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].

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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.

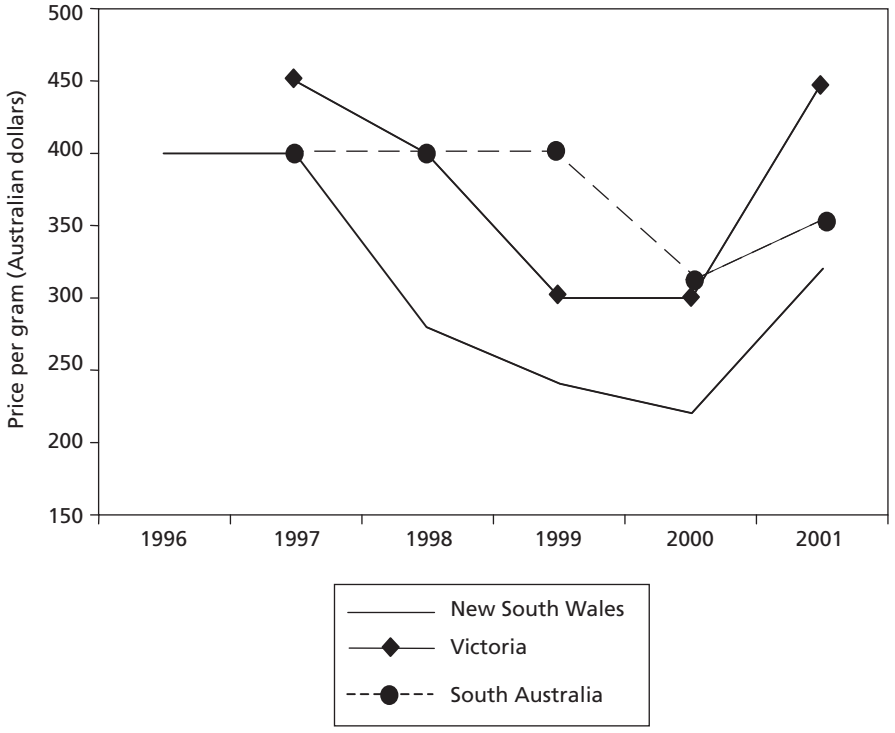
The case of the heroin shortage in Australia in 2001

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



Source: L. Topp and others, *Australian Drug Trends 2001: Findings from the Illicit Drug Reporting System (IDRS),* National Drug and Alcohol Research Centre, Monograph No. 48 (Sydney, 2002).

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

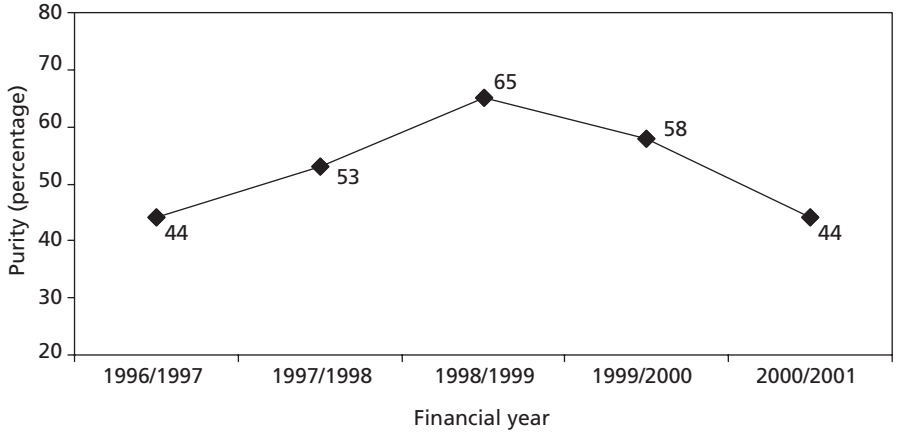
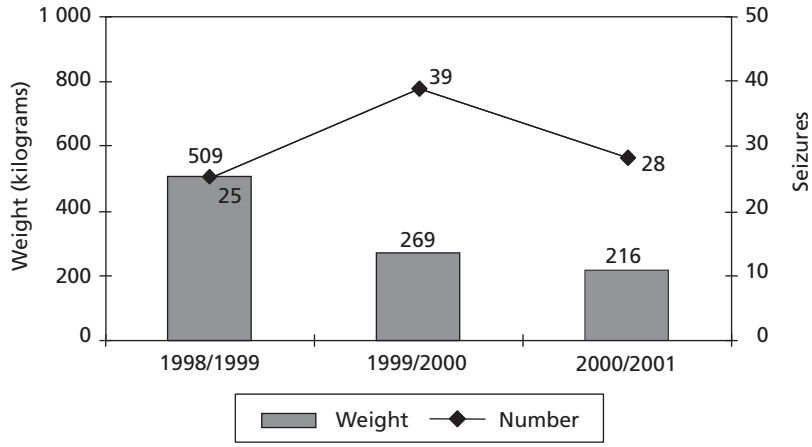


Figure III. Number of seizures of heroin made at or near the Australian coast and weight of the heroin seized, 1998/1999-2000/2001



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 informants 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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