the development and maintenance of city-based monitoring systems and networks with regard to drug use and drug problems:

(a) The multi-city study has proven to be successful in developing relevant indicators and reaching consensus about a set of common indicator data and report formats to observe general trends in drug use and drug-related problems. The structure of the multi-city network, which is based on the personal commitment of the experts involved rather than on assigned concrete tasks and formal representation of local governments, has been a key factor in this achievement. The informal character of the network allows open discourse and flexibility in covering a great variety of aspects of the drug situation. The predominant research orientation of the participating experts ensures that proposed and implemented indicators are continuously evaluated on their function as evidence for real trends and developments;

(b) The informal structure also implies that the network is less result-oriented in terms of setting priorities or completing tasks within a predefined amount of time. The general absence of direct relations to local authorities implies that the network in many cases cannot ensure the actual implementation of the developed monitoring instruments at the city level. As a consequence, the collection of city data, needed to validate indicators and to assess and analyse European trends, has major shortcomings with regard to continuity of time series and coverage and comparability of indicator data. Maintenance and continuation of city-based monitoring requires that the cities involved take ownership and responsibility for the system developed;

(c) The development of indicators and report formats should take place together with the development of facilities for maintaining a monitoring system. These include not only having effective procedures for gathering indicator data, support services for respondents and accessible databases, but also giving feedback to the cities that provide the data. For a long time, that was not the case. The increase in the number of participating cities, as well as the growing compliance with the indicator protocols and information demands without facilities for data management, made the monitoring system almost a victim of its own relative success: a data collection system that has many missing values and is also hardly accessible will not result in any meaningful analysis or an understanding of epidemiological patterns and trends.

These conclusions imply that it makes sense to differentiate between development and evaluation of monitoring systems on the one hand and implementation and maintenance on the other. Both place different demands on the types of network to be involved. Development and evaluation benefit from informal city-oriented structures; implementation and maintenance require more formal city-based structures that can ensure continuity and the necessary infrastructure.

Understanding drug trends in the United States of America: the role of the Community Epidemiology Work Group as part of a comprehensive drug information system

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ABSTRACT

At a meeting held in June 2001, the Community Epidemiology Work Group celebrated its twenty-fifth anniversary. The meeting provided it with an opportunity to reflect on its contributions to the understanding of drug abuse and drug abuse patterns in the United States of America. In the present article those contributions are discussed from two perspectives: the substance of drug abuse epidemiology and drug abuse epidemiological methods.

Keywords: CEWG model; surveillance systems; emergent drug use patterns.

Introduction

Since the creation of the National Institute on Drug Abuse (NIDA) in 1974, a number of data systems have been established to assess the use of alcohol, tobacco and drugs in the United States of America. Traditional periodic surveys of members of representative samples of households and schools have provided estimates of prevalence rates of the use of those substances and of problems associated with such use. Although the surveys provide excellent information to guide policy, they do not provide information on emergent trends in the use of substances. In addition, as the surveys are generally expensive to administer, until recently they were only conducted at the national level. State- or local-level estimates of use, in particular by household members, was calculated through a variety of extrapolation methods, each with its own methodological problems, which affected the validity

of their products. The major household survey on drug abuse in the United States, the National Household Survey on Drug Abuse, is conducted by the Substance Abuse and Mental Health Services Administration, an agency of the United States Department of Health and Human Services; that survey has recently been expanded, oversampling households within several states.

Periodic local information about drug abuse trends and, in particular, emergent patterns of use has been more difficult to assess through traditional epidemiological methods. A unique adaptation of surveillance techniques taken from the field of public health was developed in the early 1970s by a group of providers of drug abuse treatment who wanted to conduct a needs assessment in order to plan services for the Washington, D.C., area. They formed a group of experts who either had access to data or were knowledgeable about heroin use in the area. Through meetings of the group, not only was an estimate made of the number of problematic heroin users, but also emergent and other drug use problems were identified [1, 2]. That was the foundation for the Community Epidemiology Work Group (CEWG). It is through CEWG that geographical diversity in drug use patterns has been specified and emergent patterns of drug use have been detected. These emergent problems have been incorporated into the national household and school surveys to establish prevalence estimates for the country. Emergent patterns such as the use of methaqualone (Quaalude), flunitrazepam (Rohypnol), crack cocaine and the recent upward trends of cannabis, methamphetamine and heroin use have been described and recently, the use of oxycodone hydrochloride (OxyContin), *gamma*-hydroxybutyric acid (GHB) and related drugs was described [3-5]. For drug abuse epidemiologists and prevention researchers, the combination of information from household and school surveys and CEWG reports has prompted additional analytical and prevention intervention studies.

Describing the Community Epidemiology Work Group

In its current form, CEWG consists of representatives of sentinel cities* across the United States that represent the major geographical regions of the country and the diversity of the national population. Although urban information forms the core of epidemiological descriptions of the areas represented, more recently, CEWG members have begun collecting information from suburban and rural areas adjacent to the core areas. The meetings of CEWG members, which are funded by NIDA, are held twice a year, in June and December. Over a number of years, CEWG members and NIDA staff have developed routine reporting formats so that equivalent information is collected [6]. To this base, members add the findings of research studies being conducted in their areas, as well as, in many cases, ethnographical or more qualitative information focusing on an area-related drug problem.

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*Atlanta, Baltimore, Boston, Chicago, Detroit, Honolulu, Los Angeles, Miami, Newark, New Orleans, New York, Philadelphia, Phoenix, St. Louis, San Diego, San Francisco, Seattle and Washington, D.C.

The CEWG model has proved attractive to many other countries and regions of the world. It appeals, in particular, to those countries with scarce financial and human resources. Unlike surveys and other epidemiological methods, the model does not assume the presence of a particular drug abuse pattern. The primary objective of the model is to identify the current drugs being abused, to describe their chemistry and psychoactive effects, to determine the modes of administration and to identify the characteristics of the populations abusing the drugs. By understanding those parameters, other descriptive studies can be developed and hypothesis-driven analytical studies can be designed.

The model has two essential components: experts who are familiar with drug abuse in their communities and accessible data that already exist or can be readily collected from a number of local organizations or agencies. The group of drug abuse experts gathers and uses a standard format to summarize data from a variety of both "passive" sources, such as existing reports or other databases, and "active" sources, such as population surveys. The experts then present their report on current trends in a local area and discuss those trends in order to determine commonalities or to identify possible influences on any changing trend that has been noted. They also specify gaps in their databases, set priorities as to which gaps need to be closed and develop specifics about how to address those gaps. A report summarizing the data and the outcomes of the discussion is then drawn up and disseminated to policy makers, programme planners and practitioners and other researchers.

The natural history of drug use helps to determine where to look for data on drug users. Each drug has its own physiological effect on the user. Most drugs are not used in their pure form and may be mixed with other harmful substances. In addition, the way the drug is used can have health effects. For instance, injecting drugs, in particular with unclean needles, can cause emboli or clots, sepsis and other infections that require medical attention, most often from a hospital emergency department. Sometimes, a user overdoses on a drug and dies. It is also known that, as a user becomes more dependent on a certain drug, he or she develops a tolerance for it and requires higher and greater dosages to achieve the desired effects and to ward off withdrawal symptoms. As a result, some users seek treatment on their own, but more often their families, employers or the judicial system enter them into treatment. Finally, drug users may violate local drug laws or become involved in illegal activities to support themselves and their drug use. This review of the natural history of drug use suggests six potential sources for information on drug users: hospital admissions and emergency department logs; public health reports on infectious diseases; poison control reports; the records of deaths maintained by medical examiners, coroners or other departments; drug use treatment admissions; and arrest reports.

Although such information sources are good, they have the following limitations: *(a)* they include persons who may have used drugs only once; *(b)* they are not "population-based", that is, prevalence and incidence rates of drug use for the general population cannot be calculated from the numbers provided; *(c)* as a drug user can appear in one or all of their records, each record cannot be considered

independent of the others; and *(d)* the records are sensitive to administrative and policy changes (for example, if a city official, in response to public opinion, orders a crackdown on drug users, the number of arrests increases). In addition, many public programmes are designed to serve the less affluent, thus introducing another potential bias. The local expert is more aware of any factor that might influence the information he or she collects.

Other types of law enforcement data that networks have utilized include drug seizure information such as the amount and type of drugs seized over a period of time. Information on the price and quality of drugs on the street has also been collected. There are obvious limitations as to how to use or interpret such information, but, surprisingly, over time, the price and quality of drugs on the street can increase in significance, in particular when the information is used with other information gathered from more reliable sources.

This model can be used for a city, a country or a region. When areas of a country or several countries want to form a larger system, such a system or network should include individual representatives from each of the local systems or networks. Each representative should present the findings from his or her network. The discussions should relate to what is going on in the larger geographical area in order that common trends can be determined.

The model has been adapted by a number of countries for their use. Knowledge about CEWG comes from several sources. Over the past 25 years, epidemiologists, other researchers or policy makers have been invited to attend meetings and to make presentations on the drug use patterns that exist in their home countries. It was principally through this approach that the Pompidou Group of the Council of Europe created a group of experts on epidemiology in 1982. The purpose of the expert group was to develop monitoring systems to evaluate the nature and magnitude of drug abuse and related problems in Europe [7]. Over the past 20 years, several hundred experts from over 40 European countries have engaged for a period in the activities of the expert group. Each member State of the European Commission sends a representative to an annual meeting to report on patterns of drug abuse in that country. Sentinel cities, often the capital cities of member States, were selected as the sites for the data collection activities. Some countries developed their own community epidemiology work groups and identified sentinel cities in autonomous regions.

Mexican public health officials also became interested in the CEWG model and began collecting information on drug abuse in key sites. Mexico adapted the model so that, rather than reviewing solely existing data, interview instruments were developed to be used in several agency settings and were administered to a sample of clients to determine the types of drugs being used and the methods and frequency of their use. As alcohol use was seen as the principal public health problem, the instruments also were used to collect information on alcohol consumption. The reason the Mexican epidemiologists added the more active forms of data collection was that much of the existing data were either incomplete or missing. The enhancement of the model was adopted by a number of other countries in developing their drug abuse information systems [8].

The models, or variations of them, have been applied in Canada, Central and South America, the Caribbean, South and South-East Asia and in East and Southern Africa. The United Nations International Drug Control Programme has developed a guidebook on self-training and on training workshops that follows the CEWG model, for the use of States interested in establishing drug abuse information systems.

The contribution of the Community Epidemiology Work Group to the "substance" of drug abuse

In the last 25 years, CEWG has contributed to the "substance" of drug abuse in three major areas: by defining emergent trends, by examining the time-space relationship of drug abuse patterns and practices and by generating research questions.

Emergent trends

Historically, emergent drug use patterns were observed initially in law enforcement and hospital emergency department data. Those systems often note trends, generally within the drug-using population, between one and two years prior to their observation in the general population through household or school surveys. At almost all of the CEWG meetings, there are reports of new patterns of drug use, consisting of the new drugs or combinations of drugs being abused, new or alternative methods for administering drugs or new populations using drugs. Since CEWG began, several emergent patterns have been detected.

New drugs that have been noted include methaqualone (Quaalude) in the late 1970s, crack cocaine in the early 1980s, flunitrazepam (Rohypnol) in the early 1990s and, most recently, GHB and oxycodone hydrochloride (OxyContin). The detection of those drugs of abuse led to the involvement of public health agencies in the affected communities, which alerted hospitals and law enforcement agencies and used the electric and print media to alert the public. Although the response to the observations regarding crack cocaine was slow, the response to the other drugs was more immediate and widespread. Informing the public about the new drugs of abuse has been a major objective of CEWG and its sponsoring agency, NIDA, which prepares and distributes community alert bulletins on emergent drugs of abuse.

One of the new methods of administering drugs reported in the early 1990s at CEWG was the filling of large cigars with cannabis. Such cigars, called "blunts", were first observed among African-American teenagers in the north-eastern part of the United States. They were usually accompanied by a 40-ounce bottle of malt liquor. Their use spread to other parts of the country. The combined use of blunts and alcohol became so prevalent that references to the pattern were made in movies and rap music. In the late 1980s, the Drug Enforcement Administration of the United States noted that the Colombian groups associated with the preparation of and trafficking in cocaine were also growing opium poppies [9]; by the

early 1990s, Colombian heroin had become available. The Colombian heroin was purer than the heroin available from Asia and pure enough to have strong psychoactive effects even when snorted. During the same period, the association between injecting heroin or heroin in combination with cocaine and human immunodeficiency virus (HIV) infection was demonstrated. Heroin that could be used without injecting was therefore believed to be safer to use. The availability of such pure heroin at low cost led to increased reports (by law enforcement agencies and by providers of substance abuse treatment) of drug users snorting heroin, while reports of such users injecting heroin decreased. A final example of CEWG identifying new methods of drug use is the injecting of crack cocaine. Until the CEWG meeting held in New Orleans in December 1994, there had been no reports of injecting cocaine. At that meeting, Rodolphe Ingold, a psychiatrist from Paris, reported on groups of crack users injecting cocaine after dissolving it in lemon juice [10]. Subsequent to that presentation, reports began to include other incidents of injecting crack dissolved in lemon juice or vinegar. The new method of administration was of great concern to public health authorities, as it significantly increased the risk of infection with HIV and hepatitis among users.

CEWG has also noted when new demographic groups have become involved with drugs. Heroin use (at first by snorting and later by injecting) among suburban youth, for example, was monitored in the sentinel cities throughout the 1990s. More recently, while the use of crack cocaine was decreasing among some populations, in particular African-Americans, it was increasing among Hispanic youth. One of the major changes of the past decade has been the use of methamphetamines. The manufacture and use of methamphetamines had been endemic in certain parts of the United States, mostly in the western part of the country, in southern California. However, by the mid-1980s, CEWG reports from cities in other parts of the country had cited the increasing use of methamphetamines. By the 1990s, there were reports of methamphetamine use not only in areas where it had not been reported before, but also among the younger age groups. Information from the Drug Enforcement Administration, when overlaid with the CEWG reports, indicated that the source of the methamphetamines was Mexico and the distribution of cases paralleled the trafficking routes used for transporting cannabis. Further intelligence indicated that the Mexican drug traffickers who were distributing the cannabis were also manufacturing and distributing the methamphetamines.

The major challenge for CEWG members is to identify how such new patterns of drug use emerge and then spread from one area of the country to another.

The time-space relationship of patterns of drug use

As with an epidemic of an infectious disease, the various patterns of drug use have a time-space relationship. The reports from CEWG reveal many commonalities in the patterns of the traditional drugs of abuse: cannabis, heroin and cocaine. However, there appear to be particular patterns of drug use that are endemic in certain areas of the country. For example, as mentioned above, the use

of methamphetamines has a relatively long history as a problem in the western part of the country, in particular in California. Each area has its own unique problems, such as the peaking and waning use of phencyclidine (PCP) in Washington, D.C. Some cities have displayed patterns that contrast with those in most other areas, such as the low level of heroin use in Miami or San Francisco and the delayed appearance of crack cocaine in Chicago. However, those patterns have been changing over time and those cities and others are experiencing an increased use of those drugs. While the experience of the various city representatives concerning the detection, prevention and treatment of their current drug problems is discussed during the meetings, the public health response is often overwhelmed by the spread of the new pattern of drug use.

The above-mentioned observation that the use of methamphetamines was spreading across the country is a good example of this time-space relationship. The response to that development in the United States included public alerts, prevention programmes in those communities in which methamphetamine use was noted among students in middle school and secondary school, and conferences and workshops held for community practitioners and public health officials to provide information about the use of methamphetamines and the prevention and treatment of methamphetamine abuse.

Generating research questions

Discussions on the description of geographically based drug use trends and the detection of emergent drug use patterns lead naturally to the generation of hypotheses and research questions. Many of the questions are initially addressed through ethnographical or qualitative studies. Focus groups or in-depth ethnographical studies explore the research questions, further refine them and suggest target populations, sampling plans and research designs for fuller studies. Pach and Gorman describe a study on methamphetamine that emanated from such work [11]. In the study, six cities were selected. They included cities in which methamphetamine use was endemic, those in which it appeared to be a new problem and those in which patterns of use were unclear. The study provided researchers in the field with information about the characteristics of the user population and suggested additional research questions that could be explored. Two other research questions suggested by the participants at recent CEWG meetings related to why the number of admissions to hospital emergency departments and drug abuse treatment facilities as a result of cannabis use was increasing and why the use of crack cocaine was decreasing among African-Americans.

The contribution of the Community Epidemiology Work Group to drug abuse epidemiological methods

The CEWG process has contributed to drug abuse epidemiological methods in a number of different ways: one is the description of the drug abuse situation or "picture" within a defined geographical area; second is the use of existing data

sets; third is the integration of quantitative and qualitative information; and fourth is the influence of this approach on countries throughout the world.

Description of the local drug abuse situation

In the course of the past 25 years, it has been noted at CEWG meetings that certain drug use patterns are more prevalent in some cities than in others. Drug use patterns reflect not only existing drug distribution networks, but also the accepted lifestyles of the residents of geographical areas. The lifestyles may relate to dominant occupations or traditions. It has been of great interest to researchers that some of the patterns of drug use are confined to an area or certain sub-populations and do not spread to other areas or subpopulations. The CEWG model, in particular when several different sources of data are collected over different periods, provides a "picture" of the local drug abuse situation. Such an overview serves the needs of treatment providers, prevention practitioners, law enforcement and correction agencies and policy makers. Targeted interventions tailored to specific populations can be developed with this information. Furthermore, the descriptive information provides fertile ground for more in-depth ethnographical and quantitative studies.

Using existing data sets

CEWG has considerable experience in using existing data sets, and report formats and analytical approaches have been developed to handle the diverse and unsystematic data sets. In general, in most communities in the United States, information is available on drug-related arrests and drug abuse treatment admissions. In many of the models discussed above, this information, together with key informant interviews, forms the basis of information systems on drug abuse. CEWG has gone beyond these sources to include information from emergency departments, hospitals, medical examiners (or coroners), drug seizures (quality and pricing information) and poison control centres. More recently, information from the infectious disease reporting systems of health departments has been incorporated into the data sets to reflect not only cases of HIV/AIDS among drug users, but also cases of hepatitis B and C. While, as stated earlier, each data source has it own limitations, CEWG members have learned from experience how to assess the contribution of each data set and how to handle their limitations. Knowledge about drug use patterns in their geographical areas provides the "bigger picture" to improve the interpretation of the data.

Integration of quantitative and qualitative information

The CEWG model lends itself well to the integration of quantitative and qualitative information. The examination of the existing data generates a research
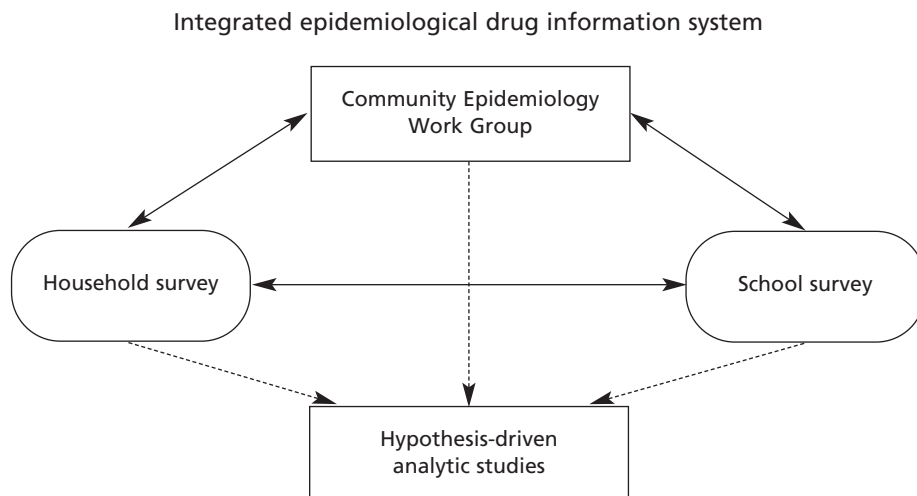
process to explore several questions or hypotheses that are prompted by the findings. Many of these exploratory studies have prompted more analytical research, both quantitative and qualitative, and have also been integrated into ongoing studies. The qualitative information puts flesh on the bones of quantitative data, enhancing the findings of these studies.

Pilot ethnographical studies have also been initiated to explore questions generated by the findings of CEWG. The process of developing research issues by deriving focused questions from quantitative data and exploring their significance through qualitative methods is described in a series of studies initiated through the CEWG project [12]. The research questions were framed through a dialogue between the CEWG representative and an ethnographer and the pilot ethnographies that resulted were intended to explore an issue of practical importance to the community. In addition, this series of studies was aimed at investigating a process for integrating the unique data resulting from utilizing quantitative and qualitative research methods. The results of this initiative point out other benefits of the CEWG approach, which are the ability to access members of the local research and service community, identify questions of immediate importance, implement a focused and grounded research study and provide feedback to public health administrators and planners within a short time frame.

Development of an information system

Probably the greatest contribution made by the CEWG concept and its implementation has been recognition that an information system based on existing data can lead to a better understanding of drug abuse patterns within a defined geographical area. This inexpensive and foundation-building approach to documenting types and modes of drug use and to identifying the characteristics and locations of drug-using populations has helped policy makers to develop both demand and supply reduction strategies and to assess their impact. The history of CEWG and the value of its contributions have demonstrated the merit of this approach. As a result, it has been advocated by community-planning groups throughout the United States and adopted by professionals in the field of drug abuse in countries around the world. An information system that combines the CEWG model with household and school surveys provides the best data to inform programme-planning and identify areas for further research. The figure shows the ideal system that provides the drug abuse picture for a community using CEWG-type information, together with household or population and school surveys. In this way, emergent problems are assessed against prevalent patterns of use of specified drug types (both household and school surveys) and the initiation of those patterns (school survey). Emergent patterns observed from CEWG-systems provide the focus for household and school survey questions that determine the extent to which the patterns have spread among the general population. Findings from all of these data sources generate research questions that can be explored in depth using both qualitative and quantitative methodological approaches.

Integrated epidemiological drug information system

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       │ survey       │                    │              │
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                    │   Hypothesis-driven     │
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Conclusions

Drug abuse is a major public health issue around the world. Yet the very nature of drug-abusing behaviours limits the use of traditional public health epidemiological methods for assessing the nature and extent of those behaviours within a defined geographical area. A particular challenge of drug abuse is its changing character. The types of drugs abused and the modes of their administration, as well as the demographics of the populations involved, require constant monitoring. The CEWG model developed in the United States in the early 1970s lends itself well to this task. Over the past three decades, the experiences of the CEWG members in carefully describing drug abuse patterns and detecting emergent drug abuse trends have greatly assisted public health service agencies in developing strategies that enable problems to be addressed before they spread. This public health tool can be used at the local, regional, national and international levels. The combination of information generated through the CEWG approach and its integration with household or general population and school surveys can provide a solid basis for describing drug abuse practices within a specified geographical area. In addition, research questions emerging from the data can be pursued through analytic or hypothesis-driven research. Clearly, the rapid diffusion of the CEWG model to other countries and regions of the world proves the efficacy of this approach.

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Drug epidemiology in the European institutions: historical background and key indicators

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ABSTRACT

The present article traces the evolution of drug epidemiology in Europe from the 1960s to the present within the context of changing perceptions of the drug phenomenon and changing information needs of policy makers. In particular, it focuses on how epidemiological indicators developed as part of emerging European political and institutional instruments and structures for responding to illegal drugs. It also notes the importance of wider international developments in drug epidemiology and of cooperation between networks of researchers.

Interest in epidemiology at the European level was first observed in the early 1970s with the creation of the Pompidou Group. Work on a variety of drug indicators accelerated in the 1980s following the establishment of an expert epidemiology group within the Pompidou Group of the Council of Europe. This foreshadowed the founding by the European Union of the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) in 1993.

During the 1990s, EMCDDA, together with the member States, further developed five key epidemiological indicators of drug prevalence and health consequences in order to improve the quality and comparability of core data needed to describe and analyse the drug phenomenon at the European level. In the early 2000s, those indicators were adopted by member States, endorsed by the European Council and incorporated into the European Union Drugs Strategy and Action Plan 2000-2004. The goal is now to ensure implementation of those key indicators in member States as the basis for a European Union epidemiological information system on drugs. It is essential that the indicators are complemented by qualitative and quantitative research and context information in order to interpret the data correctly and provide answers that are relevant to policy needs.

Keywords: epidemiology; drug monitoring systems; indicators; Europe.

Drug epidemiology in Europe: historical roots

Drug epidemiology in Europe has a mixed ancestry, incorporating influences from a range of disciplines, not only classical epidemiology and public health

surveillance, but also clinical epidemiology, sociology, social psychology, demography, anthropology, criminology and economics. The evolution of this hybrid creature has occurred at different rates and through different actors in the various countries, so it is not surprising that the term "drug epidemiology" has often been understood in different ways.

The evolution of drug epidemiology also reflects aspects of drug taking that caused concern at various points, both at the national and, from the 1970s on, at the European level. The present article traces that evolutionary process in the context of changing perceptions of the drug phenomenon and the changing information needs of policy makers. It does not describe the situation in different countries nor review the broad range of epidemiological research. Rather, it gives an overview of how epidemiology, and in particular epidemiological indicators, have developed as part of the emergence of European political and institutional instruments and structures for responding to illegal drugs.

Early examples in European countries

The domestic consumption of drugs did not become a significant topic in Europe until the 1960s, though much earlier in the century specific issues had arisen in some countries, for example about cocaine or the treatment of opiate addiction. An early example where this led to a special monitoring system comes from the United Kingdom of Great Britain and Northern Ireland where the Home Office index of notified addicts was established in the mid-1930s and continued until the 1990s.

Generally, however, interest in epidemiological studies or systems to describe or track drug taking did not arise in Europe until the emergence of youth drug scenes in the 1960s and early 1970s provoked concern and stimulated a variety of investigations, principally, though not exclusively, in northern Europe, for example in France, Germany, the Netherlands, Scandinavia and the United Kingdom. These included studies of clinical records or hospital statistics, reports based on police or forensic data, studies of small groups of drug takers and surveys of local or sometimes national samples of adolescents or students. At the time, surveys mostly concerned cannabis, though amphetamines and lysergic acid diethylamide (LSD) were included. In Norway and Sweden, regular surveys have continued to the present day.

Studies based on clinical sources reflected two different populations—an older, predominantly female group of patients dependent on barbiturates, morphine or other drugs of medical origin and a smaller but growing group of younger, often male, clients who were consuming a variety of drugs, including opiates, amphetamines and/or cannabis in more peer-oriented, non-medical contexts. In a few countries, for example Sweden and the United Kingdom, amphetamines were the focus of investigations in the 1950s or early 1960s, before cannabis became an issue.

Several epidemiological studies of heroin were carried out in the late 1960s and early 1970s, in particular in the United Kingdom. A notable example was the

analysis by de Alarcón of the case-by-case spread of heroin addiction in an English town in the 1960s [1]. The first attempts to estimate prevalence also date from that period, based, for example, on nomination techniques and multipliers in the United Kingdom [2] and on case-finding and capture-recapture in Sweden [3]. There were also sociological studies describing drug taking groups or analysing the interactions between changing patterns of drug taking, societal perceptions and responses (see, for example, Plant [4] and Young [5]).

Developments in the European and international context

Changing patterns of drug use in the 1960s also stimulated interest in epidemiological research at the international level, at the United Nations and especially at the World Health Organization (WHO) (see Granier-Doyeux [6]). At the European level, the then French President Georges Pompidou made a proposal in August 1971 to strengthen European cooperation and coordination, including joint epidemiological studies. A ministerial conference of the six members of the European Economic Community (EEC) and the United Kingdom, held in Rome in October 1972, adopted a joint, multidisciplinary cooperation programme covering health, education and information, enforcement and legislation [7]. That programme, which became known as the Pompidou Group, included cooperation with interested non-EEC countries, for example Sweden. The Public Health Division of the Council of Europe also examined the need for epidemiological studies and produced a report on drug dependence in 19 European countries [8]. This was followed in 1973 by a resolution adopted by the Committee of Ministers of the Council of Europe that included a call for closer cooperation in exchanging information on drugs and related public health and social problems [9]. (Note that the Council of Europe is not the same as the European Council, which is the political decision-making body of the European Union (previously EEC); it is a longer-standing organization for European cooperation covering a larger number of European countries, East and West.)

The 1970s also saw important methodological developments in the United States of America and Canada that subsequently influenced European work on epidemiological surveys and drug indicators in the 1980s. These included reporting systems for drug-related emergencies and deaths, client-based treatment reporting systems, applications of law enforcement statistics and studies of drug market indicators, household surveys of the general population, school surveys, prevalence estimation methods, ethnographic and other qualitative approaches and statistical and dynamic models that integrated different indicators.

The Community Epidemiological Working Group (CEWG), based on regular reporting of drug trends from a network of cities, was developed as a complementary approach to national surveys and reporting systems [10]. Several European researchers attended its meetings, establishing important links that fed into the evolution of epidemiological indicators and information systems in Europe [11]. A series of epidemiological manuals produced by WHO in 1980 and 1981 also made an important contribution to the wider dissemination of these

methodologies [12-16]. There was also a study carried out for the Organisation for Economic Cooperation and Development in 1981 to examine potential epidemiological indicators in 14 countries, including Western Europe [17]. The conclusions included recommendations for developing standard instruments, but there did not appear to be any follow-up.

European developments in the 1980s

During the 1980s, the concept of drug indicators was developed and applied in Europe, both at the national level in some countries and at the European level. One national example was the Drug Indicators Project, based in London, which developed and tested a package of indicators for assessing the nature and extent of drug problems at the local level, combining indirect indicators such as treatment demand, deaths or market indicators, prevalence estimates, "snowball" sampling and ethnographic research [18, 19]. Similar ideas were being explored in other countries, such as France, Germany, Italy, the Netherlands and Sweden [20, 21]. During the 1980s, initiatives to develop indicators extended further, for example in Denmark, Greece and Ireland. Regular surveys of youth continued in Norway and Sweden and were introduced in Germany. From 1987, Spain set up a national reporting system based on three indicators to monitor heroin- and cocaine-treatment demand, non-fatal emergencies and drug-related deaths [22].

Alongside those developments, the 1980s saw a growing interest in methods for studying hidden populations and patterns of drug taking that were not reflected in health or criminal justice indicators nor adequately covered by population surveys. These included snowball studies of cocaine users or behavioural studies of risk behaviours and human immunodeficiency virus (HIV) infection among out-of-treatment drug injectors [23-27].

In some cases, the focus was on the national level, in others, local. In many cases, important elements in the process were the enthusiasm of a relatively small number of drug researchers, combined with a slowly emerging interest by national or local authorities in information on the emerging drug phenomenon. That interest arose from a growing awareness of changing patterns of drug taking in some countries, in particular heroin, and problems related to the acquired immunodeficiency syndrome (AIDS).

Pompidou Group

At the European level, the main developments in epidemiology in the 1980s took place through the Pompidou Group of the Council of Europe. (Although the Pompidou Group was set up as an intergovernmental cooperation group on drugs involving EEC countries, from 1980 it became a "partial agreement" attached to the Council of Europe.)

In December 1982, the Pompidou Group organized an expert meeting in Strasbourg on the development of administrative monitoring systems for the assessment of public health and social problems related to drug abuse. This led to

an expert epidemiology group that met regularly and laid the basis for a two-track approach, one focusing on school surveys, the other on a multi-city study of drug indicators. The school survey group developed an instrument that was tested in six countries. However, the instrument itself was not applied at the European level until 1995.

The multi-city study developed a framework for using multiple indicators to describe and compare the drug situation at the city level. The emphasis was on interpreting indicators as a package within the local context so that cities could be compared on the basis of an understanding of what the indicators signified in each city. It was felt that it was much harder to achieve such an understanding at the national level, not only because the drug situation varied between different localities, but also because it was difficult to evaluate the significance of indicators at the national level. This is a fundamental, but often overlooked, point: regardless of whether indicators are standardized or not, it is only possible to make sense of them, to make comparisons and to draw conclusions if statistical data are combined with other, often more qualitative research as well as with broader information on context, including societal attitudes and responses. Initially, the study involved 7 cities [28], subsequently expanding to 13 [29] and then to over 20 [30].

Apart from regular collection and synthesis of city data from the early 1980s through to the present day [31], the main achievements of the Pompidou expert epidemiology group were a model for routine collection and analysis of multiple indicators; a standard protocol for the first treatment demand indicator; a standard instrument for school surveys; a review of methods for estimating the prevalence of problem drug use; a manual on snowball sampling methodology; and feasibility studies of indicators of drug-related deaths, non-fatal emergencies, police arrests, heroin seizures, price-purity of illicit drugs and general population surveys. A Pompidou Group training programme in drug epidemiology in the early 1990s helped disseminate the methodology to countries of Central and Eastern Europe and subsequently led to extension of the multi-city network [32], including a city network in the Russian Federation.

As at the national level, the vector for many of these developments was a relatively small group of drug researchers from various European countries and links with North American researchers, in particular from the National Institute on Drug Abuse (NIDA) and CEWG. The work in the Pompidou Group also foreshadowed the creation of the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA).

The European Monitoring Centre for Drugs and Drug Addiction

EMCDDA was formally established as an agency of the European Community in February 1993 through the adoption of Council regulation (EEC) No. 302/93 [33]. The founding regulation came into force on 30 October 1993, following a European Council decision that the agency should be based in Lisbon and the Centre became fully operational in 1995.

The emergence of the Centre

The concept of a European drug monitoring centre arose out of growing recognition of the European dimensions of the drug phenomenon and of the need to improve not only cooperation between member States, but also coordination of actions at the European level. This implied developing institutional instruments and competencies of the European Community. Although the Pompidou Group already existed as an intergovernmental cooperation group, it had no competencies under the Treaty of Rome.

During the first half of the 1980s, the European Parliament took the initiative at the political level, culminating in the first report to address the drug issue in the European Community, based on a 1985 commission of inquiry [34]. Among other things, the report identified the need for comparable data and coordinated research at the European level as a basis for effective and coordinated actions.

From about 1984, the European Commission took several steps concerning drugs, in particular identifying addiction as a priority and proposing Community action on prevention and health. Over the second half of the 1980s, the topic started to receive attention at the highest political level of successive European Councils.

During the 1980s, a number of activities supported by the European Commission started in the area of epidemiology. One was a concerted research action between member States on the standardization of epidemiological surveillance of illicit drugs (the EUROSID project) funded by the Committee on Medical and Public Health Research of the Directorate-General for Science, Research and Development. The Directorate for Public Health also supported various activities, including a steering group on cocaine and other drugs, which organized scientific projects and meetings on topics such as snowball sampling, indirect indicators or cocaine epidemiology. However, at that time there was no institutional framework that could enable such scientific activities to be transposed into European instruments.

In 1989, French President François Mitterand proposed to the member States and the Commission an action plan on drugs based on an instrument of political coordination involving member States and the European Community. A drug monitoring centre was a key element of the concept.

Following President Mitterand's initiative, an ad hoc political group, the European Committee to Combat Drugs, was set up in December 1989, composed of national drug coordinators. The Committee drew up the first European plan on drugs, adopted by the Council of Ministers in December 1990. Successive European Councils added momentum to those initiatives, including a decision in June 1991 to establish a European drug monitoring centre. The early 1990s also saw the first and second reports on drug demand reduction in the European Community and increasing political commitment to health indicators and networks to provide comparable and reliable information for public health policies and responses [35].

In 1993, the Maastricht Treaty on European Union came into force and established for the first time a clear institutional competence in the field of drugs,

especially in public health [36]. This was further strengthened by the Treaty of Amsterdam, which came into force in 1999.

Objectives of the European Monitoring Centre for Drugs and Drug Addiction and the need for key indicators

EMCDDA thus reflects both the evolution of the European political and institutional context and the development of scientific methodologies and networks, especially in the field of epidemiology. This can be seen in the objective set out in the Centre's founding regulation:

> "To provide objective, reliable and comparable information at European level concerning drugs, drug addiction and their consequences [in order to] help provide the Community and the Member States with an overall view of the drug and drug addiction situation when, in their respective areas of competence, they take measures or decide on action."

The first task of the Centre is to collect and analyse existing data and ensure wide dissemination, including a yearly report on the state of the drug problem in the European Union [37]. However, achieving a reliable overview at the European level meant improving the comparability and quality of data across 15 member States (now 16 countries, since Norway joined EMCDDA in 2001, and soon to rise to 28, as European Union accession countries can join the Centre from the beginning of 2003). This is the second central task of EMCDDA. Thus the founding regulation requires the Centre:

> "To ensure improved comparability, objectivity and reliability of data at European level by establishing indicators and common criteria of a non-binding nature, compliance with which may be recommended by the Centre, with a view to greater uniformity of the measurement methods used by the Member States and the Community."

Under the same heading of improving data comparison methods, the Centre is called on to facilitate and structure exchange of information, in terms of both quality and quantity (databases).

Behind this formal, institutional requirement to develop indicators at the European level lies the need for good quality, consistent and comparable data as raw material for an evidence-based public health approach to describing, analysing and responding to drug-related problems. While the process of developing and implementing indicators involves time-consuming technical, administrative and institutional elements at the national and the European levels, the fundamental purpose is to provide data to compare between and within countries, to track trends consistently over time and, above all, to help analyse and understand the drug phenomenon and the possible impact of policies and responses. Epidemiology is an applied public health science, even when embedded in a political and institutional framework.

Key epidemiological indicators

Development of five key epidemiological indicators

Since the Centre became operational in 1995, it has collected existing core data from the member States using standard statistical tables covering prevalence, health, law enforcement and market indicators. The data are collected through the Reitox network of national focal points. Each member State nominates one centre to act as the Centre's key partner for collecting and reporting the best available national data to the Centre. National focal points are also responsible for ensuring data quality and for assisting EMCDDA by facilitating the implementation of European Union standards for data collection and reporting in each member State.

It quickly became apparent that, not only did data availability vary between countries, but that major differences existed in definitions, methods, sources, coverage and quality. This made comparison and analysis very difficult. It was not practical to work on the whole range of indicators at once, so five areas covering prevalence and health consequences were selected as priorities for harmonization and improvement in data quality. These five areas, the so-called five key epidemiological indicators [38], are:

1. Extent and patterns of drug use in the general population (household surveys of the general population aged 15-64 years).

2. Prevalence and patterns of problem drug use (statistical estimates of prevalence and incidence in population aged 15-64 years).

3. Demand for treatment by drug users (statistics from anonymous, case-based reporting systems on number and profile of clients starting treatment at drug treatment centres).

4. Drug-related deaths and mortality of drug users (statistics on acute or drug-induced deaths from general population mortality registers and special registers; all-cause mortality among cohorts of drug users).

5. Drug-related infectious diseases (prevalence and incidence rates of HIV and hepatitis B and C in injecting drug users).

Drug use among the school age population (school surveys) was not included since the Pompidou Group had developed a standard instrument that was implemented through the European School Survey Project on Alcohol and Other Drugs, coordinated by the Swedish Council for Information on Alcohol and Other Drugs in 26 European countries in 1995 [39] and in 30 countries in 1999 [40]. (The next survey is planned for 2003.)

Non-fatal drug-related emergencies were not included in pilot studies, as the Pompidou Group suggested that this was not feasible in many countries. In addition to the school survey instrument, two of the EMCDDA key indicators drew extensively on work in the Pompidou Group—the treatment demand indicator, which is a joint EMCDDA-Pompidou Group protocol [41], and the prevalence of problem drug use indicator, which developed from a joint EMCDDA-Pompidou Group seminar and publication [42].

From 1995 to 2001, priority was given to methodological development, piloting and field testing of instruments and guidelines for the five key indicators. This built on work in the Pompidou Group and national examples of good practice, taking account of existing protocols (for example, the Statistical Office of the European Union (Eurostat), WHO and NIDA). Initially, work was carried out with contractors and scientific experts from countries with experience of particular indicators. This was then extended to involve all member States and work to facilitate the development and implementation of the five key indicators at the national level became a contractual core task for national focal points in October 1998.

To support the process of harmonization and to ensure coherence in implementation between different member States, European Union expert groups involving all national focal points were established for each key indicator. These groups hold annual meetings and in most cases have a small steering group that helps prepare the annual meetings. In parallel to these European Union-level groups, national focal points are responsible for establishing national work groups of key actors and experts for each key indicator to ensure coordination of efforts in each member State.

Role of key indicators in European Union policy

In 2000, the results of the pilot studies and expert groups were put together into a set of draft technical tools and guidelines for each indicator. These give definitions, recommended core data sets and methodological guidelines for data collection and reporting. They were approved by the EMCDDA Scientific Committee and presented to the Management Board of the Centre in January 2001. In September 2001, the technical tools and guidelines were adopted unanimously by the Board, which includes all 15 member States, the European Commission and the European Parliament, as formal, though legally non-binding, recommendations to the member States for harmonized data collection and reporting.

Development of the five key indicators by EMCDDA took place against the wider political context of adoption by the European Union in December 1999 of a European Union Drugs Strategy for 2000-2004. This established a general framework covering principles, objectives and main lines of action and set out six broad targets, including reducing prevalence and incidence, reducing drug-related health damage (deaths and infectious diseases) and increasing successful treatment. It underlined that the strategy had to be based on a regular assessment of the nature and magnitude of the drug phenomenon and its consequences [43].

The Drugs Strategy was followed by the European Union Action Plan on Drugs 2000-2004 [44], adopted by heads of State at the European Council in Santa Maria da Feira, Portugal, in June 2000. The conclusions of the European Council stressed [45]:

> "The European Council . . . endorses the EU Action Plan on Drugs as a crucial instrument for transposing the EU Drugs Strategy into concrete actions . . . Member States, in cooperation with the EMCDDA, are urged to

enhance their efforts to provide reliable and comparable information on the key epidemiological indicators in order to better evaluate the impact of drug-related issues."

Under the Action Plan, EMCDDA defines the indicators, collects and analyses the information at the European level and reports annually to the Horizontal Working Group on Drugs in the Council on convergence, progress and problems. The role of member States is, according to technical tools and guidelines provided by EMCDDA, to give reliable information on the five key epidemiological indicators in a comparable form drawn up by EMCDDA and adopted by the Council.

In December 2001, the Council adopted a resolution on implementation of the five key indicators, urging member States to give priority to producing comparable data and ensuring support for national focal points. It also invited member States and the European Commission to examine the best ways and means, especially financial, to support implementation of the five key indicators within the framework of European Union public health indicators and to take appropriate steps [46].

EMCDDA is now discussing this with the Commission, in particular the services responsible for the Public Health Programme (Sanco) and the Statistical Office of the European Communities (Eurostat). The goal is to ensure that the varied and specific information needs of bodies responsible for drug issues at the European and national levels are met, while ensuring that simpler, more aggregated data are available for global European health and statistical indicators.

Current status and perspectives

Although the legal status of the five key indicators is still under discussion, it is clear that not only is there broad consensus on their relevance at the scientific and technical level, but also a strong mandate at the political and institutional level for implementing them as the basis of a European Union epidemiological information system on drugs. Furthermore, despite obstacles, many member States have taken important steps towards implementing the recommended guidelines.

Compared with 1995, when the Centre opened, the number of countries which can deliver data mostly or fully complying with EMCDDA guidelines has increased substantially. In 1995, only seven countries could provide national data on lifetime prevalence in the general population and only five for last 12 months' prevalence. By 2002, 12 countries could provide both. Similarly, countries with national prevalence estimates for problem drug use increased from 5 in 1995 to 14 in 2002. While all countries could provide national data on drug-related deaths in 1995, major differences existed in definitions and methodology. By 2002, although problems of comparability remained, 11 countries could provide data on acute (drug-induced) deaths according to the guidelines and others were expected to be able to do so in the near future. Progress is slower in establishing compatible treatment

reporting systems, in part because responsibility for treatment is often local rather than national. However, clear advances have been made and nine countries now have largely compatible reporting systems for the treatment demand indicator. Similarly, there is progress in obtaining national data on HIV and hepatitis C infection in injecting drug users, though this, too, is slower because good quality data are usually available through local studies rather than national surveillance systems.

There are, of course, important challenges ahead. One is to ensure long-term stability of data collection and reporting mechanisms by institutionalizing the indicators in all member States and subsequently all candidate countries. Even in countries that currently meet EMCDDA guidelines, the future is not always assured. Problems arise from uncertainty over political and administrative commitment by the competent authorities, especially when financial investment is needed to establish or fundamentally change national information systems. This may be compounded by a lack of coordination between ministries responsible for drug matters and those responsible for the information systems concerned. As noted above, decentralization is an important factor in some countries, not only because there may be conflicts between central and local authorities over who pays, but also because local actors may not see the point of collecting data for purposes of international comparison. Motivating local actors is essential for establishing national information systems and dissemination and feedback of information are vital. Finally, data protection is becoming increasingly important in many European countries. Active efforts must be made to implement information systems that are seen to be justified in terms of value for public health and trustworthy in terms of fully respecting privacy and human rights.

The role of the national focal points is to facilitate the implementation of the indicators by other national agencies. Since they do not usually have the legal or administrative competence themselves, they must rely on support not only from national authorities responsible for drug matters, but also from other departments and institutions. This places a high responsibility on national focal points to engage and motivate a broad range of partners and to ensure feedback and dissemination through a diversity of national networks. The European Union Drugs Strategy, the Action Plan, the European Council and the Council resolution all urge member States to give adequate political and financial support to their national focal points.

At EMCDDA, implementation of the key indicators means improving systems for electronic data transmission from all member States and candidate countries and establishing more powerful data management tools and relational databases for handling, analysing and disseminating substantial amounts of data. Linked to this is the question of data quality. This must be approached both collectively, by ensuring consistency in how indicators are implemented and reported by member States, and bilaterally, by identifying particular problems and seeking solutions. Now that the indicators have been agreed upon and adopted, a high priority is to establish concrete and viable quality criteria and quality assurance mechanisms in the member States.

Limitations of indicators: the importance of interpretation

Routine, harmonized indicators are useful for making basic comparisons between countries or other geographical units and for tracking broad trends over time. They also provide standardized data that are valuable for other purposes, for example estimating incidence, social costs or burden of health or analysing socio-demographic distribution or patterns of diffusion. However, they also have limitations.

All indicators described above are time-lagged, that is, they reflect the drug situation as it was two years earlier. One reason is the process—it takes time to collect, validate, analyse and report data, especially at the national level. Some indicators, such as treatment demand, are inherently lagged, since clients go for treatment only some time after they started taking drugs. Nor are national indicators sensitive to new or changing patterns of drug use that commonly emerge at the local level. Further, indicators from health or criminal justice sources reflect the priorities and responses of medical or law enforcement agencies, as well as drug trends.

Interpreting indicators must take account of these constraints and bring in information from other complementary approaches. These include "early warning" systems to identify and track emerging phenomena, "triangulation" techniques to cross-check consistency between different indicators, dynamic models to help analyse processes or simulate scenarios and more targeted research studies, qualitative as well as quantitative, to analyse and understand specific questions in more depth. It is vital to interpret indicators in the wider social context, including cultural differences, societal attitudes to drugs and legal and other responses.

A set of indicators can be seen as providing a framework that enables a bare skeleton of the drug phenomenon to be reconstructed, compared and tracked. Questions of "Why?" and "How?" and what data mean for policy can only be answered through careful interpretation and by fleshing out the skeleton with scientific research and contextual information.

Finally, drug phenomena, policy environments, information needs, scientific methods and information technologies constantly change. Implementing information systems and carrying forward research thus involve a continual process of development and innovation. This, in turn, requires long-term commitment to a coherent framework both for funding and for facilitating continuity of institutions, individuals and networks.

The broader context: research and international cooperation

Qualitative and quantitative research

In parallel to indicators, multidisciplinary epidemiological research, both qualitative and quantitative, is vital. In the area of qualitative research, EMCDDA has organized conferences, thematic work groups and literature reviews that resulted in several publications [47-49] and a web site, Qualitative European Drug

Research, giving access to databases on qualitative research projects, researchers and publications [50]. Apart from the instrumental utility of tools for information collection and exchange, a key goal is to raise awareness of the value of qualitative research, for example in making sense of statistics or providing insight into "Why?" and "How?"

Reviews and conferences have also examined the potential utility of statistical and dynamic modelling [51, 52] and EMCDDA has promoted, with funding from the European Commission Research Directorate under the Targeted Socio-economic Research programme, a European network of modellers to develop policy-relevant models and socio-economic analyses, including incidence and time trends, applications of geographical information systems (GIS) and analysis of social costs and cost-effectiveness, in particular concerning hepatitis C [53]. An important limitation at present is data availability and quality, especially for models requiring consistent time series or more disaggregated data. As data improve, modelling should offer exciting possibilities for simulating and analysing different policy scenarios.

More limited attention has been paid to the supply side and to criminal justice system indicators, though existing data have been collected since the Centre began. Work has recently started to review available research and develop indicators of drug-related crime, availability of drugs and drug-related social exclusion. Preliminary work has also begun both at the Centre and in some member States to describe and estimate the characteristics and dimensions of drug markets and drug flows, with a view to assessing their impact and the potential effect of interventions [54, 55].

The final area concerns emerging trends and "early warning". Initially, the focus was synthetic drugs, notably methylenedioxymethamphetamine (MDMA, or Ecstasy), which became popular throughout the European Union in the 1990s [56]. A variety of studies and conferences on the techno scene and nightlife have taken place [57]. A specific legal instrument, a Joint Action on information exchange, risk assessment and control of new synthetic drugs, was adopted by the Council of the European Union in 1997 and four substances have been assessed under the auspices of the EMCDDA Scientific Committee—*N*-methyl-1-(1.3-benzo-dioxol-5-yl)-2-butamine (MBDB), 4-methylthioamphetamine(4-MTA), ketamine and gamma-hydroxybutyric acid (GHB) [58]. From an epidemiological perspective, attention at EMCDDA has been directed towards developing a broader model for understanding and, if possible, forecasting changing patterns of drug consumption within the wider context of social and cultural trends in youth based, for example, on analysis of youth media or perceptions of drugs and risks among young people [59].

European research and networks

Various reviews of epidemiological research on drugs in Europe were conducted in the 1980s and 1990s [60-64]. In addition to the EMCDDA annual reports, several reports cover data collection and drug trends in Europe, for example, by those

of the WHO Regional Office for Europe [65, 66], updates of the Pompidou Group multi-city study mentioned earlier, or the report based on the COST-A6 project on Evaluation of Action Against Drugs in Europe, funded by the European Commission Research Directorate [67]. Other research networks that also cover drug epidemiology include the European Society for Social Research on Drugs [68], the Kettil Bruun Society for Social and Epidemiological Research on Alcohol [69] and IREFREA [70].

At the European Commission, the 5th Framework Programme (1998-2002) of the General Directorate for Research for the first time included specific references to drugs under public health, but it was not easy to link research needs identified by EMCDDA and its partners to the process of application and selection of projects. The 6th Framework Programme (2002–2006) seeks to consolidate European research in priority areas through support for research networks and major research programmes, but the challenge remains to link research agendas in the drug field to decision-making processes on research funding in the Commission.

A final comment on research: research on illegal drugs has often been carried out separately from research on alcohol, tobacco or psychoactive medicines. In several member States, there are clear moves towards integrating all substances under one policy umbrella. If this trend continues and extends to the European level, then it is likely that information needs at the national and European levels will broaden too.

International connections

The development of drug epidemiology and drug indicators in Europe over the past 20 years has taken place in the context of increasing cooperation between regional and international organizations. As noted earlier, long-standing links between individuals made important contributions to this process. These international connections have been facilitated by the International Epidemiology Work Group, which has been an especially valuable mechanism for information exchange between researchers, international organizations and regional or sub-regional drug epidemiological networks. For example, a meeting of key international organizations and regional epidemiology networks held at EMCDDA and supported by the United Nations International Drug Control Programme in January 2000 led to the consensus reached by technical experts at a meeting held in Lisbon in January 2000 [71], which gives a framework for improving the comparability and value of indicators at the international level.

More specific examples of cooperation include the revision of the annual reports questionnaire [72] by the United Nations International Drug Control Programme, in close collaboration with EMCDDA and the Inter-American Drug Abuse Control Commission (CICAD), or cooperation between EMCDDA and WHO on drug-related deaths and guidelines for the tenth revision of the International Classification of Diseases (ICD–10) (together with Eurostat). In the field of AIDS and other infectious diseases, EMCDDA is an active participant in the Global Research Network on HIV Prevention in Drug-Using Populations, as well as

contributing to international harm reduction conferences and international AIDS conferences. Cooperation between EMCDDA and the Pompidou Group continues, especially on the treatment demand indicator.

While the focus of the present article is on Europe, and mainly Western Europe, the evolution of drug epidemiology in Europe is part of wider developments occurring in the international arena. Cooperation and information exchange may be time-consuming, but they are essential for cross-fertilization of ideas and stimulation of innovation.

Conclusions

Substantial developments in drug epidemiology have taken place over the past 20 years in Europe, especially in terms of indicators, methodology, comparability, implementation in member States and synthesis and analysis at the European level. Six major factors can be described that have influenced that process.

One factor was the evolution within the European Union of competencies in the field of drugs, together with a second factor, the rising political priority of drugs across the areas of public health, public security (justice and home affairs) and external relations. A third element, following from the first two, was a clear demand from the various European institutions, as well as member States, for information and evidence for policy-making and decisions. A fourth factor was the creation of instruments such as the Pompidou Group and then EMCDDA and its national counterparts to meet those information needs. A fifth factor was the existence, alongside the institutional developments, of long-standing and interlinked human networks of drug researchers and the possibilities to channel that scientific knowledge into the institutional process. The final factor was the wider influence of international connections and the exchange of knowledge and experience.

The progress achieved over the past 20 years in drug epidemiology in Europe does not mean that all the problems of distance between science and policy have been solved. But it is at least a start.

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The Caribbean epidemiological network: the complexities of developing a regional perspective

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ABSTRACT

The present article describes the geographical, political and cultural difficulties involved in developing a regional drug abuse epidemiological network in the Caribbean. Earlier initiatives such as the Caribbean Community Epidemiology Task Force failed owing to a lack of resources. It was not until 1996 that a major success was achieved, when the Plan of Action for Drug Control Coordination and Cooperation in the Caribbean laid the groundwork for the establishment of a comprehensive and sustainable effort to control substance abuse in the region through drug demand reduction. In 1997, the Santo Domingo Declaration against Drugs reinforced the recommendation of the Barbados Plan of Action and called for the timely implementation of an epidemiological system for substance abuse. Subsequently, member States of the Caribbean Community allocated resources to the Drug Abuse Epidemiological and Surveillance System Project, which is being implemented by the Caribbean Epidemiology Centre. Within the framework of the project, the Caribbean Drug Information Network was launched in 2001; this concentrates on institution-building, training and the development of practical expertise in survey research. In order for the Network to continue its work, it will need further political support, adequate funding and the ability to link its activities to other aspects of demand reduction.

Keywords: Caribbean; drug abuse; demand reduction; epidemiology network; regional initiative.

Introduction

Features of the sector

The Caribbean region has a total land area of 700,000 sq km and comprises a number of islands, including those in the Caribbean Sea, along with the Guianas (Guyana, French Guiana and Suriname). If all the Caribbean islands that fall into

the Greater Antilles, the Lesser Antilles, the southern islands and the Bahamian archipelago are counted, they total 28 countries and territories (including the Guianas and Belize) between North and South America. The Caribbean is a multi-lingual, multi-ethnic and multicultural region that reflects the influences of several major Powers. There is considerable variety in this region of 37 million people: four major languages across the territories of the Netherlands, Spain, the United Kingdom of Great Britain and Northern Ireland, the United States of America and the independent States, several judicial systems and diverse religious and political units.

The establishment of the Caribbean Community (CARICOM) has brought greater freedom of movement for both people and goods. There has also been a huge increase in commercial and other contacts abroad, in particular with neigh-bouring Colombia and Venezuela. Between the islands there is a daily movement of small fishing boats, cargo and cruise ships, yachts and private and commercial planes. There is also considerable migration and mobility among the Caribbean population within the region, with many Caribbean migrants living in North America and Europe, while direct access to North America and Europe has resulted in rising numbers of tourists from those areas. All of these factors have made the region more accessible and more attractive as a transit zone for the traffic of illicit drugs.

Given their geographical location between the main drug-producing areas of South America and the large consumer markets in Europe and North America, the Caribbean islands are vulnerable to drug trafficking: it is now estimated that 40 per cent of all the cocaine entering the United States comes through the Caribbean. In 2000, the Caribbean corridor was the source of 47 per cent of the cocaine entering the United States, overtaking Mexico as the main source of cocaine for the United States market. The Caribbean also plays a significant role in the supply of cocaine for the European market. Thirty-two per cent, or 80 tons, of European drug imports passed through the Caribbean in 2000. The cost of drug control measures is a heavy burden on the national budgets of the Caribbean States, possibly consuming up to 15 per cent. In some Caribbean countries, the cost of increased policing and national security operations to counter trafficking and violent drug-related crimes has doubled in the last five years.

Law enforcement sources have calculated that an increasing portion of the illicit drugs transiting the region is being left behind for local consumption: traf-fickers are paying in kind with drugs for services rendered and, consequently, drug use, abuse and trafficking are on the rise. The obvious consequence of this is an increasing burden on health systems as they struggle to provide services to address the psychological and physical effects of intoxication, drug withdrawal and chronic addiction. In addition, the incidence of violence and crime is rising, owing to the needs of armed drug dealers and drug abusers to maintain their habit.

Although there is no empirical evidence or causal linkage between drug activi-ties and crimes such as theft and homicide in the region as a whole, in some countries there is evidence of the association. For instance, in 1991, Jamaica reported a 75 per cent increase over 1990 in the incidence of murders linked

directly or indirectly to drug trafficking. Countries reporting thefts, homicides and serious assaults have also featured prominently over the past decade as centres of drug activity, namely, the Bahamas, the Dominican Republic, Guyana and Jamaica. Consequently, the police and judiciary throughout the Caribbean are dealing not only with petty crimes, but also with more serious crimes such as causing serious bodily harm and murder that are associated with drug abuse.

Earlier sectoral policy on a Caribbean epidemiology network

Policy makers and planners in the Caribbean nations need reliable and timely data on the prevalence and incidence of drug and alcohol use in their respective countries. This is necessary to track trends over time, develop country-specific risk profiles of particular population groups, appropriately target demand-reduction programmes and resources and establish benchmarks against which to evaluate the impact of interventions. Many Caribbean countries do not collect such statistics regularly and, although some surveys have been done, as questionnaires and methods have changed over time they have yielded results that are not comparable.

A CARICOM epidemiology task force was set up in 1991 and met several times, with the aim of deciding on the details of a regular monitoring system. The effort has run into a number of obstacles, however. While the task force did agree on the desirability of secondary school surveys, only a few countries have been able to carry them out. The analysis of the resulting data has been delayed because of a shortage of staff both in the countries and in the CARICOM secretariat and a lack of computer hardware and data analysis software. In addition, the Caribbean Epidemiology Centre (CAREC), based in Trinidad and Tobago, which originally supported drug data collection and analysis, had to cancel the contract of its resident drug epidemiologist owing to a lack of funds. The English-speaking, non-autonomous territories have not participated in any region-wide drug epidemiology effort and, as far as is known, have not compiled any statistics.

The situation in the Spanish-speaking countries is slightly different: the Dominican Republic participated for five years in the Inter-American Drug Abuse Control Commission (CICAD) drug epidemiology system in Central America and still continues to participate in the new CICAD Inter-American Drug Use Data System. Cuba has not participated in a multinational drug epidemiology programme. Thus, at the United Nations International Drug Control Programme (UNDCP) expert forum on demand reduction in the Caribbean, held in the Bahamas in October 1994, participants indicated that no coherent regional mechanism for the collection of data on drug use had been established. The forum therefore recommended that a standardized method for basic data collection be established. Eighteen months later, the joint European Union/UNDCP Regional Meeting on Drug Control Coordination and Cooperation in the Caribbean, held in Barbados in May 1996, also concluded that a Caribbean-wide drug epidemiological surveillance system did not exist and should be established promptly in cooperation with regional organizations. The Barbados Plan of Action for Drug

Control Coordination and Cooperation in the Caribbean (the Barbados Plan of Action) was therefore launched in the region.

The implementation of the Barbados Plan of Action, discussed by Caribbean Governments at a second regional meeting, held in the Dominican Republic in December 1997, called for a unified drug epidemiology system in the region to be implemented in close cooperation with CICAD. Of particular interest to the participants at the Barbados meeting was the regional drug epidemiology surveillance system established by CICAD in Central America and the Dominican Republic. Of interest also was its successor, the Inter-American Drug Use Data System, which began throughout the hemisphere in 1997. The System consists of a set of standardized instruments that can be used to collect data on drug use and abuse. It was adopted by CICAD in October 1996 and an international advisory group was formed to oversee its implementation.

Prospects for a new regional initiative

Heads of Government recognize that drug trafficking in the region continues to threaten the peace, security and sustainable economic and social development of communities and that there is an urgent need to consolidate and accelerate the process to unite and coordinate efforts to reduce demand. A new initiative is needed to focus attention on these efforts.

The many regional drug abuse forums that preceded and followed the adoption of the Barbados Plan of Action continued to reiterate the need for the implementation of a comprehensive and sustainable effort at substance abuse control in the region through demand reduction. CARICOM heads of Government approved a regional programme on drug abuse abatement and control in 1996. Most of the member States of the Caribbean Forum of African, Caribbean and Pacific States (CARIFORUM), consisting of the member States of CARICOM plus the Dominican Republic and Haiti, had already ratified the Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol [1], the Convention on Psychotropic Substances of 1971 [2] and the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988 [3] and were operating within that framework in terms of legislation and policy development. The regional programme had six components: epidemiology, surveillance, preventive education, public awareness, law enforcement, treatment and rehabilitation and the coordination of a secretariat.

In 1997, in the Santo Domingo Declaration against Drugs, the Governments of the region reiterated their policy with respect to the timely implementation of an epidemiological system for substance abuse. Member States of CARICOM, as a practical manifestation of their existing policies, decided to make an indicative allocation of resources from the Caribbean Regional Indicative Programme of the Eighth European Development Fund to a Drug Abuse Epidemiological and Surveillance System Project to establish a regional surveillance network.

The ministers of health of the CARICOM countries had earlier identified CAREC as the organization most appropriate to assume drug epidemiology

responsibilities, given its mandate; it was therefore designated the implementing agency for the project. The project is housed in and technically managed by the Non-Communicable Disease Division of CAREC. Given their expertise and experience in drug control and prevention, UNDCP and CICAD also act as key partners in the implementation of the project.

The Caribbean Epidemiology Centre and the Caribbean Drug Information Network

CAREC has as its mission to improve the health status of the people of the Caribbean region by advancing the capabilities of member countries in epidemiology, laboratory technology and related public health disciplines through technical cooperation, service, training, research and well-trained and motivated staff. It is administered on behalf of the 21 member countries by the Pan American Health Organization. CAREC enjoys an international reputation for its work in support of public health in the Caribbean.

The overall objective of the Caribbean Drug Information Network (CARIDIN), is to strengthen the capacity of Caribbean Governments, technical entities and regional agencies to respond to changing drug abuse patterns and trends and to contribute to the abatement of drug abuse in the region. The purpose of the Drug Abuse Epidemiological and Surveillance System Project is to establish a sound database and an early warning surveillance system to assist national and regional policy makers in the area of demand reduction.

The potential impact of the Drug Abuse Epidemiological and Surveillance System Project

The project is designed to lay the groundwork for the long term and therefore concentrates on institution-building, training and the development of practical expertise in survey research. Such an approach should ensure that the national drug information networks and national research teams are able to organize surveys of all types and collect surveillance data, as well as epidemiological data. The data generated as a result of the surveillance system are not expected, in the first instance, to provide a comprehensive picture of drug use throughout the population. However, over time they will serve as an early warning for policy makers in the ministries of health, education and justice and in the key social services of the type of drug abuse problems they are facing and for which they need to plan.

Limitations and potential stumbling blocks

The objective of CARIDIN is to create a foundation for regional and national drug information systems. Its success will depend to a great extent on how the initial institution-building, training and development of practical expertise are used at the regional and national levels for future research activities and projects that will

contribute to those systems. There are several potential obstacles to the success of CARIDIN, regionally and nationally: at the regional level, the project's main endeavours, such as better information-sharing between countries, increased comparability of data on drug use across the region and the use of information for regional policy decisions, will not be successful if heads of State and other regional statutory institutions fail to endorse its efforts as one of the region's priorities in its fight against drugs. In addition, a regional initiative such as CARIDIN must have the flexibility to adapt to national differences in expertise, infrastructure and language.

At the national level, the objectives of CARIDIN will not be met if its activities fail to attract broad participation of communities and related organizations or fail to contribute to developing an integrated demand and supply reduction strategy. Lack of advocacy with regard to the utility of CARIDIN products among stakeholders and government officials will diminish its long-term sustainability. Products will also need to be used in establishing national and regional prevention policies, otherwise they will not receive the recognition they deserve. The data gathered must be translated into action plans, such as new educational programmes, with care. It is also imperative that the data gathered be used to begin to enhance the quality of life of drug users, who are already in need, and young people, who are at risk.

Other stumbling blocks at the regional and national levels are changes in Government, with their associated potential changes in priorities, and attrition among and migration of trained personnel and national coordinators. The enhancement of expertise in the region cannot rely on a single project; additional training facilities are needed in order to broaden the involvement of regional expertise. The only training facilities for addiction studies in the region were the Caribbean Institute on Alcoholism and Other Drug Problems and the addiction studies course offered by the University of the West Indies. However, the Caribbean Institute has only offered two regional courses in epidemiological research methodologies, on a one-time basis only, and the addiction studies course offered by the University of the West Indies exhausted its funding and had to close.

Sustainability and future support

The policy environment throughout the Caribbean region appears at present very favourable to long-term government commitment to continuing the effort to develop a standardized methodology for drug abuse epidemiology surveillance data that would facilitate comparison among the countries. The countries of the region are now implementing the Barbados Plan of Action and enjoy considerable international support, while the member States of the Organization of American States have adopted the Anti-Drug Strategy in the Hemisphere, a new commitment in the Americas to fighting the drug problem. With drug abuse rising, the general public is demanding more effective government action to prevent drug use, in particular among young people. The concern expressed by several Governments is that they

do not have the funds to engage and maintain technical staff over the long term. This is particularly true in the smaller islands, where the health and research capacities of Governments are already overstretched. The Drug Abuse Epidemiological and Surveillance System Project will help in alleviating the human resource shortage by strengthening a Caribbean institution, CAREC, capable of performing regional data analysis and providing technical assistance. The current lack of information is holding back effective drug policies and slowing alleviation of the drug problems of the Caribbean region. The European Monitoring Centre for Drugs and Drug Addiction can play an important role in the region in that respect, since there are no other donors that can be expected to fund research. The European Union has outstanding experience in and knowledge of such research and research with European expertise can also raise the profile of the European Union in the region.

At the global level, support is given through the UNDCP Global Assessment Programme. At the special session of the General Assembly on drugs, held in New York from 8 to 10 June 1998, Member States requested UNDCP to provide the assistance necessary to compile reliable and internationally comparable data on drug use. The Global Assessment Programme was established to that end and to support regional epidemiology networks such as CARIDIN.

Implications for continued support

An epidemiological network cannot develop without taking into consideration the different aspects of demand reduction. For the Caribbean region, drug demand reduction comprises the following areas: strengthening of institutions and development of human capital; policy development; prevention education; treatment and rehabilitation; research and development; and the management and coordination of programmes. Data collection is closely linked to the level of operation within each area and improvement of each aspect thus has a substantial impact on the development of data collection strategies.

Policy development

The reality for policies in the health and social sector in most, if not all, Caribbean States is that the problems associated with the drug epidemiological transition coexist with other health and social problems. Human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) and other sexually transmitted infections, traffic accidents, crime and violence, suicides and psychiatric co-morbidity are all interrelated problems associated with drug use that lead to the subsequent social degeneration of society. In addition, large numbers of young people will exacerbate health problems stemming from interrelated risk behaviour activities such as smoking and alcohol abuse, other drug use, violence, traffic accidents and sexual activities. To address those problems, models for an organized social response to adolescents and young people and the society as a whole could be built and adopted by the region. Given the interconnection with

other health and social problems, data collection on substance abuse will need to be linked with other social data systems such as those on HIV/AIDS, youth, poverty and crime.

Prevention education

The prevention of illnesses related to drug use requires a radical change in thinking about health care. The health care systems of the CARICOM community have been based on the simple premise that people fall sick and must be treated. By contrast, the prevention of drug abuse-related illnesses requires the individual to act. He or she is now called on to take personal responsibility for his or her everyday actions and failure to do so will be seen as an infringement on the rights of his or her fellow citizens. Millions of dollars are spent on the treatment of lung cancer, 90 per cent of which is related directly to cigarette smoking, and the only way to reduce that expenditure is to persuade citizens to stop smoking or not to start smoking. The regional institutions have no choice: a conscious decision has to be made to promote healthier lifestyles. It is highly efficient to identify drug components within other developmental projects and programmes, such as poverty alleviation, HIV/AIDS, community empowerment and crime prevention. Such projects are probably more effective in reducing drug use than primary prevention projects, because developmental projects address the underlying cause of problematic drug use and focus on the groups most at risk.

Treatment and rehabilitation

One of the major problems that hinders drug abuse control initiatives in the region is the lack of treatment facilities, especially on the smaller islands. Medical detoxification for drug users is provided mainly by psychiatric or general hospitals; other treatment facilities are residential programmes aimed at total abstinence. There is a lack of specialized services other than these, for example, services for women and young people, drop-in centres and outpatient counselling services. In addition, treatment facilities often operate without any standards as regards quality of care. Until there are standards in place and the effectiveness of treatment services has been improved, any attempt to collect data among treatment facilities will be a low priority. CARIDIN will also have to advocate the evaluation of tertiary prevention, as well as the continuing development of treatment programmes.

Research and development

Member States of CARICOM are convinced that the absence of a comprehensive and comparable database on drug abuse patterns and trends, at a time when the population of the Caribbean region is increasingly exposed to illicit drugs, is inhibiting national capacities to plan and implement proper rehabilitation, prevention and control programmes. There is a tremendous need for information that can be used for the development of evidence-based policies. Member States are

convinced that planning and programming activities are not sufficiently focused or cost-effective, owing to the inadequacy of national data compilation and coordination, the poor quality of existing data and their lack of regional comparability, the scarcity of appropriately trained personnel and the low level of information-sharing across the region. For research and development activities at the regional and national levels to be truly beneficial for programme initiatives, credible evidence must be compiled and shared on a continuous basis across the region. CARIDIN is now well-placed to collect, analyse and disseminate data and studies on drug use in the Caribbean in order that the magnitude of the drug problem in the region can be properly assessed.

Conclusion

CARIDIN will need continued funds from Governments of the region and external donors, or both, in order to continue its work. In establishing regional and national drug epidemiology networks, it is essential to create links between project activities and existing or future sources of expertise, as well as to infrastructure related to epidemiological research. Donors should therefore be aware that training is essential for people working in demand reduction. Unfortunately, in the past, external donors have invested heavily in training law enforcement officers, but neglected the demand side. An integrated and balanced approach to the fight against drugs can only succeed, however, if efforts to reduce the demand for drugs are recognized as being equally as important as the efforts made to reduce supply.

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Developing the Southern African Development Community Epidemiology Network on Drug Use: methods and issues

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ABSTRACT

In 2000, the Southern African Development Community (SADC) commissioned the Medical Research Council of South Africa to establish the SADC Epidemiology Network on Drug Use (SENDU). The goal of SENDU is to improve the information base for policy makers in SADC member States to address the health, social and economic burden caused by the misuse of alcohol and other drugs. In the present article, the authors describe the methods being used to set up an alcohol and drug surveillance system in the 14 SADC member States, focusing in particular on areas such as training and technical support, the development of networks of stakeholders in each country, core indicators and data sources, data validation and collation and information dissemination. The article also discusses other issues of relevance to establishing community epidemiology networks on drug abuse in developing countries, including structural issues at the national and international levels, resource constraints, funding and concepts such as the need for flexibility and adopting a "small-wins" approach. While it is too early to assess the impact of the SENDU initiative, the authors believe that it is already proving to be of value.

Keywords: Southern Africa; surveillance; drug abuse; epidemiology; methods.

Introduction

The Southern African Development Community (SADC) was established in 1992 and comprises 14 member States. Its member States differ greatly in terms of land area, population, income levels and official languages (see table 1). The region has a population of approximately 200 million and a land mass equal to that of the United States of America. Poverty reduction, managing the impact of the human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) and dealing with political instability are among the key issues currently facing SADC.

Table 1. Southern African Development Community member States: selected indicators

Member State	Land area (sq km)	Population[a]	Gross domestic product per capita[b] (United States dollars)	Official language or languages
Angola	1 246 700	10 366 031	1 000	Portuguese
Botswana	600 370	1 586 119	6 600	English
Democratic Republic of the Congo	2 345 410	53 624 718	600	French
Lesotho	30 355	2 177 062	2 400	English
Malawi	118 480	10 548 250	900	English and Chichewa
Mauritius	1 860	1 189 825	10 400	English
Mozambique	801 590	19 371 057	1 000	Portuguese
Namibia	825 418	1 797 677	4 300	English
Seychelles	455	79 715	7 700	English and French
South Africa	1 219 919	43 586 097	8 500	[c]
Swaziland	17 363	1 104 343	4 000	English and Siswati
United Republic of Tanzania	945 087	36 232 074	710	English and Swahili
Zambia	752 614	9 770 199	880	English
Zimbabwe	390 580	11 365 366	2 500	English
Total	9 296 201	202 789 533		

Source: United States of America, Central Intelligence Agency, *The World Fact Book 2001,* Washington, D.C.

[a]2001 estimates.

[b]Purchasing power parity (2000 estimates).

[c]There are 11 official languages. English predominates.

In 2000, the Medical Research Council of South Africa was commissioned to establish sentinel surveillance systems in all SADC member States as part of the SADC Regional Drug Control Programme [1]. This initiative has been driven by the view that the burden of harm from alcohol and other drug use in Southern Africa is likely to increase with development and by the 1996 SADC Protocol on Combating Illicit Drugs, which highlights the importance of information and research to inform interdiction and demand reduction activities [2].

The regional network established in October 2000 was named the SADC Epidemiology Network on Drug Use (SENDU). SENDU has been modelled on the South African Community Epidemiology Network on Drug Use (SACENDU), an alcohol and drug surveillance system established in 1996 and comprising a network of researchers, practitioners and policy makers from five sentinel sites in South Africa [3]. In addition to providing information on trends in alcohol and drug use and abuse, SACENDU has been instrumental in building research capacity, stimulating alcohol- and drug-related research in new or underserved areas and in providing suggestions for substance abuse policy and practice [4].

The overall goal of SENDU is to improve the information base for policy makers in SADC member States with a view to addressing the health, social and economic burden caused by the misuse of alcohol and other drugs. Specific objectives include:

(a) Developing a network of stakeholders at one or more sites in each of the SADC member States;

(b) Reaching agreement on a set of indicators for measuring the nature, extent and effect of alcohol and drug use;

(c) Collecting data on alcohol and drug indicators at each site;

(d) Sharing, validating and collating the information collected every six months at each site and regionally;

(e) Disseminating information to policy makers and practitioners at the national and regional levels;

(f) Lobbying key decision makers to use the information provided by the surveillance system and to support its ongoing development;

(g) Evaluating the effectiveness of the project.

Methods

The above-mentioned objectives are being addressed through the tasks described in the sections below, which are to be undertaken between 2000 and 2005.

Training and technical support

A consultation was held in Pretoria for four days in October 2000. It was attended by representatives of all SADC member States. Support was provided to the consultation by the SADC Drug Control Officer and United Nations International

Drug Control Programme (UNDCP) staff involved in the Global Assessment Programme on Drug Abuse [5]. Prior to the consultation, representatives had completed an audit form to assess the nature and extent of possible sources of information on alcohol and drug use in each country and identify avenues for improving the quantity and quality of such information. At the consultation, training was provided via lectures and participation in a national meeting on the SACENDU project. Training objectives included providing participants with information on *(a)* the need for ongoing monitoring of trends in alcohol and drug use; *(b)* different methods of monitoring trends in alcohol and drug use; and *(c)* the establishment of aggregate community-based epidemiology networks, the identification of the specific indicators used and the methods for collecting, analysing and reporting on data.

A second major component of training involves four- to seven-day technical support visits to each country. In 2001 and the first half of 2002, visits were made to Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia and the Seychelles. Visits to the remaining countries will be completed by the end of June 2004 (see table 2). The objective of the visits is to learn more about patterns of alcohol and drug use in each country, to meet with government officials to inform them about the SENDU initiative, to assist countries in developing instruments to collect and collate information on alcohol and drug use and the associated consequences, support country coordinators in organizing an initial meeting of potential members of a network for the surveillance of alcohol and drug use, to conduct visits to agencies where data are to be collected and to identify other areas where technical or other forms of support are required.

Table 2.   Proposed schedule for the development of SENDU sites

Member States	Technical support visits	Official start of data collection	First report on data at regional meeting
Lesotho, Mauritius and Seychelles	January-June 2001	July-2001	April/May 2002
Botswana and Namibia	July-December 2001	January 2002	October/November 2002
Malawi and Mozambique	January-June 2002	July 2002	April/May 2003
United Republic of Tanzania	July-December 2002	January 2003	October/November 2003
Zambia and Zimbabwe	January-June 2003	July 2003	April/May 2004
Swaziland	July-December 2003	January 2004	October/November 2004
Angola and Democratic Republic of Congo	January-June 2004	July 2004	April/May 2005

Note: South Africa's system for the surveillance of alcohol and drug use has been operational since July 1996, the first data having been reported in April 1997.

Additional training is provided via ad hoc training exercises (for example in data management and analysis techniques), biannual regional "report-back" meetings, one-on-one contact between Medical Research Council staff and site facilitators, and via biannual newsletters (*SENDU Update*) and reports.

Developing networks of stakeholders

The establishment of community epidemiology networks at one or more sites in each country is both an objective of the SENDU project and a means of achieving other objectives. Community epidemiology networks are multi-agency work groups with a public health orientation that study the spread, growth or development of substance abuse and related problems [6]. Network members access existing information from a variety of sources. They meet periodically to review, compare and draw conclusions from the data. The data are presented in standardized format to facilitate review and comparative analysis. Qualitative studies may be conducted to help members understand the quantitative findings from existing data sets [6]. Regional, national and local networks have been established in various parts of the world [7].

The primary objectives of network members are to identify patterns of drug use in defined geographical areas; identify changes in drug abuse patterns over defined periods in order to establish trends; detect emerging trends of drug abuse; and communicate and disseminate the information to appropriate community agencies and organizations so that it can be used in developing policies, practices, prevention strategies and research studies. Network members include individuals who are in a position to contribute and assess information about drug use in specific geographical areas. They may represent agencies and organizations that have some responsibility for addressing substance abuse problems or that directly benefit from acquiring information about drug abuse. Researchers and other individuals who have special knowledge about a particular drug-using population may also participate [6, 7].

In the SENDU project, the establishment of local networks is initially stimulated through one-on-one meetings and site visits set up as part of the technical support visits, as well as through a one-day workshop held during each visit. Further impetus for developing the network comes from the "report-back" meetings that take place at each site twice annually. New members can be added to the networks at any time.

Agreeing on core indicators and identifying data sources

At the consultation, country representatives were presented with a list of indicators of alcohol and drug use and the associated consequences, categorized by data source. Indicators and data sources included:

(a) Primary and secondary substances of abuse reported by clients on admission to facilities specialized in the treatment of alcohol and drug abuse;

(b) The proportion of admission and discharge diagnoses related to substance abuse, as reported by acute psychiatric treatment facilities;

(c) Deaths related to alcohol and drug use, as reported by mortuaries;

(d) Emergency department admissions related to alcohol and drug use, as collected via self-report measures and biological markers;

(e) Arrest, seizure, drug composition and price data obtained from narcotics squads and police forensic science laboratories;

(f) Behaviour related to alcohol and drug use and the associated consequences reported through surveys or focus-group interviews of secondary school students, persons attending rave parties, sex workers, street children, prisoners or persons attending primary health-care clinics;

(g) Crime related to alcohol and drug use via self-report and urinalysis from persons arrested for a variety of crimes.

These indicators have considerable overlap with the core indicator package identified by a group of technical experts in Lisbon in January 2000 at a meeting sponsored by UNDCP on the principles, structures and indicators necessary for effective drug information systems. This indicator package later served as the basis for the redrafting of part II of the revised United Nations annual reports questionnaire of UNDCP.

At the consultation meeting, broad agreement was reached on the suitability of the indicators and sources listed above. Further refinement of the core indicator set ("basic system") and additional elements has taken place during technical support visits to different countries. Where appropriate, it has been recommended that data should be reported by defined age category and by gender. The "basic" system comprises data on treatment demand from specialist substance-abuse treatment facilities, if available, and psychiatric hospitals, as well as information from the police on arrests, seizures and drug prices (table 3). Additional components might include school studies, mortuary or emergency department studies or data collected from non-governmental organizations (for example, agencies that work with youth). Additional components can be added as the data collection system develops at a particular site. The intention is to look for agreement across indicators collected from different sources to understand alcohol and drug abuse behaviour and the associated consequences.

Collecting data on alcohol and drug indicators at each site

Following the establishment of site-specific networks and having reached agreement on the indicators and data sources to be accessed at a specific site, country facilitators are encouraged to start collecting data twice annually from each source, starting either from 1 January or 1 July. Where required, further assistance is given to stakeholders. For example, in most countries, workshops have been held to assist staff from centres for the treatment of alcohol and drug abuse and the responsible government department in preparing a standardized

data-collection instrument and in reaching agreement on mechanisms for collating information across centres. Model data-collection instruments have been developed and made available in various areas, for example, for centres for the treatment of alcohol and drug abuse, police narcotics units, primary health-care centres, prisons and psychiatric facilities.

Table 3.   Main data sources likely to be used in selected countries during phase 1

Source	Botswana	Lesotho	Mauritius	Mozambique	Namibia	Seychelles	South Africa
Health, social service sector							
Specialist treatment centres		x	x	x	x	x	x
Psychiatric units	x	x	x	x	x	x	x
Mortuaries	x				x	x	x
Emergency rooms							x
General wards				x			
Law enforcement, justice, prisons							
Drug unit or forensic science laboratory	x	x	x	x	x	x	x
Prison data			x		x		
Probation services	x					x	
Traffic department	x				x		
Other							
Alcohol production			x			x	
Other non-governmental organizations	x			x	x	x	
School counsellors						x	

Sharing, validating and collating the information collected

The intention is for each local network to hold biannual "report-back" meetings, at which information will be presented by data source. Persons hosting the meetings are encouraged to allow sufficient time for discussion, so that members of the network can "interrogate" the data, that is, look for similarities, dissimilarities and changes over time and find explanations for them. It is then the job of the site facilitators to collate the information across the different sources (and over time, once trend data are available) and to prepare site reports according to a model format. Site coordinators are also encouraged to highlight issues to monitor, issues requiring more in-depth research and implications or suggestions for policy and practice.

Biannual "report-back" meetings are also held at the regional level to facilitate the presentation of country reports and discussions on similarities, dissimilarities, trends, and so forth. The Medical Research Council has been commissioned to prepare regional reports twice a year, collating the information obtained from the country reports and undertaking further trend and predictive analyses.

Information dissemination and advocacy

Information dissemination is a vital component of the SENDU initiative. Dissemination focuses on various audiences. At the national level, it includes members of the network at each site, the media, the general public and policy makers who are not part of the network. At the international level, it includes network members from other national or local networks, the SADC Drug Control Committee and United Nations entities such as UNDCP and the World Health Organization (WHO). In order to reach such diverse target audiences, a variety of technologies are employed, ranging from briefing documents and press releases to reports of varying length. These are sent by post and put on a web site.[1] Radio and television interviews have been held in most of the countries that have joined to date. Special briefings have also been made to parliamentary committees and to selected policy makers in South Africa using data derived from SACENDU. To date, presentations on both the South African and regional networks have been given at international meetings held in the United States of America and in Europe. Ongoing advocacy for SENDU is required to ensure that the data generated are fed through to policy makers and to facilitate financial support for the national and regional networks.

Project evaluation

An external evaluation of the SENDU initiative is planned by SADC. It is expected that this will be undertaken towards the end of the first five-year funding cycle and will include an assessment of the project in terms of the level of participation of the stakeholders, the completeness and quality of the information obtained, the usefulness of the process and the information obtained by network participants and policy makers and the appropriateness of indicators. A good evaluation will be a major boost to ensuring ongoing support for the initiative by SADC member States.

Key issues

The section on methods contained an outline of the broad strategies to be used to achieve the specific objectives detailed in the introduction to the present article. There are, however, other issues that need to be discussed to give a fuller picture

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[1]The South African health knowledge network (www.sahealthinfo.org/admodule/sendu.htm).

of what has been implemented in Southern Africa and those ingredients believed to be of value in establishing community epidemiology networks in developing countries.

Structural issues

At the national level, it is essential to have a strong lead agency that can nurture the development of the surveillance system. The lead agency should be an institution with a stable funding base. Ideally, there would be more than one "champion" within each country to drive the process. Each country has been encouraged to establish a small steering committee comprising persons from different sectors with diverse skills to oversee the development of local networks. The functions of the steering committee include determining the data sources to be included in each surveillance system; liaising with the various persons or agencies responsible for collecting data to ensure that they are willing and equipped to start data collection; assisting the lead agency in collecting, collating and analysing the data generated at each phase and in preparing country reports at the end of each phase of data collection and in preparing presentations for the regional "report-back" meetings; supporting the lead agency in preparing for biannual "report-back" meetings; and ensuring the ongoing functioning and expansion of the surveillance system.

International support is also useful in developing national surveillance systems. Having the cooperation of the SADC secretariat, in particular, has facilitated the establishment of SENDU. The technical support visits by the Medical Research Council team (accompanied by the SADC Drug Control Officer) have been a useful catalyst in establishing such systems at the country level. Furthermore, the regular regional "report-back" meetings that are also attended by the members of the SADC Drug Control Committee facilitate the ongoing functioning of the national surveillance systems. The support given by the Global Assessment Programme has also been of value, particularly in terms of the technical support given by the regional epidemiology advisers. Both the National Institute on Drug Abuse of the United States and UNDCP have provided opportunities for the SACENDU and SENDU initiatives to be represented at international forums and for project staff to observe how other national and regional surveillance systems operate.

Capacity development and resource constraints

Countries differ greatly in their capacity to set up the kinds of surveillance systems outlined in the present article. In particular, they differ in human and other resources. Some have most of the elements in place and only need encouragement to establish the network and start collating the information already being collected from various sources. Others, however, lack resources such as laboratory equipment needed by the police to test for drugs, computer hardware and software and

the personnel to enter, analyse and collate data. UNDCP, through the Global Assessment Programme, has been very supportive in providing computer hardware and software to several SENDU member States and in organizing a workshop on data management and analysis.

Funding

Community surveillance systems are a relatively cost-efficient way of monitoring alcohol and drug abuse [4]. Funds are, however, required to support regular "report-back" meetings (at the local, national and regional levels), dissemination activities and ad hoc studies. The SACENDU project initially received funding from the United Nations Development Programme (through WHO) and later used that to leverage funding from various national and provincial government departments. The SENDU initiative has been supported by a five-year grant from SADC (through the European Union). The funds are being used to pay for training and consultation meetings, technical support visits (including the first in-country network meeting) and biannual regional "report-back" meetings and to facilitate the writing of reports and the dissemination of information. It is hoped that, at the end of this period, the project will be supported largely by individual SADC member States.

Flexibility

In establishing SENDU, the intention has been to build a surveillance system that will allow for comparisons across countries. However, such a system cannot be rigidly imposed. It is recognized that countries may differ in such aspects as the lead agency, data sources and whether the focus is the country as a whole or sentinel sites within the country. Local networks must also be willing to adapt should they become aware that something is not working (for example, if data are no longer available from a particular data source).

Small wins

Building a city, country or a regional network is likely to take time. Setbacks are sometimes experienced, for example, when data are not released in time for a "report-back" meeting. The key is to build on the successes and work around the obstacles, always striving to move forward and improve the system.

Conclusion

It is too early to assess the impact of the SENDU initiative. The view of the authors is that, thus far, country-level facilitators and their political leaders have shown a substantial commitment to supporting the project. It has stimulated networking between countries and with international agencies such as UNDCP, as well as between stakeholders within countries working across different sectors. Capacity

within countries has been strengthened to facilitate the monitoring of alcohol and drug use and the associated consequences, baseline information on the drug abuse situation and resources for data collection has been obtained and seven countries have started to systematically collect data according to the SENDU format. Information coming out of the first "report-back" meeting, held in Cape Town, South Africa, in April 2002, reinforces the view that the burden of alcohol and drug abuse differs greatly among SADC member States and that the profiles of drugs being used in the region and of drug users are changing.

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The challenge of developing drug information systems in Africa

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ABSTRACT

Several challenges face the development of systems to collect data on drug consumption in sub-Saharan Africa. The political, cultural and economic climates generate a range of challenges, ranging from the inconvenience of a limited communications infrastructure through to more fundamental issues such as those concerning the prioritization of government health spending. In addition to the general challenges faced by any development initiative in sub-Saharan Africa, designers of drug information systems are faced with the problem of an absence of routinely collected indicator data and a shortage of individuals with the skills or qualifications necessary to oversee drug information systems. In order to obtain reliable information on drug consumption, the Global Assessment Programme on Drug Abuse of the United Nations International Drug Control Programme, alongside other regional and country-level counterparts such as the Southern African Development Community, has been supporting the development of drug information systems in the region. The present article documents some of the key challenges in developing drug information systems in the region and highlights priority development issues to improve capacity for collecting better information on patterns and trends in drug consumption in sub-Saharan Africa.

Keywords: drug monitoring systems; Africa; drug use; epidemiology; trends.

Few reliable data on the prevalence, patterns and trends of illicit drug consumption exist in most countries of the world [1]. This information deficit seriously impedes the development, implementation and evaluation of policies and programmes designed to reduce levels of drug consumption or limit the adverse health and social consequences associated with such behaviour. The paucity of good data is particularly apparent in Africa. To date, most of the information on drug epidemiology available from Africa has been in the form of rapid situation

assessments [2-4]. While rapid assessments can provide good contextual informa-
tion on the type and modes of drug consumption, they are of limited use in mon-
itoring trends in drug use. Of more utility for the ongoing surveillance of patterns
and trends in drug consumption are integrated drug information systems.

Integrated drug information systems bring together routinely collected drug-
related data, such as data on admissions to drug treatment centres or arrests for
drug-related offences, with other, more focused epidemiological data, such as sur-
vey data and specialized studies, to provide an overview of patterns and trends in
drug consumption in a particular area [5]. The triangulation of the variety of data
sources used in such a system minimizes the effects of confounding factors, with
the information provided becoming more robust with an increasing number of
contributing data sources [6]. This approach has been used with success in a num-
ber of developed countries and regions, as exemplified by the Community
Epidemiology Work Group in the United States of America [7], the European
Monitoring Centre for Drugs and Drug Addiction in Western Europe [8], and the
Illicit Drug Reporting System in Australia [5]. Such systems have also been estab-
lished recently in a number of developing regions, such as the Caribbean and Latin
America.

The development of drug information systems is also under way in subregions
of Africa. Support for these systems in Southern Africa is being provided by the
Southern African Development Community through its Epidemiological Network
on Drug Use. In addition, the Global Assessment Programme on Drug Abuse of the
United Nations International Drug Control Programme is active in Southern
Africa, where it supports the Epidemiological Network on Drug Abuse, and in East
Africa, where it supports the development of the East Africa Drug Information
System. These programmes aim to build local capacity in order to collect better
information on drug consumption through human networks and by developing
sound data collection practices. This is done in part through the development of
regional information systems, while at the national level the programmes assist in
the development of national drug information systems and provide training and
resources to meet key needs.

Sub-Saharan Africa is arguably the world's least developed region and,
although the development of drug information systems there is a priority, it pres-
ents particular challenges. The area of East and Southern Africa covered by the
Global Assessment Programme encompasses countries from Eritrea in the north,
east to the island States in the Indian Ocean, south to South Africa and west to
Angola and the Democratic Republic of the Congo.* It is estimated that over 338
million people reside in those regions, accounting for almost 6 per cent of the
world's population [9]. The average gross domestic product of the two regions is
US$ 2,075 per capita per annum; adult literacy is 62.7 per cent; life expectancy is

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*The countries covered by the Global Assessment Programme are: in East Africa, Burundi, Djibouti,
Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, Uganda and the United
Republic of Tanzania; and in Southern Africa, Angola, Botswana, the Democratic Republic of the Congo,
Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe.

47.3 years; and infant mortality is 99 deaths per thousand live births (see table). The prevalence of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) across the two regions is estimated to be 11 per cent of the adult (14-49 years) population [10], ranging from less than 1 per cent of the adult population in the Indian Ocean island States to approximately 35 per cent in Botswana. However, as the range around each of these indicators suggests (see table), there is great intraregional variation in the development status of member States. While 50 per cent of the countries in the two regions are ranked among the 30 least developed countries of the world in the United Nations Development Programme Human Development Index [9], the regions also include several middle-income countries.

Development indicators: East and Southern Africa and the world as a whole		
Indicator	*East and Southern Africa*	*World*
Population	338.4 million (0.1 million-59.6 million)	5 862.7 million
GDP per capita	US$2 075 (US$480-10 600)	US$6 980
Life expectancy at birth	47.3 years (40.3-71.6 years)	66.7 years
Infant mortality	99 per thousand (14-172 per thousand)	56 per thousand
HIV/AIDS prevalence	11.1 per cent (0.1-35.8 per cent)	1.1 per cent
Adult literacy	62.7 per cent (42.0-93.8 per cent)	72.9 per cent

Challenges in establishing drug information systems

Many of the challenges facing those attempting to establish drug information systems in Africa are not unique to either drug epidemiology or Africa, but are problems encountered when attempts are made to establish any new processes or programmes in developing countries. The basic infrastructure that is taken for granted in developed countries, such as efficient postal and telecommunication services, is often lacking. Thus, the logistics of any project being implemented in the developing world is inevitably more complicated than similar projects undertaken in developed countries. Over and above the challenges posed by poor infrastructure, however, are a set of challenges brought about by economics, culture and politics.

Economics

Resource limitations underlie both the deficit of consumption data in Africa and the difficulties inherent in rectifying that deficit. While the effects of resource

limitations are felt in all countries, they are particularly pronounced in sub-Saharan Africa. Lack of resources limits government capacity to collect drug data through the health and law enforcement sectors, while limited educational opportunities result in a small pool of people with the expertise necessary for data collation and reporting. Similarly, resource limitations restrict service provision, resulting in fewer potential data sources than are available to drug information systems in more developed countries. Finally, data collection itself is hampered by poor communications infrastructure, lack of funding and limited computer facilities.

Human resources

Drug information systems require, at a minimum, an individual or organization to oversee the collation and reporting of existing data. In sub-Saharan Africa, limited budgets prevent Governments from employing an individual specifically for this role or from subcontracting the activities to non-governmental agencies. Civil servants have been charged with this responsibility over and above their regular duties, which has resulted in their having to determine where those activities lie among their priorities and having to find time to complete them in addition to their regular workload. In many cases that has been difficult. Consequently, many of the activities required for the development of sustainable drug information systems have been considerably delayed. Such delays cause problems for epidemiologists attempting to build capacity to monitor drug use, in that the sustainability of the resulting drug information systems depends on Governments finding the human resources necessary to collate and report drug data.

Health services

Drug information systems also require basic indicator data. While some form of law enforcement data is available in all countries in the region, many of the other data sources that are fundamental to drug information systems in developed countries are simply non-existent. This is primarily due to the extremely limited health services that are available in most African countries, relative to the more developed nations. Mortality registers, for example, exist in very few African countries. Thus drug-related deaths, a key indicator of trends in the consumption of opiates, are simply not recorded. Similarly, specialized treatment for drug and alcohol dependency is not available in the majority of countries in East and Southern Africa. Where such treatment is available, the coverage of the service is limited and the capacity is small. For example, in Uganda, a specialized drug treatment centre has recently opened; it has a capacity of less than 20 patients and offers the only treatment for drug dependency available in a country with a population of over 20 million. In the majority of cases, treatment for drug- or alcohol-related problems is usually provided by psychiatric hospitals. On a per capita basis, such treatment is extremely limited, with many countries only having a single psychiatric hospital. The caseload of such hospitals, combined with a lack of computerization in

record-keeping, makes it very difficult to separate drug-related case records from those of the general psychiatric population. Many of the drug information systems being developed, therefore, are overly reliant on law enforcement data. In addition to the dearth of basic indicator data sources, more specialized drug research, such as school surveys, is conducted rarely and is often limited in scope, owing to a lack of both the financial resources to undertake such research and researchers with adequate skills.

Professional education

The limited number of opportunities for higher education available in Africa means that only a small proportion of the population is able to attain tertiary training in specialized fields such as drug epidemiology. Of the 26 people who serve as focal points for the Global Assessment Programme on Drug Abuse, for example, only one has received formal training in epidemiology and only two are medical doctors. The remainder are civil servants from the law enforcement or health sectors such as detectives and pharmacists with an interest in illicit drug issues. While such individuals may be highly competent, without appropriate training in drug epidemiology they cannot be expected to produce valid or reliable research in that field. The major challenges in the region, therefore, are how to address the problem of the lack of basic indicator data and how to train staff to the standard required to undertake primary data collection. One of the key tasks for the development of sound data collection practices is to build human resource capacity through the provision of training and training materials.

In an environment where such specialized knowledge is lacking, it becomes necessary to consider the validity and reliability of such data as do exist, since they may have been collected without consideration being given to potential confounders and biases. Similarly, a lack of awareness of the need for such data and the purposes for which they are collected often results in the collection of poor quality data. For example, in certain countries, police arrest data do not differentiate between arrests for possession and arrests for trafficking; in psychiatric hospital records, although codes from the Diagnostic and Statistical Manual of Mental Disorders or the International Classification of Diseases are used, all drug-related diagnoses are often grouped together under a general code such as "drug abuse" or "drug-induced psychosis", with no indication of the type of drugs involved; and data from specialized treatment centres are used to draw inferences about trends in drug use despite very small sample sizes. The drug-related data that are available have to be treated with a degree of scepticism. The challenge, therefore, is how to maintain sufficiently rigorous standards of data quality in the context of limited data.

Setting priorities

Another challenge for illicit drug epidemiology in Africa is how to ensure that it is given sufficient priority. As mentioned earlier, resources in Africa, in particular

health resources, are extremely limited. The question is how to determine where drug epidemiology should rank among the health priorities of countries suffering high levels of poverty and unemployment and an HIV/AIDS pandemic. It could be argued that the relatively modest investment required to monitor patterns and trends in drug consumption might be offset by the potential savings that such monitoring could generate by, for example, targeting early intervention to reorient health services to treat emerging drugs and possibly limit the spread of the use of such drugs, or by providing services to minimize the adverse health and social consequences of such drugs. However, it may be difficult to convince Governments or individuals to invest in drug epidemiology when resources could be used to address more immediate health concerns, such as the provision of clean water or vaccination services. It is clear that systems must be low-cost to justify investment and ensure sustainability.

Communication

Perhaps the most obvious of the problems that arise when communication is attempted with different cultures is that of language. The predominant official languages of sub-Saharan Africa are English, French and Portuguese. As interpretation is often required, this impedes both the quality and efficiency of communication. Even when interpretation is not required, intraregional differences in accent and technical vocabularies can impede effective verbal communication. Compounding these difficulties is the fact that the official national language of most countries in the region is the second or third language of the majority of the population. It is consequently crucial for information to be communicated clearly and concisely and for mutual comprehension to be verified.

Cultural differences other than language, while seldom immediately apparent, also affect development work, including epidemiology. For example, in some cultures it is considered inappropriate to say no or admit to experiencing difficulties, which results in problems being masked by overwhelmingly positive feedback. Cultural differences in communication can easily compound the difficulties imposed by language barriers, in that one may not realize that what is being said is not being understood or that what is being asked is, in fact, not feasible. Major problems can result if such subtle cultural differences are not recognized and measures are not taken to ensure that they do not negatively affect the work being done. The potential pitfalls of such cultural barriers to communication highlight the value of working closely with and actively involving local counterparts in projects to develop drug information systems.

Politics

The objective of the Global Assessment Programme on Drug Abuse is to build capacity for data collection through collaboration with national counterparts. These are usually selected with the support and approval of Governments and the delegated counterpart is therefore often a government department or individual

civil servant. This institutionalizes the system, which improves sustainability, but also exposes projects to the foibles of politics. The effects of this can be felt at the level of individuals, of parties and, indeed, of entire nations. For example, each Government in East and Southern Africa is requested to nominate a focal point for the project. For political reasons, the national focal point appointed by a Government may not always be the most suitable individual; this obviously impedes the development of drug information systems and poses problems for the external epidemiologist, who has no choice but to work with the nominated individual. Upon occasion, when a suitable individual has been appointed as the project focal point, he or she has unexpectedly been removed for political reasons, thus disrupting the continuity of the project. When this happens in the developmental stage of a project, the skills acquired by the focal point can be lost before the project has developed to the point at which they can be passed on to untrained colleagues.

Political activity can not only disrupt the smooth development of projects, but can also jeopardize their feasibility. For example, in one country a disputed general election left the country without a legitimate Government for an extended period. As a result, the activities of the Global Assessment Programme in that country were indefinitely suspended, pending a resolution of the political stalemate. In a number of countries in the region, such political instability is endemic: civil conflicts frequently occur and some continue for many years. Others are of relatively short duration, but their effects can be devastating to both the population and the infrastructure of the country (for example, the genocide that took place in Rwanda in 1994). It is inevitable that such conflicts adversely affect development work of any kind. They have been identified as being owing to, and a cause of, poverty in the region [11] in an environment of pre-existing resource limitation. Thus, not only does conflict restrict the feasibility of drug epidemiology, it also diminishes a nation's ability to conduct drug epidemiology in the future by further draining already scarce resources. However, it is also important to note that the instability and deterioration of civil infrastructure associated with these conflicts may increase the vulnerability of the countries involved to drug problems.

Recommendations

There is clearly a need for drug information systems in Africa and the many difficulties preventing their development have to be overcome. Indications of the possible emergence of heroin use in the region, particularly in South Africa [12] for example, highlight the need for drug surveillance even where drug abuse is not yet perceived to be particularly prevalent or problematic. The ability of these systems to highlight new drug trends proves that they are operationally feasible and a worthwhile investment.

Collaborating with Governments at the highest level possible can mitigate the impediments of politics and resource limitations. When senior government officials are well briefed on the need for drug epidemiology and the purpose of drug

information systems, political support and resource allocation for drug information systems are procured more readily and drug epidemiology is given the priority it deserves. Such support is more easily won when the drug information system being proposed can be shown to be efficient and cost-effective. When the system is in place and information has been gathered, it should be clearly and concisely packaged and reported in order to ensure relevance to policy formulation and assessment and to demand-reduction activities. Maximizing the utility of the system in this way may ensure the continuation of government support.

Innovative approaches are required to respond to the lack of routinely collected indicator data in many countries, such as the use of key informant networks. In the Comoros, for example, psychiatric nurses are being trained in illicit drug issues before being posted to work in primary health care centres; once there, they will be able to provide expert opinion on the drug use situation in the country, even in the complete absence of any other health sector data. Where traditional data sources do exist, but are unable to be utilized, the provision of training to workers in the field and modest investments in the development of such data sources may allow these sources to contribute to the system in the future. In these ways, existing resources may be maximally utilized.

Priority issues for the region

The challenges encountered while developing drug information systems in East and Southern Africa have enabled the clear identification of the priority issues that need to be addressed to strengthen drug epidemiology in the region. The three greatest of these are training, infrastructure and technical support.

At the grass-roots level, training in basic data entry and data analysis and reporting is needed to gain the maximum benefit from the data that are currently collected but not reported. Such training should encompass both computerized data management, which is being provided by the Global Assessment Programme on Drug Abuse, and, where the sustainability of computer facilities is in doubt, non-computerized methods. At an institutional level, the inclusion of epidemiology, and in particular drug epidemiology, into the curricula of courses on health sciences at the tertiary level would greatly improve the ability of future health professionals to contribute to the ongoing monitoring of patterns and trends in drug consumption. Similarly, the development of continuing education courses in basic drug epidemiology for health professionals in the field would greatly increase their capacity to identify potential sources of data and streamline the collection and reporting of those data into developing drug information systems.

The lack of basic infrastructure to collate and report drug data is a second need that requires addressing. The Global Assessment Programme on Drug Abuse is providing computing equipment and software to national focal points. However, it is important to be mindful of the issue of sustainability. There is a risk that donated equipment may not be maintained owing to a lack of funds or technical expertise, or that those with the skills to use the relevant software are unable to disseminate their skills effectively and thus take their skills with them when

they retire or transfer to other positions. Nonetheless, addressing deficits in infrastructure in the short term can be done at relatively little expense, greatly improving the capacity of government agencies to collate and analyse drug-related data.

Finally, there is a need to have more intensive support available at the local level to provide assistance in the utilization of existing data, in overcoming communication barriers, in providing technical guidance in the development of local training programmes, in the collation of indicator data and in the development and implementation of primary data collection activities such as school surveys.

Conclusion

Epidemiologists in Africa, and indeed any professionals in the field of human development, are faced with a number of challenges when developing drug information systems. The very need for development impedes development activities. For the benefits of development to be sustained, national capacity must be enhanced. However, the extreme resource shortages faced by Governments in the region limit the availability of human resources, the level of professional skills and the infrastructure available for development activities. The challenge for the development of drug information systems in this context, therefore, is how best to work within these constraints and utilize existing resources to monitor drug use cost-effectively and how to build national capacity by resolving some of these difficulties, such as through the provision of training or through grants for the improvement of infrastructure. Training, technical support and infrastructure for drug information systems is being provided in East and Southern Africa by both the Global Assessment Programme and the Southern African Development Community Epidemiological Network on Drug Use and the progress of these systems shows that minimal investment can pay considerable dividends in improving the information available on drug consumption in the region. However, such programmes can only dent the surface in the development of drug information systems in Africa. Sustainable development of these systems is only possible through the engagement of local people, the institutionalization of data collection activities across all sectors and at all levels and an appreciation of the utility of these systems to assist with formulating policies and strategies to reduce the burden of drug use in these societies.

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Mexico: systems for the epidemiological diagnosis of drug abuse

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ABSTRACT

The study of the demand for psychoactive substances in Mexico has a long history, with the earliest accounts dating from the eighteenth century. It was not, however, until the 1970s that epidemiological studies began to be undertaken. The strategies that have been adopted to assess the problem of drug abuse are similar to those used internationally: they include household surveys, studies of student populations and high-risk groups, the introduction of epidemiological observation systems and the analysis of mortality statistics. They have also included other methodologies suited to studying populations that are difficult to access and analysing the contextual factors surrounding drug consumption. These methodologies are employed from an anthropological perspective through qualitative methods, including ethnographic observations, interviews with key informants, focus groups and in-depth case studies. Through these studies, it has been shown that since the 1990s, there has been a significant increase in the illicit use of drugs in Mexico, primarily cocaine and certain amphetamine-type drugs (the most common being methylenedioxymethamphetamine (MDMA), known as "Ecstasy") and a decrease in the abuse of inhalants. Existing data collection systems also show an increase in the consumption of heroin in the area bordering the United States of America, with a large proportion of the heroin

users injecting the drug and engaging in injecting practices that carry a high risk of transmitting blood-borne viruses such as human immunodeficiency virus (HIV) and hepatitis. Cases of heroin use are also beginning to appear in other parts of the country. The research strategy followed in Mexico has been useful in establishing an epidemiological diagnosis of the drug abuse situation; however, action needs to be taken to meet the new challenges presented to decision makers by drug use trends.

Keywords: epidemiology; drug use; trends; Mexico.

Introduction

Substance abuse in Mexico follows the same pattern as in other countries with regard to the type of substances used, consumption patterns and associated problems. However, it also has features specific to the local social and cultural context in which consumption takes place. Social research in this field has a long history in Mexico, with accounts of the consumption of alcoholic drinks in colonial times [1] and of the use of other substances for the purpose of intoxication in the eighteenth century [2]. It was not, however, until the 1970s that carefully designed epidemiological studies began and academics from different institutions carried out surveys to establish the extent of the problem among various population groups [3-5].

The founding of the Centro Mexicano de Estudios en Farmacodependencia (CEMEF) in 1972 led to an expansion of epidemiological and social research. Household surveys [6], student population surveys [7] and studies of high-risk groups [8] were conducted. A register was established of patients attending the Centros de Integración Juvenil (CIJ) (youth integration centres) [9], which began operating in the early 1970s and which offer specialized care for drug addicts. CEMEF subsequently changed its name to the Centre for Mental Health Studies and changed it once again to the Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz (the Ramón de la Fuente Muñiz National Institute of Psychiatry). Various lines of research were pursued and expanded in the new institutions.

In the 1980s, the General Directorate of Epidemiology and the National Institute on Psychiatry carried out the country's first national household survey [10] and the city's first drug information system (Sistema de reporte de información en drogas (SRID)) was established [11]. That system gathered information from all the cases treated in health and rehabilitation centres. CIJ continued to report on drug demand and to conduct studies on high-risk populations [12, 13]. In the 1990s, the same strategies were maintained and an epidemiological monitoring system was introduced in selected cities to obtain information on the demand for treatment in specialized addiction treatment centres, some run by the Government and some not, and emergency departments, on actions detrimental to health and on the consumption of tobacco, alcohol and illicit and medicinal drugs by the general public or high-risk groups [14].

Through these data collection activities, it has been possible to assess the scope of substance use, abuse and dependence, as well as their underlying trends,

the problems arising from the introduction of new drugs, such as changes in consumption patterns and in the characteristics of the population groups that use drugs, the social and health consequences of drug use, the utilization of services and the context in which drug use takes place. Several factors increased the usefulness of the data collected on the nature of the drug problem. These included the diversity of the population groups studied, the regularity with which the studies were conducted, the use of common indicators suggested by the World Health Organization in 1976 and the testing of methodologies, definitions and instruments in various contexts, including Mexico [15]. It was therefore possible to make a realistic diagnosis of the substance abuse phenomenon, which was used as a basis for the national programmes against addiction.

To meet the need for early publication of drug consumption data (that is, prior to their publication in the scientific literature), a new Epidemiological Surveillance System on Addictions (SISVEA) was set up under the General Directorate of Epidemiology. SRID created links between the various institutions involved in the gathering of epidemiological data. More recently, in 2001, a drug observatory was established under the National Council against Addictions, with participation by the various institutions that compile systematic information in this field. Among the objectives of the drug observatory is standardization of information on drug demand, establishing priorities and promoting the gathering and timely reporting of information on drug consumption to facilitate decision-making.

Data collection methods

Information is obtained through regular population surveys, carried out among sample households, student populations and high-risk groups, and through continuous epidemiological monitoring systems.

General population surveys: household surveys (1974-2002)

The strategy of the first household surveys, conducted between 1974 and 1986, was to investigate substance use in cities with different characteristics and risks; seven surveys were conducted. The first national survey of the country's urban population, which took place in 1988, included questions on alcohol, tobacco and other drugs [10]; the second was conducted in 1993 [16] and a third in 1998 [17]. Those surveys were carried out on the basis of probabilistic samples of individuals of both sexes between the ages of 12 and 65 living in urban areas containing more than 2,500 inhabitants and covered 75 per cent of the country's population.

The 1993 survey included a specific study of cities in the northern border area, Tijuana, Ciudad Juárez and Matamoros, and two large conurbations, Monterrey and Mexico City. The survey design allowed for countrywide data on adolescents (persons aged 12-17) and adults (persons aged 18-65) as well as data on the northern, central and southern regions of Mexico. It also included new information on three cities located on the northern border and the three large

metropolitan areas covered by the earlier survey. A fourth national survey is currently in progress; it will provide, for the first time, information on the country's rural population.

In 2002, a new national survey of the urban and rural population of from 12 to 65 years of age was carried out. In the above-mentioned surveys, information was obtained through a standardized questionnaire administered through face-to-face interviews. The questionnaire had been extensively piloted and included questions from household surveys conducted in the United States of America and, more recently, questions proposed by the Inter-American Drug Abuse Control Commission (CICAD) to facilitate comparability of data within the region.

Studies of student population (1975-2000)

The Institute and the Secretariat of Public Education have carried out cross-sectional epidemiological studies using representative samples of the student population at the intermediate and upper intermediate educational levels. The aim of these surveys was to establish the prevalence of drug use and the subgroups of the student population most affected. To date, there have been three national surveys of the student population, carried out in 1976, 1986 [18] and 1991 [19]; the first two focused on the urban population, while the most recent covered the whole country, including rural areas.

In the federal district, surveys have been conducted every two or three years between 1976 [18] and 2000. The last two covered all 16 districts, with samples of more than 12,000 adolescents registered in the school system [20, 21]. In 1981, CIJ carried out a study in the 15 cities that they serviced, surveying young people from the sixth grade of primary level to university level [22]. Studies have also been carried out at the State level, which have improved understanding of the specific local features of the problem.

Studies of marginal, hidden and high-risk groups (1978-2002)

Population groups that were impossible to access through general or school surveys, or both, were the subject of special studies. Intensive research methods used to examine such groups included case studies [23], key informants [24] and capture-recapture methods [25, 26].

In this category, the most striking research has concerned working children, with a particular focus on those who work for their living on the streets [27, 28], and specific groups, such as women [29]. With support from the United Nations Children's Fund and the United Nations International Drug Control Programme, the National System for Comprehensive Family Development (DIF) conducted a study of child workers aged 6-17 in 101 Mexican cities [28]. More recently, in 2001, Cravioto carried out a study of heroin abuse on Mexico's northern border. This study analysed the magnitude of the problem, using capture-recapture methods, and also used focal studies and life stories to provide more in-depth information on the nature of drug use patterns and information on the contextual factors associated with drug use [26].

Studies have also been conducted on the psychological and social features associated with cocaine use, on how psychotropic drugs used outside a medical context are distributed and on the use of methamphetamines and their growing role in juvenile subcultures, among others. In all these studies, qualitative orientation techniques have been developed or adapted, or both, according to the particular needs of the groups under consideration.

Drug information reporting system (1986-2002)

SRID, the drug information reporting system that began operating in 1986, records the most important trends in drug use in Mexico City through assessment of data obtained in June and November of each year. Everyone held in participating institutions during the observation period, whether they be first time or recurrent users of the services, is asked whether he or she has ever taken drugs. More detailed information on drug use is obtained in cases where drug use is identified. A "case" is taken to be anyone over 12 years of age enrolled with a participating institution who admits to having taken any non-prescription drug at least once or to having deliberately used a prescription drug in a way not in accordance with its prescribed use. Cases of occupational or accidental, or both, intoxication are not included in this category. The interview form used for data collection contains sections relating to users' socio-demographic data, including the reason why they are in the institution, and problems associated with drug use. Consumption patterns are charted with reference to 12 drugs. This makes it possible to assess which drugs are most commonly used, the frequency of use, the route of administration and the age of initiation into drug use. Alcohol and tobacco consumption is also investigated, but only in relation to the use of other drugs, since people who use only alcohol and tobacco are not included in the data collection system [30]. To date, 34 assessments have been carried out. SRID contains information on more than 15,000 users in 44 health and rehabilitation institutions that provide services to people of all ages in the general population, although only data from the population 12 years and older are considered, the majority of cases being from youth integration centres.

Epidemiological Surveillance System on Addictions (1990-2002)

SISVEA operates under the General Directorate of Epidemiology of the Secretariat of Health and obtains information from the country's governmental and non-governmental treatment centres, supervisory institutions, admissions to emergency reception centres, the forensic medical service and drug seizures. It gathers information on the basic socio-demographic characteristics of cases identified, the drugs used, the principal drug of use (the one causing the greatest problem) and the user's personal history (the order in which he or she took the drugs), among other variables. SISVEA is part of an international network of systems operating in the United States, Central and South America and the Caribbean and is a member of the Community Epidemiology Work Group in the United States.

SISVEA categorizes information on patterns and trends by city and state, using quantitative indicators obtained from public health agencies, medical treatment centres, law enforcement agencies, surveys and any other source of information available in the reporting areas. The most significant indicators include:

(a) Cases of death related to drugs obtained from the forensic medical service;

(b) Drug use claimed in emergency reception centres;

(c) Main drug of abuse reported by patients attending treatment centres;

(d) Urine analysis of arrested persons;

(e) Drug seizures; and the price, purity and characteristics of the drugs seized.

In addition to such quantitative information, SISVEA also includes qualitative information obtained from daily records in the field, focal groups and interviews, among other sources. It is currently extending its activities to cover one city in each Mexican state [14].

Register of cases under treatment (1977-2002)

In the framework of SISVEA, CIJ reports information obtained from 72 centres across the country and from regions that have treatment centres. CIJ also has a system for monitoring drug consumption in the towns and districts covered by them, comprising:

(a) An assessment of the social stratification in those towns (that is, urban infrastructure, public services, buildings, the "environmental area", including indicators of public safety and the existence of open spaces and recreational areas);

(b) Key informant surveys classified into three categories: institutional informants (that is, middle management or working staff in public or private institutions); community informants; and experts working for CIJ. Also conducted are surveys of social factors in high- and low-risk groups among students in the fifth and sixth grades and in secondary education and among heads of household [31].

Psychiatric epidemiology (1990-2002)

The 1990s saw the introduction of studies on psychiatric epidemiology, including the epidemiology of substance dependence [32, 33] using international psychiatric diagnostic instruments that have been validated in Mexico [32]. A national survey of the urban population is currently being conducted as part of Mental Health Survey 2000 of the World Health Organization.

Evolution of the problem

The most recent national addiction survey, conducted in 1998 [17], found that 5.27 per cent of the urban population between the ages of 12 and 65 had tried an illegal drug (including inhalants), while 1.23 per cent had done so in the month preceding the study and 0.8 per cent over the previous 30 days. The highest life-time prevalence occurred among men between the ages of 18 and 34 (15.61 per cent), followed by men and women between 35 and 65 (10.65 per cent) and, in the last place, among persons aged 12-17 (3.57 per cent). If only current use in the month prior to the study is considered, however, more adolescents had used these substances (1.4 per cent) than had people over 35 (0.85 per cent), with the highest rates being found among young adults aged 18-34 (2.72 per cent). Consumption is much lower among women, the figures given for having ever taken drugs being 0.6 per cent, 1.18 per cent and 0.62 per cent respectively in the three age groups considered (ages 12-17, 18-34 and 35-65).

The drug with the highest lifetime prevalence is marijuana (4.7 per cent), followed by cocaine (1.45 per cent) and inhalants (0.8 per cent). The northern and central regions of the country reported higher prevalence (6 and 5.97 per cent respectively), while prevalence was significantly lower in the southern region (2.69 per cent). Among the cities included in the study, the highest rates were found in two cities on the border with the United States, Tijuana (14.73 per cent) and Ciudad Juárez (9.2 per cent), and the country's two major cities, Guadalajara (7.5 per cent) and Mexico City (7.28 per cent). In every case, the prevalence for men was higher than for women; for example, drug use among men interviewed in Tijuana was as high as 28 per cent, while that among women was no more than 0.92 per cent.

Significant variations also occurred in the rate of drug use by region. Marijuana is consumed primarily in the central (5.4 per cent) and northern (5.25 per cent) regions, cocaine in the central (5.4 per cent) and northern (1.84 per cent) regions and inhalants in the central and southern regions.

Trends

Data from the three addiction surveys conducted in 1988, 1993 and 1998 show significant increases in the lifetime use of illicit drugs (3.33 per cent in 1988, 3.9 per cent in 1993 and 5.27 per cent in 1998 reported having used such substances), with increases in the consumption of marijuana (2.99, 3.32 and 4.7 per cent respectively) and cocaine (0.33, 0.56 and 1.45 per cent), while the figures for the use of inhalants (0.76, 0.5 and 0.8 per cent) remained stable (figure I) [10, 16, 17].

Cocaine was responsible for the highest increase in substance abuse, a fact reflected in all the available information systems. The Mexico City registration system shows that the number of registered drug users reporting the use of cocaine rose from 4 per cent of cases in 1986 to 60 per cent in 1999 [30] (figure II). Results from SISVEA have shown an increase in the demand for treatment for cocaine from 7.8 per cent in 1991 to 35.3 per cent in 2001 [14].

Figure I.   Trends in lifetime prevalence of drug use in Mexico, from national household surveys, 1988, 1993 and 1998
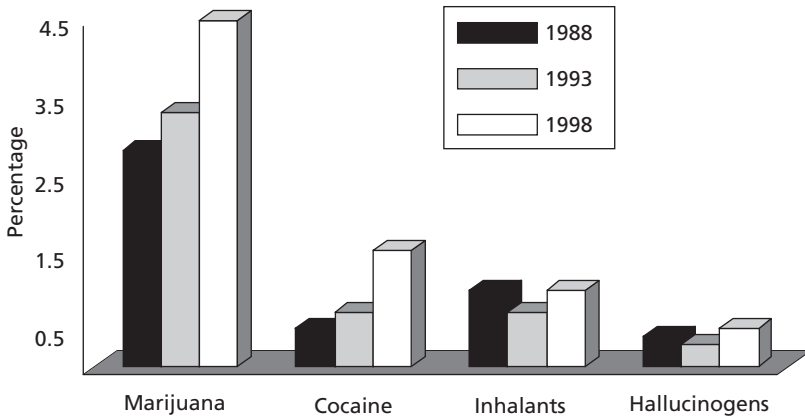
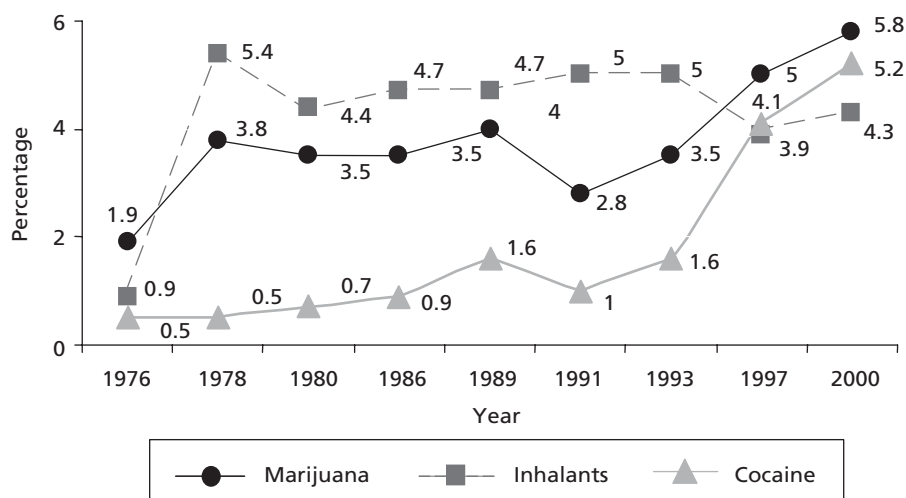*Sources:* México, Secretaría de Salud, *Encuesta Nacional de Adicciones,* 1988 (Dirección General de Epidemiología, Instituto Mexicano de Psiquiatría, 1990); México, Secretaría de Salud, *Encuesta Nacional de Adicciones,* 1993 (Dirección General de Epidemiología, 1993); México, Secretaría de Salud, *Encuesta Nacional de Adicciones,* 1998 (Dirección General de Epidemiología, Instituto Mexicano de Psiquiatría, 1998).

Figure II.   Drug information reporting system, 1987-1999 (Percentage of cases by drug type)
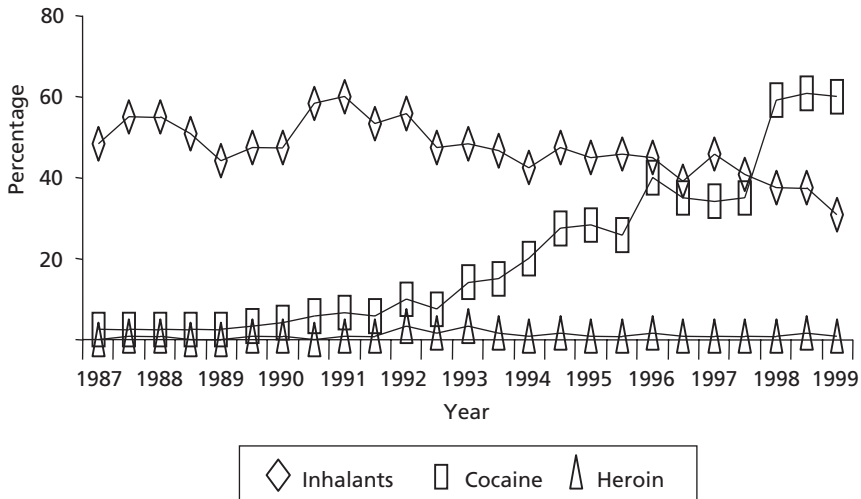
Source: A. Ortíz and others, "Sistema de reporte de información en drogas: tendencias 1987-1999", *Observatorio Epidemiológico sobre Adicciones* (Mexico City, Instituto Mexicano de Psiquiatría, 2001).

Studies conducted among the student population also show an increase in the proportion of students who have experimented with cocaine; in Mexico City lifetime prevalence of cocaine use rose from 0.5 per cent in 1976 to 5.2 per cent in 2000. A slight decrease in solvent inhalation was observed, with the lifetime prevalence dropping from 5.4 per cent in 1978 to 4.3 per cent in 2000 [18, 20, 21, 34] (figure III). Relative trends in the lifetime prevalence of drug use among males and females in the student population are shown in figures IV and V. More males than females consumed substances; there were significant increases in marijuana and cocaine use in both groups; and there was a drop in solvent use among males, a trend not observed among females. The drop in inhalant consumption could be seen in the lower demand for treatment in government-run centres, which fell from 56 per cent in 1990 to 35 per cent in 2000 [31]. However, inhalants remained the preferred substance among child workers.

Figure III.   Trends in lifetime prevalence of drug use among intermediate and upper intermediate students, Mexico City, 1976-2000

Sources: M. E. Castro and others, "Epidemiología del uso de drogas en la población estudiantil: tendencias en los últimos 10 años", *Salud Mental*, 1986, vol. 9, No. 4, pp. 80-85; J. De la Serna and others, "Medicin del uso de drogas en estudiantes de educación media y media superior del Distrito Federal y zona conurbada, 1989", *Memorias de la IV Reunión de Investigación, Instituto Nacional de Psiquiatría*, 1991, pp. 183-187; M. E. Medina-Mora and others, "Consumo de sustancias con efectos psicotrópicos en la población estudiantil de enseñanza media y media superior de la República Mexicana", *Salud Mental*, vol. 16, No. 3 (1993), pp. 2-8; J. Villatoro and others, "La situación del consumo de sustancias entre estudiantes de la Ciudad de México: medición otoño 1997", *Salud Mental*, vol. 22, No. 1 (1999), pp. 18-30; J. Villatoro and others, "Estudios en estudiantes de enseñanza media y media superior, Ciudad de México", *Observatorio Epidemiológico en Adicciones* (Mexico City, Secretaría de Salud, 2001).

Figure IV. Trends in lifetime prevalence of drug use among intermediate and
            upper intermediate male students, Mexico City, 1991-2000

According to the 1999 survey of the National System for Comprehensive Family Development [28], the drugs most frequently taken by child workers were inhalants (lifetime prevalence: 3.5 per cent of males and 0.9 per cent of females) and marijuana (lifetime prevalence: 3.4 per cent of males and 0.9 per cent of females). Prevalence was lower for cocaine (0.7 per cent of males and 0.4 per cent of females) and pills (0.7 per cent of males and 0.5 per cent of females). Prevalence rates varied significantly according to the type of population group considered, rising to 56 per cent when the child did not live at home [28]. The average age of child workers in the sample was 13 years (range: 6-17 years), of whom 72 per cent were male, 23 per cent worked packing groceries in supermarkets and 44 per cent were street vendors. The majority lived with family members, including father figures (90 per cent), while only 2 per cent lived in the street; 65 per cent were enrolled in school.

Figure V. Trends in lifetime prevalence of drug use among intermediate and upper intermediate female students, Mexico City, 1991-2000
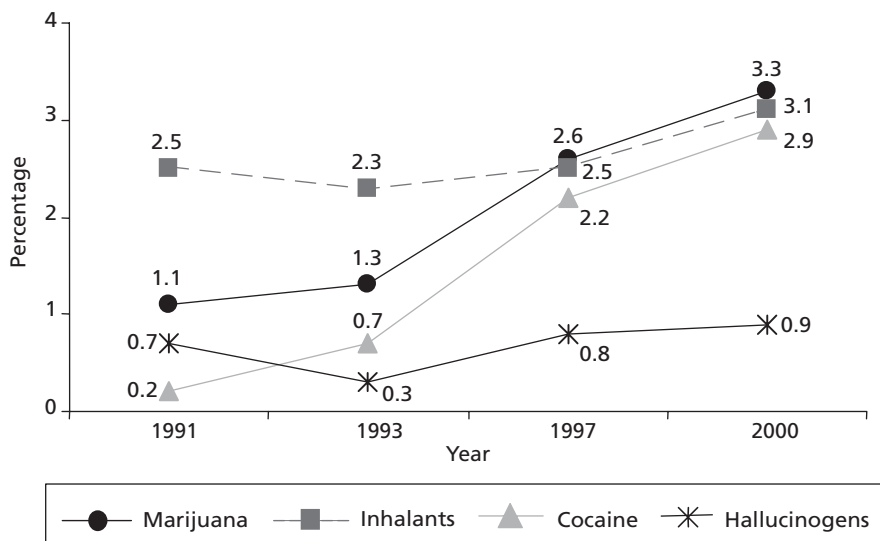
Sources: M. E. Castro and others, "Epidemiología del uso de drogas en la población estudiantil: tendencias en los últimos 10 años", *Salud Mental*, 1986, vol. 9, No. 4, pp. 80-85; J. De la Serna and others, "Medicina del uso de drogas en estudiantes de educación media y media superior del Distrito Federal y zona conurbada, 1989", *Memorias de la IV Reunión de Investigación, Instituto Nacional de Psiquiatría*, 1991, pp. 183-187; M. E. Medina-Mora and others, "Consumo de sustancias con efectos psicotrópicos en la población estudiantil de enseñanza media y media superior de la República Mexicana", *Salud Mental*, vol. 16, No. 3 (1993), pp. 2-8; J. Villatoro and others, "La situación del consumo de sustancias entre estudiantes de la Ciudad de México: medición otoño 1997", *Salud Mental*, vol. 22, No. 1 (1999), pp. 18-30; J. Villatoro and others, "Estudios en estudiantes de enseñanza media y media superior, Ciudad de México", *Observatorio Epidemiológico en Adicciones* (Mexico City, Secretaría de Salud, 2001).

Heroin consumption in Mexico seems to be concentrated in regions on the border with the United States, although some cases are found in other regions of the country [35]. Suárez-Toriello [36] noted a sudden increase in the number of new heroin cases in the 1970s among the prison population in Baja California State and among patients attending the Centro de Integración Juvenil in Tijuana, Baja California, the only Centre to have a residential programme at that time. Taking the starting year as a baseline indicator, he noted that the incidence of new cases was stable between 1960 and 1970, but rose significantly from 1972 in the prisons and from 1973 in the treatment centres, where a 700 per cent increase was observed in the number of new cases found in 1976 by comparison with those found in 1970.

Between 1976 and 1982, 2 out of every 100 people attending CIJ across the country were heroin users. Of those, 82 per cent were treated in the treatment

centres located in the four cities on the United States border, Tijuana, Ciudad Juárez, Nogales and Piedras Negras [12]. In 2000, 5 per cent of the patients who came to CIJ had used heroin; this figure rose to between 23 per cent and 46 per cent in the Centres on the United States border [31]. SISVEA noted a rise in the use of heroin as the drug of impact from 6.2 per cent to 43.9 per cent between 1994 and 1998 among patients attending non-governmental institutions on the country's northern border [14].

According to the 1998 national survey on addictions, 6 out of every 1,000 adult males had injected drugs, compared with only 5 out of every 100,000 women. Just over half the men (56 per cent) had engaged in intravenous injection in the year prior to the study. The drug most frequently associated with this mode of use is heroin: 73 per cent of users said that they had injected the drug, whereas very few cocaine users had done so (1.2 per cent). One in five of those injecting reported having done so with a used syringe. According to acquired immunodeficiency syndrome (AIDS) registers, 1.7 per cent had been infected by injecting drugs [37]. Given current trends, this proportion may well be on the rise.

These studies document the fact that the drug problem is not identical across all regions of Mexico: surveys in the northern border region show that the rate of drug use is more than twice as high in Tijuana and Ciudad Juárez as in the rest of the country. Studies of adolescents also show significant variations in consumption rates; for example, the inhalation of solvents occurs far more frequently in central and southern Mexico. Information systems show that the heroin problem is at its most acute on the country's northern border.

Emerging problems

Not only have new groups of users appeared, but new substances of abuse have also emerged. One such substance, Refractyl Ofteno, which is inhaled in order to achieve intoxication, was first observed in Mexico City in 1995, but controls were placed on it and it ceased to be abused shortly afterwards. Substances of medical utility, such as flunitrazepam, are also abused, as shown by the number of times that drug users in the capital's registration system report having used it: 105 in 1994, compared with 16 in 1988. High levels of abuse have persisted since then [30].

Amphetamine-type drugs (the most common one being methylene-dioxymethamphetamine (MDMA), known as "Ecstasy") have appeared on the market. The use of "Ecstasy" was first documented in the early 1990s, mainly on the country's north-western border. The patient registers of CIJ indicate a national average of 2.7 per cent "Ecstasy" use for 1995, whereas in that same year the drug had been taken by 42 per cent of patients attending the centre in Tijuana, Baja California. This geographical variation remains in force to this day.

Perspectives

The research strategy pursued by Mexico has been useful in providing an epidemiological diagnosis of the drug consumption situation. Of particular

significance has been the uniformity of indicators used across various studies conducted by different institutions. This has allowed information from different sources to be assembled to form an overall diagnosis of the situation, while the continuity of the studies has made it possible to note the emergence of trends.

Several challenges remain for the diagnosis of the epidemiological situation on drug consumption in Mexico. Action needs to be taken to ensure that information on the drug situation supports decision makers in how they tackle the new challenges presented by drug trends. To date, reporting timetables have been tailored to meet academic needs, in terms of deadlines for publication in scientific journals. What is now needed is a system whereby the data can be produced in a manner more appropriate for decision-making. Routine studies and existing information systems should also be expanded to take more timely account of new trends, including new drugs of abuse, changes in the groups that abuse drugs and changes in the ways in which drugs are administered. Strategies could include indicators sensitive to such changes which could be complemented with the introduction of rapid assessment studies on emerging problems. Despite their importance, few studies have been conducted to date on court-initiated referrals. People under arrest or in social rehabilitation institutions should be included in information systems. Various studies could provide information that would be more useful in assessing treatment needs and evaluating prevention, treatment and rehabilitation programmes. It would therefore be advisable to include indicators providing such evaluations. These are the challenges that the recently established drug observatory is currently attempting to address.

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Trends in the prevalence of psychoactive substance use in the Russian Federation

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ABSTRACT

Between 1991 and 2000, the number of drug addicts in the Russian Federation increased tenfold and the number of people abusing narcotic drugs increased by a factor of 6.4. According to the resulting indicator, the number increased by a factor of 7.7 as the population of the country fell by 2 per cent during that period. The prevalence of drug addiction among women is rapidly increasing. Between 1993 and 2000, the number of women drug addicts rose by a factor of 12.6. Adolescents are still the social group exhibiting the most prevalent use of and dependency on narcotics and other psychoactive substances. Over the past decade, not only has there been a quantitative (seventeenfold) increase in the prevalence of drug use among adolescents, but there has also been a qualitative change: the number of adolescents using drugs has grown and the proportion with an established dependency on drugs has increased. The number of adolescents seeking treatment for the first time is almost twice as high as the equivalent figure for the population as a whole (84.5 per 100,000 adolescents compared to 50.6 per 100,000 of the population as a whole).

Research conducted in cities in the Russian Federation has shown that there is a clear upward trend, demonstrated by both direct and indirect indicators, in the prevalence of narcotics use in all of them. The situation requires urgent action because the incidence of hepatitis and human immunodeficiency virus (HIV) infection among users is growing and the proportion of intravenous drug users is increasing.

Keywords: illicit drugs; drug addiction; incidence; prevalence; Russian Federation; dynamics.

The past decade has been characterized by a sharp deterioration in the drug situation in the Russian Federation, which poses a threat to the country's national security. By the beginning of 2001, 2.1 per cent of the population was under clinical observation in the country's drug clinics: more than three million patients (or 2,095.4 per 100,000 of the population) were suffering from alcoholism, drug addiction or substance abuse, including a group receiving preventive care.

A comparison of statistical data on alcoholics and drug addicts shows that alcoholism is much more widespread among the population than drug addiction. However, two factors must be taken into account here: first, there is more latent drug addiction than latent alcoholism and, second, the social risks associated with drug addiction are greater than those associated with alcoholism.

Since the beginning of the 1990s, drug addiction has become a much more topical issue, both in terms of the health of the population and in terms of society's awareness of the problem. According to sociological data for 2000-2001, the spread of drug addiction was the top social problem in many regions of the country. There are many reasons for this phenomenon, such as the aftermath of the war in Afghanistan, the porosity of the borders of the Russian Federation and the liberalization of the economy, and most specialists give discouraging projections of how the situation will develop.

The present article is intended to provide an assessment of the drug use situation in the Russian Federation, based on data compiled by the Ministry of Health. Drug treatment in the Russian Federation is provided by State drug hospitals, clinics, special surgeries, drug treatment departments in psychiatric institutions and by a network of private drug treatment centres. Information on patients who seek treatment from State drug clinics is included in the statistical records of the Ministry of Health. The following main groups of patients are registered in the statistics: *(a)* those diagnosed with alcohol dependency syndrome (alcoholism); *(b)* those diagnosed with narcotic drug dependency syndrome (drug addiction); *(c)* those diagnosed with non-narcotic substance dependency syndrome (substance addiction) and *(d)* those using alcohol, narcotic and non-narcotic substances to harmful effect (alcohol and narcotic and non-narcotic substance abuse).

According to official statistical data, the number of drug addicts under observation in drug treatment clinics increased almost ninefold in 10 years: in 2000, it stood at 269,093, or 185.8 per 100,000 of the population, whereas in 1991, it was 21.2 per 100,000 (figure I). In 22 territories, the level of this morbidity indicator was higher than the national average for the Russian Federation. The Samara region had the highest number (515.6 per 100,000 of the population), followed by the Tomsk (495.0) and Kemerovo (442.6) regions.

The number of people in the Russian Federation seeking treatment for drug addiction for the first time reached 50.6 per 100,000 of the population in 2000, having increased thirteenfold in 10 years (figure I). The number of drug addicts seeking treatment for the first time increased as a proportion of the overall number under observation, from 18 per cent in 1991 to 27 per cent in 2000.

Along with the growth in drug addiction, the number of people abusing narcotic drugs is also increasing. The number of people under observation in drug treatment clinics increased by a factor of 6.4 between 1991 and 2000 (from 13.5 to 86.9 per 100,000 of the population) (figure II).

Of the total number of those under observation in drug treatment clinics as a result of narcotic drug abuse, the proportion who had sought help for the first time was 41 per cent. In 2000, in the Russian Federation as a whole, the number of people abusing narcotic substances who sought treatment for the first time in their

Figure I.   Number of drug addicts registered at year end and number of
            first-time diagnoses in the Russian Federation: change over
            the period 1991-2000
            (Per 100,000 of the population)
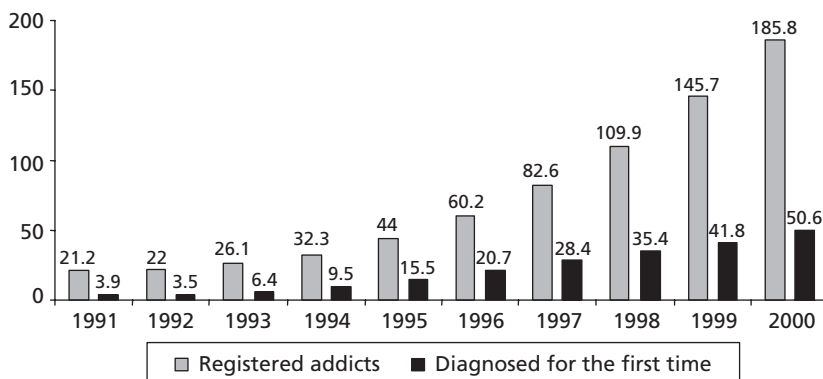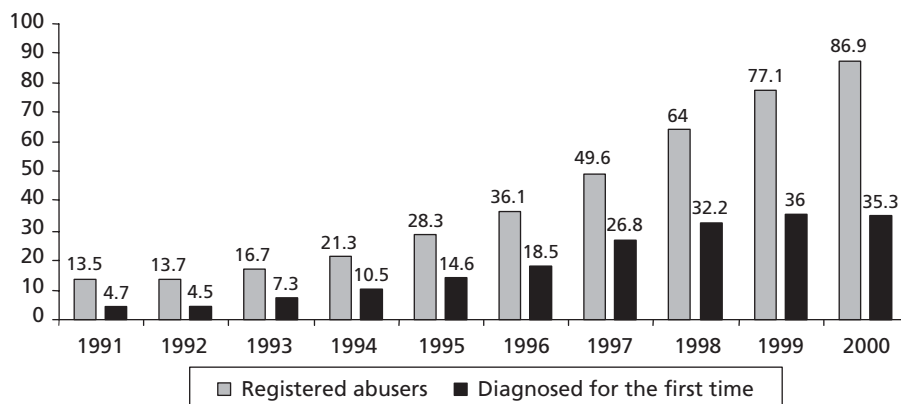

Figure II.   Number of narcotic drug abusers registered at year end and
             number of first-time diagnoses in the Russian Federation: change
             over the period 1991-2000
             (Per 100,000 of the population)

lives was 51,157, or 35.3 per 100,000 of the population. This indicator showed an
upward trend over nine years, and between 1991 and 1999 it increased by a fac-
tor of 7.7 (in 1991, the number was 4.7 per 100,000 of the population). In 2000,
the indicator was close to the level of the previous year (figure II).

   The following is a breakdown of the narcotic drugs used in the Russian
Federation, based on data about those who sought drug treatment in 2000:
opioids accounted for 90.1 per cent of the narcotics used, cannabinoids accounted
for 4.3 per cent, other narcotic drugs and their combinations 3.6 per cent and
psychostimulants 2 per cent (figure III).

Figure III.   Types of narcotic drug used by those undergoing treatment in
              the Russian Federation in 2000
              (Percentage)

Stimulants
1.9

Other drugs and
combinations
3.9

Cocaine
0.1

Cannabis
5.4

Opiates
88.8
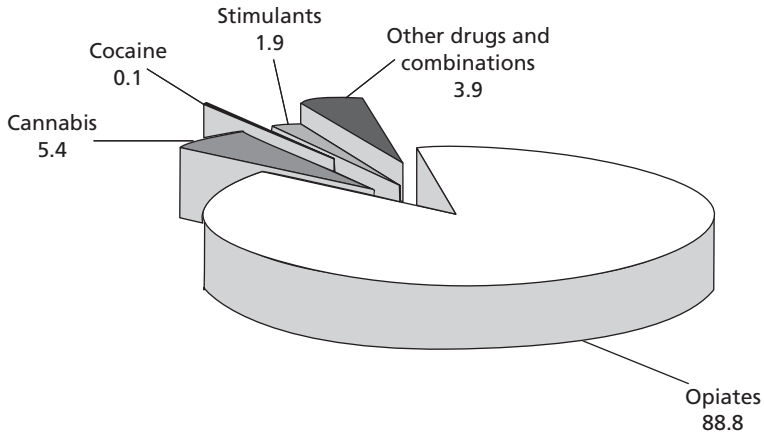
Note: Percentages do not add up because of rounding.

The prevalence of substance abuse is a less pressing problem because for a long period there was no substantial increase in the incidence of illnesses caused by non-medical use of non-narcotic substances in the Russian Federation. Between 1991 and 2000, the number of substance abusers who were under observation in drug treatment clinics increased by a factor of 1.9, from 4.7 to 8.4 per 100,000 of the population. In total, 12,821 diagnosed substance abusers were registered in the country's medical institutions in 2000.

The use of narcotics is becoming increasingly prevalent among women. At the end of 2000, there were 41,000 women drug addicts under observation in drug treatment clinics in the Russian Federation. That number represents 53.9 per 100,000 of the female population (figure IV).

The prevalence of drug addiction among women is subject to significant regional variations: there is a more than tenfold difference between the highest rate of prevalence and the lowest (in the Samara region it is 172.5 per 100,000 of the female population, in the Kemerovo region 135.7 and in the Tyumen region 129.6).

The change in the above indicator is caused primarily by the change in the number of women drug addicts who have been diagnosed for the first time in their lives. Between 1993 (1.2 per 100,000 of the female population) and 2000 (16.1 per 100,000) the number of women registered for the first time with a diagnosed drug addiction increased by a factor of 13.4 (figure V).

One of the main reasons for the deterioration in child and adolescent health is the increasing prevalence of self-destructive forms of behaviour, primarily the

Figure IV.   Number of drug addicts registered at year end in the
Russian Federation: change over the period 1991-2000
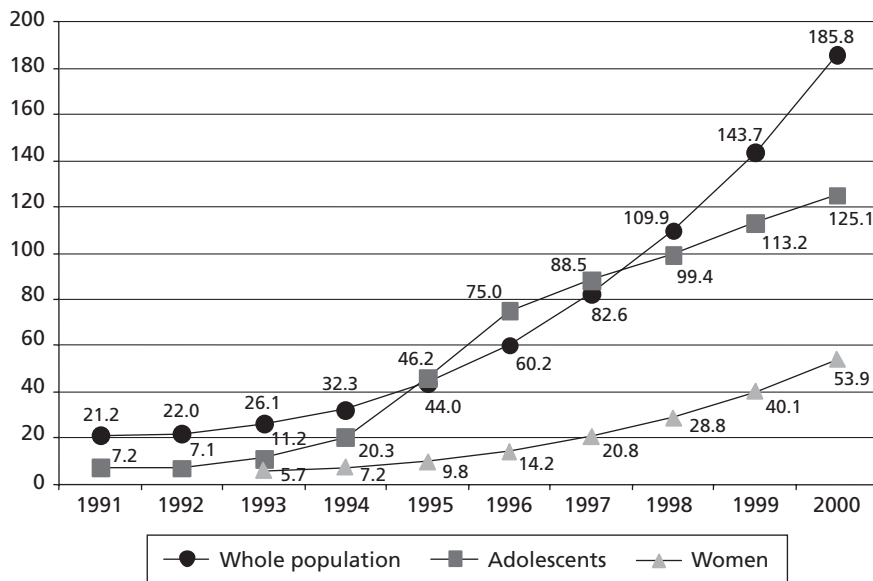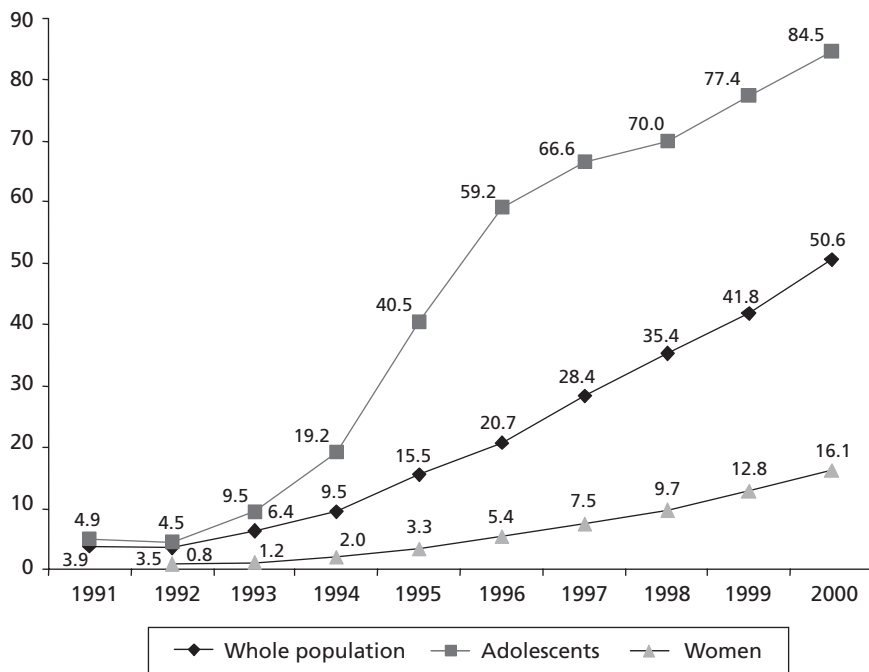*(Per 100,000 of the population)*

Figure V.   Number of first-time diagnoses of drug addiction in the
Russian Federation: change over the period 1991-2000
(Per 100,000 of the population)

use of psychoactive substances. The contemporary youth subculture is replete with information that, in one form or another, advertises the use of narcotic substances.

It is considered that drug use among adolescents is most typically occasional and non-dependent. Adolescents seek to try out a great variety of substances on themselves, from alcohol and inhalants to hashish and hallucinogens. For most of them, this period of "testing" passes as they grow up. However, for some adolescents occasional abuse becomes systematic and a psychological and physical dependency then develops. These people subsequently make up the majority of narcotics users.

In 2000, a total of 9,062 adolescent drug addicts, 125.1 per 100,000 of the adolescent population, were under observation in drug treatment clinics (figure IV). The indicator for 2000 increased seventeenfold in comparison with that for 1991. In 2000, the indicator for 18 territories was higher than the national average and in eight of those it was at least twice as high. The highest indicator was recorded in the Irkutsk region (604.6 per 100,000 of the adolescent population).

The number of adolescents seeking treatment for drug addiction for the first time went up from 4.9 per 100,000 in 1991 to 84.5 in 2000, also a seventeenfold increase (figure V).

Narcotic drug abuse indicators also show a discouraging trend: between 1991 and 2000, the number of adolescents under observation as a result of narcotic drug abuse increased fivefold.

In 2000, a forecast was made of the number of people in the 0-17 age group expected to seek treatment for drug addiction. For the analysis and forecasting, dynamic data sets of patients were selected, calculated per 100,000 of the population of the relevant age, because data sets standardized in this way are free of fluctuations in population numbers and therefore show a more stable trend. According to the patterns that emerged, the incidence of addiction in the 0-17 age group may reach 51.4 per 100,000 of the population by 2003 and the number seeking treatment for drug addiction for the first time may increase to 27.2 per 100,000. Therefore, if existing socio-economic trends are maintained, the level of these indicators will rise by 42 per cent compared to those for 2000.

Since 1994, a multi-city project has been operating in the Russian Federation, in conjunction with the Pompidou Group of the Council of Europe, for the purpose of monitoring and assessing the drug situation in 11 Russian Federation cities. The data presented include a comparative assessment of data from the State records of the health and internal affairs system for 1995-2000, outlining the drug treatment situation in eight cities: Moscow, St. Petersburg, Krasnodar, Orenburg, Yaroslavl, Novosibirsk, Kemerovo and Yekaterinburg.

As a result of the research conducted in the 11 cities, indicators emerged showing the pattern of change in the spread of drug use among the population:

(a) The number of people seeking drug treatment for the first time increased by factors of 1.3 to 5.7, while the national average was 2.5 (table 1);

(b)   The proportion of women among those who sought treatment for the first time increased (by 2-10 per cent, compared to a national average increase of 3 per cent) (table 2);

(c)   The incidence of viral hepatitis does not follow a consistent pattern. The indicators for Orenburg and Yaroslavl increased significantly by a factor of 9 and 6 respectively. For the remaining cities they increased by a factor of between 1.3 and 2, with the exception of Yekaterinburg and Kemerovo (since 1996), where the indicator fell slightly. The national average indicator rose by a factor of 1.2 (table 3);

(d)   The number of people with HIV infection and acquired immunodeficiency syndrome-related illnesses is increasing in all the cities studied, but the growth patterns are not uniform: in Moscow it increased by a factor of 198, in Yekaterinburg by a factor of 174, in Yaroslavl by a factor of 88.6, in St. Petersburg by a factor of 28.5, in Kemerovo by a factor of 10.2 and in Krasnodar by a factor of 7.8. The national average for the number of people infected with HIV has increased by a factor of 78.1 (table 4);

(e)   In all the cities studied, the mortality rate among registered drug addicts increased compared to 1996 by a factor of between 3 (St. Petersburg) and 14 (Orenburg), with the exception of Krasnodar, where it fell slightly (table 5);

(f)   The number of drug-related arrests, including arrests for drug dealing, is increasing in most of the cities studied, as in the country as a whole (table 6).

Table 1.   Number of drug addicts, substance abusers and abusers of narcotics and other psychoactive substances seeking treatment for the first time
(Per 100,000 of the population)

City	1995	1996	1997	1998	1999	2000
Moscow	34.0	54.0	82.3	122.9	135.2	115.9
St. Petersburg	12.3	12.2	30.5	55.6	64.3	62.1
Krasnodar	212.9	213.1	250.0	260.0	266.8	274.8
Orenburg	77.6	81.2	120.3	206.6	404.2	438.8
Yaroslavl	6.9	7.8	12.2	25.8	32.7	34.1
Novosibirsk	64.2	171.3	179.1	73.1	102.1	105.4
Kemerovo	46.9	44.5	77.8	190.8	130.0	181.1
Yekaterinburg	36.8	51.2	38.5	64.5	132.9	129.8
Russian Federation	36.6	47.4	67.3	79.0	83.4	90.5

Table 2. Proportion of women among drug addicts, substance abusers and abusers of narcotics and other psychoactive substances seeking treatment for the first time
(Percentage)

City	1995	1996	1997	1998	1999	2000
Moscow	13.1	13	17.9	18.5	19.8	19.7
St. Petersburg	19.6	20.6	22.2	23.6	22.2	26.7
Krasnodar	11.01	11.3	12.5	12.3	12.5	16.0
Orenburg	2.7	7.2	8.2	6.7	8.3	9.9
Yaroslavl	11.6	18.3	15.6	17.5	13.1	13.5
Novosibirsk	10.4	12.1	12.9	15.01	16.6	19.5
Kemerovo	14.2	24.5	7.7	. .	23.8	19.9
Yekaterinburg	13.1	14.3	17.9	13.0	18.1	18.4
Russian Federation	11.9	14.2	13.4	15.9	14.3	15.2

Note: Two dots (. .) indicate that data are not available.

Table 3. Incidence of viral hepatitis
(Per 100,000 of the population)

City	1995	1996	1997	1998	1999	2000
Moscow	31.6	40.05	61.2	65.03	61.1	40.27
St. Petersburg	40.0	33.4	23.6	29.8	86.9	78.1
Krasnodar	73.5	71.4	55.2	67.0	111.3	103.3
Orenburg	54.6	44.2	54.2	78.4	199.6	487.8
Yaroslavl	12.2	12.7	23.2	38.0	50.76	67.31
Novosibirsk	65.1	116.6	137.3	115.5	91.2	111.3
Kemerovo	. .	103.5	85.2	33.6	87.0	55.2
Yekaterinburg	95.6	97.5	99.1	99.3	189.8	76.2
Russian Federation	35.6	35.9	36.8	35.6	43.35	42.5

Note: Two dots (. .) indicate that data are not available.

Table 4.   Incidence of AIDS and HIV infection
         (Per 100,000 of the population)

City	1995	1996	1997	1998	1999	2000
Moscow	0.64	0.76	1.00	5.4	76.5	126.9
St. Petersburg	4.7	5.6	7.4	9.0	17.5	134.0
Krasnodar	0	1.6	2.1	6.8	8.2	12.4
Orenburg	. .	. .	0.38	0.38	6.1	. .
Yaroslavl	1.3	0.8	1.77	3.4	20.8	115.2
Novosibirsk	0.21	0.87	1.07	2.36	2.7	. .
Kemerovo	. .	0.9	0.6	5.6	4.3	9.2
Yekaterinburg	0.9	1.0	1.6	1.8	3.6	156.3
Russian Federation	0.77	0.97	0.68	7.2	12.6	60.17

Note: Two dots (. .) indicate that data are not available.

Table 5.   Mortality rate among drug addicts, substance abusers and abusers
         of narcotics and other psychoactive substances
         (Per 100,000 of the population)

City	1995	1996	1997	1998	1999	2000
Moscow	. .	1.21	1.9	3.3	3.77	4.1
St. Petersburg	1.5	1.9	2.1	1.8	2.9	5.9
Krasnodar	6	8.2	6.5	4.6	3.1	6.4
Orenburg	0.57	1.7	5.11	8.5	13.4	23.8
Yaroslavl	2 persons	0.48	0.81	2.75	. .	. .
Novosibirsk	0.28	3.65	3.93	5.5	9.8	19.1
Kemerovo	2.4	6.6	10.6	15.4	15.3	50.9
Yekaterinburg	6.3	5.2	5.2	10.7	21.2	30.6
Russian Federation	. .	1.31	1.5	1.9	2.6	4.8

Note: Two dots (. .) indicate that data are not available.

Table 6. Arrests for illegal drug dealing
(Per 100,000 of the population)

City	1995	1996	1997	1998	1999	2000
Moscow	27.9	43.0	67.9	95.7	146.2	168.0
St. Petersburg	74.3	86.3	96.2	. .	170.4	. .
Krasnodar	255.4	124.8	813.5	231.3	. .	243.2
Orenburg	28.9	55.9	. .	. .	183.4	186.4
Yaroslavl	28.7	29.6	35.5	. .	91.3	95.6
Novosibirsk	. .	. .	187.7	. .	. .	295.5
Kemerovo	40.1	55.6	228.5	872.0	202.8	210.4
Yekaterinburg	132.6	170.8	459.8	522.5	802.9	. .
Russian Federation	50.6	54.3	77.6	92.0	88.5	92.6

Note: Two dots (. .) indicate that data are not available.

The research carried out showed that, in the Russian Federation as a whole and in all the cities studied, there is a clear upward trend in the prevalence of narcotics use, which is demonstrated by all the indicators analysed. The situation is so alarming that it requires urgent action because the incidence of hepatitis and HIV infection among users is growing, the proportion of intravenous drug users is increasing and the proportion of women and young people involved is also rising.

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Issues surrounding the detection of a reduction in drug supply: the heroin shortage in Australia in 2001

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ABSTRACT

In the present article, the authors discuss the challenges in characterizing and documenting changes in the availability or supply of drugs. A distinction is made between supply and demand (or consumption), as the assessment of each requires a different set of data. The distinction is illustrated by the recent experience of a heroin shortage in Australia. In late December 2000 or early January 2001, heroin markets in Australia experienced an unexpected and significant reduction in the availability of heroin. That shortage was sustained throughout 2001 in all Australian jurisdictions in which heroin had been freely available for some years at low cost and relative purity.

Keywords: heroin; drug supply; drug monitoring systems; early warning systems.

Introduction

In the present article, the challenges in characterizing and documenting changes in the availability or supply of drugs are discussed. A distinction is made between supply and demand (or consumption), as the assessment of each requires a different set of data. The distinction is illustrated by the recent experience of a heroin shortage in Australia.

In late December 2000 or early January 2001, heroin markets in Australia experienced an unexpected and significant reduction in the availability of heroin. The reduction was sustained throughout 2001 in all Australian jurisdictions in which heroin had been freely available for some years at low cost and relative purity [1].

The possible causes of reduced heroin availability are not explored in the present article, nor are the consequences of the shortage or the policy implications of the phenomenon. Such questions are currently the focus of an 18-month detailed programme of research being coordinated in three Australian jurisdictions by the National Drug and Alcohol Research Centre of the University of New South Wales. Attention is, however, drawn to the manner in which routinely collected information may be used to track the availability of drugs within defined geographical areas. The article is divided into two sections: the first outlines indicators that are appropriate to monitor the availability of drugs, discussing the relative strengths and limitations of each; the second presents a case study that illustrates the way in which those data sources were used to detect the heroin shortage in Australia in 2001.

Appropriate indicators of the availability of drugs

There are a number of valid indicators of changes in illicit drug availability. Those indicators reflect changes in supply, rather than reflecting changes consequent to changes in patterns of drug use, health outcomes of drug use, availability of treatment and resources provided to target drug-related crime. They include the following:

(a) Self-report data on availability, purity and price among regular drug users;

(b) Law enforcement data on the availability, purity and price of drugs seized;

(c) Key informant data on the availability, purity and price of drugs.

When a variety of data pertaining to the same issue are collected, the convergent validity (or the degree of consistency) of the data can be examined, which allows apparent trends to be reported with greater confidence. Although each of the data sources is subject to biases and flaws, triangulation may allow the biases to be overcome [2]. The presence of integrated information systems that combine a critical information processing function with the ongoing collection of data from a variety of sources will allow policy responses to be developed and implemented in an efficient and timely manner [2].

Self-report data from regular drug users

Data collected from regular users' reports of the price, purity and availability of drugs are arguably the most important indicators of a change in drug supply. In simple terms, it must be recognized that the participants of illicit drug markets themselves are best able to provide information about those markets. It is important to note that the prices of drugs reported by users represent actual purchases of those drugs. They are thus not secondary estimates or data reported from "buy-bust" operations, but primary data on purchases obtained from active participants in the illicit drug market. Illicit drug users are a crucial source for detecting

changes in the cost or availability of their drugs. Such information can be obtained on a second-hand basis from key informants (that is, experts who work with drug users), but it is clear that the information provided first-hand by users is more up-to-date, more sensitive and more accurate than that which could be obtained from a second-hand source.

Some of the limitations of such data include the fact that reports of availability are dependent upon the nature and extent of users' participation in the drug scene. It is also questionable whether users can be sensitive to changes in the purity of an illicit drug that they use. Finally, given the illicit nature of the drug market, fluctuations in availability are likely to be experienced by many, if not all, illicit drug users at times, without such fluctuations necessarily reflecting significant changes in the overall availability of the illicit drug. Such limitations can be overcome by monitoring the objective data on purity and supply obtained from indicator data.

Indicator data on illicit drugs

Indicator data on drug seizures provide another measure of the availability of illicit drugs. Estimates of purity from seizure data are reliable and valid indicators of the quality of the drugs seized by law enforcement and, given reasonably consistent methods for analysing drugs, they provide measures of quality that are consistent across time. Such data can therefore act as a reliable and precise measure of a drug trend (in particular, they can be more reliable estimates of drug purity than estimates from users).

However, such data are also subject to a number of problems [3]. The amount of drugs seized may be affected by specific law enforcement operations rather than reflecting changes in the amount of illicit drugs being imported into or trafficked around the country per se. In addition, not all illicit drugs seized by Australia's law enforcement agencies are subjected to forensic analysis. In some instances, as the seized drug is analysed only in the case of a contested court matter [4] purity figures relate to an unrepresentative sample of the illicit drugs available. Furthermore, there is a difference between street-level seizures and high-level seizures, each representing different levels of the distribution hierarchy. Finally, some jurisdictions may not share data with others, making it difficult to establish global estimates of the purity of illicit drugs in a general region or country. In summary, although seizure data are objective and sensitive measures of drug purity, procedural and political obstacles may reduce the quality of the data available for monitoring purposes.

Key informant reports

Key informants can provide another important source of information [1, 5, 6]. They may be selected on the premise that they have regular or sustained contact, or both, with users of different drug types or have a good knowledge of drug user groups, including knowledge of changes in the price, purity and availability of

such drugs. They may include representatives from health, welfare or law enforcement sectors. Key informants from the health or welfare sector can be recruited from drug abuse treatment and detoxification agencies, needle and syringe programme services, emergency services and health and other welfare organizations (such as crisis accommodation and youth outreach services) situated within key illicit drug markets. Such sources often have good information on the street-level availability of drugs. Key informants from the law enforcement sector can be drawn from regions corresponding to the main illicit drug markets or selected on the basis of their work pertaining to activity and crime related to illicit drugs. Depending on the agency contacted, law enforcement representatives can provide information on drug availability both at the street level and at higher levels. Reports from key informants are good indicators of changes in the illicit drug markets: they have considerable knowledge of and contact with the illicit drug market, yet they are not immersed in the drug-using lifestyle. Key informant interview data are therefore the most sensitive measures of emerging drug trends and drug availability [7].

However, one of the limitations of such data is that data from key informants are less reliable and more subjective than illicit drug user and indicator data. The reports depend entirely on the specific group with whom informants had the most recent contact. They are also less capable of providing specific data relating to the purchases, prices and patterns of drug use of illicit drug users than the users themselves, who are reporting on their own behaviours.

Limitations of the use of other data sources

In any examination of changes in drug availability, it is important to avoid using data that may be confounded by other factors, in particular, those data that primarily reflect the demand for or consumption of illicit drugs such as patterns of drug use, health outcomes of drug use, treatment for problematic drug use and law enforcement data on drug-related crime.

Data on patterns of drug use

It is reasonable to assume that, if an illicit drug becomes less available, then users of that drug may use it less often, change their route of administration or alter their patterns of other drug use, or both. However, the reverse is not necessarily true: just because an illicit drug is used less often by drug users does not mean that they are doing so because it is less available. It is just as possible that users altered their patterns of use owing to changes in the preferences for or availability of other drugs.

Data on negative health outcomes of drug use

It is reasonable to assume that, if a drug becomes less available, then the number of instances in which persons experience negative health consequences as a result

of using the drug will be reduced. Furthermore, changes in rates of the negative outcomes of the use of other drugs may reflect, at least in part, changes in the patterns of use and of risk-taking behaviours of drug users. For example, increased rates of drug overdose could result from changing patterns of polydrug use or from drug users calling for medical assistance less frequently owing to changes in police practices related to attendance at the site of drug overdoses.

Data on treatment for problematic drug use

Treatment data include new treatment admissions, particularly those programmes that address specific drug problems such as methadone maintenance for heroin or other opiate dependence. Although such data may reflect changes in the availability of specific drugs, they may also be affected by other factors such as changes in funding and the availability of treatment facilities and changes in the recording practices of treatment agencies. Furthermore, although illicit drug users may be prompted to enter treatment due to difficulties obtaining their drug of choice (leading to an increase in entrants), they may also reduce their use and therefore have fewer problems associated with their use and, as a result, not present themselves for treatment.

Data on drug-related criminal activity

It is reasonable to assume that changes in the number of arrests for possession of an illicit drug such as heroin may reflect changes in the availability of the drug. Similarly, it is reasonable to assume that a reduction in drug availability may lead to a reduction in drug-related offences, such as property crime and violent crimes linked to the use of the drug. However, the major difficulty with such data is the confounding effect of law enforcement operations that target specific crimes and changes in the funding of law enforcement. It is also possible that changes in criminal activity could occur as a result of reduced supply of illicit drugs. For example, if users of an illicit drug cease using it owing to a reduction in supply, then it would follow that crimes associated with such drug use, such as dealing in drugs or breaking and entering offences to pay for drugs, might be reduced. However, users of an illicit drug might equally escalate their criminal activity in response to an increase in the price of the drug resulting from a reduction in supply if they continue to use it and require more money to pay for it.

The case of the heroin shortage in Australia in 2001

The value of routine monitoring systems was demonstrated in Australia in 2001, when such a system detected the reduced availability of heroin. Since 1996, a strategic early warning system called the Illicit Drug Monitoring System (IDRS) has operated in Australia. Surveys are conducted annually in all eight jurisdictions in order to provide a national picture of emerging trends in illicit drug use and associated harm [6]. Under the system, data are triangulated from a number of sources

to overcome the biases and flaws inherent in each individual source [8, 9]. The data are derived from *(a)* a quantitative survey of a sentinel group of illicit drug users, *(b)* a qualitative survey of key informants who have significant contact with and knowledge of illicit drug users and markets and **(c)** a collection of indicator data on illicit drug supply, illicit drug use and their associated harms. Among other things, IDRS collects data from each of these sources on the price, purity and availability of Australia's five main illicit drugs, including heroin. The findings of the study on the availability of heroin prior to and during 2001 are discussed below.

The first data set to be examined derives from surveys of illicit drug users. Each year, IDRS conducts a survey of injecting drug users (IDU) who have injected a drug at least monthly in the preceding six months with respect to their patterns of drug use and the price, purity and availability of a range of illicit drugs used by them. Figure I shows IDU estimates of the price of a gram of heroin in three Australian jurisdictions (New South Wales, South Australia and Victoria) over the six years of operation of IDRS. The year 2001 was the first in which IDRS detected increases in the cost of heroin, following stable or decreased heroin prices every year since 1996.

Figure I.   Injecting drug users' estimates of the price of a gram of heroin in Australia, by jurisdiction, 1996-2001
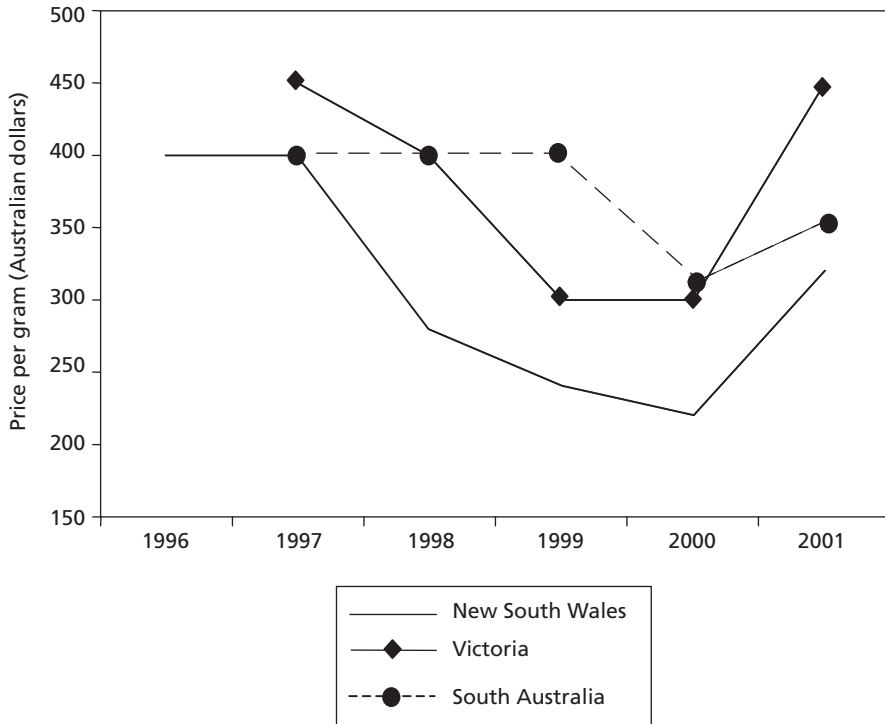
Between 2000 and 2001, there were marked reductions in the proportion of IDUs who described heroin as "very easy" to obtain in New South Wales (from 85 to 46 per cent), the Australian Capital Territory (from 78 to 23 per cent) and Victoria (from 86 to 36 per cent) [1]. There were concomitant increases in the proportion of IDUs who described heroin as "difficult" or "very difficult" to obtain in the same jurisdictions: New South Wales (from 1 to 16 per cent), the Australian Capital Territory (from 1 to 22 per cent), and Victoria (from 2 to 19 per cent). Similarly, compared with 2000, in 2001 a far greater proportion of the overall sample reported that heroin had been more difficult to obtain in the preceding six months (7 versus 30 per cent) or that availability had fluctuated (4 versus 12 per cent). Those response patterns were observed in the three major heroin markets New South Wales, the Australian Capital Territory and Victoria [1].

It should be noted, however, that the majority of IDUs in those jurisdictions still considered heroin to be "very easy" or "easy" to obtain in 2001, suggesting that the changes in the availability of heroin did not make it impossible for them to obtain heroin. Rather, the changes in availability were relative to the previous period, when heroin was freely available.

Given that the shortage was a relative rather than an absolute one, a more sensitive indicator of availability than estimates of the proportion of IDUs using heroin, or the frequency of their use may be the "search time", or the time taken by an illicit drug user to successfully obtain drugs. Research conducted in Sydney during the period of the shortage in 2001 revealed that heroin users reported increases in the time taken to obtain heroin [10]. Search time increased significantly, from a median of 10 minutes (range 2-60) to 90 minutes (range 5-1440) (p<0.001). The longer search time appeared to produce a shift towards opportunistic purchases, with a rise from 42 per cent to 54 per cent of IDUs reporting street purchases [10].

The second data source examined was the average purity of heroin seized by Australian law enforcement agencies. Figure II shows the average purity of heroin seized and analysed by law enforcement agencies in Australia between the financial year 1996/1997 and the financial year 2000/2001. The average purity of all the heroin seized and analysed in Australia over the financial year 2000/2001 was 44 per cent, which represented the second consecutive year in which the average purity of heroin seizures had declined. Despite the overall decreases in heroin purity, the average purity of analysed heroin seizures made in New South Wales remains higher than in other jurisdictions, which is not unexpected, given that Sydney, in New South Wales, is the major hub of heroin importation and trafficking in Australia [4]. However, the variability across jurisdictions is not wide, ranging in the financial year 2000/2001 from an average of 39 per cent in Queensland to 51 per cent in New South Wales. In the financial year 2000/2001, the number of heroin seizures made at or near the Australian coast was 28, a reduction from 39 detections in the financial year 1999/2000, and the total amount seized (216 kilograms) was also lower (figure III). This is consistent with a reduction in the supply of heroin to Australia.

Figure II.   Average purity of heroin seized and analysed in Australia,
              1996/1997-2000/2001
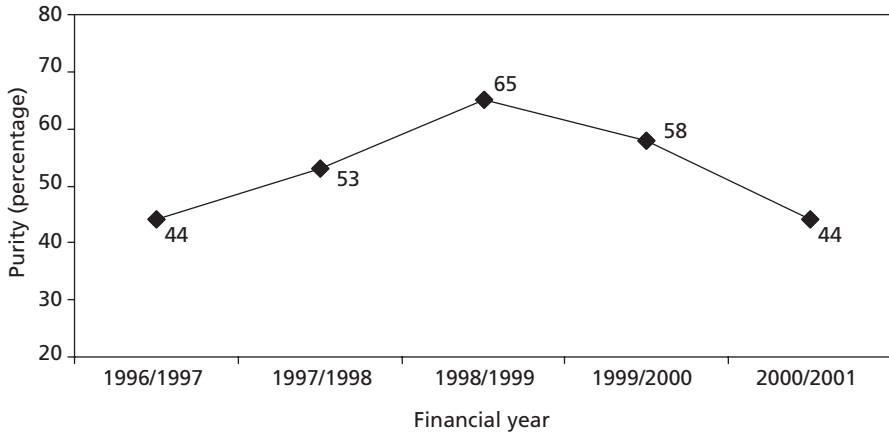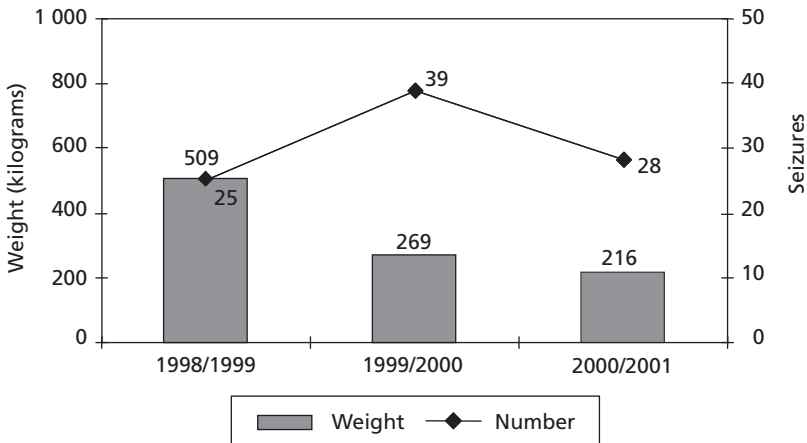

Figure III.   Number of seizures of heroin made at or near the Australian coast
              and weight of the heroin seized, 1998/1999-2000/2001

   Finally, the third source of information on drug availability was interviews
with key informants. These are conducted annually using a standardized semi-
structured interview schedule. The reports from key informants regarding heroin
were consistent with IDU reports, with more than half (56 per cent) of key inform-
ants in New South Wales reporting that heroin had become more difficult to
obtain in 2001 and the remainder reporting that availability had fluctuated.
Estimates by key informants of the price of a gram of heroin were consistent with
those reported by IDUs. The median price per gram indicated by key informants
was 340 Australian dollars (A$) and the price of a cap of heroin was reported to

be A$ 50-80. Consistent with IDU reports, key informants also reported heroin being sold in quarter grams (A$ 70-120) and half grams (A$ 140-160).

Conclusions

It is necessary to carefully evaluate the data sources used to assess changes in drug availability. Indicators that are affected by other variables such as changes in the preferences of drug users, changes in the likelihood of negative health outcomes of drug use, changes in treatment availability and changes in the focus of law enforcement activity will not provide valid information on the availability of drugs in a defined geographical area. It is necessary to look at measures that directly assess availability such as price, purity and ease of purchase. Such data can be obtained from users themselves, from key informants with significant contact with drug users and knowledge of drug markets such as the police and from data collected by law enforcement agencies on seizures of the drug concerned. Each of these data sources is subject to biases that could affect the reliability of the patterns observed. However, if they are triangulated with each other and concurrent validity is adequate, it can be inferred with greater confidence that changes observed reflect actual shifts in the availability of the drug concerned and it is then possible to provide timely information about relative changes in the price, purity and availability of illicit drugs. This is clearly of crucial importance to policy makers, who are required to respond to changes in illicit drug market trends, as such information enables them to make well-informed decisions about requirements for drug policy.

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