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The Australian Heroin Drought and its Implications for Drug Policy

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Around Christmas 2000, heroin users in Sydney and other large capital cities in Australia began reporting significant shortages in the availability of heroin. Initial research conducted by the National Drug and Alcohol Research Centre early in 2001 confirmed the existence of the heroin 'drought' in one major heroin market. This bulletin presents the results of a more detailed study into the scale and effects of the Australian heroin drought on heroin use, heroin expenditure, heroin overdose, entry into methadone treatment, use of other illicit drugs and crime. The study results indicate that the heroin drought in NSW has led to sharp falls in heroin use, expenditure on heroin and the number of heroin overdoses. The drought also appears to have prompted some heroin users to seek methadone treatment and others to consume more of other drugs, such as cocaine. No lasting effects of the drought on heroin-related property crime have been observed.

INTRODUCTION

Australia's drug policy is based on harm minimisation (Ministerial Council on Drug Strategy 1998). The policy is underpinned by three strategies: supply reduction, demand reduction and harm reduction. A good deal is known about the measures which might be useful in reducing the demand for heroin and the harm which it causes. We know, for example, that methadone maintenance treatment is effective in reducing heroin use (Hall 1996) and that providing addicts with a safe means of injecting heroin helps reduce the spread of infectious disease (Hurley, Jolley & Kaldor 1997). Much less is known about the measures which might prove effective in reducing the supply of illicit drugs and about the impact which reduced supply has on illicit drug consumption and drug-related harm.

This is not to say that supply control policy lacks any rational foundation. Supply-side drug law enforcement seeks to reduce the demand for illegal drugs by making them expensive and hard to obtain. It makes illicit drugs expensive (mainly) by threatening

importers and sellers with arrest, imprisonment and asset confiscation. To compensate themselves for these risks, importers and sellers of illegal drugs demand a significant return on their investment. This desire for risk compensation is reflected in the (relatively) high prices paid by consumers of illicit drugs. At about \$30 a cap, for example, heroin probably sells for far more than it costs to produce and distribute. Some argue that the high cost of heroin limits the amount of heroin consumed. Since many of the harms associated with heroin (e.g. the rate of overdose) are probably related to the frequency of heroin use, it can be argued that supply control policy helps reduce at least some of the harms associated with the drug.

Scholarly acceptance of this argument is far from universal. Reuter (2001) argues that supply-side drug law enforcement efforts to increase the price of illegal drugs have been singularly unsuccessful. He points out that, during the 1980s, the risk of being imprisoned for drug trafficking in the United States rose rapidly but cocaine and heroin prices fell. Furthermore, the percentage of high

school students reporting that cocaine was available or readily available was much the same in 1999 as it was in 1991. He argues that one of the major problems facing supply-side drug law enforcement is the steep price gradient for illicit drugs from the customs barrier to the street. Since the cost of importing illegal drugs is a negligible fraction of their street value, importers and distributors can afford to sustain heavy losses before having to raise the price of the drugs they sell by any large margin.

Reuter's arguments are compelling but not conclusive. Whether drug law enforcement authorities can increase the street price of illegal drugs is a question whose answer may vary from country to country, drug to drug and time to time. A potentially more damaging criticism of supply-side drug law enforcement is that, even if it could increase the price of illicit drugs, the result would be more rather than less drug-related harm. The argument is based on the assumption that demand for addictive drugs, such as heroin, is price-inelastic. Demand for a drug is price-inelastic if the total quantity of the

drug being purchased does not change much in response to changes in the cost of the drug. If demand for heroin were price-inelastic, pushing up the price of heroin would reduce demand for the drug but overall expenditure on heroin would still increase.² This would increase revenues to heroin dealers, thereby increasing the profitability of heroin trafficking. The higher cost of heroin might also prompt heroin users to commit more crime to fund their addiction.

The question of whether demand for heroin is price-inelastic is clearly of critical importance to drug law enforcement policy. Yet we know little about the price-elasticity of demand for heroin. There is evidence in Australia that normal fluctuations in the price of heroin have no effect on treatment entry (Weatherburn & Lind 1997). However, the high cost of maintaining a heroin habit seems to be a significant factor in prompting long-term heroin users to enter methadone maintenance treatment (Weatherburn & Lind 2001). Overseas estimates of the price-elasticity of demand for drugs such as heroin have been highly variable, ranging between -0.59 and -2.5 (Manski, Pepper & Petrie 2001).³ This variability is not surprising, given the difficulties involved in accurately measuring drug prices and illicit drug demand. All the same, the lower bound would suggest that demand for heroin is relatively inelastic while the upper bound would suggest demand is highly elastic.

Changes in the price of heroin can influence consumption of other drugs. Surveys carried out in Bankstown and Parramatta, in New South Wales (NSW), for example, reveal that, of those testing positive for heroin use, 12 per cent also test positive for cocaine and 17 per cent test positive for amphetamines and 53 per cent test positive for cannabis (Australian Institute of Criminology 2001). If supply-side drug law enforcement succeeded in making heroin harder or more expensive to obtain, it may force heroin users to consume larger quantities of some other illegal drug. In this case, suppression of one illicit drug market would only serve to strengthen another. This would be a matter of real concern if the drug market being strengthened were more harmful than the one which has been weakened.

Any strengthening of the market for cocaine would be a matter of particular concern. Cocaine has a number of highly undesirable characteristics from the vantage-point of both crime and public health. These have recently been highlighted by van Beek, Dwyer & Malcolm (2001). Because of cocaine's short duration of effect (compared with heroin) and its local anaesthetic and psychomotor stimulant properties, it is typically injected more frequently and frenetically than heroin. This increases the damage to a user's veins and skin, a problem exacerbated by the frequent 'skin picking' which is characteristic of many chronic users of the drug. Frequent injectors of cocaine are also prone to psychiatric disorders, such as anxiety, paranoia and aggression. This can increase the risk of serious criminal violence. The confidence induced by the drug also appears to encourage other forms of behaviour, such as needle sharing and engaging in unprotected sex. These kinds of behaviour potentially increase the spread of blood-borne viruses (BBVs) and other forms of infection.

THE SYDNEY HEROIN DROUGHT

One of the principal impediments to a better understanding of the effects of supply control policy is that large and abrupt shifts in the price of illegal drugs are comparatively rare. Such shifts would make it easier to identify the effects of drug price changes on drug consumption. As it happens, a major increase in the price of heroin appears to have occurred in Australia in the period just after Christmas 2000. In the four years to 2000, the price of heroin in Australia had been in steady decline (Darke, Hall & Topp 2000). Early in 2001, however, media reports began appearing in Sydney and other capital cities (DeBelle 2001; Totaro 2001) of a heroin 'drought'. In response to these reports the National Drug and Alcohol Research Centre conducted a survey in Kings Cross (a major Sydney heroin market) of some 41 heroin users and a number of key informants designed 'to examine the credibility of these reports' (Rouen, Dolan, Day, Topp, Darke & Hall 2001, p. v).

Interviews with both heroin users and key informants confirmed the existence of a significant heroin shortage. Interviews with heroin users indicated that the search time for heroin had risen from just over 15 minutes 'before Christmas' to more than four hours at the time of interview (mid February 2001). Most users stated that the price of heroin had increased. In a similar survey conducted between July and August 2000, 89 per cent of respondents had reported paying \$70 for their last quarter gram of heroin (Darke, Topp & Kaye, in press). By contrast Rouen et al. (2001) found only 41 per cent of their sample paying this price for the last quarter gram of heroin they purchased. Most were paying more. Most heroin users interviewed as part of their study also reported that the purity of heroin had decreased and that they were using heroin less frequently. Furthermore, Rouen et al. also found evidence that heroin users were increasing their consumption of other illicit drugs, such as cocaine and amphetamines.

The cause(s) of the heroin drought are not known with any great degree of certainty but there are probably a number of factors at work. Firstly, the quantity of heroin seized by authorities has risen significantly (Australian Bureau of Criminal Intelligence 2001, p. 34). In 1993-94, around 50 kilograms of heroin were seized in Australia by drug law enforcement authorities. In 1998-99 more than 500 kilograms were seized. The quantity seized fell back to about 270 kilograms the following year but, even at this level, the quantity seized is still substantially above that seized in the early part of the decade. Secondly, State and Federal police have arrested a number of significant figures involved in importing and distributing heroin in Australia (Totaro 2001; Palmer 2001). Thirdly, the opium poppy growing regions of Myanmar (Burma) are presently experiencing a severe (water) drought (Australian Bureau of Criminal Intelligence 2001, p. 29).

The possibility that the heroin drought might have been caused by poor rainfall in source countries might seem to raise doubts about the relevance of the heroin drought to supply control policy. However in some ways it does not matter whether the heroin drought has

been caused by drug law enforcement, natural causes or some combination of the two. If it is caused by drug law enforcement then we are provided with a unique opportunity to examine what happens when drug law enforcers actually succeed in reducing the supply of heroin. If it is caused by natural forces then we are provided with a unique opportunity to see what *would* happen if drug law enforcers did succeed in further reducing the supply of heroin.

Rouen et al. (2001) have taken a valuable first step in examining these effects. However they were only able to interview a fairly small sample of heroin users and were not able to examine the effect of the heroin drought on a number of key outcome measures, including crime, entry into treatment and heroin expenditure. The purpose of the present study is to build on the work carried out by Rouen et al. (2001). We are interested in two sets of questions. The first concerns the scale of the heroin drought:

1. Has the retail price of heroin increased in response to the drought?
2. Has the purity of heroin declined?
3. Has the availability of heroin decreased?

The second set concern the effect of the drought itself:

4. Has the drought produced a reduction in heroin use?
5. Has it produced a reduction in heroin expenditure?
6. Has it produced improvements in the health of heroin users?
7. Has it produced an increase in drug-related property crime?
8. Has it produced an increase in the use of other drugs?

In the next section we describe the sources of data employed to try and obtain answers to these questions.

DATA SOURCES

It is impossible to obtain a comprehensive or completely reliable picture of the heroin market from any single source of information. The approach adopted in this study is to rely on a variety of data sources, each

having its own strengths and weaknesses. By testing hypotheses about the effect of the drought across several independent sources of data (i.e. through triangulation) it is hoped that the risk of error about the nature and effects of the drought on the heroin market can be minimised.

To assist in answering questions (1)-(5), (7) and (8), a special-purpose survey was conducted of 165 heroin users on the streets in and around Cabramatta between May and June 2001.⁴ (Cabramatta is generally considered Australia's largest heroin market.) Participation in the survey was voluntary and anonymous, but respondents were paid \$10 each to participate. Subjects were recruited to the heroin user survey either by a direct approach on the part of the interviewers or by word of mouth. A complete copy of the questionnaire is included in the Appendix; however a brief account of the purpose and structure of the survey now follows.

In essence the heroin user survey sought to measure the scale and effects of the drought on those who remained in the heroin market after the drought. It did this by asking a series of questions about respondents' experiences of the heroin market before and after Christmas 2000 (a common reference point for the onset of the drought). For example, to assess the effect of the drought on heroin expenditure, question 4(a) asked respondents 'How much do you spend on heroin for yourself each week at the moment?' Question 4b asked 'How much did you spend on heroin for yourself each week before Christmas?' A series of more direct questions were then put to respondents asking them to describe the state of the heroin market and their response to it. For example, question 10c asked respondents 'Overall, would you say that heroin is less pure now than it was before Christmas?' Question 11a asked respondents 'Are you using more of other drugs to make up?'

The heroin user survey provides a clear picture of the impact of the heroin drought on heroin price, purity and availability in Cabramatta. However the picture it provides of changes in heroin price, purity and availability on heroin users is conditioned by the experiences of those who remained in the heroin market after the drought. Many might

have left. The survey, therefore, cannot provide a complete picture of the effect of the drought on heroin consumption, crime, health or other forms of drug taking. To assist in examining these phenomena we draw on data from a range of other sources, including:

- Health Department records of needles and syringes dispensed by public hospitals
- Ambulance Service records of Narcan administration by ambulance officers
- Health Department records of admissions to methadone treatment
- Police records of recorded offences and arrests
- Drug Use Monitoring in Australia (DUMA) program records of urine test results among police detainees.

Trends in the number of needles and syringes dispensed provide evidence bearing on question (4) because injection is the main means by which heroin is consumed and because the needle and syringe program in Australia is well developed and widely utilised by injecting drug users (Hurley, Jolley, & Kaldor 1997). Because the risk of infection with blood-borne viruses (BBVs) increases with the incidence of injecting drug use, data on the number of needles and syringes dispensed to injecting drug users are also useful in assessing answers to question (6).

Trends in Narcan (an opioid antagonist used to resuscitate overdose victims) administration provide direct evidence on the effect of the drought on the risk of heroin overdose. They are therefore useful in answering question (6). Since the risk of overdose is related to the rate of heroin use, data on Narcan administration also provide another source of data bearing on question (4).

Entry into methadone maintenance treatment is a common, if not the primary, means by which heroin users seek to leave the heroin market or limit their heroin consumption. Admissions to methadone treatment therefore provide some insight into the effect of the drought on the rate of departure of heroin users from the heroin market and the level of heroin consumption. Since entry into such treatment is usually accompanied by improvements in the

health and social functioning of heroin users, data on methadone treatment entry also provide useful information in relation to question (6).

The survey provides some scope for assessing whether the heroin drought has increased the amount of crime committed by heroin users. Changes in crime reported by respondents to the survey, however, may have been offset (or more than offset) by changes in crime amongst those who left the heroin market in response to the drought. Although heroin users are not responsible for all property crime, they resort to crime to fund their purchases of heroin so frequently (Dobinson & Ward 1985; Makkai 1999a) that trends in the major categories of property crime can be used to gain some insight into the effect of the drought on crime levels among heroin users (question 7).

Valuable data bearing on the answers to question (8) can also be obtained as a result of the DUMA program (Makkai 1999b). Under the NSW component of the DUMA program, every three months a sample of persons arrested by police in Parramatta and Bankstown is asked to undergo a urine test and submit to an interview, both of which are designed to obtain information relevant to their drug use. Because they are located fairly close to the major illicit drug markets in South West Sydney, Parramatta and Bankstown Local Area Commands provide good sites for assessing the effects of the heroin drought on heroin, cocaine and methadone use.

The DUMA urine testing process involves tests for a number of drugs, including heroin, cocaine, amphetamines, methadone and cannabis. The DUMA program, therefore, permits independent assessment of whether heroin users are using less heroin, entering methadone treatment or 'topping up' with other drugs in response to the heroin drought. The first effect is relevant to question (4), the second, to question (6) and the last, to question (8).

Needle and syringe exchange data over the 12 months from July 2000 to June 2001 were obtained from the Drug Intervention Service Cabramatta (DISC) and from the AIDS and Infectious Diseases Branch of NSW Health. Data (over the same period) on the

administration of Narcan were obtained from Ambulance Service paramedics servicing Cabramatta. Data (over the same period) on the number of admissions and re-admissions to methadone were obtained from the NSW Pharmaceutical Services Board. DUMA data (over the same period) were obtained from the Australian Institute of Criminology. Finally, data (over the period July 1999-June 2001) on trends in the number of reported property offences in various categories in Cabramatta (and across the State as a whole) were obtained from records held by the NSW Bureau of Crime Statistics and Research.

RESULTS

The results are presented in four sections. The first section examines changes in the price, purity and availability of heroin. The second section presents data relevant to the effect of the drought on heroin use and heroin expenditure. The third section presents data relevant to the effect of the drought on heroin overdose, treatment entry and the use of other drugs. The fourth section presents data relevant to changes in heroin-related criminal activity. A number of the graphs which follow present data on trends in some variable (e.g. crime) over the period before and after the drought. To facilitate interpretation of these graphs a vertical line has been drawn at December, the reference point in the survey for the onset of the drought.

CHANGES IN HEROIN PRICE, PURITY AND AVAILABILITY

To assess changes in the cost of heroin, respondents to the survey were asked whether they thought heroin was more expensive 'now' than it was 'before Christmas'. Figure 1 displays the pattern of response to this question.

It is obvious that the vast majority of respondents (82%) regarded heroin as more expensive after Christmas than before. To further investigate this question, respondents were asked whether they usually buy heroin in caps, quarter grams, half grams, grams or some other amount. All respondents purchased heroin in one of the four listed categories, but the most common purchase unit was a quarter (50%) followed by a cap (26%), a half (12%) and a gram (12%). They were asked how much their preferred unit of heroin costs at the moment and how much they were paying for the same unit of heroin in the month before Christmas. Figure 2 shows the average reported cost of heroin by the usual purchase unit before and after Christmas.

There is little difference in the average cost of caps and quarters but the cost of a half and a gram appears higher after Christmas than before. The average cost of a half has risen by 35 per cent, from \$138 to \$186. The average cost of a gram has risen 75 per cent, from \$218 to \$381. To test the significance of these changes, a Wilcoxon signed ranks test was applied to the reported cost differences before and after Christmas.

Figure 1: Effect of the drought on perceived cost of heroin

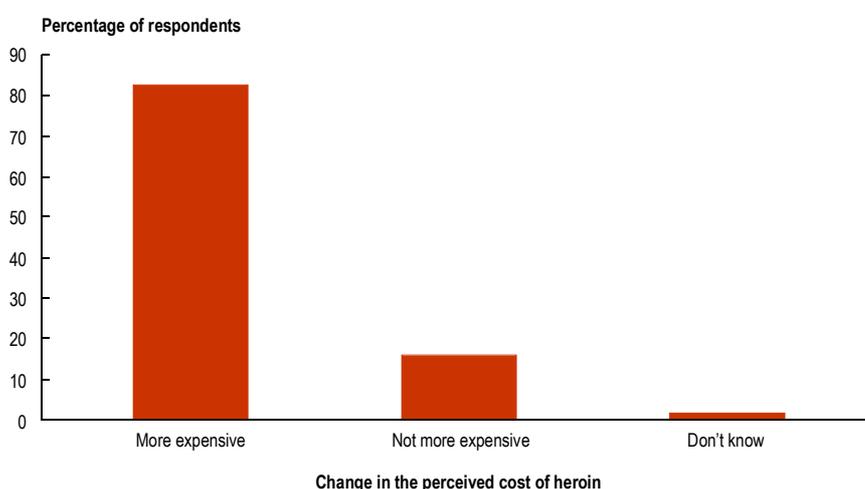
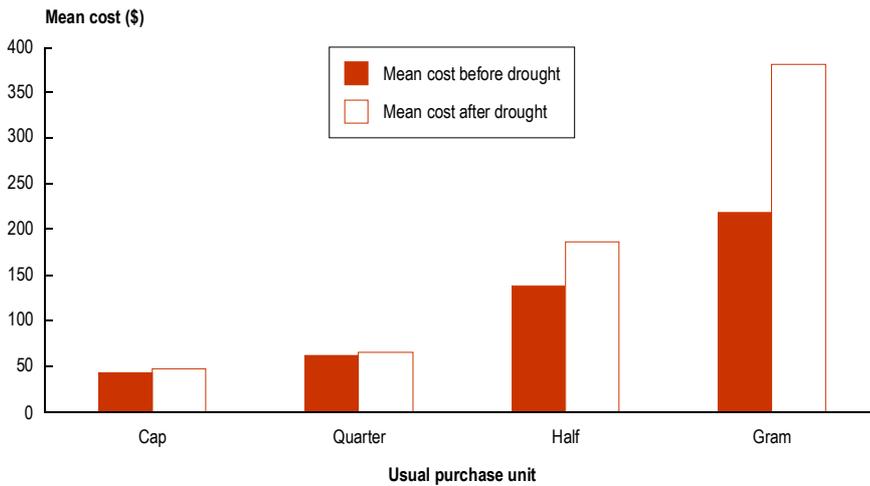


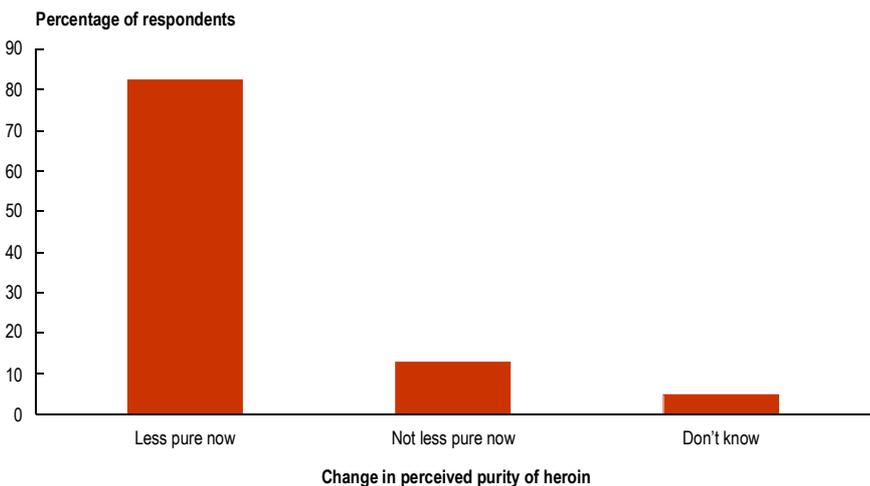
Figure 2: Changes in the cost of heroin by usual purchase unit



There was no significant increase in the cost of a cap or a quarter but the cost of a half and a gram was significantly higher after Christmas than before ($p\{\text{half}\} = 0.012$, $p\{\text{gram}\} = 0.001$). Although there was no significant increase in the average cost of a cap or a quarter, the differences in the corresponding minima were substantial. For 38 respondents whose usual purchase unit was a cap the minimum amount paid before the drought was \$10 and rose to \$20 after the drought. For 78 respondents whose usual purchase unit was a quarter the minimum amount paid before the drought was \$20 and rose to \$40 after the drought.

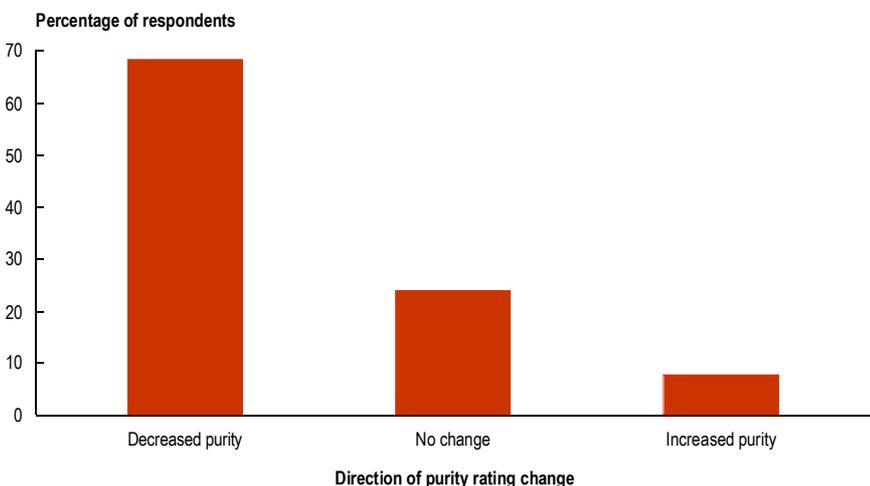
To measure changes in the perceived purity of heroin, respondents were asked two questions. The first asked whether heroin was 'less pure now' than it was 'before Christmas'. Figure 3 shows the pattern of response to this question.

Figure 3: Effect of the drought on perceived purity of heroin



It is obvious that the vast majority of respondents (82%) regarded heroin as less pure after Christmas than it had been before Christmas. To further investigate changes in the perceived purity of heroin, respondents were asked to rate the purity of heroin 'at the moment' (options: 'high', 'medium', 'low', 'varies', 'don't know'). They were also asked to rate the purity of heroin 'before Christmas' using the same rating options. Less than 10 per cent of respondents endorsed 'varies' or 'don't know' in response to either question. These respondents were excluded from the analysis and a new measure of the perceived change in the purity of heroin was then constructed in the following way.

Figure 4: Changes in heroin purity ratings



First, the individual ratings given in response to each question were assigned a '1', '2' or '3', according to whether the perceived purity of heroin was 'low', 'medium' or 'high'. Then the difference between each respondent's purity rating before and after Christmas was computed. The differences necessarily take on the values -2, -1, 0, +1 and +2. A Wilcoxon signed ranks test was applied to these ranked values. The test showed that the perceived purity of heroin was lower after Christmas than before ($p < 0.001$).

Figure 4 illustrates this result. It shows the relative frequency with which the difference in a respondent's purity ratings indicated either a drop in perceived purity, no change in purity or an increase in purity. For simplicity of exposition, negative values have been

grouped and assigned the label 'decreased purity', those who had a value of zero have been assigned the label 'no change' and the positive values have been grouped and assigned the label 'increased purity'.

As with heroin price and purity, two questions were asked to measure changes in the availability of heroin. The first asked respondents whether heroin was 'harder to get now' than it was 'before Christmas'. Figure 5 shows the pattern of response to this question.

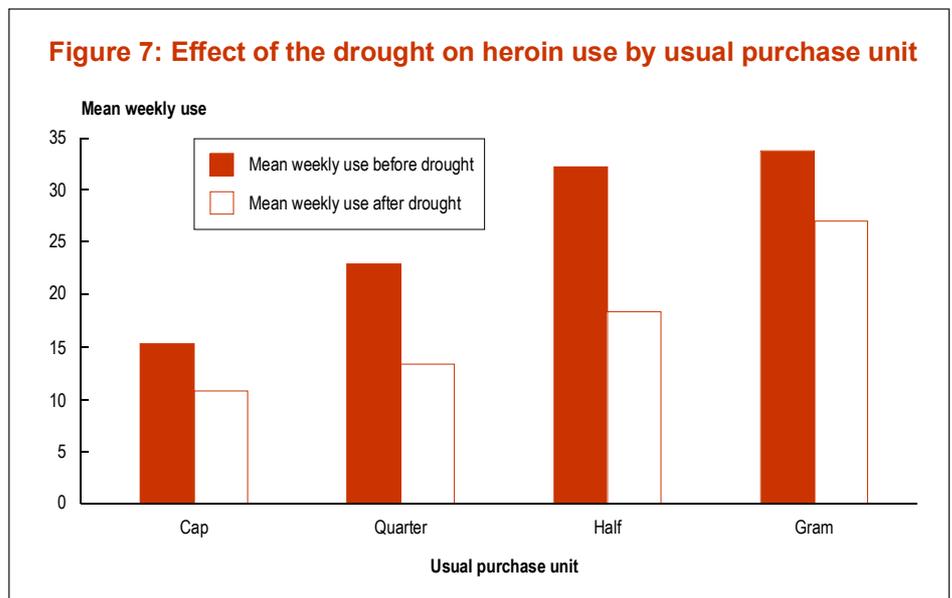
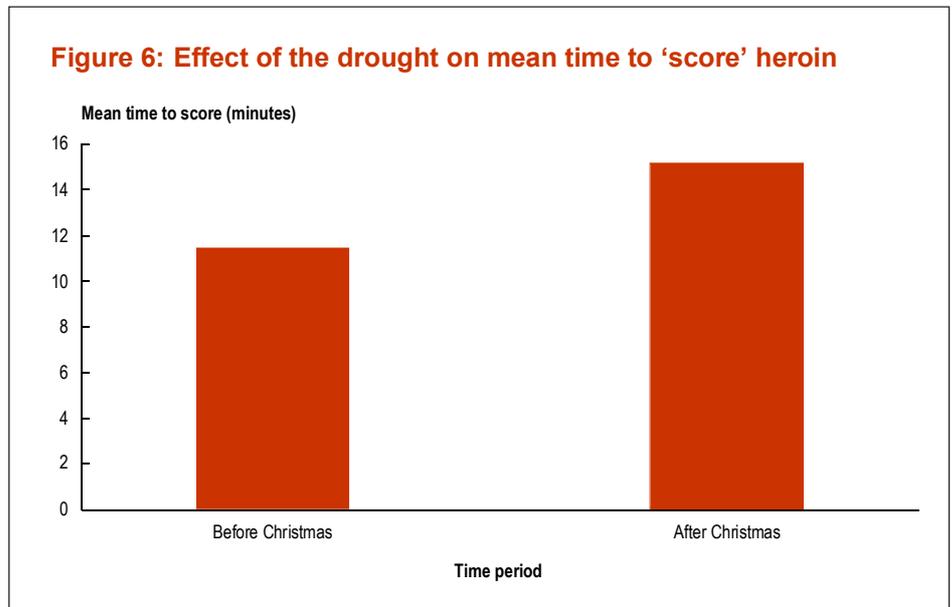
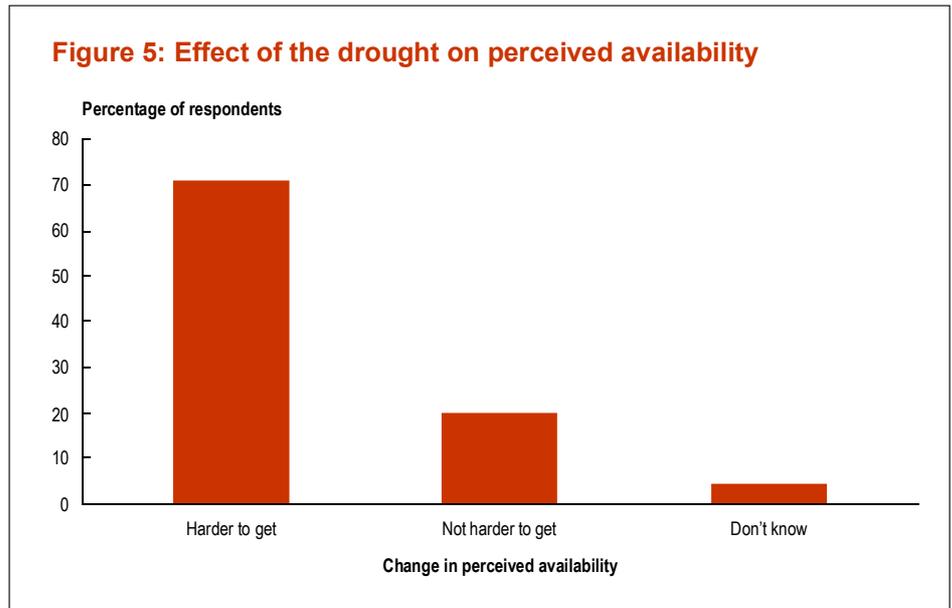
The majority of respondents (71%) regarded heroin as harder to get after Christmas than before. To further investigate changes in the availability of heroin the survey asked each respondent how long it takes to score heroin 'at the moment' and how long it took 'before Christmas'. Figure 6 shows the average reported time to score before and after Christmas.

The average time it took to score heroin before Christmas was 11.4 minutes. This increased to 15.2 minutes after Christmas. The data were analysed using a Wilcoxon signed ranks test using the same procedure as was used in testing for changes in the cost of heroin. Although it appears to have taken respondents only a few minutes longer to score after Christmas, the difference is statistically significant ($p = 0.010$). Note, however, that the mean time to score after the drought shown in Figure 6 is substantially less than the four hours reported by Rouen et al. (2001).

CHANGES IN USE AND EXPENDITURE

We now turn to the effect of the drought on heroin use and expenditure.

To gauge the effect of the drought on heroin consumption, respondents in the heroin user survey were asked to state, on average, how many times they currently use heroin each week and how many times each week they were using heroin before Christmas. Averaged over all respondents, the frequency of heroin use fell by 36 per cent, from an average frequency of 23 times per week before Christmas to an average frequency of 15 times per week after Christmas. Figure 7 shows the average frequency of self-reported heroin use in response to each of these questions, cross-classified according to the usual unit respondents purchased.



It is evident from Figure 7 that the average self-reported weekly heroin use after Christmas is lower than it was before Christmas, regardless of the unit of heroin respondents usually purchase. A Wilcoxon signed ranks test indicated that the overall drop in heroin consumption was significant ($p < 0.001$). The difference in heroin consumption before and after Christmas was also significant for caps, quarters and halves but it was not significant for grams ($p\{cap\} = 0.012$, $p\{quarter\} < 0.001$, $p\{half\} = 0.006$, $p\{gram\} = 0.308$).

The evidence of a drop in heroin consumption in the wake of the drought just presented is consistent with trends in the percentage of people arrested testing positive for heroin use under the DUMA program. Figure 8 shows the quarterly trend in the percentage of people arrested testing positive for heroin use in the six quarters leading up to Christmas 2000 and the two quarters immediately following. Separate trends are shown for Bankstown and Parramatta.

There is a marked drop in the proportion of people arrested testing positive for opiate use in the first two quarters of 2001 for Parramatta and a more gradual decline in Bankstown.

Although both the survey and the DUMA data provide evidence of a drop in heroin consumption, neither can be regarded as completely reliable. This is because both datasets tend to reflect patterns of heroin use at a particular location. As already noted, less frequent (or less dependent) heroin users may have simply left the heroin market altogether or gone elsewhere. One way to get an overall picture of the scale of the drop in heroin use is to examine data on the number of needles and syringes dispensed under the needle exchange program. Figure 9 shows the trend in the number of needles and syringes dispensed in the Cabramatta area by DISC between July 2000 and June 2001.

The overall drop in needles and syringes dispensed in Cabramatta is 59 per cent lower in the first half of 2001 than it was in the last half of 2000. Prima facie this suggests that there has been a very large drop in heroin use in Cabramatta. Since it is possible that those who used to obtain their heroin in that location have moved elsewhere to buy and use heroin, we need to examine trends in the

Figure 8: DUMA trends in positive urine tests to opiates (September 1999 to June 2001)

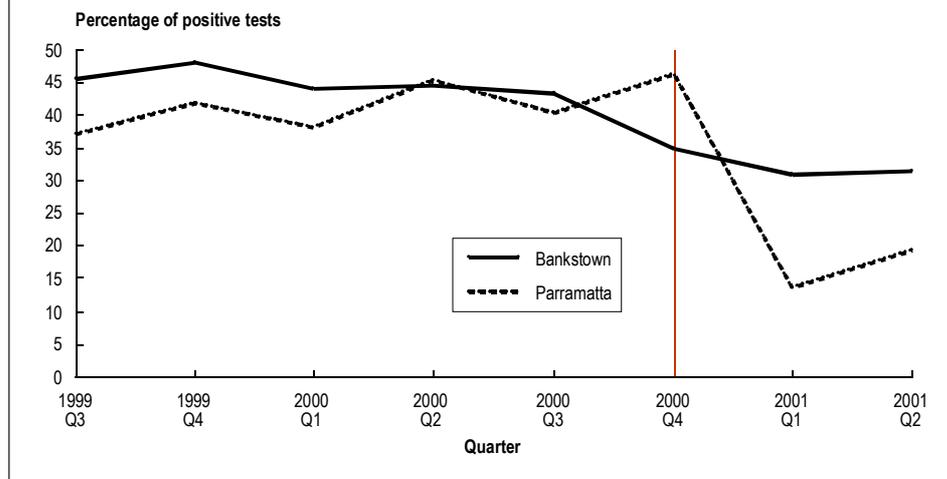


Figure 9: Trends in needles and syringes dispensed by DISC (July 2000 to June 2001)

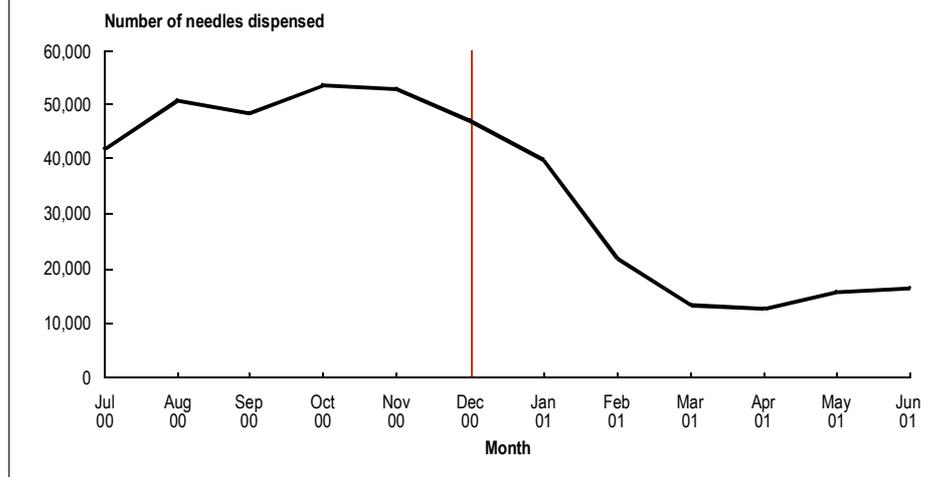
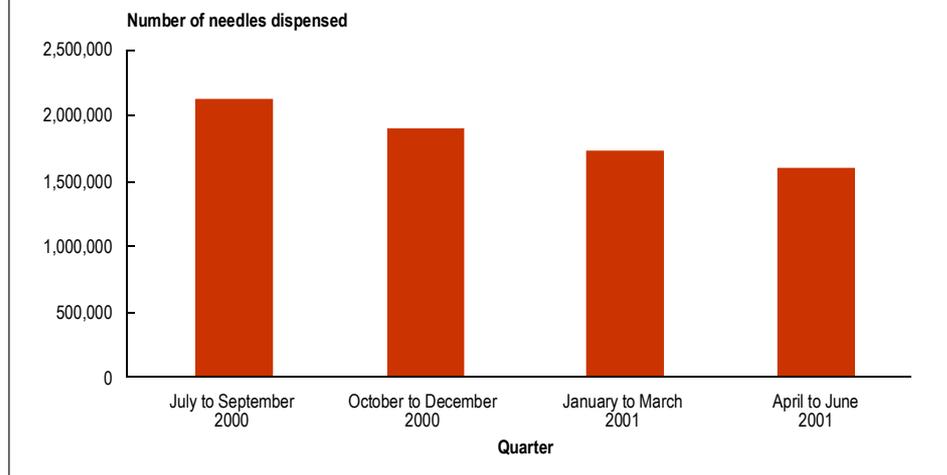


Figure 10: Statewide trend in needles and syringes dispensed through public hospitals (July-September 2000 to April-June 2001)



number of needles and syringes dispensed through the publicly funded needle and syringe exchange program across the State.

Figure 10 shows this trend. Note that this figure excludes data from Western Sydney, Southern Sydney and the Greater Murray Area Health Services. This is because, at the time of writing, NSW Health did not have precise records of the numbers of needles and syringes dispensed in these Area Health Services during each of the years in question. Nevertheless the Area Health Services included in Figure 10 each dispensed more than 100,000 needles and syringes per quarter in the quarter immediately preceding the drought. Collectively they account for 87 per cent of all needles and syringes dispensed by the Area Health Services in NSW.

There is evidence of a decline in the number of needles and syringes dispensed across the State but the decline between the October-December quarter 2000 and the April-June quarter in 2001, while still sizable, is much smaller (16%) than the fall over the corresponding period in Cabramatta which is seen in Figure 9.

Figure 11 shows that individual Area Health Services exhibit marked variation in the number of needles and syringes dispensed.

Area Health Service (AHS) Code:

- SWS = South Western Sydney AHS,
- SES = South Eastern Sydney AHS,
- NR = Northern Rivers AHS,
- CC = Central Coast AHS,
- HU = Hunter AHS,
- CS = Central Sydney AHS,
- NE = New England AHS,
- IL = Illawarra AHS,
- WE = Wentworth AHS,
- MW = Mid-Western AHS,
- MNC = Mid-North Coast AHS,
- FW = Far West AHS,
- MQ = Macquarie AHS,
- NS = North Sydney AHS,

While most major Area Health Services appear to have dispensed fewer needles and syringes in the three months to June this year than in the three months preceding Christmas 2000, the largest change is clearly that in South Western Sydney.⁵ The second largest change is that in South Eastern Sydney, which encompasses the major heroin market in Kings Cross. Three

Area Health Services showed small increases in the number of needles and syringes dispensed.

The data presented so far strongly suggest a decline in heroin use in response to the drought but this does not necessarily indicate a drop in expenditure on heroin. Indeed, as noted in the introduction, one of the concerns about supply-side drug law enforcement is that raising the cost of heroin may cause heroin users to spend more money on the drug. It is impossible to determine directly whether the total expenditure on heroin by heroin users has risen or fallen in response to the heroin drought. The survey data, however, provide strong evidence that individual expenditure on heroin may

have fallen, at least among frequent users of the drug. Across all respondents, median weekly expenditure fell 36 per cent, from \$550 to \$350. This difference is statistically significant (Wilcoxon signed ranks test, $p < 0.001$).

Figure 12 shows the median reported weekly expenditure on heroin by survey respondents before and after Christmas. Changes in weekly expenditure were calculated separately, according to the respondent's usual purchase unit.

The difference in expenditure on caps approached significance (Wilcoxon signed ranks test, $p = 0.058$). The difference in expenditure on quarters was significant (Wilcoxon signed ranks test, $p < 0.001$). The differences in expenditure on halves and grams were not significant.

Figure 11: Absolute change in number of needles and syringes dispensed (October-December 2000 to April-June 2001)

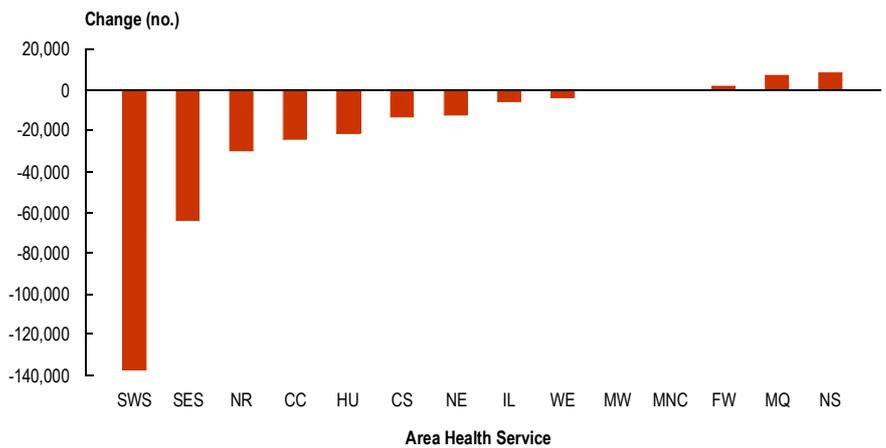


Figure 12: Effect of the drought on median weekly heroin expenditure

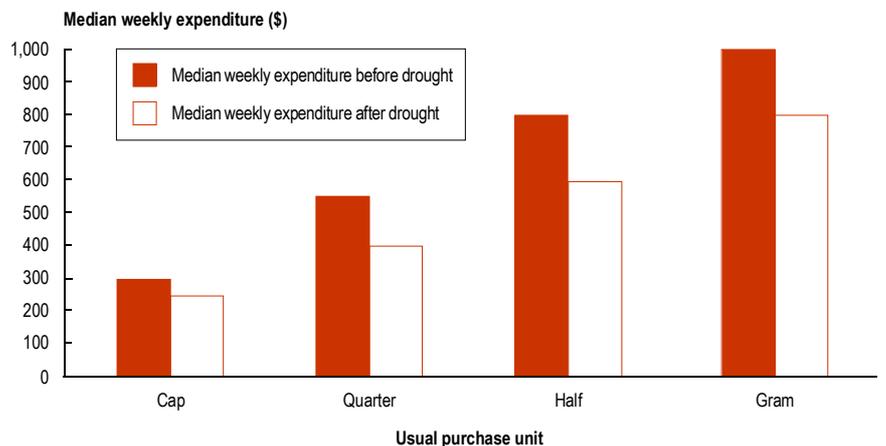
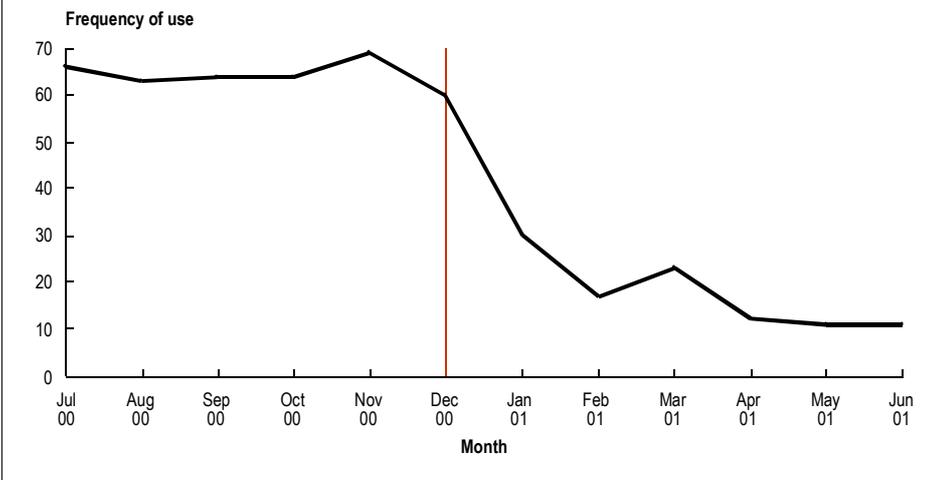


Figure 13: Trends in Narcan use in Cabramatta (July 2000 to June 2001)



CHANGES IN OVERDOSE, TREATMENT ENTRY AND OTHER DRUG USE

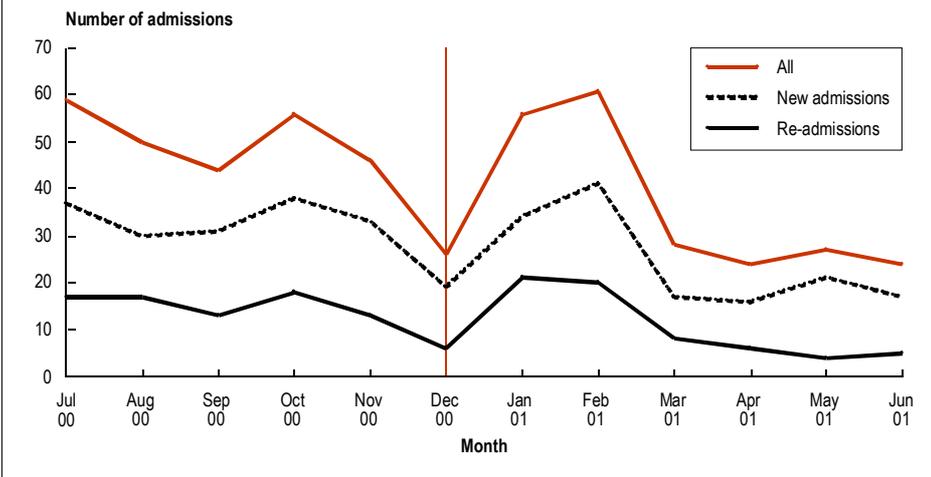
In this section we examine the impact of the drought on heroin overdose, methadone treatment entry and the use of drugs other than heroin.

Figure 13 presents data on the number of Narcan administrations in Cabramatta over the period July 2000 to June 2001.

The pattern in Figure 13 is very similar to that in Figure 9, although the scale of the drop between the last six months of 2000 and the first six months of 2001 is even larger (74%). The trend in Figure 13 therefore provides strong confirmatory evidence of a drop in heroin use in Cabramatta. More importantly, it shows a sharp fall in heroin overdose (whether because of reduced use, reduced purity, or both).

One possible reason for a decline in heroin overdose and use is an increase in entry into methadone treatment. More than half (53%) of the respondents in the heroin user survey said that they had sought treatment for heroin use since Christmas. This appears high but, in the absence of a suitable baseline, it is difficult to be certain that this rate of treatment seeking is higher than that which prevailed before Christmas. A more direct means of assessing whether the drought has prompted an increase in the number of heroin users seeking methadone treatment is to examine trends in the number of admissions to methadone. Figure 14 shows the number of methadone treatment admissions (new, re-admissions and total) in the Cabramatta region between July 2000 and June 2001.

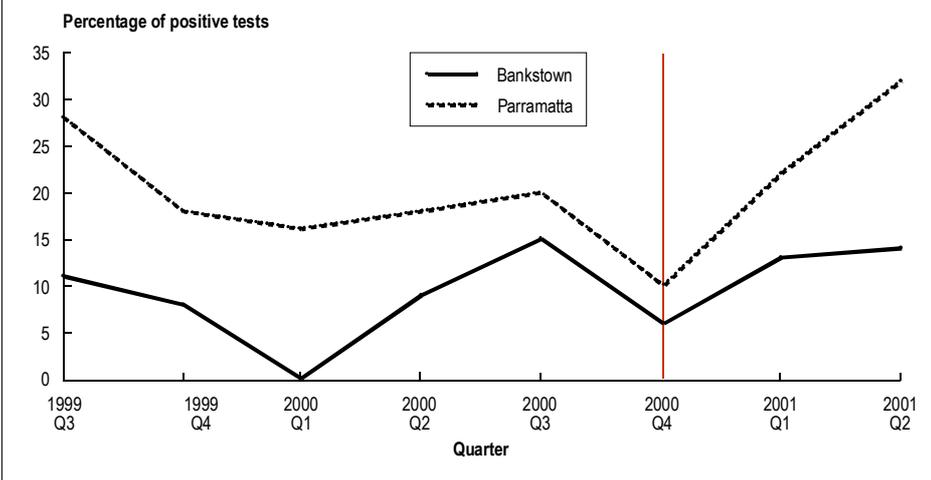
Figure 14: Admissions to methadone in Cabramatta (July 2000 to June 2001)



Although the methadone admission data show some volatility, there is clear evidence of a sharp upturn in the number of new admissions and re-admissions to treatment after December 2000.

The evidence in Figure 14 of an increase in methadone treatment entry is also supported by DUMA data. Figure 15 shows the percentage of DUMA detainees testing positive for methadone between the September quarter 1999 and the June quarter 2001. Again, although the trend shows considerable volatility from quarter to quarter, there is evidence of an increase between the

Figure 15: DUMA trends in positive urine tests to methadone (September 1999 to June 2001)



first and second quarters of 2001 in the number of police detainees in Bankstown and Parramatta testing positive to methadone.

Once again, because heroin users may have moved we need to look at trends in methadone use across the State. The sharp increase in admissions to methadone treatment seen in Figure 14 for Cabramatta is not as pronounced in methadone admissions across the State. Figure 16, shows the trend in new admissions, re-admissions and total admissions to methadone across NSW between July 2000 and June 2001.

There is some evidence of an upswing in total methadone admissions in January and February 2001 but the upswing is not as pronounced as it was in Cabramatta and appears to have come more from re-admissions to methadone rather than from new admissions.

Reducing their heroin use and/or entering treatment are not the only ways in which heroin users might respond to an increase in the cost and a decrease in the purity and availability of heroin. Another obvious response is to increase their use of other drugs, whether licit or illicit. In the heroin user survey, respondents who said that heroin was either harder to get, more expensive or less pure were asked whether they were using more of other drugs 'to make up'. A majority (56%) said they were. Those who said they were using other drugs 'to make up' were provided with a list of other drugs and asked which of them they were now using more frequently. Respondents could endorse more than one drug. Figure 17 shows the pattern of response to this question.

Amongst those who have increased their use of other drugs, the major compensatory response has been to use more cocaine. Notable proportions of heroin users, however, have also increased their consumption of cannabis, benzodiazapines and 'speed' (amphetamines). Interestingly, the pattern of 'topping up' tends to vary with the level of heroin use prior to the onset of the drought.

While the predominant tendency was to use more cocaine, those using heroin twice daily or less were less likely to

Figure 16: Admissions to methadone in NSW (July 2000 to June 2001)

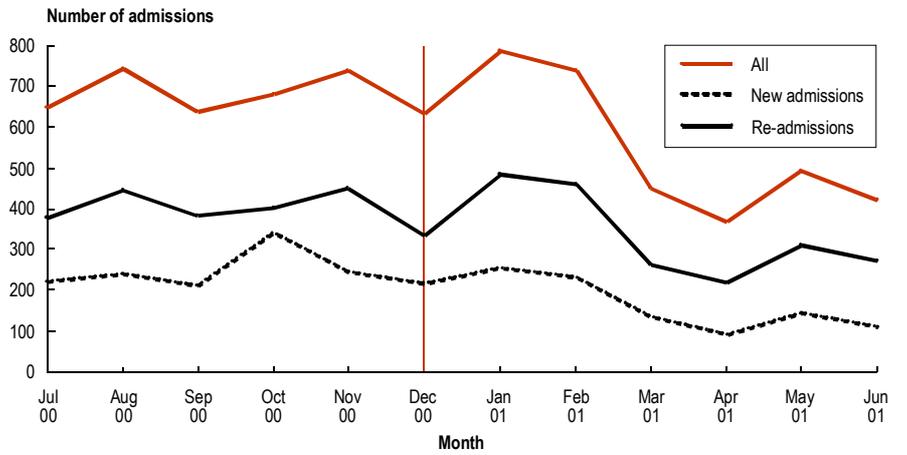


Figure 17: Type of other drug being used more frequently

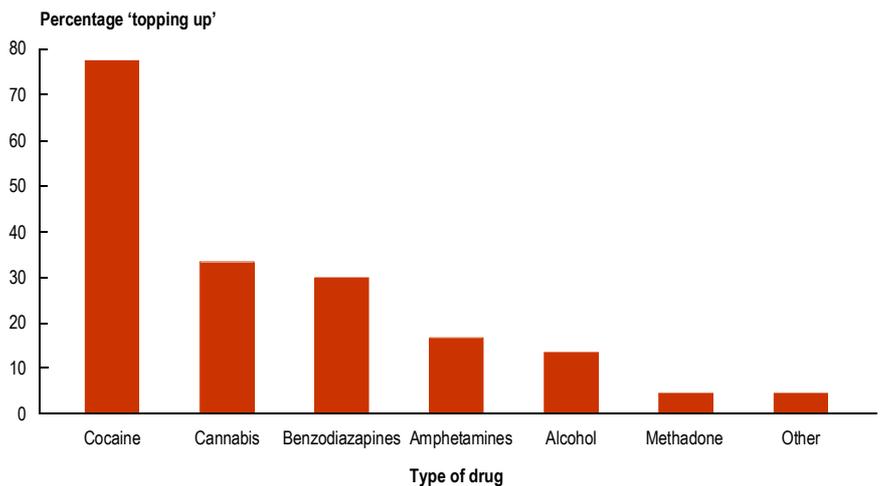
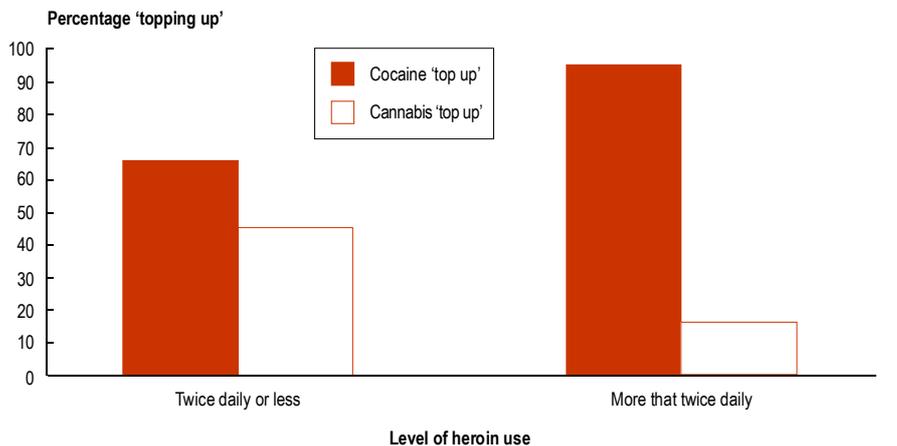


Figure 18: Percentage 'topping up' by drug type and level of heroin use

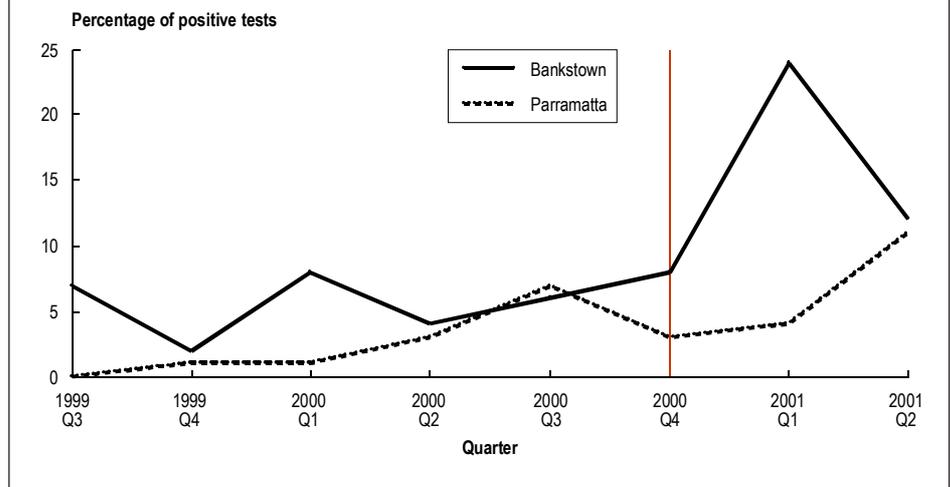


'top up' with cocaine and more likely to 'top up' with cannabis than those using heroin more than twice daily. The differences are statistically significant ($\chi^2\{\text{cocaine} \times \text{level of heroin use}\} = 10.3, df = 1, p = 0.001$; $\chi^2\{\text{cannabis} \times \text{level of heroin use}\} = 8.3, df = 1, p = 0.003$).

There is some confirmation of the shift to cocaine in the DUMA data. Figure 19 shows the quarterly trend in Bankstown and Parramatta in the percentage testing positive to cocaine.

Figure 19 shows a sharp jump in the percentage testing positive to cocaine in Bankstown in the first quarter of 2001 and a somewhat less pronounced increase in the percentage testing positive for cocaine in Parramatta in the second quarter.

Figure 19: Trends in positive urine tests to cocaine (September 1999 to June 2001)



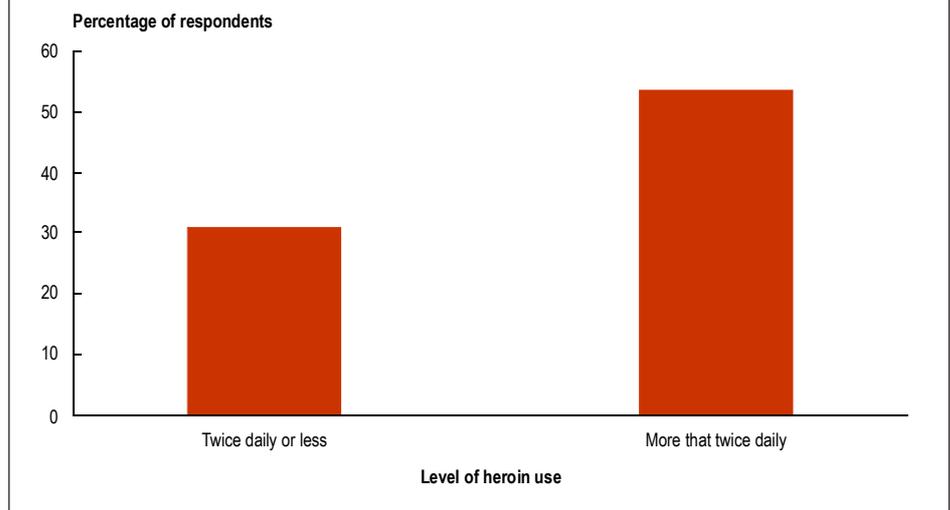
CHANGES IN CRIME

We turn, finally, to the effect the heroin drought has had on crime. As noted earlier, it is impossible to determine by any reliable means how much crime in any given month is committed by heroin users to raise money to purchase heroin. In the heroin user survey, respondents were asked whether they usually commit crime to pay for heroin. If they answered affirmatively to this question they were then asked whether they were committing more crime now than before Christmas. Slightly less than half of the respondents (49%) said that they usually committed crime to purchase heroin. Forty-two per cent of these respondents said that they were committing more crime now than at Christmas. As can be seen from Figure 20, those with larger heroin habits were more likely to report that they were committing more crime now than before Christmas ($\chi^2 = 4.3, df = 1, p = 0.032$).

The heroin user survey, however, may provide a misleading picture of the effect of the drought on heroin-related crime because heroin users who left the heroin market for treatment or significantly reduced their heroin consumption may have reduced their crime.

To obtain a more general picture of the effect of the drought on crime we now examine trends in police-recorded property crimes often committed by heroin users to raise cash to purchase heroin. Because heroin users may

Figure 20: Percentage reporting more crime by level of heroin use



commit crime outside the area in which they purchase heroin, each graph presents data both for Fairfield (the Local Government Area containing Cabramatta) and for the State as a whole. So as to make it easier to gauge whether any changes in recorded crime after Christmas 2000 are attributable to seasonal factors, we present trends for the period July 1999 to June 2001.

Figure 21 shows the trend in police-recorded motor vehicle thefts. Motor vehicle theft is an offence often committed by heroin users either to get to Cabramatta or to leave there.

There is no evidence of any upward trend in motor vehicle thefts in the period immediately before or after Christmas

2000, either for the State as a whole or for Cabramatta. In fact, if anything, the number of motor vehicle thefts in Fairfield appears to have declined in the first few months of 2001.

Figure 22 shows the trend in the number of thefts from retail stores, another common offence committed by heroin users, particularly in Cabramatta.

Once again, there is no evidence of any upward trend in crime in the period immediately before or after Christmas 2000, either in Cabramatta or for NSW as a whole. As with motor vehicle theft, if anything, there is a drop in the incidence of retail theft in Fairfield in the first few months of 2001.

Figure 21: Trends in motor vehicle theft (July 1999 to June 2001)

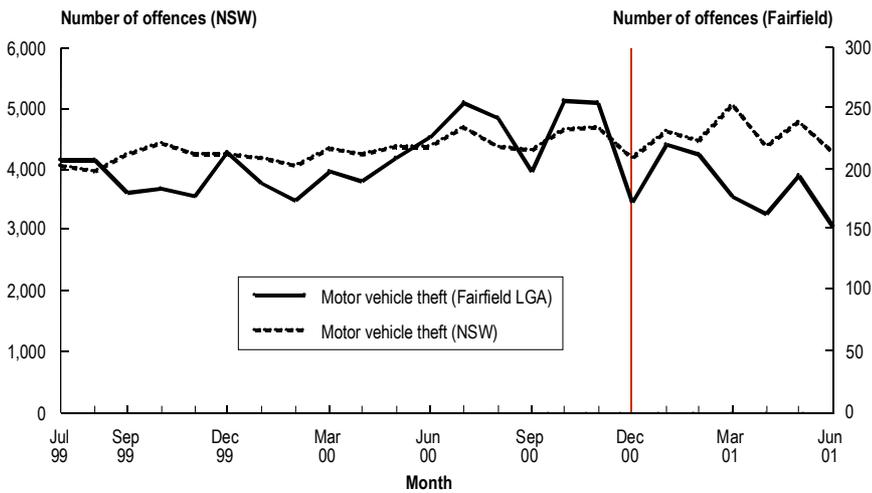
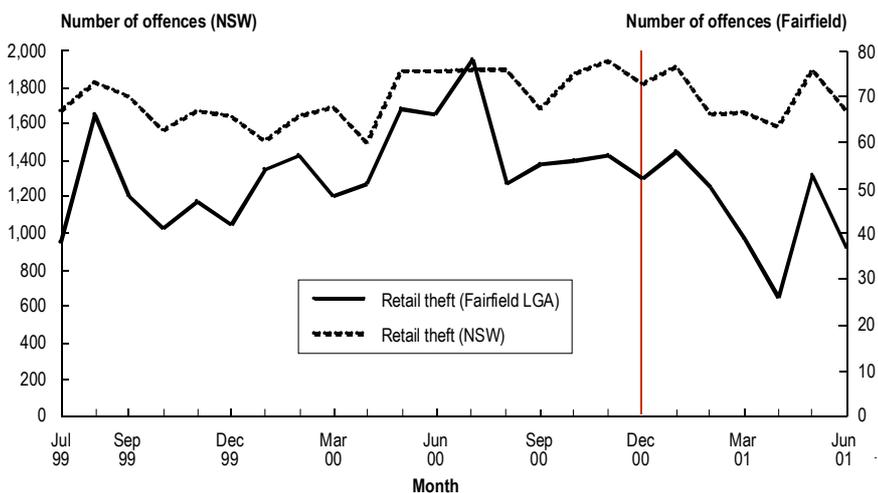


Figure 23 shows the trend in the number of break and enter – dwelling offences recorded by police over the period in question.

There is evidence of a jump in the number of break and enter – dwelling offences reported to police in the Fairfield area in the first few months of 2001 and a somewhat fainter echo of the same jump across the State over the same period. By June, however, the number of break and enters appears to have returned to levels similar to or lower than those prevailing during 1999 and most of 2000.

Figure 24 shows the trend in the number of offences involving theft from the person recorded by police.

Figure 22: Trends in retail theft (July 1999 to June 2001)

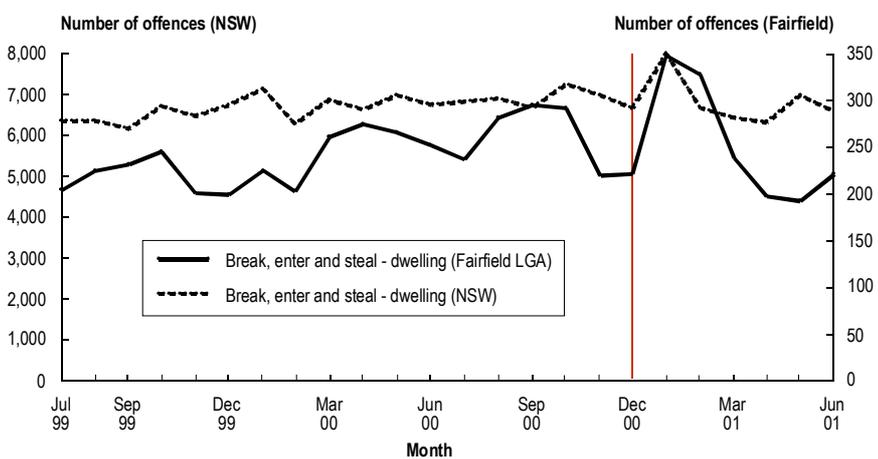


The number of theft from the person offences recorded by police in both Fairfield LGA and across the State reaches a peak immediately after Christmas and then declines. However as there is another similar peak in December 1999, the jump which occurs after Christmas 2000 cannot safely be regarded as attributable to the heroin drought.

Figure 25 shows trends in the number of robbery offences recorded in both Fairfield and the State as a whole.

There is a clear and substantial increase in the number of robbery offences recorded by police in Fairfield in the early months of 2001. The pattern in Fairfield is reflected in the number of robbery offences recorded across NSW as a whole. As with the pattern involving break and enter – dwelling, however, the jump in offending appears to be followed by an equally dramatic fall in offending. By June 2001, robbery offences have returned to levels which prevailed through most of 1999 and 2000.

Figure 23: Trends in break, enter and steal - dwelling (July 1999 to June 2001)



DISCUSSION

The overall picture, then, is as follows. Some time around Christmas 2000 there was an abrupt increase in the cost and a reduction in the purity and availability of heroin in Cabramatta, Australia's largest heroin market. The immediate effect of these changes appears to have been a substantial reduction in heroin consumption. Evidence for this can be found in the fall in needles and syringes

dispensed, the fall in heroin overdoses, the fall in the percentage of people arrested by police who test positive for heroin and the fall in heroin use reported by respondents in the heroin user survey. The second major effect, although this is less certain, appears to have been a fall in overall expenditure on heroin. Support for this effect can be found in the reduced expenditure reported by respondents in the heroin user survey and in the evidence that heroin use has fallen. Our certainty about whether there has been a fall in overall expenditure on heroin across NSW stems from the fact that we cannot tell whether the reduced expenditure on heroin found among survey respondents applies to all heroin users.

The third effect appears to have been a reduction in the health risks and problems faced by heroin users. This is evident in the drop in Narcan administration and in the increase in new enrolments (and re-enrolments) in methadone maintenance treatment. It is also implicit in the drop in heroin use.

One question arising from the study is why there is such large regional variation in the number of needles and syringes dispensed.

The least likely explanation is that heroin users in Cabramatta and other parts of South Western Sydney have simply moved elsewhere. If this were true we would have expected significant increases in the number of needles and

syringes dispensed in areas to which they went. Three Area Health Services did record an increase in the number of needles and syringes dispensed (North Sydney, Macquarie and the Far West). None of these areas, however, dispense large numbers of needles and syringes compared with the other Area Health Services shown in Figure 11. More to the point, the increase in needles and syringes dispensed in these areas was more than offset by decreases in other areas. The total number of needles and syringes dispensed across all Area Health Services for which reliable figures could be obtained fell by 295,224 from the last quarter of 2000 to the second quarter of 2001.

It is possible in some areas that the fall in heroin use is being offset by a growth in the frequency with which people are injecting other kinds of drugs, especially cocaine. This explanation is supported by three lines of evidence. Firstly, 70 of the 165 respondents to the heroin user survey (42%) indicated that they were responding to the heroin shortage by increasing their consumption of cocaine. Secondly, the DUMA data indicate that the number of police detainees in Bankstown and Parramatta testing positive for cocaine increased after the onset of the drought. Thirdly, client surveys conducted by staff managing the Medically Supervised Injection Centre in Kings Cross indicate a sharp growth in the first few months of this year in the frequency of cocaine injection (van Beek 2001).

Perhaps the most important reason for the larger relative fall in needles and syringes dispensed in Cabramatta is that there was a sharp rise in arrests for heroin and cocaine use and/or possession in Cabramatta in the period leading up to and after Christmas 2000. In Cabramatta the number of people arrested for use and or possession of narcotics doubled between August and December 2000 (from 37 in August to 81 in December) and then fell back by about the same amount by June 2001. Arrests for use and or possession of cocaine rose six-fold between December 2000 and March 2001 (from 4 in December to 24 in March) and then fell back by almost the same amount by June 2001. This street-level drug law enforcement activity may have

Figure 24: Trends in theft from the person (July 1999 to June 2001)

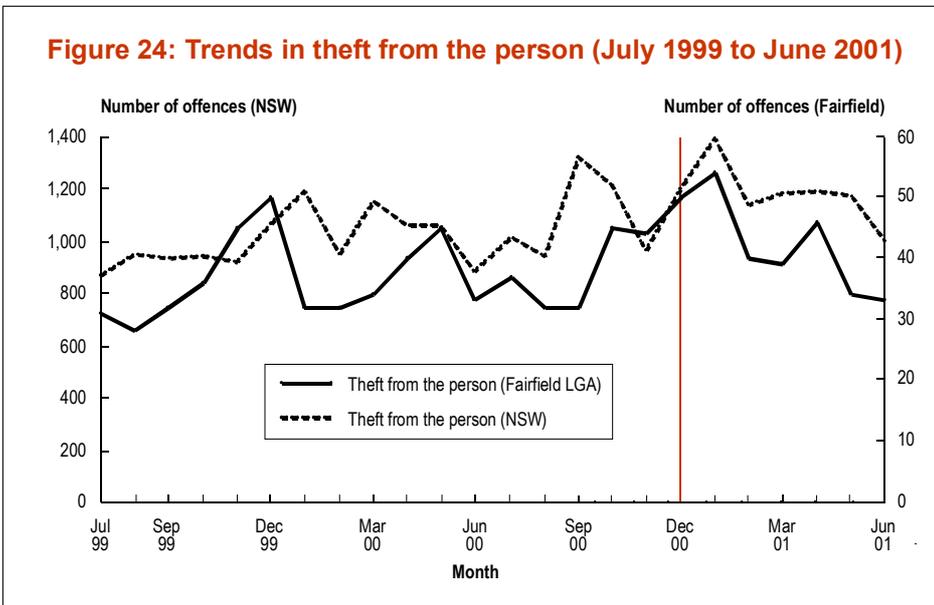
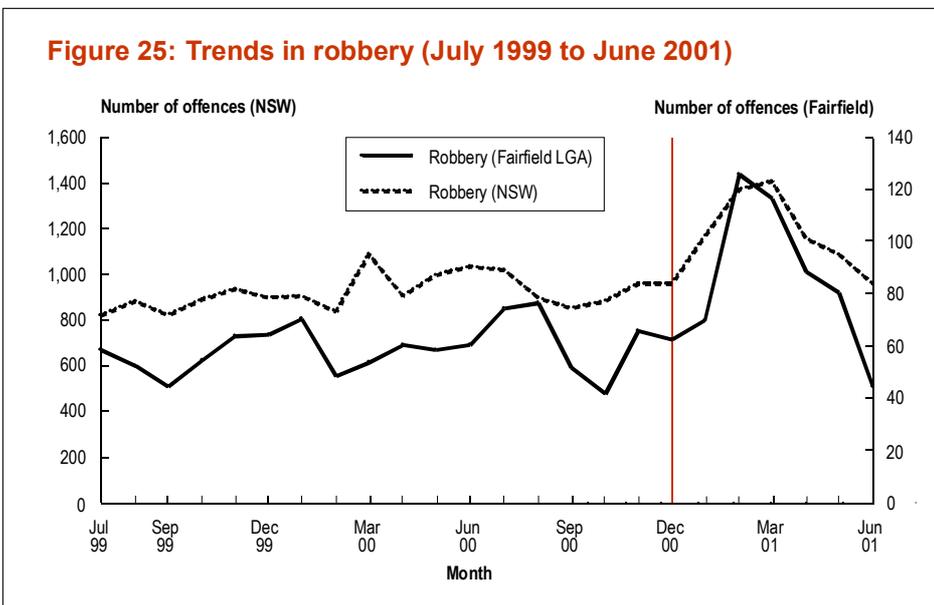


Figure 25: Trends in robbery (July 1999 to June 2001)



combined with higher heroin prices to magnify the rate of departure from the heroin market in South Western Sydney compared with other areas of the State.

In general the present results provide encouraging evidence of the potential value of supply control policy. Indeed, if drug law enforcement is credited with causing the heroin drought the results may be regarded as providing evidence of its actual value. The increase in heroin prices and the reduction in heroin purity and availability appear to have exerted a substantial suppression effect on the demand for heroin. This suppression effect is all the more notable because it appears to have been accompanied, at least among dependent heroin users, by a significant reduction in aggregate expenditure on heroin, a sharp fall in the rate of heroin overdose and an increase in the number of admissions to methadone treatment. The expectation that increased heroin prices would immediately lead to higher property crime rates, on the other hand, has not so far been borne out.

Some may be tempted to argue that dependent heroin users are simply switching from heroin to cocaine, a far more dangerous drug from the vantage-point of both public health and crime. Both the heroin user survey and the DUMA data confirm that heroin users are responding to the shortage of heroin by using more cocaine. The increase in cocaine use, however, must be set against three other considerations. Firstly, since there is a net reduction in the number of needles and syringes dispensed in most major needle distribution sites, it seems unlikely that the increase in cocaine use is as large as the fall in heroin use. Secondly, a majority of the 165 heroin users interviewed as part of this study indicated that they were *not* using more cocaine because of the shortage of heroin. Thirdly, data from the Illicit Drug Reporting System indicate that the increase in cocaine use began well before the onset of the heroin drought (McKetin, Darke & Godycka-Cwirko 1998).

This said, it must be acknowledged that the impetus given to cocaine use by the heroin drought must be regarded with concern. How long the drought continues remains to be seen. The longer it continues, however, the greater

the risk that heroin users will compensate for the shortage of heroin by consuming other injectable stimulants, such as cocaine or amphetamines. Authorities anxious to consolidate the gains in harm reduction produced by the heroin drought therefore need to focus immediate attention on measures which may help limit the uptake of other drugs, particularly injectable stimulants. There are a range of law enforcement, criminal justice, treatment and public education measures which may prove of assistance in achieving this goal.

Increased enforcement activity directed at importers and distributors of cocaine and local producers of amphetamines may assist in preventing any reduction in the price of cocaine and amphetamines. Increased street-level enforcement activity directed at retail cocaine and amphetamine markets may assist in reducing their availability or increasing the risk and (non-monetary) costs associated with their purchase. If the Drug Court and other similar coerced treatment options presently being trialed prove successful in reducing drug-related crime, it would be worth making these options available to a wider range of individuals arrested on charges related to heroin, cocaine and amphetamine use. Further expansion of the range, quality and flexibility of voluntary treatment regimes may also assist in encouraging a larger proportion of injecting drug users into treatment. Finally, keeping drug users fully informed about the risks they face injecting stimulants may limit the number who try them or who shift from sniffing or swallowing drugs to injecting them.

The purpose of this study was to build on the work carried out by the National Drug and Alcohol Research Centre (Rouen et al. 2001) on the effects of the heroin drought. While this research covers a wider range of issues than Rouen et al. were able to investigate, there is a lot more work to be done in this area. In the interests of providing early advice to policy makers we did not pursue a number of avenues of inquiry in as much depth as we would have liked. It is important to examine the drought and its effects in other parts of Australia. It would also be useful to obtain objective measures of changes in the purity of heroin on the street.

The short-term effects of the heroin drought may differ substantially from its long-term effects. If the heroin drought continues there is, accordingly, a need for ongoing monitoring of its influence on heroin use, expenditure on heroin, heroin overdose, entry into treatment, use of other drugs and crime.

There are also other critical issues for policy. While the information presented here is of value whether or not we credit drug law enforcement with producing the heroin drought, its value would be greatly increased if we had a better understanding of what caused the drought. It would be useful, in particular, to know whether and to what extent it was affected by problems in the production of heroin in source countries, the increase in quantities of heroin seized at the customs barrier and the arrest of a number of high-level domestic heroin distributors. A better understanding of the relative contributions made by these factors to the drought would provide clearer guidance on the relative effectiveness of source country controls, border interdiction and high level domestic enforcement in reducing the supply of heroin and the harms associated with it.

ACKNOWLEDGEMENTS

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NOTES

- 1 Dr Toni Makkai is the national project manager for the Drug Use Monitoring in Australia (DUMA) project at the Australian Institute of Criminology.
- 2 To see this, suppose 72,000 users consume 0.5g per day at a cost of \$300 a gram. Collectively, therefore, they spend \$10.8 million per day. Assume the price of heroin goes up by 10 per cent to \$330 a gram but demand drops 8 per cent for each user to 0.46g per day. Now, despite the drop in demand, the 72,000 users are collectively spending \$10.93 million a day. This is an extra \$130,000 a day than they were spending before the price rise.
- 3 An elasticity of -0.59 would mean that a 1 per cent increase in the price of heroin would result in a fall of -0.59 per cent in the amount of heroin consumed. An elasticity of -2.5 would mean that the fall in consumption from a 1 per cent price rise would be 2.5 per cent.
- 4 Data collection for this survey was carried out by Forsythe Consultants, PO Box 280, Helensburgh NSW 2508.
- 5 This Area Health Service encompasses the major drug markets in Cabramatta and Bankstown.

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APPENDIX

HEROIN QUESTIONNAIRE

Date of interview:.....

Interviewer:.....

First name of respondent:.....

Gender of respondent:
(1 = male, 2 = female)Age of respondent:.....
(whole number in years)

Interview location:.....

Q.1a Have you used heroin in the past six months?
(1 = Yes, 2 = No)
If NO, then STOP

Q.1b Are you still using heroin now?
(1 = Yes, 2 = No)

Q.1c How old were you when you first began using heroin regularly?
(ie, every day or almost every day)

Q.2 Do you *usually* buy heroin in caps, quarter grams, half grams, grams or some other amount?
(1 = caps, 2 = quarter grams, 3 = half grams, 4 = grams, 5 = other (specify:.....))

Q.3a How much does a (unit) of heroin cost at the moment?
(Prompt: eg, in the last month)
(888 = Don't know)

Q.3b How much were you paying for a (unit) of heroin before Christmas?
(Prompt: eg, in the month before Christmas) (888 = Don't know)

Q.4a How much do you spend on heroin for yourself each week at the moment?

Q.4b How much did you spend on heroin for yourself each week before Christmas?

Q.5a How pure would you say heroin is at the moment?
(1 = High, 2 = Medium, 3 = Low, 4 = Varies, 5 = Don't know)

Q.5b How pure would you say heroin was before Christmas?
(1 = High, 2 = Medium, 3 = Low, 4 = Varies, 5 = Don't know)

Q.6a About how long does it take you to score heroin at the moment?
(code whole minutes)
(999 = not applicable)

Q.6b About how long did it take you to score heroin before Christmas?
(code whole minutes)
(999 = not applicable)

Q.7a Where do you *usually* score heroin at the moment?
(1 = Street dealer, 2 = Dealer's home
3 = Friend, 4 = Mobile dealer
5 = Other (specify:.....)
6 = not applicable)

Q.7b Where do you *usually* get your needles from at the moment?
(1 = DISC Van, 2 = CCC/FLYHT Van
3 = Other NSPs.....,
4 = Chemists, 5 = Friends,
6 = Dealers, 7 = Fit sellers
8 = Other (specify:.....))

Q.7c Where did you *usually* score heroin before Christmas?
(1 = Street dealer, 2 = Dealer's home
3 = Friend, 4 = Mobile dealer
5 = Other (specify:.....)
6 = not applicable)

Q.7d Where did you *usually* get your needles from before Christmas?
(1 = DISC Van, 2 = CCC/FLYHT Van,
3 = Other NSPs.....,
4 = Chemists, 5 = Friends,
6 = Dealers, 7 = Fit sellers,
8 = Other (specify:.....))

Q.8a On average, how many times do you use heroin each week?
(code whole number)

Q.8b On average, how many times were you using heroin each week before Christmas?
(code whole number)

Q.9a Have you tried to get formal drug treatment since last Christmas?
(1 = Yes, 2 = No)
If NO, go to Q.10

Q.9b What sort(s) of treatment did you look for?
Methadone (1 = Yes, 2 = No)
Detox (1 = Yes, 2 = No)
Rehab (1 = Yes, 2 = No)
Counselling (1 = Yes, 2 = No)
Therapeutic Community (1 = Yes, 2 = No)
Naltrexone (1 = Yes, 2 = No)
Other (specify)

Q.9c Were troubles with the police important in your decision to get treatment?
(1 = Yes, 2 = No)

Q.9d Were family problems important in your decision to get treatment?
(1 = Yes, 2 = No)

Q.9e Was the price of heroin important in your decision to get treatment?
(1 = Yes, 2 = No)

Q.9f Was the quality of heroin important in your decision to get treatment?
(1 = Yes, 2 = No)

Q.9g Was the availability of heroin important in your decision to get treatment?
(1 = Yes, 2 = No)

Q.9h Which of those reasons was the most important in your decision to get treatment?
(1 = troubles with police
2 = family problems
3 = the price of heroin
4 = the quality of heroin
5 = the availability of heroin
6 = all equally important
7 = none of the above.)

Q.10a Overall, would you say that heroin is harder to get now than it was before Christmas?
(1 = Yes, 2 = No, 3 = Don't know)

Q.10b Overall, would you say that heroin is more expensive now than it was before Christmas?
(1 = Yes, 2 = No, 3 = Don't know)

Q.10c Overall, would you say that heroin is less pure now than it was before Christmas?
(1 = Yes, 2 = No, 3 = Don't know)

If NO to Q.10a, Q.10b AND Q.10c, then go to Q.12a

Q.11a Are you using more of other drugs to make up?
(prompt: for giving up heroin/ for lack of availability/ high price/ low purity)
(1 = Yes, 2 = No)

Q.11b Which ones?
Street methadone (1 = Yes, 2 = No)
Cocaine (1 = Yes, 2 = No)
Alcohol (1 = Yes, 2 = No)
Benzos (1 = Yes, 2 = No)
Speed (1 = Yes, 2 = No)
Cannabis (1 = Yes, 2 = No)
Other (specify)

Q.12a Do you *usually* have to commit crime to pay for heroin?
(1 = Yes, 2 = No, 3 = Refused)
If NO or REFUSED, then go to Q.13

Q.12b Are you committing more crime now than before Christmas?
(1 = Yes, 2 = No, 3 = Refused, 4 = Not applicable)
If NO or REFUSED, then go to Q.13

Q.12c Why?

Q.13 Is there anything else about using heroin that has changed in the last 6 months?