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The causes, course and consequences of the heroin shortage in Australia

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The causes, course and consequences of the heroin shortage in Australia

Louisa Degenhardt, Carolyn Day and Wayne Hall (editors)
National Drug and Alcohol Research Centre
University of New South Wales

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Abbreviations

A&E	Accident and Emergency
ABCI	Australian Bureau of Criminal Intelligence
ACC	Australian Crime Commission
ACS	Australian Customs Service
ACCV	Anti-Cancer Council of Victoria
AD	Anno Domini
ADCP	Adult Drug Court Program
ADIS	Alcohol and Drug Information Service
AFP	Australian Federal Police
AGD	Attorney General's Department
AHS	NSW Health Area Health Service
AIC	Australian Institute of Criminology
AIDB	AIDS and Infectious Diseases Branch
AIDR	Australian Illicit Drug Report
AIDS	Auto-Immune Deficiency Syndrome
AIHW	Australian Institute of Health and Welfare
ALP	Australian Labor Party
AMS	Aboriginal Medical Service
ANCO	Australian National Classification of Offences
AOD	Alcohol and other Drug
ASGC	Australian Standard Geographical Classification
ASNSW	Ambulance Service of NSW
ATS	Amphetamine-Type Stimulants
ATSI	Aboriginal and Torres Strait Islander
AVO	Apprehended Violence Order
BBVI	Blood Borne Viral Infection
BC	Before Christ
BDO	1,4-bromo-2,5-dioxyamphetamine
BEACH	Bettering the Evaluation and Care for Health
BOCSAR	Bureau of Criminal Statistics and Research
BTOM	Brief Treatment Outcome Measure
CATI	Computer Assisted Telephone Interviewing
CBD	Central Business District
CCIS	Children's Court Information System
CCN	Cannabis Caution Notice
CDAT	Community Drug Action Teams
CDHA	Commonwealth Department of Health and Ageing

CEA	Cost Effectiveness Analysis
INHMD	National Hospital Morbidity Database
NHMRC	National Health and Medical Research Council
NIDS	National Illicit Drugs Strategy
NMDS-AODTS	National Minimum Data Set - Alcohol and other Drug Treatment Services
NNDSS	National Notifiable Diseases Surveillance System
NSP	Needle and Syringe Program
NSW	New South Wales
OCR	Operational Crime Review
ODP	Office of Drug Policy
OMCG	Outlaw Motor Cycle Gang
ONCB	Office of the Narcotics Control Board
PaLMS	Pacific Laboratory Medicine Service
PCA	Prescribed Content of Alcohol
PDR	People's Democratic Republic
PFS	Pharmacy Fitpack Scheme
PMA	4,-methoxy-1-methylphenylethylamine
PSB	Pharmaceutical Services Branch
R & R	Rest and Relaxation
RCD	Recorded Crime Statistics Database
RRMA	Rural, Remote and Metropolitan Areas
RTP	Royal Thai Police Narcotics Suppression Bureau
SA	South Australia
SCC	State Crime Command
SESAHS	South Eastern Sydney Area Health Service
SLA	Australian Bureau of Statistics Statistical Local Area
SP	Starting Price
SSDA	Social Sciences Data Archives
SSD	Australian Bureau of Statistics Statistical Sub-Division
SWSAHS	South Western Sydney Area Health Service
TSA	Time Series Analysis
UN	United Nations
UNDCP	United Nations International Drug Control Program
US	United States
WHO	World Health Organisation

Executive Summary

Chapter 2. Global heroin markets

- For the last decade, the two major opium-cultivating countries in the world have been Afghanistan and Myanmar. In 2002, these two countries cultivated 76% and 18%, respectively, of world opium supplies.
- A small amount of the world's opium is cultivated in Central and Southern America, and has little or no contribution to Australia's heroin supply.
- In 2001, there was a dramatic drop in opium being cultivated in Afghanistan, due to the actions of the Taliban ruling party. Opium cultivation in Myanmar was largely unchanged during this time.
- Heroin cultivated in the Afghanistan region is largely trafficked through the Middle East, Central Asia and Africa to the European and American markets.
- Heroin from the Myanmar region largely supplies Australia, Canada and East Asia through routes traversing Southern China and South East Asia.
- For the last decade, Australia predominantly received its supply of heroin from the opium cultivating areas of Myanmar.
- The wholesale price of heroin in both the United States and Western Europe has been steadily decreasing since the late 1980s.
- There were increases in the farm gate price of opium in Afghanistan in 2001, but these were not translated into heroin price increases in Western Europe, the region primarily supplied by Afghanistan.
- Farm gate prices of opium in Myanmar and Lao PDR did not show any major fluctuations in 2001.
- Canada, who receives its heroin from Myanmar, did not experience any alteration in heroin supply at the time of Australia's heroin shortage, nor did they experience any changes in heroin prices.

Chapter 3. An overview of Australia's heroin markets

- Australia had a history of quasi-medical use of opiates in the 19th century
- Restrictions on access to opiates began in the 1890s and continued until heroin was prohibited in the mid 1950s.
- It has been proposed that illicit drug markets flourish only when a number of variables exist: supply of the drug; potential consumers; some level of corruption in law enforcement; the existence of organised crime; and the influence of such groups upon persons in positions of power. These factors (particularly the first four) have been documented in Australia in past decades.
- Illicit heroin use largely began in Australia in the early to mid 1960s, when it was introduced by United States servicemen on leave from the Vietnam War.
- The illicit heroin market increased after the end of the Vietnam War as organised criminals previously involved in prostitution and gambling began importing heroin from South East Asia.
- Law enforcement corruption has long been associated with the heroin market.

- In the mid 1980s a substantial increase in heroin use and associated harms resulted in the launch of a National Campaign Against Drug Abuse.
- A further increase in heroin use in the early to mid 1990s provided a clear indication of an expanding heroin market.
- In late 2000 heroin suddenly became very difficult for experienced heroin users to find.

Chapter 4. Documenting the heroin shortage

- In early 2001 heroin supply decreased in New South Wales, Victoria and South Australia.
- The time taken for regular heroin users to purchase the drug increased in New South Wales and the proportion of regular drug users reporting heroin as "easy to obtain" decreased in the three States.
- The price of heroin caps increased in New South Wales and Victoria from 2000 to 2001, but remained stable at $50 in South Australia.
- The price per gram of heroin also increased in New South Wales, Victoria and South Australia in 2001, having decreased steadily (New South Wales, Victoria) or been stable (South Australia) since 1996. The price of catti (700g) also increased in 2001 following decreases since 1998.
- Heroin purity decreased in all states according to the subjective accounts of drug users and state police heroin seizures. The purity of Federal seizures was stable in New South Wales but was variable, appearing to decrease in early 2001 in Victoria.
- The amount of heroin seized at the border in 2000/2001 was at the lowest level since 1998/1999.
- The peak period of the shortage appears to have been January to April 2001.
- The heroin market appears to have stabilised, though it has not returned to pre-2001 levels.

Chapter 5. Evaluating factors responsible for the heroin shortage

- It is likely that the shortage was due to some combination of these factors that operated synergistically to reduce the availability of heroin in Australia in 2001. This has been suggested by many discussants of the reasons for the reduction in heroin supply.
- It is important to understand the market conditions that preceded the shortage. The heroin market in the late 1990s was of an unprecedented scale, and given the scale of the reduction in supply that occurred, it was likely to have been in some way related to the decline.
- In the early 1990s, Drug Law Enforcement in Australia received little funding. This probably made it easier for high level heroin suppliers in Asia (who may have needed to offload heroin displaced from the United States) to establish large scale importation networks into the country. This led to the increase of street based illicit drug markets around the country; increased purity of heroin, and decreased price of the drug.
- The heroin market in Australia was well established by the late 1990s, but it had a low profit margin, with high heroin purity, lower than ever before cost, and a large number of seizures that had increased risk. The increased funding of the Australian Federal Police and the Australian Customs Service as part of the National Illicit Drug Strategy probably made the risks of importation greater.
- The combination of low profits and increased success of law enforcement, probably led to the reduced dependability of key suppliers of heroin to Australia. This occurred against a backdrop of gradually declining production in South East Asia. These factors may have reduced the attractiveness of Australia as a destination for heroin trafficking.

- It is possible that heroin was sent to other countries instead of Australia, such as Canada or China, but the relatively small scale of the Australian market means that even if *all* heroin was diverted from this country, it would be difficult to observe the effects in another country given the larger scale of those markets.
- The heroin market is clearly still being supplied, but it seems to be more like previous decades than late 1990s: smaller, less consistent levels of supply.

Chapter 6. Changes accompanying the reduction in the availability of heroin

- The reduction in the supply of heroin led to significant changes in patterns of drug use.
- There was good evidence that some drug users switched to cocaine, methamphetamine, and benzodiazepine use.
- The magnitude of changes differed across jurisdictions. Large or detectible changes tended to be observed in New South Wales and Victoria, but were less evident in South Australia, which had a much smaller population of heroin users.
- There was evidence to suggest that the extent (or frequency) of injecting drug use decreased. There may have also been a reduction in the number of injecting drug users in New South Wales which had the largest heroin market.
- There was a sustained reduction in the number of heroin overdoses in all States.
- Increases in psychosis and violence, associated with stimulant use were reported in all jurisdictions.
- Demand for opioid treatment reduced in the three States, but varied by different types of users. The demand for psychostimulant treatment was reported to increase.
- Following an initial increase, acquisitive crime decreased across the jurisdictions.
- There was evidence of changed drug distribution and importations methods.
- Health drug treatment agencies in all three States reported the heroin shortage impacted on their services, by way of increased client aggression and greater demand for the treatment of drugs other than heroin. Most services were able to adapt well.
- State police services reported a shift in focus away from heroin, but there was no fundamental change in strategies and approaches with regard to drug law enforcement.

Chapter 7. Implications for health

- The population level harms associated with heroin use decreased following the reduction in heroin supply, for example, a significant decrease in fatal and non-fatal overdoses.
- However, supply reduction appeared to have mixed health effects upon different groups of heroin users. Younger (less entrenched) heroin users appeared to be particularly affected by the reduction in heroin supply, with many indicators suggesting that they might have ceased (or substantially reduced) heroin use. There were indications that this younger group may have switched to psychostimulants, but may not have been injecting these drugs. This probably led to decreased aggregate harms related to heroin *and* injecting drug use among younger age groups.
- Older, more entrenched users did not seem to be as affected, with smaller reductions in harms related to heroin use and possibly the addition of other risky forms of drug use to their repertoire. There is a need for harm reduction initiatives among this group given that they may

experience significant harms associated with (for example) the injection of benzodiazepines and pharmaceutical opioids, as well as of cocaine and methamphetamine. There may also be a need for demand reduction through this group, which might be achieved through the development and delivery of effective treatments for these other drug problems.

- There was suggestive evidence (in New South Wales) that users in opioid pharmacotherapy may have increased their adherence to treatment when heroin supply was reduced.
- The heroin shortage placed many changed demands upon health and drug treatment services, and highlighted the need for such services to be flexible to changes in drug markets, as well as skilled to deal with an increasing range of drug use problems among their client base.

Chapter 8. Implications for law enforcement

- The behavioural consequences of the use of cocaine and methamphetamine had significant implications for police, who needed to deal with an increase in incidents involving violent and aggressive individuals and, in New South Wales, short term increases in illicit sex work and acquisitive crime.
- Police were not always aware of the reason for the change in the behaviour of drug users or the change in drug use patterns amongst drug users, signalling the need for improved communication across all levels of policing.
- The decline in heroin use reduced media attention and political pressure on the policing of illicit drugs at Federal, State and local levels.
- The apparent addition of other drug types to some users' repertoires may need to be considered by those in law enforcement who will come into contact with this group.
- It is difficult to clearly document changes in criminal activity among organised crime groups; however, heroin distributors in Australia appeared to be flexible and possibly adapted to the reduction in heroin availability by switching to other drug distribution and/or other crime types.
- Some low level dealers may have shifted in the short term from heroin to other drug distribution around the time of the heroin shortage.
- In the absence of assistance from skilled trafficking facilitators, there may be opportunities for law enforcement to apprehend less experienced high level distributors.
- Street level policing may have some deterrent or displacement effect and improve public amenity, but drug supply was not significantly affected through policing at the street level.
- Law enforcement agencies at both Federal and jurisdictional levels (in particular New South Wales) have increased the number of monitoring tools and increased the number and the size of drug units.

Chapter 9. Policy implications of the reduction in heroin supply in Australia

- Reducing the availability of heroin in Australia appears to have produced significant reductions in the aggregate harm caused by illicit heroin use by substantially reducing fatal and nonfatal overdose. There has probably also been a reduction in the number of regular heroin users, most markedly among younger age groups.
- More entrenched heroin users probably have *not* ceased heroin use, and some may have also begun using other drugs in a risky fashion. Some younger drug users may have shifted to stimulant drugs.

- The heroin shortage was probably caused by changes in heroin supply to Australia related to Australian drug law enforcement rather than to natural events (such as changes in heroin production).
- The most important implication of the heroin shortage is that it is possible *under some circumstances* for law enforcement to accomplish a substantial reduction in the availability of imported drugs like heroin. It is most likely the result of actions aimed at the very high levels of drug trafficking. This suggests the importance of maintaining programs at that high level and of developing a better understanding of how such interventions affect supply.
- It is uncertain to what degree the reduction achieved in heroin supply in Australia in 2000 could be easily reproduced by an act of policy. Such events have been rare in the history of Australian heroin markets and the 2000 event may have arisen from a confluence of events. These included a marked increase in heroin availability in the 1990s followed by a sharp decrease in supply at the beginning of 2001 that was produced by a major increase in Federal resources for DLE in 1998-1999.
- Supply reduction is an important part of drug policy but it is important to also have policies that aim to reduce *the* demand for drugs, as well as the harms among those who use drugs despite our best efforts to discourage use.

Chapter 10. Research strengths and limitations

- There were inherent problems with the retrospective research required in this study.
- Researching an event such as the shortage necessitated an "historical" approach and use of data that existed at the time, rather than data collected to a pre existing plan.
- The available indicator data was sometimes incomplete, unreliable, inconsistent across jurisdictions and often took considerable time to obtain.
- Key informant data offered valuable insights but was subject to recall bias.
- There were significant problems associated with recruitment of IDU and the use of information gained from these interviews. This included recall and selection bias as those recruited were from treatment agencies and not representative of the overall population of IDU.
- Obtaining information about illicit drug markets is difficult particularly as a result of their illicit and often clandestine nature. In light of this, evidence from a wide range of sources was used to infer events.
- The project has highlighted the need for ongoing prospective cohort studies of illicit drug users in Australia.
- Given these concerns, the project demonstrated considerable strengths. These included triangulation of numerous data sources to confirm findings, close collaboration with agencies and individuals providing data to ensure accurate interpretation and use of classified data providing new insights into drug market activity.

Introduction

Louisa Degenhardt, Carolyn Day and Wayne Hall

In early 2001, Australia experienced an abrupt and substantial reduction in the availability of heroin that was widely reported by health and law enforcement key informants across Australia (Rouen, Dolan et al. 2001). The reduction was notable because in the several years preceding its onset heroin had been readily available in most Australian capital cities with a high purity and low price, something that had not occurred in Australia previously. This was particularly evident in steeply increasing overdose deaths, rising nonfatal overdoses and drug-related crime in public heroin markets in Sydney and Melbourne (Topp, Day et al. 2003).

There have been other marked interruptions to illicit drug supply in the 20th century. There seems to have been a shortage of illicit morphine and heroin in the US during World War II (Courtwright 1982; Courtwright, Joseph et al. 1990; Jonnes 1996; Massing 2000), and a heroin shortage in the US in the early 1970s (Jonnes 1996; Massing 2000). However, these events were not well documented apart from narrative historical accounts (e.g. Courtwright, 1982; Jonnes, 1996). The Australian heroin shortage of 2001 was remarkable for the relative wealth of data and information that were available in drug monitoring systems that had been developed in the preceding half decade. These data meant that Australian researchers had an unprecedented opportunity to examine the impact of a marked reduction in the availability of heroin on heroin use and heroin related harm.

The present study was commissioned by the National Drug Law Enforcement Research Fund (NDLERF) to provide a detailed description of the course of the heroin shortage, a comprehensive analysis of its effects and an examination of the factors contributing to its occurrence. The work was undertaken by researchers from the National Drug and Alcohol Research Centre (NDARC) in collaboration with researchers from Turning Point in Victoria and the Drug and Alcohol Services Council (DASC) in South Australia (SA).

The objectives of the research were to:

- Describe the structure and dynamics of the heroin market in Australia and document any changes that may have resulted from the reduced supply of heroin;
- Document the progression of the heroin shortage;
- Identify and evaluate theories regarding the cause of the heroin shortage;
- Document the impact of the heroin shortage on the extent and methods of heroin and other drug use, public health, treatment utilisation, the commission of crime, health service provision and law enforcement operations; and
- Consider the implications of the heroin shortage for drug policy in Australia and other countries.

While some objectives were examined at a national and international level, other objectives were achieved by a focused examination of drug markets in three jurisdictions: New South Wales (NSW), Victoria and South Australia (SA). NSW and Victoria contained by far the largest heroin markets in Australia during the period under study, whereas the SA heroin market was much more limited in scope and probably dependent upon the Sydney and Melbourne markets for its supply. This report contains the results of the nationally focused work and brings together the investigations of the three jurisdictional drug markets. Statistical analysis of the trends described herein can be found in the three accompanying jurisdictional reports - NSW, Victoria and SA (Degenhardt and Day 2004; Dietze, Miller et al. 2004; Harrison, Christie et al. 2004) - which contain detailed information of the heroin shortage and its impact on these drug markets.

In this study, we have looked across different sources of data in all areas of investigation. This has been done to verify whether different data sources conveyed the same patterns of changes (or lack thereof) and to critically evaluate the implications of the similarities or differences across these data sources. In order to examine the shortage retrospectively, a number of data sources and methodological approaches were utilised. These included interviews with regular heroin users, key informants with good knowledge of different aspects of illicit drug markets around the time of the heroin shortage, and indicator data such as arrests and overdose deaths. Each methodological approach and data source has a number of inherent biases, and to overcome these, we have triangulated across data sources where possible.

Chapter 1 of this report provides a brief discussion of the areas in which each of these data sources can provide valuable information, and a discussion of the limitations of the information[1].

Chapter 2 examines global trends in heroin production and trafficking prior to the heroin shortage. It provides a background on the global situation with respect to heroin markets. An historical review of the Australian heroin market is then briefly provided in Chapter 3[2], as a backdrop against which to consider the heroin shortage. Chapter 4 documents the heroin shortage. It is preceded by a discussion of data sources appropriate for studying these consequences.

Chapter 5 outlines the approach taken towards the investigation of the possible causes of the shortage, enumerating and evaluating various factors that have been hypothesised to be responsible for the reduction in heroin supply. As will be clear in this chapter, complex markets such as heroin markets are affected by multiple factors, and more than one factor is likely to have contributed to the sharp reduction in heroin supply in Australia in 2001.

Chapter 6 provides a brief summary of the changes documented across the three States in the study. The summary depicts the changes (or lack thereof) detected, and similarities and differences across the States in these changes where they were found. For details on the changes documented, the reader is encouraged to read the three reports describing in detail the NSW, Victorian and SA markets separately.

The following chapters consider some of the implications of the reduction in heroin supply, its causes and its consequences. Chapters 7 and 8 consider the implications for health and law enforcement (as broad concepts). Chapter 9 considers the implications of the Australian heroin shortage for Australian and global drug policy.

This report should be read in concert with the accompanying jurisdictional reports which provide more extensive discussion and statistical analysis of the progress and impact of the heroin shortage in the three drug markets selected for in-depth study.

This series of reports is the result of 18 months' cooperation with 172 key informants and 141 heroin users. It is notable for the cooperation and landmark collaboration between health and law enforcement agencies attempting to uncover as many sources of information to document an event that, although not unique, is probably the best documented reduction in drug supply in history. We trust that it provides readers with useful information on the dynamics of drug supply, use, and harms and helps to understand something of the confluence of events that produced this particular occurrence of reduced heroin supply.

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[1] See also Degenhardt, L., L. Topp, et al. (2002). "Issues surrounding the detection of a reduction in drug supply: The case of the heroin shortage in Australia, 2001." Bulletin on Narcotics **LIV**(2).

[2] This was adapted from other work completed by NDARC - for further detail see Gibson, A., L. Degenhardt, et al. (2003). Global and Australian heroin markets. NDARC Technical Report No. 167. Sydney, National Drug and Alcohol Research Centre, University of NSW.

Chapter 1: A note on methods used in the study

Louisa Degenhardt and Carolyn Day

A range of data has been used in the current study, and each has its strengths and limitations. We interviewed heroin users about their own experiences. We interviewed key informants at local, State, national and international levels from the health, law enforcement, research and policy arenas. We drew lists of possible indirect indicators of drug use and related harms, as well as of heroin and other drug availability, and investigated ways in which we might be able to obtain access to such data. As a result, we compiled data from local, State and national level agencies across the gamut of drug supply, use and harms in the Australian and (where necessary and possible) international community.

Each of these data sources can provide valuable information, although each also has its limitations. In this study, we have aimed, in all areas of investigation, to look across the different sources of data. This was done to verify whether different data sources conveyed the same patterns of changes (or lack thereof); and to critically evaluate what the similarities or differences across these data sources implied.

This chapter describes each of the methodologies employed and discusses the strengths and limitations of their application to the present research.

Self report data from heroin users

An initial sample of 82 heroin dependent users recruited from a range of health services were retrospectively surveyed regarding drug use and associated behaviour using timeline follow-back methodology. However, test re-test reliability was poor and this approach was subsequently abandoned. The data was not used in the present study. Information regarding the methodology, analysis and results of this approach are reported elsewhere (Day, Gibson et al. 2004).

Following the failure of the timeline follow-back method, face to face interviews were conducted with an additional 141 pharmacotherapy clients across the three jurisdictions. Clients were surveyed on a number of domains including patterns of drug use, treatment seeking behaviour, physical health, psychosocial health, criminal behaviour and drug market activity. The survey contained both quantitative and qualitative measures of these domains.

Participants were recruited according to two time periods: those commencing treatment preceding the heroin shortage (August to October 2000) and those commencing treatment during the heroin shortage (February to April 2001). Recruitment was by way of flyers distributed at major methadone and buprenorphine dosing points and included maintenance pharmacotherapy clinics, pharmacies and GPs. Details of the recruitment process in each jurisdiction can be found in the relevant jurisdictional reports (Degenhardt and Day 2004; Dietze, Miller et al. 2004; Harrison, Christie et al. 2004). Recruitment was stopped short of the target sample size of 300 owing to difficulties in recruitment, possibly because the length of time that had elapsed since the heroin shortage and the commencement of the study meant that some clients had either left/completed treatment or transferred to another treatment provider.

Analysis of the quantitative components of the survey utilised Pearson's chi squared test for proportional data, except where expected values in cells were less than five, in which case Fisher's exact (2 tailed) test was used. For continuous data, student's *t*-test was used, except where the data was not normally distributed, in which case the Mann Whitney U test was employed. All statistical analyses were carried out using SPSS 11.0. Qualitative data was analysed thematically.

Data obtained from users has the benefit of detail and direct, personal experience. On some levels, it must be recognised that the participants of illicit drug markets themselves are best able to provide information about those markets and the effect of changes in the markets on themselves.

The price of drugs reported by users represents actual purchases of these drugs. They are thus not secondary estimates, nor data reported from buy-bust operations, but primary data on purchases obtained from active participants in the drug market. Illicit drug users are a crucial source for detecting changes in the cost or availability of their drugs. We can also obtain detailed information about firsthand experiences of the effects of changes in supply, and assess how behaviours of individuals may have changed over time. Illicit drug users are able to provide detailed information on their own behaviours: drug use, risk taking behaviour and harms associated with their drug use.

This information is not without its limitations. First, we can only infer changes in the broad users community to the extent that we feel users interviewed are representative of all users - something it is difficult to be sure about (particularly if the users interviewed are visible users recruited from areas such as street based drug markets, where the more entrenched and disadvantaged users may congregate). Second, reports of availability and perhaps use may be dependent upon the nature and extent of users' "immersion" in the drug scene. Third, 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 some points in time, without such fluctuations necessarily reflecting significant changes in the availability of the illicit drug overall. Finally, drug users may simply not remember very well the events or issues that we are interested in investigating (Day, Gibson et al. 2004).

These limitations can be overcome by monitoring the objective data on purity and supply, and on harms associated with illicit drug use, obtained from indicator data.

Key informant reports

Qualitative interviews were conducted with 172 key informants (KI) recruited from a range of health and law enforcement agencies across the three jurisdictions selected for in-depth study. These included agencies involved in drug policy, drug treatment, welfare support, criminal intelligence and operations. KI were selected on the basis of their degree of contact with drug users and the drug market, the level of this contact (whether management, middle management or front-line) and the length of time they had held their positions (i.e. pre to post shortage). Specific details on key informant characteristics and recruitment methods can be found in each of the jurisdictional reports (Degenhardt and Day 2004; Dietze, Miller et al. 2004; Harrison, Christie et al. 2004).

KI can provide an important source of information (Topp and McKetin 2003). They may be selected on the premise that they have regular and/or sustained contact with users of different drug types, or have a good knowledge of drug user groups, their drug use and the related harms of this use.

Health sector KI may be recruited from drug treatment and detoxification agencies, needle and syringe program (NSP) services, emergency services such as ambulance or emergency departments, and health and other welfare organisations (such as crisis accommodation and youth outreach services) situated within key illicit drug markets. KI from the law enforcement sector can

be drawn from regions corresponding to the main illicit drug markets, or on the basis of their work pertaining to illicit drug related activity and crime. Depending on the agency contacted, law enforcement representatives can provide information on drug availability at both the street and higher levels; and on criminal activity related to same.

KI reports 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. Because of this, KI data have been argued to be the most sensitive measures of emerging drug trends and drug availability (McKetin 1999).

One of the limitations of such data is that KI are less reliable and more subjective than illicit drug user and indicator data. Their reports depend entirely on the specific group with whom they had most recent contact. They are also less capable of providing specific data relating to purchases, prices and patterns of drug use of illicit drug users than the users themselves, who are reporting on their own behaviours. Finally, in the current context, KI are just as vulnerable as anyone else to the biases that creep into memory after time elapses after a specific event, which may occur due to media reports, subsequent events, the comments of peers, the use of other data (which may be incomplete or irrelevant to the particular issue in question), or simply forgetting.

Indicator data

Indicator data refers to data that provides an indirect measure of drug use, availability, and harms. It includes data on drug seizures, arrests for drug use and drug related crime, deaths related to drug use, emergency department admissions for overdose or drug induced psychosis, calls to telephone help lines about drug use, needles distributed for injecting drug use, and notifications of illnesses that may be transmitted by injecting drug use such as hepatitis C and HIV. To the extent that data recording methods are accurate measures of the variables of interest, and consistent over time, such data may be considered reliable and valid.

However, such data are also subject to a number of problems (Stimson, Fitch et al. 1999). 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 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.

Times series analysis

Data representing a process over time - or *time series data*, such as the indicator data used in the current study - can show evidence of *serial dependence*. This means that data from a particular point in time is related to data in other points in time, such as the previous month or the same month in a previous year[3]. Unless we adjust for this relationship, we may draw erroneous conclusions about changes (or lack thereof) in a time series. This needs to be adjusted when conducting statistical analyses to determine whether there has been any effect of a given event - in this case, the reduction in heroin supply. Time series analyses were used in this study where sufficient data existed to conduct valid analyses. Details of these analyses can be found in the accompanying jurisdictional reports. Further information regarding the application of time series analysis in the current research can be found in Appendix A of this report.

[3] Please see Appendix B of the NSW report for a more detailed discussion of time series analysis and the approach taken to time series analysis in the current study.

Methods used in evaluating potential explanations of the reduction in heroin supply

Our method was historical and forensic using the method of exclusion (Doyle (1892/1983): "… when you have excluded the impossible, whatever remains, however impossible, must be the truth" (p. 154) (Doyle 1983 (1892)). We accordingly generated a list of hypotheses that had been advanced to explain the heroin shortage by law enforcement officials, drug users, drug policy analysts and the media. These hypotheses were evaluated by the consistency with a range of information sources and their coherence with each other. We excluded hypotheses where possible, leaving a small set of hypotheses as the most probable explanations of the heroin shortage.

Our information sources included: government reports, classified police and drug law enforcement documents and briefings, classified briefing documents by Australian agencies, key informant (KI) interviews, examination of indicator data, and the use of research data where relevant. In addition to earlier comments regarding the strengths and limitations of these data sources, further notes are set out below.

Key informant interviews

Interviews were conducted at an international level with representatives of: the Royal Thai Police (RTP), Narcotics Suppression Bureau, Bangkok Intelligence Centre, Thailand; the Thailand Office of the Narcotics Control Board (ONCB), Ministry of the Prime Minister, Chiang Mai, Thailand; and Australian Federal Police (AFP Thailand), based in Bangkok and Chiang Mai, Thailand. Interviews were conducted in Australia with representatives of: the Australian Federal Police (AFP); the Australian Customs Service (ACS); and NSW Police.

Law enforcement documents

Briefings and discussion documents were also provided by the following Commonwealth law enforcement agencies: the ACS; the AFP; the Office of Strategic Crime Assessments (OSCA); and the Australian Crime Commission (formerly the National Crime Authority).

Documents from NSW Police were also examined. These documents included intelligence reports, reports of the outcome of NSW Police operations, as well as reports on drug markets from various NSW Police agencies. These were jointly written up by NDARC and NSW Police representatives in a document summarising NSW Police documentation of illicit drug market trends, 1999-2002 (Collins, Degenhardt et al. 2003) (available upon request).

Limitations

We necessarily relied on existing information. To that extent, we were reliant on the information collected by law enforcement on illicit drug trafficking and distribution, in particular that which we were permitted to view. However, we talked to a wide range of key informants (both National and international), we were granted good access to information within NSW Police department and Federal agencies, and we consulted a range of law enforcement and publicly available documents on illicit drug markets, and the information from all of these was quite consistent.

Reliance on law enforcement KI to analyse a reduction in heroin supply has the potential to be biased because the reduction in supply is itself an aim of drug law enforcement and is actively pursued. However, reports from Australian KI - who have a vested interest in reduced heroin supply to Australia - and international KI - who have no such interest - were supportive of one another and consistent with other data sources.

Furthermore, we also only had the information that was collected at the time - it was not possible to collect additional information that would have been of interest. Nevertheless, we did manage to logically exclude a number of widely touted but ill-fitting hypotheses through this process.

Chapter 2: Global Heroin Markets

Amy Gibson, Louisa Degenhardt and Rebecca McKetin

Summary

- For the last decade, the two major opium-cultivating countries in the world have been Afghanistan and Myanmar. In 2002, these two countries cultivated 76% and 18%, respectively, of world opium supplies.
- A small amount of the world's opium is cultivated in Central and Southern America, and has little or no contribution to Australia's heroin supply.
- In 2001, there was a dramatic drop in opium being cultivated in Afghanistan, due to the actions of the Taliban ruling party. Opium cultivation in Myanmar was largely unchanged during this time.
- Heroin cultivated in the Afghanistan region is largely trafficked through the Middle East, Central Asia and Africa to the European and American markets.
- Heroin from the Myanmar region largely supplies Australia, Canada and East Asia through routes traversing Southern China and South East Asia.
- For the last decade, Australia predominantly received its supply of heroin from the opium cultivating areas of Myanmar.
- The wholesale price of heroin in both the United States and Western Europe has been steadily decreasing since the late 1980s.
- There were increases in the farm-gate price of opium in Afghanistan in 2001, but these were not translated into heroin price increases in Western Europe, the region primarily supplied by Afghanistan.
- Farm-gate prices of opium in Myanmar and Lao PDR did not show any major fluctuations in 2001.
- Canada, who receives its heroin from Myanmar, did not experience any alteration in heroin supply at the time of Australia's heroin shortage, nor did they experience any changes in heroin prices.

Introduction

Heroin (diacetylmorphine) is produced from the opium poppy, *Papaver somniferum* and belongs to the opium family. Opiates such as morphine, opium and codeine are all derivatives of the opium poppy, whereas methadone and pethidine are synthetically produced opioids (Australian Crime Commission 2003).

Opium is one of the oldest medicines known. The writings of the Sumerians suggest that they used opium in 3300 BC for medicinal and recreational purposes (Fernandez 1998). The Chinese were familiar with the therapeutic qualities of opium before 1000 AD (Rolls 1992), and it was incorporated into Western European medicine by the sixteenth century (Berridge 1987).

Opium was usually taken orally until the 17th century, when the supply of opium and tobacco by the Dutch East India Company led to a diffusion of opium smoking throughout Asia (Harding 1988). During the 19th century, opium use also increased in Great Britain, where it was usually consumed orally in a large range of commercial preparations known as proprietary medicines or "secret remedies" (Berridge 1987). By the end of the 19th century, Australia had the world's largest per capita consumption of proprietary medicines (Manderson 1993), many of which contained opium.

In this chapter, we outline the major regions of opium cultivation and heroin production, major trafficking routes, and the source of heroin supply to Australia and other countries pertinent to this study. We also attempt to outline some of the changes in production and trafficking that have occurred over past decades.

Opium cultivation

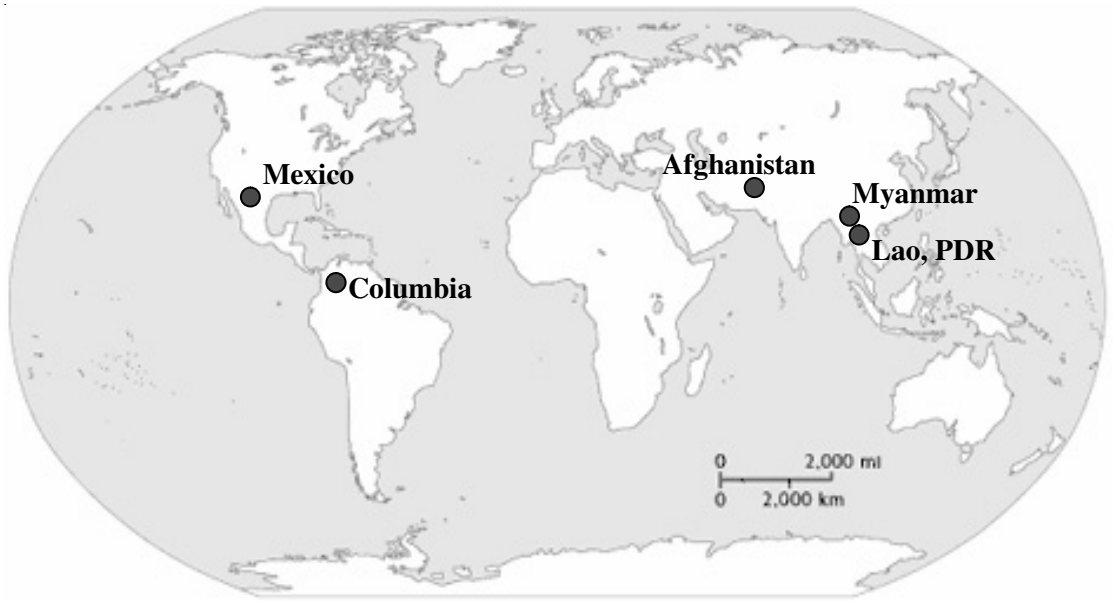
The opium poppy can be grown at high altitudes in poor soils, and in some parts of the world is the only convenient cash crop for peoples living over 1000 metres above sea level (Williams 1980).

Once a crop of opium poppies is ready for harvesting, the poppy seed pods are carefully scored with a knife to allow the milky sap inside to seep out and harden to form a brownish-black gum. This gum is opium in its rawest form and is generally shaped into bricks or cakes for transportation. Opium gum is then processed into morphine base, then to heroin. Extraction of heroin from raw opium reduces the weight and volume to one tenth and requires both precursor chemicals and reagents (Williams 1980; United States Drug Enforcement Administration 2000). This extraction is generally done close to the site of cultivation.

The predominant chemical used for the production of heroin is acetic anhydride. Approximately one kilogram of acetic anhydride and one kilogram of morphine is required to produce one kilogram of heroin (Australian Bureau of Criminal Intelligence 1996). Other chemicals used for the synthesis of heroin from opium include lime, ammonium chloride and hydrochloric acid (United States Drug Enforcement Administration 2000). It is estimated that approximately 50% of the reagents are common to the production of both heroin and methamphetamine (Senior Australian Government Law Enforcement Officer, personal communication, 2003).

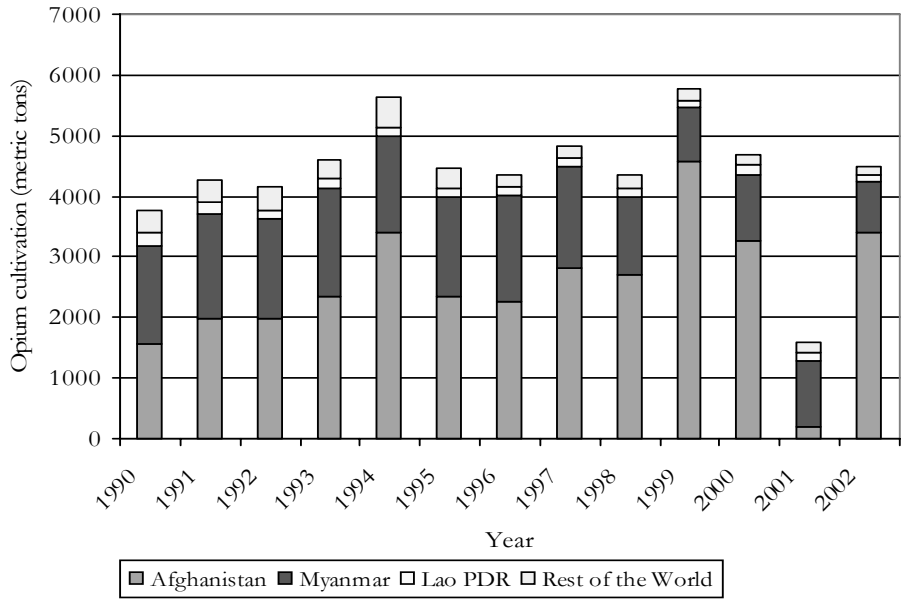
In recent years, the majority of the world's opium has been cultivated in three regions (Figure 2.1): South West Asia "The Golden Crescent" (Afghanistan), South East Asia "The Golden Triangle" (Myanmar, Lao PDR, Thailand) and in Central and Southern America (Columbia and Mexico).

Figure 2.1: Global opium cultivation regions in the last decade



In 2002, the majority of the world's opium cultivation was concentrated in two countries: Afghanistan (76% of world cultivation) and Myanmar (18% of world cultivation) (Figure 2.2)[4] (United Nations Office on Drugs and Crime 2003). In comparison with Afghanistan and Myanmar, Central and Southern America are minor cultivators of opium (Australian Crime Commission 2003), cultivating about 3% of the world's total supply in 2002 (United Nations Economic and Social Council Commission on Narcotic Drugs 2003).

Figure 2.2: Global opium cultivation 1990-2002



Source: United Nations Office on Drugs and Crime (Australian Crime Commission 2003).

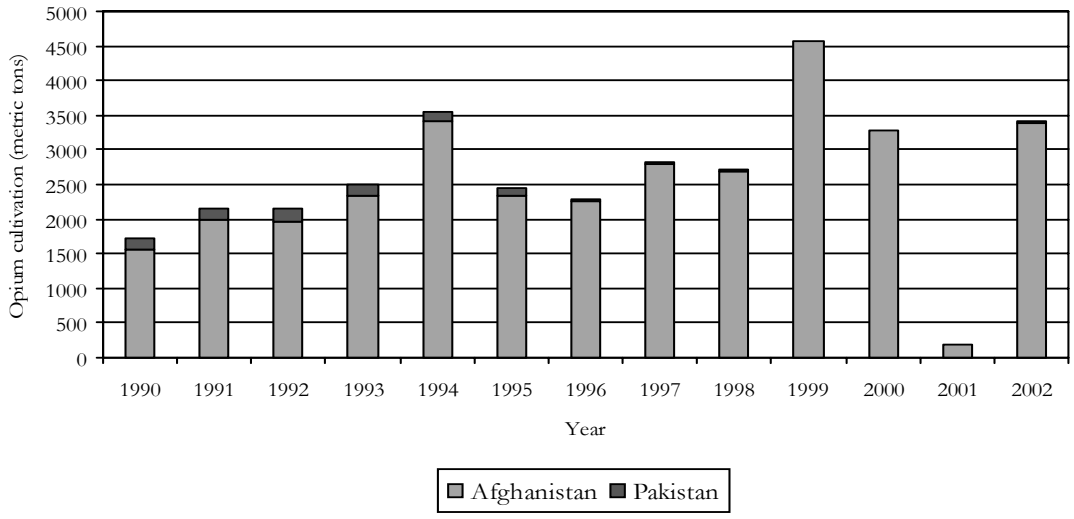
[4] It should be noted that the 2002 figures came from the first UNDCP comprehensive survey of opium poppy cultivation using a combination of extensive fieldwork and satellite imagery United Nations Office for Drug Control and Crime Prevention (2002). Myanmar Opium Survey 2002, United Nations. Since this survey uses a different methodology than 2001 and previous years, the significance of the decrease between the 2001 and 2002 production levels is yet to be determined.

South West Asia (Golden Crescent)

Opium has long been a traditional crop in some parts of Afghanistan (Cowell 1997). From the late 1980s onwards, with intense fighting and civil war destroying agriculture and other income generating activities, opium cultivation increased dramatically (Reid and Costigan 2002). Afghanistan became the world's leading opium-producing country in 1991 (Figure 2.2).

World opium cultivation experienced a dramatic change in July 2000, when the Taliban party of Afghanistan imposed a total ban on the cultivation of opium poppies. The high degree of compliance with this ban resulted in a 94% reduction in opium poppy yields in Afghanistan from the 2000 to the 2001 harvest (Figure 2.3) (United Nations Office for Drug Control and Crime Prevention 2002). As a result, the world cultivation of opium was estimated as 1,600 tons in 2001, compared to approximately 4,700 tons in 2000 (Figure 2.2). The ban on opium cultivation renewed by the Afghan Interim Administration after the overthrow of the Taliban in September 2001 was only mildly effective (Australian Crime Commission 2003) and 4,600 tons of opium were cultivated globally in 2002 (Figure 2.2).

Figure 2.3: South West Asian opium cultivation 1990-2002



Source: United Nations Office on Drugs and Crime (Australian Crime Commission 2003).

South East Asia (Golden Triangle) and China

From the mid-1990s, the only countries to cultivate a substantial amount of opium in the South East Asian region were Myanmar and Lao PDR. China, Thailand and Vietnam, although with past histories of opium cultivation, are no longer major opium-cultivating countries (see Figure 2.4) (United Nations Office on Drugs and Crime 2003).

Through aerial surveillance in North East and North West China, the Chinese State Council reports that the illegal cultivation of drug plants was virtually eradicated from 1992 (Information Office of the State Council of the People's Republic of China 2000).

Opium cultivation in Thailand historically occurred in the northern border areas near Myanmar and Lao PDR, in the Chiang Mai, Chiang Rai, Hong Son and Tak provinces. The levels of opium cultivation in Thailand and Vietnam have continued to decrease since the early 1990s (see Figure 2.4) (United Nations Economic and Social Council Commission on Narcotic Drugs 2003). Opium crop replacement programs in Thailand have been associated with a decrease in the area under cultivation for opium from 9000 hectares in 1985 to just over 1000 hectares in 2001 (United

Nations Economic and Social Council Commission on Narcotic Drugs 2003). In an attempt to avoid eradication efforts by the Thai authorities, farmers have been planting crops outside of traditional cultivation times, in different locations and using fertilizers and irrigation systems (Office of the Narcotics Control Board 2002). Some small level of opium cultivation continues in the north-western provinces of Vietnam (Reid and Costigan 2002).

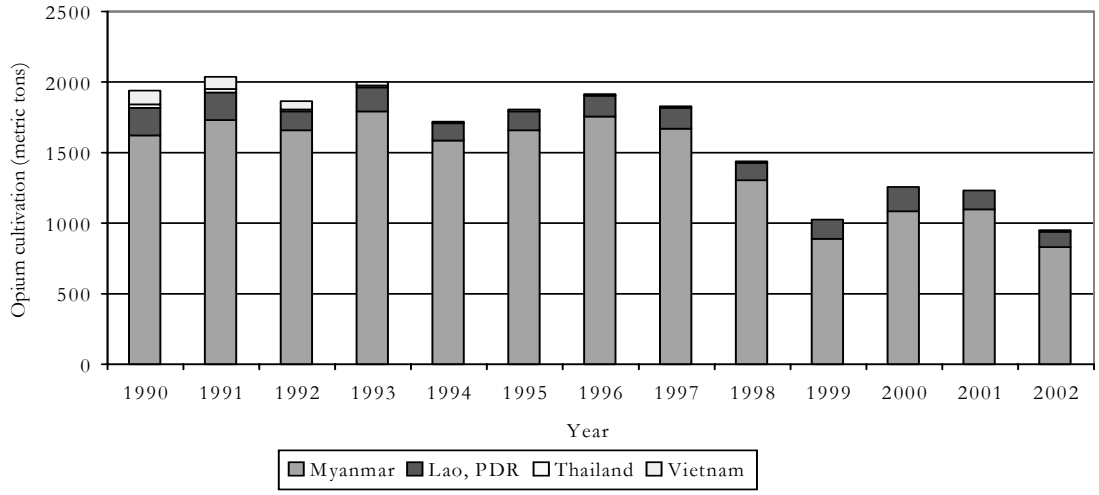
Lao PDR is currently the third largest opium cultivator in the world after Afghanistan and Myanmar (Australian Bureau of Criminal Intelligence 2000). Between 1992 and 1998, the number of hectares under opium poppy cultivation increased (Australian Bureau of Criminal Intelligence 2000). This was followed in 1999 by decreasing levels of opium cultivation, and in the 2001/2002 season the number of hectares under cultivation was the lowest on record since 1992. Nevertheless, in 2002 it produced 2% of the world's opium (United Nations Office on Drugs and Crime 2003).

In Myanmar, opium poppy cultivation has been a major source of income for separatist groups, and the market expanded considerably during the Vietnam War (Gordon 2001). Originally, opium poppy cultivation was based close to the Thai border, but after the 1996 surrender of the drug lord Khun Sa in nearby Myanmar, the main cultivation area shifted north to areas close to the Chinese border (Gordon 2001).

1998 and 1999 saw reductions in South East Asian opium cultivation levels caused by three years of drought in the opium cultivation regions, followed by abnormal flooding (Gordon 2001). This drought had the greatest effect in Myanmar, where the area planted with opium poppies decreased by 16% to 130,300 hectares (Australian Bureau of Criminal Intelligence 2000). There were no major changes in the opium cultivation levels in either Myanmar or South East Asia during 2001, but opium cultivation in the region has shown a decreasing trend since the mid-1990s (Figure 2.4).

In 2002, almost all (92%) of Myanmar's opium poppy cultivation occurred in Shan State, a mountainous region with limited road access near the Chinese border (United Nations Office for Drug Control and Crime Prevention 2002). Within the Shan State, nearly half (46%) of cultivation takes place in the northern state, and 22% occurs in the Wa Special Region (United Nations Office for Drug Control and Crime Prevention 2002). The Wa special region is an autonomous region in one of the poorest areas in Myanmar, with a history of conflict, isolation and poor infrastructure[5].

Figure 2.4: South East Asian opium cultivation 1990-2002



Source: United Nations Office on Drugs and Crime (2003).

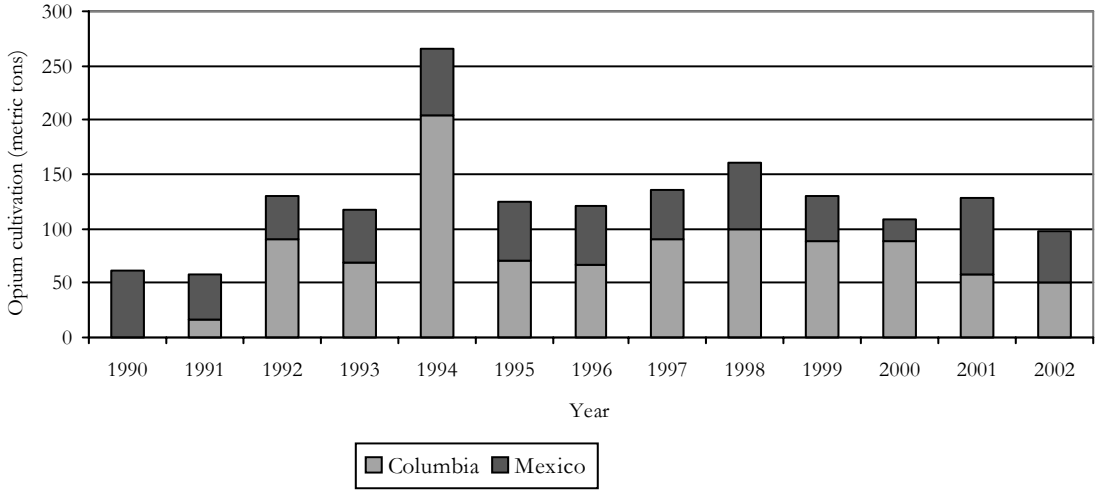
[5] A project to develop infrastructure and aiming to achieve rice self-sufficiency, the Wa Central Committee aims to phase out poppy cultivation by 2005 Ibid. This would be aided if viable alternatives to opium cultivation were made available to farmers, and only if heroin production and trafficking were no longer considered a desirable method of income generation for key players in that area.

Central and Southern America

In the last decade, Central and Southern American opium cultivation regions have contributed only a small part of world opium supplies (Figure 2.2). Mexico and Columbia were the two major countries in this region to cultivate opium poppies in 2002 (Figure 2.5).

Mexican heroin is generally lower grade brown heroin or "black tar", compared to the white heroin produced in Columbia. The brown colour of this form of heroin is due to insufficiently purified morphine and is often contaminated with procaine and methapyriline hydrocarbons (Australian Bureau of Criminal Intelligence 2000). There is recent evidence that traffickers operating in Mexico are seeking the expertise of Columbian chemists to produce higher grade heroin for export (United States Drug Enforcement Administration 2000).

Figure 2.5: Central and Southern American opium cultivation 1990-2002



Source: United Nations Office on Drugs and Crime (Australian Crime Commission 2003).

The first reports of heroin production by Columbia started to appear around 1992 when the drug lords were said to be introducing high-grade heroin into the United States (Cowell 1997). In 1999, Columbia cultivated 1.7 percent of the world's opium poppies (Australian Bureau of Criminal Intelligence 2001). A United States-sponsored aerial eradication program led to dramatic decreases in the hectares of opium poppies under cultivation in 2002. Almost all heroin produced in Columbia is exported to the United States (United States Department of State 2003).

Heroin from this region is unlikely to greatly contribute to Australia's heroin supply as Australian users typically prefer South East Asian heroin, and most heroin from Mexico and Columbia supplies the US market[6] (Australian Crime Commission 2003).

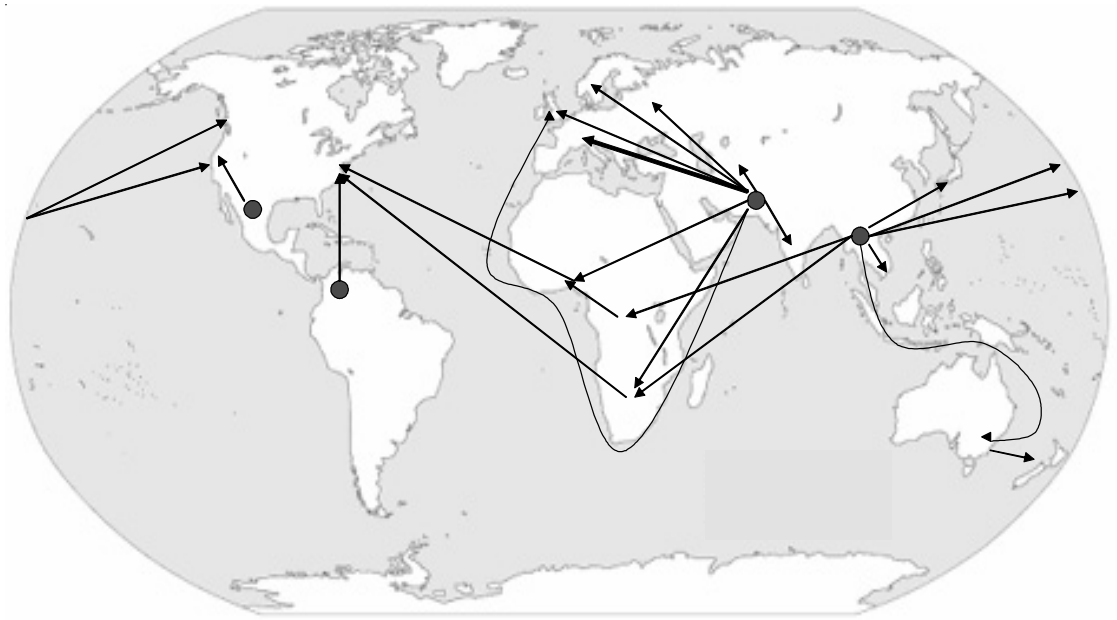
[6] Nevertheless, heroin from this region does enter Australia. In 1999, the Australian Federal Police made the first known seizure of "Mexican tar" in Australia. Australian Bureau of Criminal Intelligence (2000). Australian Illicit Drug Report 1998/99. Canberra, Commonwealth of Australia.

Trafficking routes

Most heroin production is now thought to occur close to the sites of opium cultivation, so a greater amount of opiates are being trafficked as heroin, and seizures of opium and morphine are decreasing (United Nations Economic and Social Council Commission on Narcotic Drugs 2003)[7]. Refined forms such as heroin are more compact and easier to conceal.

Drug trafficking groups in the South West Asian region are thought to supply the bulk of the European heroin market (Figure 2.6). Groups in South East Asia predominantly supply Canada and Oceania (United Nations Office for Drug Control and Crime Prevention 1997). Opium produced in Central and Southern America mainly supplies the United States (United Nations Economic and Social Council Commission on Narcotic Drugs 2003).

Figure 2.6: General directions of heroin and opium traffic from world production areas



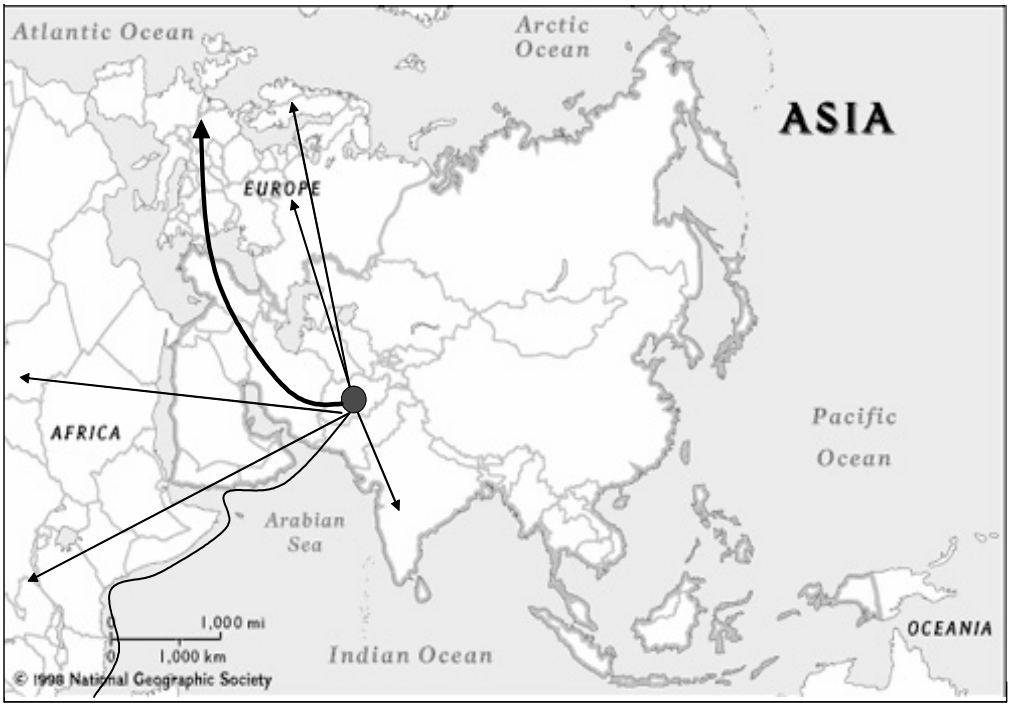
Note: Routes shown are general indications of the directions of illicit drug flows.
Source: Modified from United Nations Office on Drugs and Crime (United Nations Office on Drugs and Crime 2003).

South West Asia

There are three major trafficking routes for opiates from Afghanistan: through Iran, Pakistan and through Central Asia (Figure 2.7). Iran links the opium cultivation area of Afghanistan with Europe, Turkey, Russia and the Persian Gulf (Reid and Costigan 2002). Iran, with its close proximity to Afghanistan, accounted for most of world heroin and opium seizures in 2000 and 2001 (United Nations Office for Drug Control and Crime Prevention 2002; United Nations Office on Drugs and Crime 2003).

[7] Drug trafficking trends are assessed mainly on the basis of seizure data. It is important to note that seizures are indirect indicators of drug trafficking trends and also measure the level and effectiveness of law enforcement capabilities. United Nations Economic and Social Council Commission on Narcotic Drugs (2003). World situation with regard to illicit drug trafficking: Report of the Secretariat. Vienna, United Nations.

Figure 2.7: General directions of heroin and opium traffic from the South West Asian production areas



Note: Routes shown are general indications of the directions of illicit drug flows.
Source: Modified from United Nations Office on Drugs and Crime (United Nations Office on Drugs and Crime 2003).

South East Asia

Heroin travelling from the South East Asian region takes a number of different trafficking routes (Figure 2.8). These routes appear to have gradually changed in the last decade (United Nations Economic and Social Council Commission on Narcotic Drugs 2003).

Trafficking of South East Asian heroin through China substantially increased from the early 1980s, with the opening of the country and growth of foreign trade. By the mid-1990s, the primary trafficking route for South East Asian heroin was by road from Myanmar to Kunming, the capital of the Chinese province of Yunnan, and then along the southern Chinese provinces of Guangxi and Guangdong en route to Hong Kong (United States Department of State 1993; Australian Bureau of Criminal Intelligence 1996). Aided by China's political decentralisation and the rapid increase in the availability of road, air and rail links, new trafficking routes also developed through a number of interior provinces (United States Department of State 1997). The amount of heroin travelling across the Myanmar-Chinese border increased at a rapid rate from 1993 to 1999, accompanied by increasing levels of seizures in the country (United States Department of State 1999).

In 2000, the number of Chinese heroin seizures remained steady. This was accompanied by reports that narcotics traffickers had increased the production of methamphetamine and other synthetic drugs in China, suggested by highly increasing methamphetamine seizures (United States Department of State 2001). Seizures of heroin and amphetamine type substances both increased in 2001 and 2002.

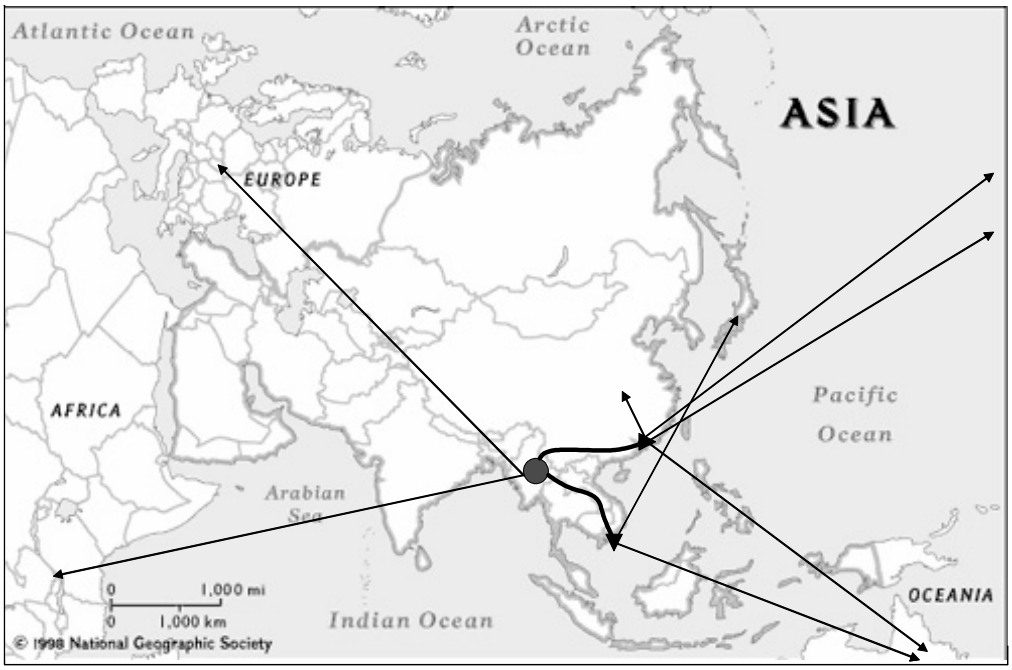
Opium seizures in the South East region and China in 2001 were largely similar to seizure levels reported in 2000. However, the size of China's heroin seizures doubled in 2001 compared to 2000 to become the country with the highest levels of heroin seizures worldwide (United Nations Office

on Drugs and Crime 2003). It seems that China is now being used as an important transit country for South East Asian heroin supplies (United Nations Economic and Social Council Commission on Narcotic Drugs 2003).

Another potential trafficking route for heroin produced in the Golden Triangle region is the Mekong River (Australian Bureau of Criminal Intelligence 1996). The Mekong River originates high on the Tibetan plateau and travels through China, Myanmar, Lao PDR, Thailand, Cambodia and Vietnam before entering the South China Sea near Ho Chi Minh City, Vietnam. This river is the principal transport route linking Yunnan province in China with South West China and South East Asia. The volume of cargo being transported along this river grew significantly in the early 1990s (Australian Bureau of Criminal Intelligence 1996).

There is a smaller level of trafficking through various points of the Lao PDR/Vietnam border, on to Ho Chi Minh City on the coast. In recent years, Singapore remains a major financial and transport centre, and is thought to be a target for money laundering and drug transhipment (Lintner 2002; Reid and Costigan 2002). Sri Lanka's popularity as a transhipment point for heroin from the Asian production regions has been growing since the late 1970s, given the poorly patrolled coastline. Shipments of heroin are thought to pass out of the country through Colombo international airport and seaport (Reid and Costigan 2002).

Figure 2.8: General directions of heroin and opium traffic from the South East Asian production areas



Note: Routes shown are general indications of the directions of illicit drug flows.
Source: Modified from United Nations Office on Drugs and Crime (United Nations Office on Drugs and Crime 2003).

The traditional trafficking route for heroin from Myanmar was across the Myanmar-Thai border. Since the opening of Chinese trafficking routes, this route is less used but heroin still passes through and Thailand remains an important transit location (Australian Crime Commission 2003). Most heroin exits Thailand via maritime routes in the south of the country (Office of the Narcotics Control Board 2002).

There has been a growing tendency recently for drugs to be trafficked south through the Andaman Sea, in the Indian Ocean south of Rangoon. Australia's largest heroin seizure to date of 390 kg in 1998 came through this route, and there have also been cases of mixed shipments of methamphetamine and heroin through this route (Gordon 2001).

Heroin supply

Western Europe

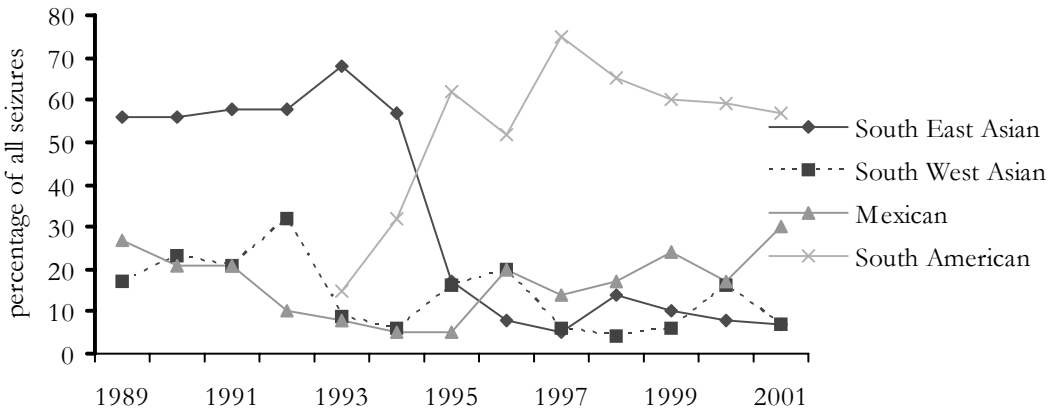
The West European heroin market has been primarily supplied by Afghanistan since 1990 (Gordon 2001), though it also receives some supply from the South East Asian region (European Monitoring Centre for Drugs and Drug Addiction 2002). Most monitoring of the European market is concentrated on Afghanistan-produced heroin, so it is not possible to ascertain if there was an increased supply of South East Asian heroin to the Europe market during Afghanistan's reduced production in 2001 (Senior Australian Government Law Enforcement Officer, personal communication, 2003).

United States

Currently, the vast majority of heroin supplied to the United States is thought to come from South America (see Figure 2.9). However, in the early 1990s, the majority of heroin in the United States originated from South East Asia. In 1994, South East Asian trafficking was disrupted by a joint Royal Thai Government/ Drug Enforcement Agency operation (US Department of Justice Drug Enforcement Administration 2002), allowing Columbian syndicates to take advantage of the gap in the market. This shift is seen clearly in Figure 2.9. South East Asian syndicates may have sought other markets, particularly Canada and Australia, to replace the United States market (law enforcement source).

In recent years, there has been an increased supply of Mexican heroin to the United States market (see Figure 2.9), and increased collaboration between Mexican and Columbian heroin production and trafficking groups (United States Drug Enforcement Administration 2000).

Figure 2.9: Source of heroin seized in the United States, 1989-2001



Source: US DEA heroin signature program; based upon net weight of seizures. Heroin signature for South American heroin developed mid-1993.

Canada

South East Asia is the principal source of heroin available in Canada (Royal Canadian Mounted Police 2002). Heroin is commonly trafficked to Canada via the international airports of Vancouver, Toronto and Montreal. Trafficking routes to Canada are thought to pass through India, Nigeria, Thailand and Ghana, though recently there has been some diversification through China, Malaysia, Indonesia and small South Pacific nations.

Approximately 71 kg of heroin was seized in Canada over 2001, less than half of the 2000 total (Royal Canadian Mounted Police 2002). The Royal Canadian Mounted Police report that the seizures in 2000 were a major loss for criminal organizations, and may have been a deterrent to suppliers and importers. The same Asian based trans-national importation groups have reportedly targeted Australia and Canada with heroin shipments in the past (Royal Canadian Mounted Police 2002).

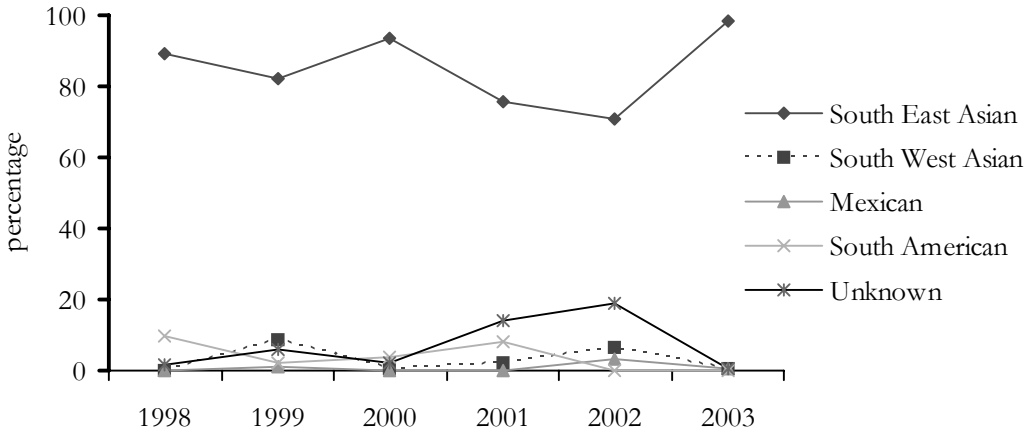
Despite these seizures, no reductions in supply of heroin have been noted in Canada in recent years. Indeed, a recent seizure was analysed by researchers and found to have had no effect upon supply in the region (Wood, Tyndall et al. 2003).

Australia

In the late 1970s and early 1980s, Thailand was the immediate source of most heroin entering Australia (Williams 1980) and the main mode of transportation was via body or baggage concealment methods on commercial airlines. A high incidence of small heroin importations also occurred by overseas mail to Australia (Australian Federal Police 1980). From the 1990s, there were increased reports of use of "mother ships" to traffic heroin to Australia. These ships would carry large supplies of heroin, while "shore parties" would collect heroin in smaller quantities from the "mother ship" and take it ashore (Collins, Degenhardt et al. 2003).

The majority of heroin supplied to the Australian market from the late 1990s to the present originates from South East Asia and Myanmar in particular (Figure 2.10) (Australian Crime Commission 2003).

Figure 2.10: Source of heroin seized in Australia, 1998-2003



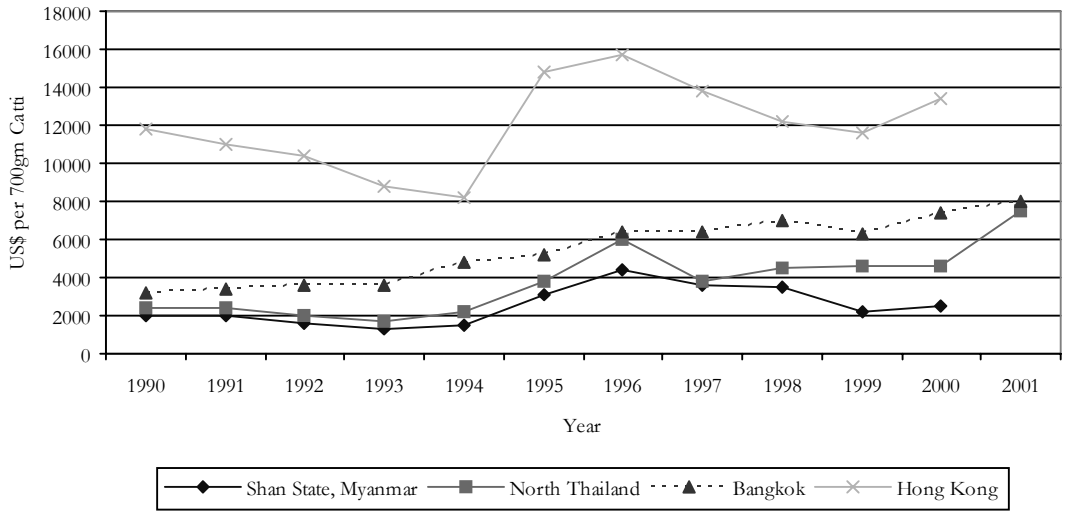
Source: AFP heroin signature program; based upon number of seizures.

Opium and heroin prices

The "farm gate price" is the price offered by opium traders to opium poppy farmers in their own villages (US Department of Justice Drug Enforcement Administration 2001). This farm gate price for opium and heroin fluctuates over the year and is influenced primarily by crop cultivation levels (US Department of Justice Drug Enforcement Administration 2001).

The farm gate price of opium is the lowest in the supply chain. As heroin is trafficked, the price increases with costs such as smuggling fees and profit margins. Prices are higher at the end-point of distribution where the controls are stricter and the risk of getting caught is higher (Figure 2.11) (Lintner 2002). For instance, in 2000, the price of a US$2500 "catti" (700 gm) heroin in Shan State, Myanmar had increased to approximately US$47,000 by the time it reached Australia (Australian Bureau of Criminal Intelligence 2001) or US$60,000 by the time it reached the United States (US Department of Justice Drug Enforcement Administration 2001).

Figure 2.11: Average wholesale prices (US$) of South East Asian heroin in different Asian locations, per catti (700gm), 1990-2001[8]



Source 1990-2000 data: (US Department of Justice Drug Enforcement Administration 2001).
Source for 2001 data: (US Department of Justice Drug Enforcement Administration 2001).

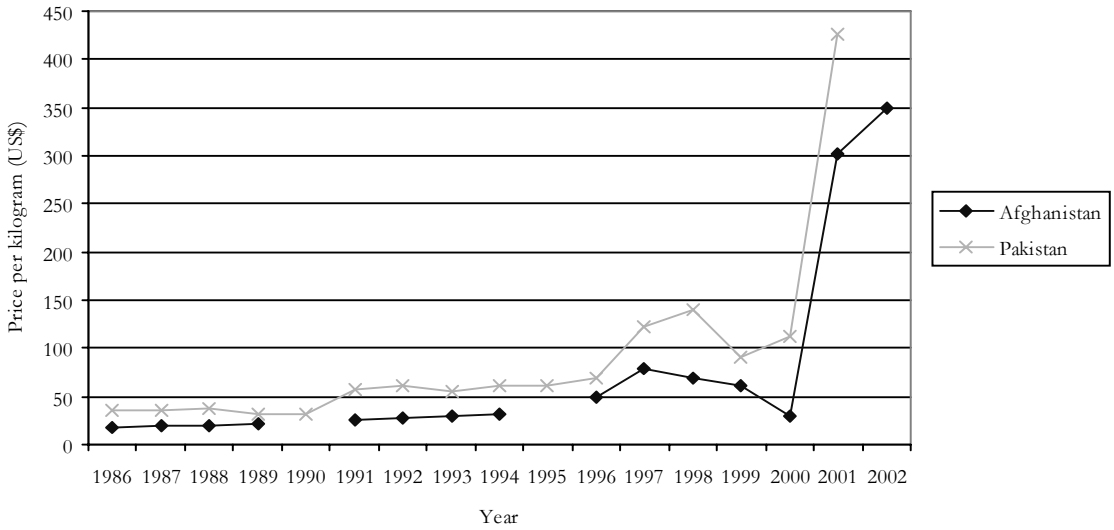
Source countries

South West Asia

Farm gate prices of opium in Pakistan and Afghanistan can be seen to fluctuate according to the levels of cultivation (Figure 2.12). When Pakistan's opium cultivation reduced to 24 metric tons in 1996, the price per kilo rose accordingly. The price of Afghanistan's opium rose dramatically in 2001, with less substantial price rises continuing in 2002 as opium cultivation levels began to recover.

[8] Note: For clarity, this graph only shows the lower estimate of average price estimates.

Figure 2.12: South West Asian opium farm gate prices 1986-2002

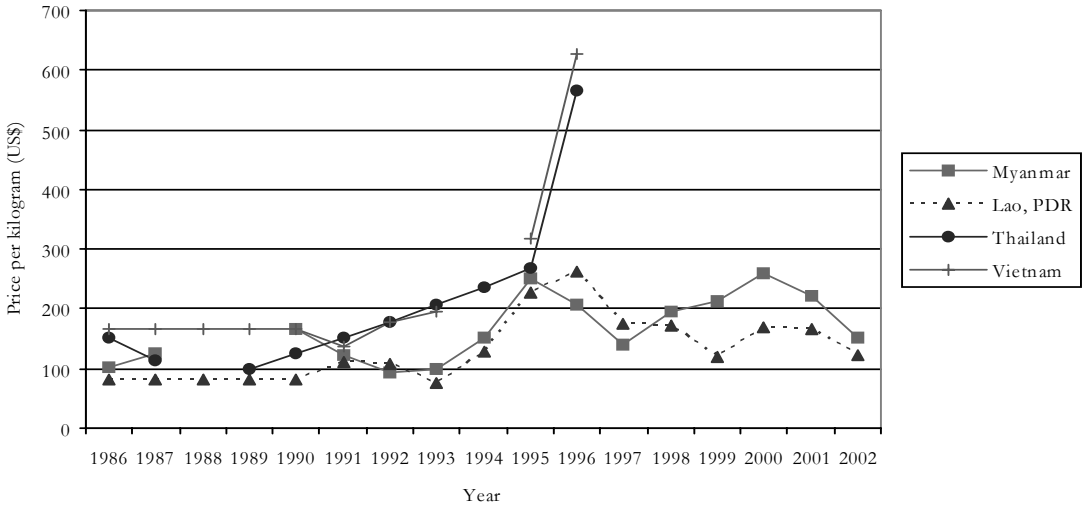


Source: Prices for 1997-2001 are expressed in constant 2001 US$ (United Nations Office for Drug Control and Crime Prevention 2002). For 2002 data, it is presumed that the 2002 US$ value was used as a comparison, but this was not stated (United Nations Office on Drugs and Crime 2003). Prices for 1986-1996 data expressed in constant 1996 US$ (United Nations Office on Drugs and Crime 1998).

South East Asia

The prices of South East Asian heroin are driven by Myanmar and Lao PDR as the major cultivation countries. In general, prices of opium and heroin in South East Asia have remained robust throughout the 1990s despite decreasing cultivation of raw opium (US Department of Justice Drug Enforcement Administration 2001). Farm gate prices for opium sales in Myanmar and Lao PDR between 1986 and 2002 have shown gradual changes (Figure 2.13) but no dramatic price fluctuations such as those seen in Thailand, Vietnam, Afghanistan and Pakistan (United Nations Office on Drugs and Crime 2003).

Figure 2.13: South East Asian opium farm gate prices 1986-2002



Source: Prices for 1997-2001 are expressed in constant 2001 US$ (United Nations Office for Drug Control and Crime Prevention 2002). For 2002 data, it is presumed that the 2002 US$ value was used as a comparison, but this was not stated (United Nations Office on Drugs and Crime 2003). Prices for 1986-1996 data expressed in constant 1996 US$ (United Nations Office on Drugs and Crime 1998).

The US Department of Justice Drug Enforcement Administration (2001) believe it is likely that South East Asian heroin prices will continue to be stable in the future. These prices have withstood economic, political and climatic disruptions in the region for the last decade, and short-term price fluctuations in South East Asia were not translated into price fluctuations in the Metropolitan New York heroin market (US Department of Justice Drug Enforcement Administration 2001).

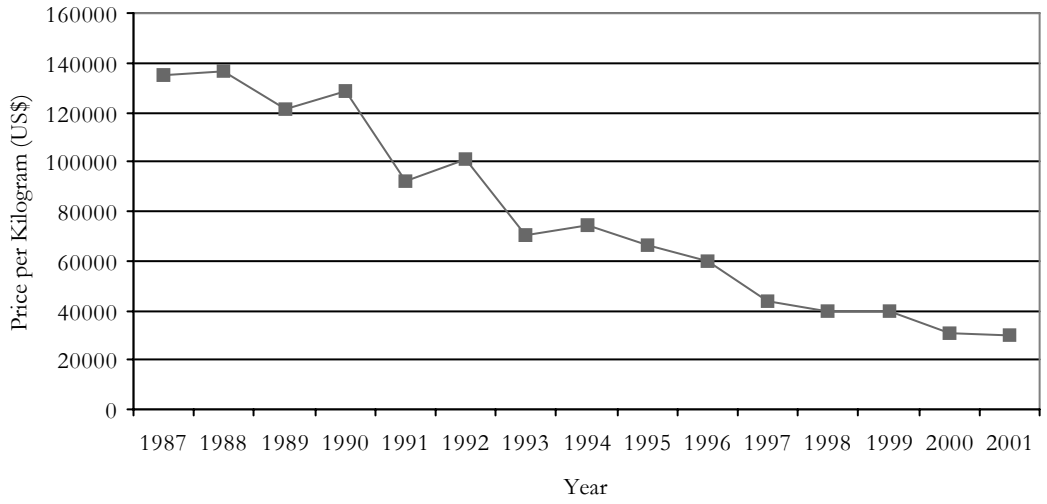
Destination countries

Western Europe

The price per kilogram heroin has decreased in Western Europe over recent years (Figure 2.14) (United Nations Office on Drugs and Crime 2003). Street prices of heroin ranged between EUR 25 and EUR 330 per gram in 2000, and were generally reported to be stable or decreasing for all countries except for Portugal, Sweden and the United Kingdom, where the price of "brown heroin" showed an increase (European Monitoring Centre for Drugs and Drug Addiction 2002).

The price of opioids in Europe remained stable for the majority of 2001, only increasing in price near the end of that year. It appears that a proportion of opiates produced in pre-2001 harvests were stockpiled and released in 2001 (United Nations Economic and Social Council Commission on Narcotic Drugs 2003). The price of opium rose at a higher rate than heroin, suggesting that heroin was still being released from stockpiles (Australian Crime Commission 2003). Heroin shortages were not reported in the European markets during 2001, although the purity of street heroin in the United Kingdom fell from 61% at the beginning of 2001 to 43% at the end of 2001 (United Nations Economic and Social Council Commission on Narcotic Drugs 2003).

Figure 2.14: Heroin price per kilogram (US$) in Western Europe, 1987-2001[9]



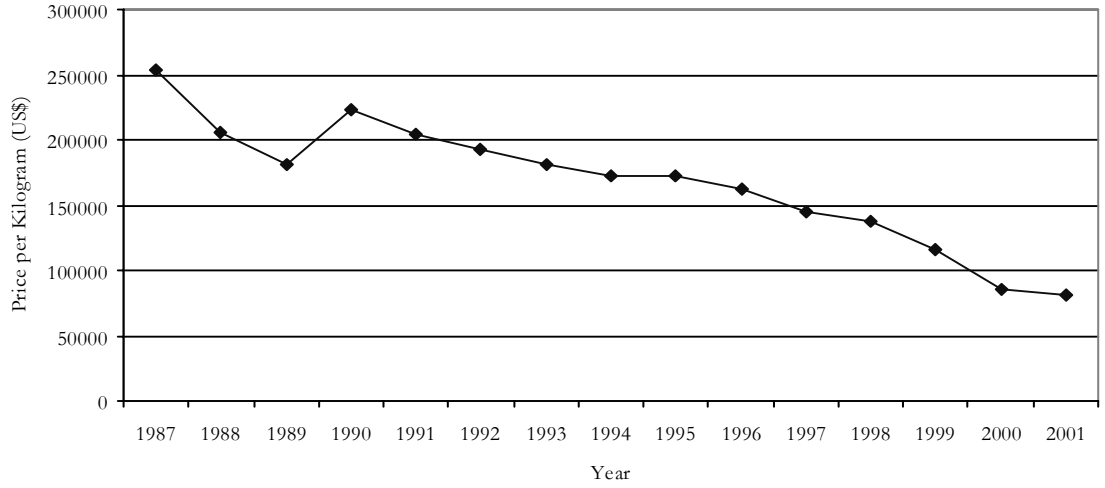
Source: (United Nations Office on Drugs and Crime 2003). Prices are expressed in constant 2002 US dollars.

[9] The price for Western Europe has been calculated from the Annual Reports submitted to the UN Office of Drug Control and uses a weighted average (by population) of: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. United Nations Office on Drugs and Crime (2003). Global Illicit Drug Trends 2003. New York, United Nations.

United States

In the United States, heroin markets tend to be unique for each major metropolitan area, and the US Department of Justice Drug Enforcement Administration (2003) caution against attempts to calculate national "averages" in price and purity levels. However, this program expresses heroin prices for each metropolitan area in units of "price per milligram pure", units that bear little relation to the street price of heroin. Data from the Annual Reports given to the UN Office of Drug Control (United Nations Office on Drugs and Crime 2003) show how the reported price per kilogram heroin in the United States has steadily decreased over the years (Figure 2.15).

Figure 2.15: Heroin price per kilogram (US$) in the United States, 1987-2001



Source: (United Nations Office on Drugs and Crime 2003). Prices are expressed in constant 2002 US dollars.

Canada

Vancouver is one of the major Canadian heroin markets and generally the first arrival point for South East Asian heroin. In 2002, heroin price per catti (700 gm) ranged between AU$71,000 and AU$77,000 and street prices per gram were estimated at AU$175. These prices are relatively unchanged since 1999, and are also fairly consistent across the major Canadian urban centres (Senior Officer, Vancouver Police Department, personal communication, 2003).

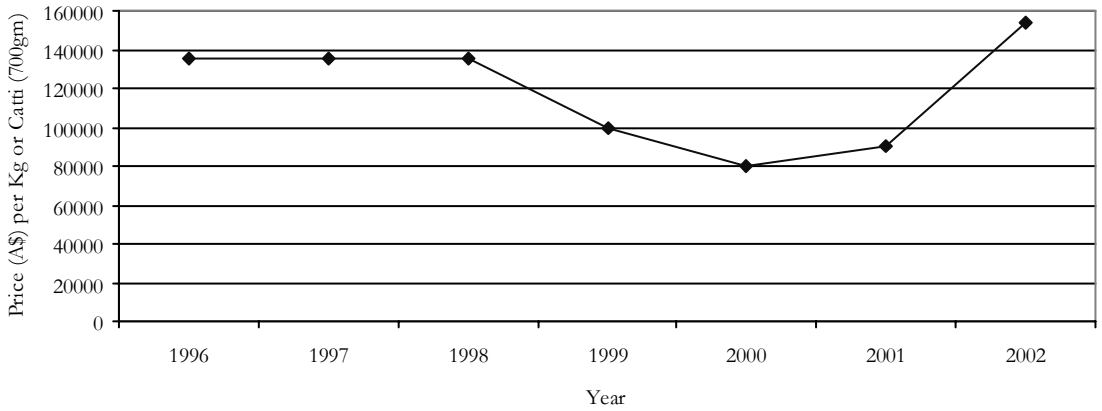
Australia

South East Asian heroin trafficking groups are thought to have targeted the Australian heroin market from the early 1990s, supplying cheaper, purer heroin than had previously been supplied to Australia (law enforcement source). This was reflected by the reduction in the wholesale (catti) price of heroin during that time (Figure 2.16).

In Sydney, Australia's largest heroin market, the median street heroin price almost halved, from $400 per gram in 1996 to $220 per gram in 2000 (Darke, Topp et al. 2002). Australian heroin street prices increased in markets around the country in accordance with a reduced supply of heroin in 2001 (Degenhardt, Reuter et al. 2004; Dietze, Miller et al. 2004; Harrison, Christie et al. 2004).

The wholesale prices of heroin appear to have been slower to increase, although it should be noted that the number of seizures used to construct the prices for Figure 2.16 were not mentioned in the original Australian Illicit Drug Report data (Australian Bureau of Criminal Intelligence 1996; 1997; 1999; 2000; 2001; 2002; Australian Crime Commission 2003).

Figure 2.16: Heroin prices in NSW, Australia per catti (700gm), 1995-2002[10]



Source: Australian Bureau of Criminal Intelligence and Australian Crime Commission reports[11]. Data originally recorded per quarter (with some missing data), this data presented as the median of quarterly values.

Conclusions

The majority of the world's opium supplies originate from Afghanistan (South West Asia) and Myanmar (South East Asia), with both countries supplying largely separate regions of the world. While Afghanistan's opium is trafficked to the markets of Europe and Central Asia, Myanmar predominantly supplies South East Asia, China, Canada and Oceania (including Australia). The United States receives the majority of its heroin supply from the smaller cultivation areas of Southern America.

In 2001, Afghanistan's opium cultivation decreased dramatically, driving down world opium cultivation. The countries supplied by this region did not experience heroin shortages during this year, although the purity of heroin in the United Kingdom started to decrease towards the end of that year.

There was a continuing downwards trend in opium cultivation from the mid-1990s in the South East Asian cultivation regions, with more marked decreases in cultivation noted in 1998 and 1999 due to drought conditions in the area. During 2001, opium cultivation in the Myanmar region showed no major changes. Trafficking routes from the region have showed some diversification in recent years with the level of heroin seizures in China continuing to increase and seizure being discovered on less common trafficking routes such as through the Andaman Sea. However, these changes to trafficking routes have occurred gradually.

The great majority of Australia's heroin supply is from South East Asia, and Myanmar in particular. While Australia experienced a reduction in heroin supplies in 2001, this was not seen in the other countries being supplied with South East Asian heroin.

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[10] Note: For clarity, this graph only shows the lower estimate of average price estimates.

[11] Australian Bureau of Criminal Intelligence (1996). Australian Illicit Drug Report 1995/96. Canberra, Commonwealth of Australia, Australian Bureau of Criminal Intelligence (1997). Australian Illicit Drug Report 1996/97. Canberra, Commonwealth of Australia, Australian Bureau of Criminal Intelligence (1999). Australian Illicit Drug Report 1997/98. Canberra, Commonwealth of Australia, Australian Bureau of Criminal Intelligence (2000). Australian Illicit Drug Report 1998/99. Canberra, Commonwealth of Australia, Australian Bureau of Criminal Intelligence (2001). Australian Illicit Drug Report 1999/00. Canberra, Commonwealth of Australia, Australian Bureau of Criminal Intelligence (2002). Australian Illicit Drug Report 2000/01. Canberra, Commonwealth of Australia, Australian Crime Commission (2003). Australian Illicit Drug Report 2001/02. Canberra, Australian Crime Commission.

Chapter 3: An overview of Australia's heroin markets

Louisa Degenhardt, Wayne Hall, Libby Topp, Linette Collins, Paul Dietze and Paul Christie

Summary

- Australia had a history of quasi-medical use of opiates in 19th century.
- Restrictions on access to opiates began in the 1890s and continued until heroin was prohibited in the mid 1950s.
- It has been proposed that illicit drug markets flourish when a number of variables exist: supply of the drug; potential consumers; some level of corruption in law enforcement; the existence of organised crime; and the influence of such groups upon persons in positions of power. These factors (particularly the first four) have been documented in Australia in past decades.
- Illicit heroin use largely began in Australia in the early to mid 1960s, when it was introduced by US servicemen on leave from the Vietnam War.
- The illicit heroin market increased after the end of the Vietnam War as organised criminals previously involved in prostitution and gambling began importing heroin from South East Asia.
- Law enforcement corruption has long been associated with the heroin market.
- In the mid 1980s a substantial increase in heroin use and associated harms resulted in the launch of a National Campaign Against Drug Abuse (NCADA).
- A further increase in heroin use in the early to mid 1990s provided clear indication of an expanding heroin market.
- In late 2000 heroin suddenly became very difficult for experienced heroin users to find.

Introduction

As noted in Chapter 1, opium use has a long history. In the 1870s, Australia provided a ready market for patent medicine companies who derived large profits from the sale of "secret remedies". These products generally had a high opium or alcohol content and often contained both (McCoy 1980). By the end of the 19th century, Australia held the doubtful honour of having the world's largest per capita consumption of proprietary medicines, many of which contained opium (Manderson 1993).

The Commonwealth Department of Health prohibited the importation of opium for smoking on September 7, 1914 in response to international pressure to suppress opium smoking expressed in the Hague Convention of 1912. Fear that Chinese opium smokers were evading the prohibition by substituting legal opiates, such as laudanum and morphine, led to increased restrictions on the use of *all* licit opiates. The prohibition on the importation of opium established a precedent on which Australian legislators built. A regime evolved in which the use of many drugs was progressively prohibited.

In May 1953, under considerable pressure from the UN Drug Commission and with little consultation within Australia, the Commonwealth prohibited the importation of heroin. Australia's signing of the United Nations Single Convention on Narcotic Drugs (1961) and its ratification in 1967, committed the country to the system of international drug control.

The heroin market in Australia began increasing from the 1960s, but the most marked increase was in the 1990s, when rising rates of use and harms were contrasted with decreasing heroin price. This background is the setting in which in late 2000 or early 2001, there was an unexpected and dramatic reduction in the availability of heroin.

This chapter aims to place the recent heroin shortage in the context of the heroin market over previous years, and in a wider context of law enforcement and heroin supply dynamics. For information on the longer term history of heroin and other illicit drug use in Australia, please see other work completed by NDARC (Gibson, Degenhardt et al. 2003). It is an historical account: such things are reconstructive.

To use a framework for this work, ideas proposed by McCoy (1980) were used. McCoy suggested that for illicit drug markets to flourish in a sustained manner, several things were required:

> "(1) a reliable source of supply;
>
> (2) a potential group of consumers;
>
> (3) a tradition of political tolerance of some sort of organised crime;
>
> (4) a modicum of police corruption; and
>
> (5) an informal alliance between the drug syndicates and some influential leaders of established political parties, senior public servants and skilled professionals." (p. 22).

These ideas have been explored in the chapter. As will become apparent, these factors were present in the country over past decades.

Drug law enforcement in Australia

McCoy (1980) argued that the prohibitions of the 1920s - severe restrictions on alcohol sales and the prohibition of "dangerous drugs" - provided an economic base that permitted the emergence in Sydney and Melbourne of organised crime. As in most developed countries in the 19th century, Australian Governments had tolerated and taxed personal vices such as gambling, prostitution, and alcohol and drug use. During the early 20th century, governments sought to suppress these vices and their organised trade by enacting criminal legislation. McCoy (1980) argued that rather than their elimination, the criminalisation of these vices resulted in the establishment of demand driven illegal industries vulnerable to control by professional criminals.

This trend was more marked in Sydney than Melbourne. According to McCoy (1980), the greater organisation of crime in Sydney than in Melbourne reflected the characteristics of these cities and their police forces. Early in the 20th century, both were port cities with core businesses of transport and cargo handling that allowed the shipment of contraband and organised theft (Morrison 1997). During world economic downturns when port cities experience high rates of unemployment, prostitution, gambling and other forms of organised crime provide alternative sources of employment and income. Unlike Sydney, Melbourne's economy relied on manufacturing and banking as well as transport and cargo handling. This diversification provided some protection against downturns in global trade, reducing the necessity for organised crime.

The Victorian Police was established with a local community orientation in 1852. They did not recruit from the ranks of convicts to the same extent as NSW Police, who during colonial times were often found to collaborate with the criminals they were supposed to apprehend. The Victorian Police also provided a more consistent restraint on the growth of organised crime.

The combination of Sydney's economic dependence on its port and a police force of limited capacity, created an environment conducive to the development of organised crime. The Sydney criminal milieu developed into an organised professional criminal class between 1920-1940 (McCoy 1980). This was further encouraged by unprecedented affluence in Sydney during World War II when US and Australian soldiers spent their recreational leave in Sydney, increasing the demand for sly grog, gambling, hotel accommodation, restaurants, prostitution, and female escorts. NSW Police were generally free of systematic corruption in the 1930s but emerged from World War II seriously compromised in their capacity to control organised crime and professional criminals. The result was a steady expansion of the scale of criminal operations throughout the 1950s and 1960s, as was revealed in subsequent Royal Commissions.

The 1920s: cocaine prohibition

During World War I, the Australian Army attempted to minimise drunkenness in the interests of military discipline, by imposing restrictions on the sale of alcohol and penalties for drunkenness. Untrained Army dispensers, however, liberally dispensed cocaine, heroin and morphine, to soldiers seeking relief from the stresses of trench warfare (McCoy 1980).

The use of cocaine was introduced by the troops to the prostitutes with whom they consorted, and a pattern of use continued after the war when the soldiers returned home. In the 1920s, cocaine use among prostitutes in Sydney and Melbourne caused considerable concern among police in these cities. State police forces formed specialist Drug Squads to enforce drug laws (McCoy 1980). By 1920, Victorian Police were arresting street dealers and pharmacists who sold cocaine to criminals. NSW Police did not enforce drug laws until the passage of the Police Offences (Amendment) Drugs law of 1927, which made the possession of cocaine an offence (Manderson 1993). The politically powerful NSW pharmacy industry, however, ensured that it was not until

1934 that NSW legislation granted the Police Drug Bureau responsibility for the suppression of illicit drug use, when before the pharmacists had had control (had responsibility for the regulation of its sale) (Manderson 1993).

As the resources devoted to drug control increased, and the ability of pharmacists and petty traffickers to sell drugs was restricted, the criminal "underworld" became the main source of cocaine. Price and profitability increased, and the ensuing violence among rival distribution groups caused great public concern. Police regained control of Sydney's streets after the passage in 1929 of the NSW Vagrancy (Amendment) Act, providing harsh penalties for anyone "consorting with criminals". This law made it a serious crime for known criminals to be seen in each other's company. By the mid-1930s, the Drug Bureau and the Consorting Squad had effectively eliminated cocaine trafficking.

The experience with cocaine trafficking indicated that NSW Police were able to effectively enforce laws against cocaine use when given the necessary means, a market of sufficiently small scale, and in an environment of political determination and public support.

Heroin use and the Vietnam War

In the late 1960s, (Chinese) heroin producers established heroin laboratories along the Thai-Burmese border areas (this was known to the US Government and was permitted in exchange for the support of local tribes and the Mong against the North Vietnamese), and exported heroin to Vietnam for sale to US soldiers involved in the Vietnam War (1962-1972) (Hirst 1979). Within a relatively short period, as many as a third of US troops were using heroin (Robins, Helzer et al. 1975). American soldiers visiting Sydney on "R & R" leave introduced heroin use to prostitutes and bohemians. By the late 1960s heroin was able to be purchased in Sydney's Chinatown and Kings Cross from the market originally established to meet the demand from US soldiers (Rolls 1992). The growth of the heroin market during this period prompted the establishment of methadone maintenance programs in the early 1970s (Mattick and Hall 1993).

Other Australian criminals also became involved in this profitable business. The case of John Egan, a police officer with the NSW Special Branch, illustrates the ease with which Australians could enter the international heroin trade in the late 1960s: in 1966-1967, Egan's team of heroin couriers transported AU$22 million worth of heroin into the US and Sydney before being "busted" in early 1967. Their operations also revealed the capacity for corruption within NSW Police (McCoy 1980).

Throughout the 1960s, the ruthlessness and professionalism of Sydney's organised criminals continued to increase. The Australian Labor Party (ALP) was defeated by the (conservative) Liberal-Country Party (LCP) in the 1965 NSW State elections, rendering the political contacts of established criminal leaders relatively useless. A small number of criminal syndicates with allies in the new Government expanded their power through involving police and political protection. By the late 1960s it was evident that, in addition to a burgeoning demand for drugs, there were sufficient corrupt police in NSW to allow professional drug trafficking to develop (McCoy 1980). The biographies of criminal personalities such as Arthur "Neddy" Smith (Smith and Noble 1993) reveal the way in which organised crime figures, using the massive profits from heroin trafficking, corrupted some NSW Police officers.

Between 1965 and 1976, NSW developed a significant problem with political and police corruption (McCoy 1980). Sydney's criminal entrepreneurs enjoyed unprecedented prosperity, expanding into illegal casinos and systematic fraud in the flourishing poker machine and licensed club industries. The fact that 14 illegal casinos were established in Sydney during the tenure of the LCP Government illustrated the city's tolerance for organised crime. McCoy (1980) argued that the organisation of the criminal milieu in Sydney would have been more limited if some of the State's politicians had not reached an understanding with organised crime leaders.

The public visibility of organised crime in NSW prompted media and parliamentary scandals that led to the establishment in August 1973 of a Royal Commission into Organised Crime under Mr Justice Moffitt. Justice Moffitt concluded that organised crime was well established and that Sydney's organised criminal syndicates had developed links with the American Mafia. He highlighted the inability of NSW Police to suppress organised crime. Evidence from Europe and America revealed a strong association between gambling and heroin smuggling and Justice Moffitt was concerned that these links would be forged in NSW. His recommendations were not acted upon, and by the late 1970s, organised crime in NSW was a professional, ruthless and powerful industry (McCoy 1980).

Despite public pressure on the NSW Government, the heroin market continued to grow. A decade of corruption connected with the illegal casino industry, starting price (SP) bookmaking and prostitution impaired the ability of the NSW Police and NSW Government to control organised crime. They were unable to prevent the move of organised crime from traditionally "acceptable" vice trades to large scale and highly profitable heroin distribution.

The mid 1990s: NSW Wood Royal Commission

This status quo was disturbed by the 1994-1997 Royal Commission into the NSW Police Service, under Justice James Wood. The Commission's terms of reference were to investigate "The nature and extent of corruption within the [NSW] Police Service, particularly of any entrenched or systemic kind" (Wood 1997).

The NSW Wood Royal Commission found evidence of endemic and systematic corruption related to drug law enforcement including the following:

> *"Protection of drug dealers, 'licensing' of certain drug cartels and of 'shooting galleries', and of certain gaming establishments, by elimination of their competitors;*
>
> *Stealing of money, and of drugs found during the execution of search warrants, and the recycling of the latter, usually to favoured dealers or informants;*
>
> *Leaking of confidential information to persons who were under investigation or otherwise interested in its reception and warnings of pending gaming, licensing and drug raids;*
>
> *Compromise of prosecutions by the gutting of police briefs, and loss of material evidence in return for payment"* (Wood 1997).

Justice Wood further commented on higher level corruption surrounding drug law enforcement in NSW:

> *"Perhaps the most disturbing disclosures related to the activities of an elite joint Commonwealth-State Task Force on Drug Trafficking. This was a Force comprised of detectives of supposedly high calibre, integrity and experience, hand chosen from the New South Wales Police Service and the Australian Federal Police, supported with the best available resources and tasked with targeting high level drug dealers. Although it achieved a high conviction rate it quickly became a hot bed of corruption, and there were strong suggestions that participation in corrupt practices became a rite of passage"* (Wood 1997).

Although the need for reform was without doubt established, the capacity of the NSW Police Service to intervene in illicit drug matters, particularly at the level of mid and upper level drug distribution may not have improved following the Wood Royal Commission. The disbanding of units and groups within the Service found to have corrupt associations by the Commission was

reported to have resulted in an overall lack of resources and capacity in this area. There was also a loss of experience in this area as officers left the Service or moved from criminal investigation into street level uniformed work. The introduction of more managerial positions at the expense of operational policing positions may also have reduced capacity at a local level. Timidity among police with regards to the drug law enforcement area associated with a fear of exposure to possible corruption allegations was also reported (KI Commissioned Officer, State Command). The potential for a reduction in the capacity of public administrations associated with the introduction of anti-corruption initiatives has been observed in law enforcement agencies elsewhere (T Anechiarico 1996).

The disruption of the status quo that occurred following the Commission (from 1994 onward) - whereby some level of organised crime had been "tolerated", restricting opportunities for other criminal groups to enter the heroin distribution market - may also have made the establishment of new heroin importation and distribution networks easier as the capacity and willingness of law enforcement to investigate new drug networks had been compromised. This may have been important in the further development of Sydney as a major importation and distribution point for heroin in Australia.

The 1990s: Commonwealth drug law enforcement

In November 1979, the functions of the Federal Bureau of Narcotics were transferred to the newly established Australian Federal Police (AFP). The Bureau was disbanded as a result of findings of the Williams Royal Commission into Drug Trafficking. Officers of the Bureau had also been identified in the Stewart Royal Commission as associated with a significant heroin trafficking group, the "Mr Asia" syndicate (Stewart 1983). The AFP had early success with the disruption of Australian based criminal syndicates. Drug seizures increased through the 1980s (Stewart 1983). However, the success of the AFP was limited in the 1990s.

The early to mid 1990s was a time of scarce resources for both the Australian Customs Service (Customs), and AFP Australian border and international operations. One key informant with many years experience, interviewed for this study, reported that they had been "starved of funds" in the early 1990s, with the years 1996-1997 being a very low point for the AFP as an organisation. At this time, the AFP was capable only of looking at heroin importation from the border, not from overseas locations.

Funding from the National Illicit Drugs Strategy (NIDS) Tough on Drugs from 1998 onwards increased funding for drug law enforcement. In total, the Tough on Drugs included an extra $213 million for supply reduction measures, and $303 million for demand and harm reduction measures.

This led to increased resources for Customs, the AFP, and the establishment of the Joint Asian Crime Group. The outcome from the funds devoted to supply reduction included AFP and Customs border and international strategies, as well as enhanced State and Federal legislation and policy against street dealing and drug houses[12]. NIDS funding allowed the AFP to expand operations overseas, with AFP liaison officers, overseas law enforcement partners (under the Law Enforcement Cooperative Program, or LECP), as well as to extend operations within Australia through the Avian strike teams.

[12] Law enforcement source.

Groups involved in importing and distributing heroin

There was a small illicit heroin market in the 1950s and 1960s among some members of Sydney's Chinese community. Heroin was imported from Hong Kong for personal use because it was cheaper and easier to conceal than opium (Rolls 1992). As in other countries, attempts in Australia to suppress *opium* smoking may have inadvertently increased *heroin* use (Westermeyer 1976; Courtwright 1982; Gray 1995).

In the early 1970s, cannabis became a symbol of rebellion against authority, and produced the first mass market for an illicit drug in Australia (Penington 1999). The demand for cannabis was efficiently exploited by organised criminals, who played a major role in the development of the market (McCoy 1980). Although no single group is thought to have dominated supply, cannabis distribution provided a welcome new business opportunity for criminal entrepreneurs, who from 1972-1977 had lost a number of their profitable activities[13].

Sydney's organised criminals are thought to have utilised the police and political contacts they had acquired through a decade of involvement in the more "acceptable" illegal industries of gambling, abortion and prostitution (McCoy 1980). The income generated from illegal drugs allowed criminal persons to achieve the balance of power in relationships with corrupt police and politicians (McCoy 1980). This, according to McCoy, permitted Sydney's syndicates to move into drug trafficking with a relatively high degree of protection from law enforcement.

Meetings in the mid-1970s between local criminals and American organised crime groups may have linked Australia with the international narcotics traffic (McCoy 1980). Whether coincidental or not, the amount of heroin from South East Asia entering Australia increased substantially after visits by Mafia representatives to Australia. Bulk heroin importation at this time was controlled by a small number of criminal groups. Law enforcement efforts in Bangkok had resulted in Chinese exporters who preferred to deal only with established contacts that purchased large amounts of heroin for distribution in Australia. In the late 1970s the Australian Royal Commission of Inquiry Into Drugs, under Mr Justice Williams, defined the key threat of drug trafficking as arising from the involvement of organised crime, rather than from drug use per se (Manderson 1993).

No single syndicate dominated Australia's drug traffic in the 1970s. Unlike traffickers in the US in the 1960s, who regularly imported large amounts, Sydney drug syndicates of the 1970s handled smaller quantities, using couriers and smuggling techniques (Hall 1981). As summarised by McCoy (1980), there was no single "Mr Big", but there was a number of "Mr Big Enoughs". While individuals travelling on commercial airlines took the risks of importing small amounts of heroin during the 1970s, organised crime importers were the most regular and substantial suppliers of Australia's heroin. Leading syndicate figures subcontracted out the management of the operations. In turn, the "manager" employed reliable criminal operatives, and retained legitimate professionals - solicitors, police, and judiciary - as required. Their success was evident in the continued expansion of Sydney's, and subsequently, Australia's, heroin markets, and by the fact that, as in other countries, organised crime syndicates remained the key players in the importation of heroin into Australia (Morrison 1997; Lintner 2002).

The late 1970s: the entry of new players

After American forces withdrew from Vietnam in the mid 1970s, the Chinese heroin syndicates that had supplied heroin to US troops shifted their focus elsewhere (McCoy 1980). The scale of heroin use among US soldiers in Vietnam and the potential for continuation of this use in the US had

[13] The "legalisation" of abortion, the loss of "standover" income from prostitutes who serviced American servicemen, and the closing of illegal casinos in December 1977.

become apparent. At this time, it became a political imperative to ensure that South East Asian heroin did not fill the void in the US heroin market created by the eradication of Turkish opium production. Although the syndicates attempted to follow the American soldiers home, by 1975, the US Drug Enforcement Agency's (DEA) successful interception of heroin shipments to the US led to a marked decrease in the amount of South East Asian heroin entering the US. Traffickers may have sought new markets for heroin in Europe and Australia, where there were (then) relatively few addicts (McCoy 1980).

Furthermore, in the mid-1980s, the newly created AFP disrupted many of the criminal syndicates that had traditionally controlled Australia's heroin distribution, including those of Leonard "Lenny" McPherson and Arthur "Neddy" Smith (Lintner 2002). The success of these police operations may have created a vacuum in heroin distribution in NSW.

The 1990s: changes that set the scene

Criminal groups with links to South East Asian heroin producers may have moved to fill a vacuum in the supply of heroin to Australia in the 1990s. From the late 1980s to early 1990s, high purity South East Asian heroin dominated the east coast US market. In 1994, a joint Royal Thai Government and US DEA operation[14] disrupted South East Asian heroin trafficking to the US (US Department of Justice Drug Enforcement Administration 2002). This disruption, along with increased opium cultivation and heroin production in Columbia, allowed Columbian heroin traffickers to replace the supply of South East Asian heroin to the US (see also Chapter 1). It also meant that South East Asian heroin previously trafficked to the US again needed a new destination country.

South East Asian trafficking groups are thought to have successfully targeted the Australian heroin market to attain significant market share, supplying cheaper, purer, heroin than had previously been supplied to Australia[15]. This was achieved through links with the increasingly influential and numerous members of Asian crime gangs in Australia, particularly in key areas in Sydney, namely Haymarket and Cabramatta (Lintner 2002).

In addition, there appeared to be a shift in the mode of importation of heroin. Specifically, this appeared to move towards the use of "middle men" or *facilitators*, based in South East Asia, who had connections between producers, financiers in South East Asia, and importers/distributors in Australia[16]. This appeared to be a strategic change:

> *"For many years importation into Australia was Australia based…It involved Australian based people going overseas and organising and managing imports, or organising it through somebody who was overseas…In the early-mid 90s [a business decision was made] to reduce risk by organising importations overseas by contracting overseas based people to organise the importations. This was a big network shift that meant you had fewer importers into Australia."* (Commissioned Officer, State Command NSW Police)

The vacuum left by the syndicates of the 1980s appears to have been filled in the early 1990s by South East Asian crime syndicates. The extent of the increase in the market may be inferred to some extent from the increase in heroin seizures from the late 1970s to the late 1990s (Figure 3.1). The heroin market flourished further, but now with a wider range of nationalities involved in street level heroin dealing that had traditionally been controlled by Anglo - Australians (Lintner 2002).

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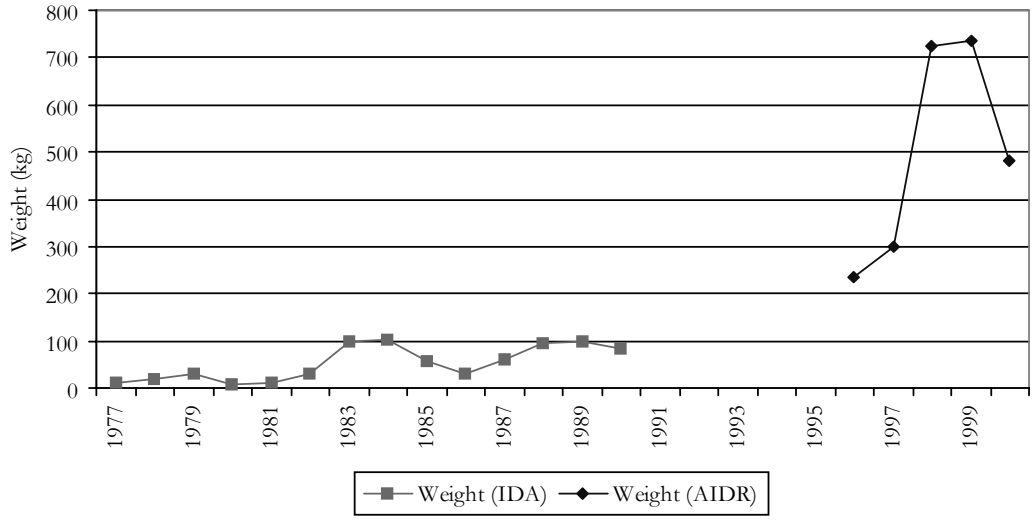
[14] Operation Tiger Trap.

[15] Law enforcement source.

[16] Information obtained from key informants from the AFP and NSW Police.

Figure 3.1: Amount of heroin seized in Australia, 1997-2000



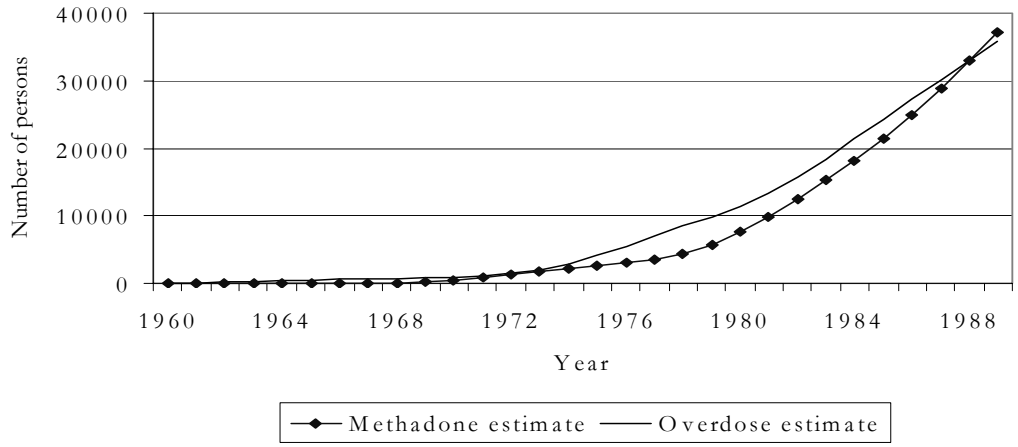
Source: Illicit Drugs in Australia (IDA) reports; Australian Illicit Drug Reports (AIDR).

Heroin markets in three Australian jurisdictions

The use of illicit heroin has increased in many countries around the world in past decades, and Australia is no exception to that trend. Sufficient supply of heroin, of course, is necessary for its use to increase, but an important prerequisite for that use is the wish to do so. It would appear that the *demand* for use has also increased over past decades, possibly reflecting increasing numbers of young people willing to try heroin and other illicit drugs. This trend among young people has been documented worldwide, and could reflect the massive social and cultural changes that have occurred over this period (Rutter and Smith 1995).

Increases in the number of dependent heroin users in Australia were particularly evident in the 1980s (Hall, Lynskey et al. 1999); Figure 3.2). Political concerns led to a Special Premiers' Conference that launched a National Campaign Against Drug Abuse (NCADA) with additional Federal funding for drug programs. The NCADA funded a number of policy responses to dependent heroin use, including an increase in 1985 in the provision of methadone maintenance treatment for heroin dependence (Mattick and Hall 1993) and the establishment in 1987 of the first needle and syringe programs (Feacham 1995).

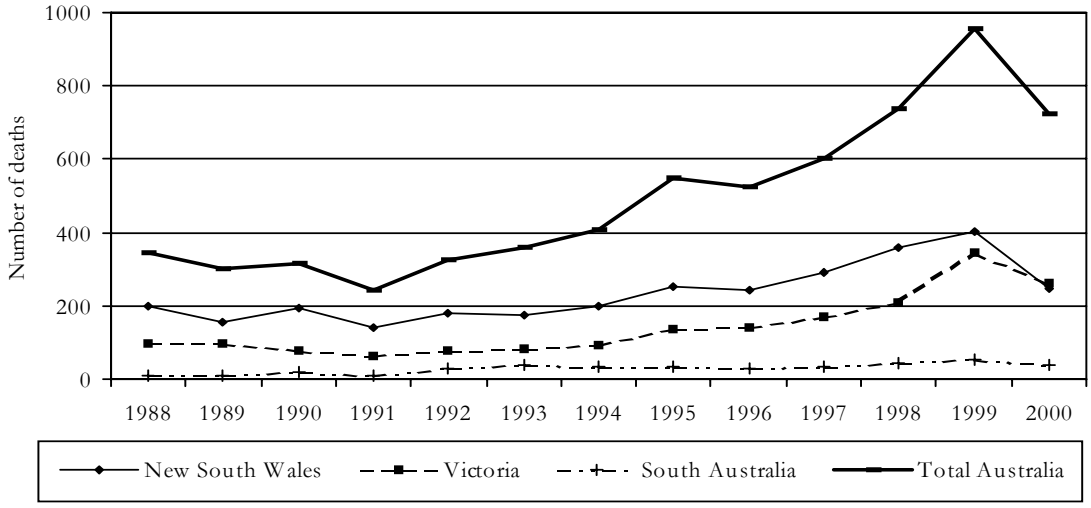
Figure 3.2: Back projection estimates of the number of dependent heroin users, 1960-1989



Source: Hall, Ross, Lynskey, Law & Degenhardt (2000).

The clearest indication of growth in the Australian illicit heroin market during the 1990s was the steep rise in opioid overdose deaths that began in the early 1990s, predominantly in NSW and Victoria (Hall, Lynskey et al. 1999; see Figure 3.3).

Figure 3.3: Number of opioid deaths among persons aged 15-44 years, 1988-2000



Source: Australian Bureau of Statistics.

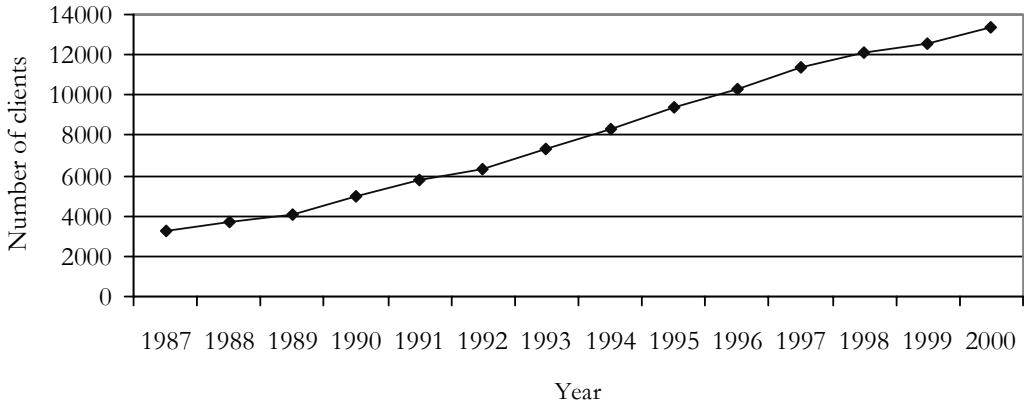
The steepest increase in heroin related deaths occurred around the time that national illicit drug monitoring systems were established (Fry and Topp 2002; Shand, Topp et al. 2003). These included the annual Needle Syringe Program (NSP) survey (MacDonald, Robotin et al. 2001) and the Illicit Drugs Reporting System (IDRS)(Hando, Darke et al. 1998; Topp and McKetin 2003; Topp and McKetin in press). Data collected on illicit drug markets nationally suggested that heroin was the most often injected drug in the country (MacDonald, Robotin et al. 2001). The purity was relatively high and the price of heroin either remained stable or decreased every year (Topp, Darke et al. 2001).

A wide range of indicators (price and purity of heroin, drug first injected by IDU, overdose events, police incidents of possession/use of heroin) suggested that heroin dominated injecting drug markets in NSW and Victoria (Darke, Hall et al. 2000). These two States were thought to account for one half and one quarter, respectively, of Australia's heroin markets (Hall, Ross et al. 2000). The capital cities - Sydney and Melbourne - probably contained the majority of illicit drug market participants in those States. Law enforcement intelligence suggested that Sydney remained Australia's centre for heroin importation and trafficking during this growth period (1990s) (Australian Bureau of Criminal Intelligence 2002). The heroin market in South Australia was much smaller. Monitoring systems indicating that methamphetamine was the drug most frequently injected in this State (MacDonald, Robotin et al. 2001; Longo, Humeniuk et al. 2002).

NSW

Much evidence suggests that the NSW heroin market increased substantially during the 1990s. This was evidenced by increases in overdose deaths (see Figure 3.3), along with increases in the number of methadone clients (Figure 3.4) and other indicators of heroin related harm suggesting that heroin became more widely used in the State (Darke, Kaye et al. 2002). In Sydney, the median price of a street gram almost halved, from $400 in 1996 to $220 in 2000 (Darke, Topp et al. 2002). Analyses of the average purity of heroin seized by law enforcement officials increased over the same period from 44% in 1996/97 to 58% in 1999/00 and 65% in 1998/99 (Topp, Day et al. 2003).

Figure 3.4: Number of methadone clients in NSW on 30 June by year, 1987-1999



Source: Pharmaceutical Services Branch database.

Along with the expansion in the size of the heroin using population, there was a shift in the 1990s in the location of the drug markets where heroin was distributed.

Kings Cross

Kings Cross was long considered Australia's premier drug market. American soldiers visiting Sydney on "R & R" leave during the Vietnam War (1962-1972) introduced heroin use to prostitutes and bohemians. By the late 1960s, heroin was available in Sydney's Chinatown and Kings Cross from the markets originally established to meet the demand from US soldiers (Rolls 1992). By the 1980s, Kings Cross was home to a thriving open air drug market, dealing in heroin, cannabis, amphetamine, and later, "party drugs" such as ecstasy and more recently cocaine and methamphetamine. The drug market offered opportunities for small time and large scale drug dealing (Southgate, Day et al. 2003). The market attracted local and out-of-town injecting drug users (IDU), sex workers, young people, a nightclub crowd, backpackers and an array of tourists

and visitors (Southgate, Day et al. 2003). Public injecting was common (MacDonald, Rutter et al. 1999), and commercial (illegal) drug injecting rooms were present in Kings Cross from the early 1990s (Rutter, Dolan et al. 1997), and were brought to public attention during the Wood Royal Commission (Dolan, Kimber et al. 2000).

Cabramatta

In the early 1990s, there was a notable increase in heroin distribution and use in the South Western Sydney suburb of Cabramatta. From the early 1990s, there were increasing reports of heroin in the area, thought to be "Chinese No. 4" heroin (Maher, Dixon et al. 1998). The establishment of a visible, street level heroin market in the area led to increases in heroin overdoses, heroin related arrests, other associated crimes, and substantial increase in community concern, with extensive reports of heroin injection on the street, and many reports of increasing numbers of young persons - many of Indochinese descent - involved in the market as user/sellers (Maher, Dixon et al. 1998). Much of the lower level dealing was thought to be relatively freelance, but there was evidence that dealers were in some cases "taxed" by local gangs (Maher, Dixon et al. 1998).

In response to this increasingly visible market, there was a period of "high profile, intensive and sustained police intervention", with increases in the number of beat police, mobile patrols, officers on horseback and police dog teams (p. 47) (Maher, Dixon et al. 1998). These interventions did not appear to reduce the availability of heroin, but rather led to reports of more risky street based heroin injection, as users attempted to use before being apprehended by police (Maher, Dixon et al. 1998). These changes were reported to be particularly among younger users, who were more likely to use in a group in a public setting and share equipment, raising concerns about the risk of blood borne virus transmission, particularly hepatitis C (Maher, Dixon et al. 1998).

Redfern

Little has been written about the history of the Redfern drug market. Residents of the Redfern area report heroin use first occurring there in the late 1970s and early 1980s. Heroin use in Redfern and inner city Sydney increased quite quickly from the early 1980s (Morgan and Sleigh 1986). It was reported that by the early to mid 1980s heroin was being brought into the Redfern area by a dealer and sold to around 80 drug users. The sale of heroin was reported to be mainly to regular users living in the area (Morgan and Sleigh 1986).

In 1985, the Redfern Aboriginal Medical Service (AMS) established a sub-committee "Proposed program for users of Narcotics and Barbiturates" and a proposal was put forward to establish a drug treatment service (Munro 1986). Three drug counsellors were employed at that time. These positions ceased when Commonwealth funding was not renewed. From the mid 1980s, the availability of heroin and the number of users in Redfern increased (Morgan and Sleigh 1986). The Central Sydney Area Health Service (CSAHS) established a NSP in the area in May 1989. A permanent NSP service to the Redfern area was established in 1991 (personal communication, NSW Health Manager, October 2003).

It has been argued by Lintner (2002) that the drug market in Redfern was in part developed through links developed in prisons and juvenile detention. He argued that indigenous Australians in custody may have developed links with persons of Indo-Chinese descent also detained, leading to the establishment of the drug market in Redfern.

Whatever the reason for the development of this market, there has been a small, street based market in Redfern for around 20 years, which has involved the sale of heroin and cocaine in a small locale to injecting drug users of both indigenous and non-indigenous descent.

Victoria[17]

The major parameters of Victoria's heroin market have only been widely documented and understood since the emergence of monitoring and surveillance systems such as the IDRS that was first implemented in Melbourne in 1997 (Rumbold and Dietze 1999). This means that little was known about the characteristics of Victoria's heroin market prior to this time apart from that available in specific research studies and reports from a variety of sources such as the media. Nevertheless, the widely used description of the heroin shortage as a "drought" implies that there was some understanding of what the "normal" characteristics of Victoria's heroin market were prior to the onset of the heroin shortage. In their discussion of the heroin drought in Melbourne, Dietze and Fitzgerald (2002) presented an overview of the history of Melbourne's heroin markets. Their overview has been reproduced here with additional information inserted where available.

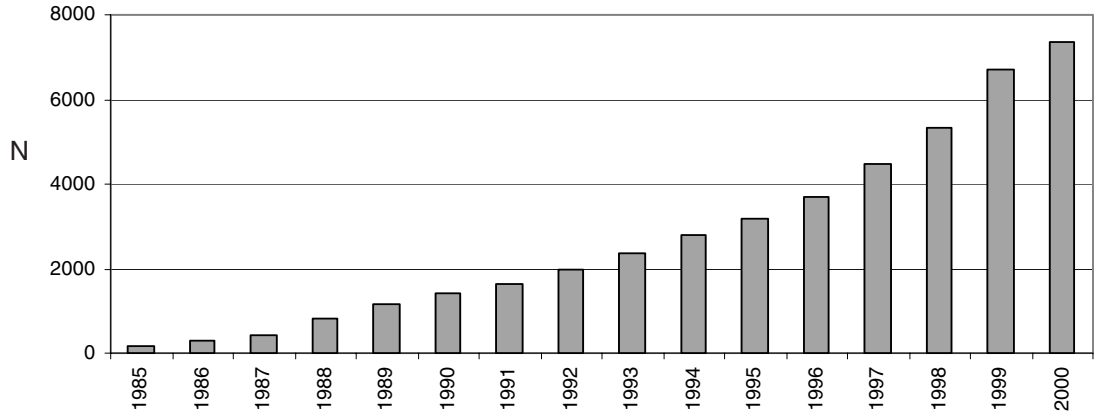
In the early 1980s in Melbourne, inner city suburbs had yet to experience gentrification. The Fitzroy/Collingwood area still housed substantial welfare and working class populations. High rise public housing estates were also a feature of these areas. Alongside this residential population were working class hotels. In the early 1980s, local police were reported to be wary of entering some of these hotels on their own for fear of violence. Police knew that these hotels were the best places to look for newly released prisoners, wanted offenders, amphetamine use among the indigenous community and the organised heroin trade (The Age, 18/10/83). Likewise, covert operations on these public hotels during the 1980s resulted in a documentation of what appeared to be more consumer accessible location based drug trade.

Later in the 1980s and early 1990s, amusement parlours and poolrooms became sites for drug markets in Fitzroy/Collingwood. This trend had been apparent for some time in the southern edge of the Melbourne CBD in St Kilda. For a period in the 1980s and early 1990s, a poolroom on Smith Street in Fitzroy was a thriving site for heroin trade. Likewise, hotels in Fitzroy and Richmond became well known as places to score heroin and amphetamines. At the time, there was a cultural shift in the inner city. Inner city hotels were now the sites of a burgeoning live and independent music scene and were increasingly becoming host to a vibrant and eclectic mix of people following this new entertainment. Streets like Smith Street in Fitzroy/Collingwood and Church Street in Richmond were also becoming entertainment precincts. The increased flow of recreational consumers provided an opportunity for the distribution of illegal drugs. This created opportunities for the changes in heroin supply that were later observed.

The changes in heroin availability in inner city Melbourne during the 1980s were perhaps precursors to the rapid expansion of the street markets across greater Melbourne in the mid 1990s. The number of people receiving methadone maintenance treatment increased steadily from the mid-1980s (Figure 3.5). The critical cultural shift that occurred during the 1980s created a linkage between access to heroin and the development of the inner city recreational consumer commodity market. Licensed hotels, live music venues, amusement parlours, and poolrooms all distributed pleasurable commodities; heroin became available through the same sites. There was a cultural shift that increased the visibility of the heroin market to those who attended these venues.

[17] The content of this section was drawn largely from work conducted by Fitzgerald and Dietze.

Figure 3.5: Number of clients on the Victorian methadone maintenance program, 1985-2000



Source: Drugs and Poisons Unit, Victorian Department of Human Services.

The emergence of street-based heroin markets in Melbourne

A number of shifts occurred in the distribution and use of heroin in Melbourne from mid 1995 to 2001 which saw the emergence of the street-based drug markets (Fitzgerald, Broad et al. 1999; Fitzgerald and Hope 1999). Melbourne's street-based drug markets had all the characteristics of "open" markets: access to the market was high, drug dealing was highly visible, the market was mobile, and rapidly re-deployed in response to police activity. A high level of associated crime, public disorder and public drug use occurred in these locations.

Similar changes were noted in other areas of Melbourne, notably the inner suburb of Footscray and the outer suburbs of Springvale, Dandenong and Frankston. This produced areas that have commonly been termed the "drug hotspots" in Melbourne. The increased visibility of the street heroin markets resulted in increased levels of drug outreach and needle and syringe program services, enabling documentation of the size and nature of the heroin market. Over this period, Melbourne's daily newspapers periodically produced maps of the drug hotspots.

South Australia

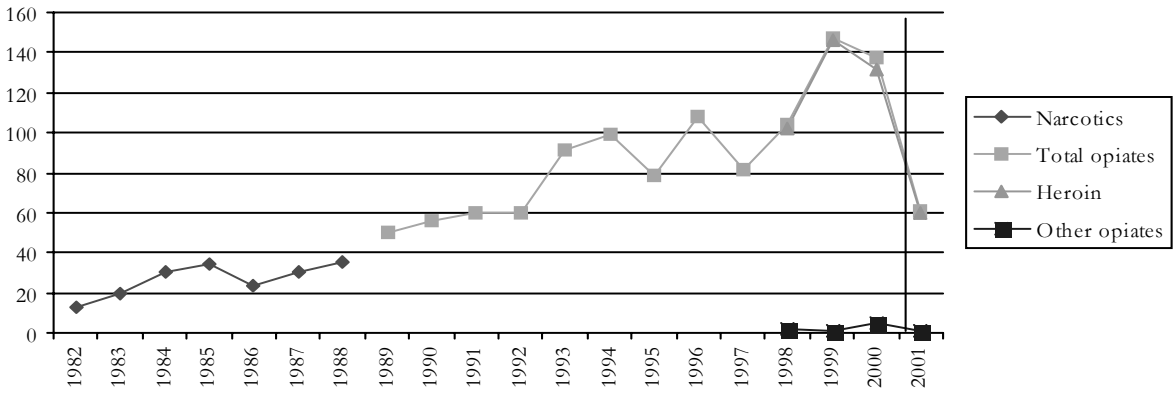
As indicated in the previous sections, the heroin markets in NSW and Victoria have been the dominant markets in Australia since the emergence of heroin as a major problem drug. The heroin market in South Australia (SA) is smaller and has been less thoroughly researched and documented, although similar trends to those seen in the eastern States have been observed in the prevalence of heroin use in the decades since the 1970s.

Around 180 persons were enrolled in the Hillcrest Hospital methadone program in Adelaide by end of 1978, the number having increased from less than 20 in 1975. Methadone maintenance services reached a critical point in the early 1990s, with long waiting lists for induction into treatment. These problems were alleviated with a restructure of methadone treatment services, resulting in an escalation of clients on the program.

Other indicators from this time also reflected a small but emerging heroin problem. The Office of Crime Statistics and Research of the SA Attorney General's Department has collated data on drug offences since the early 1980s. This provides a picture of the growth in the heroin market in South Australia (Figure 3.6) as reflected by opiate offences. This is consistent with other information that indicates expansion in the heroin market in the 1980s reaching a peak in the mid to late 1990s.

Anecdotal reports suggest that the use of "home bake", a heroin substitute derived from codeine based drugs was widespread in the late 1980s, to meet the demand for suitable opiates when supplies of heroin were scarce. Indications are that home bake became much less common in the 1990s, when supplies of heroin in South Australia became much more consistently available at an affordable price.

Figure 3.6: Number of offences relating to possess or sell narcotics/opiates/heroin in South Australia, 1982-2001



Source: Crime and Justice Reports, Office of Crime Statistics and Research (SA).

Information on the markets for heroin within South Australia is limited. In the mid-1990s, the trafficking of heroin by Indo-Chinese dealers in the north west suburbs of Adelaide became a focus of attention for both law enforcement and drug treatment agencies, as they were seeing increasing problems associated with the marketing and use of heroin within the local community. The influx of heroin through these dealers was also apparently associated with an increased availability of cheaper heroin of higher purity across Adelaide. Furthermore, a study of Indo-Chinese heroin users in Adelaide (Ali, Jittiwutikarn et al. 2000) showed that dependent users in this community were for various reasons not accessing suitable treatments for their dependence, similar to the work of Higgs in Melbourne and Maher in Sydney.

During the late 1990s, media attention was focused on the increasingly visible problems of illicit drug use and dealing in the community, especially with the emergence of young Indo-Chinese heroin dealers operating in Rundle Mall, the major central shopping precinct in Adelaide. Around this time, South Australia Police established Operation Mantle to target low to middle level drug dealers, with additional staff resources provided to Local Service Areas across Adelaide. The appearance of young heroin dealers in Rundle Mall was no doubt the most obvious manifestation of a more open and widespread heroin market in Adelaide, and probably the most visible street level dealing that had yet been seen. Other anecdotal reports from around this time suggested that heroin use was becoming increasingly visible in certain parts of Adelaide, including the city centre, with relatively young users being observed by city workers to be injecting drugs during business hours (Longo, Humeniuk et al. 2002).

Conclusions

Australia had a long history of quasi-medical use of opiates in 19th century. Progressive restrictions on access to opiates began in the 1890s and continued until heroin was prohibited in the mid 1950s. With the exception of some limited heroin use among the Sydney Chinese community in the late 1950s, illicit heroin use largely began in Australia in the early to mid 1960s when it was introduced by US servicemen on R & R. The size of the illicit heroin market increased after the end of the Vietnam War as criminals who had hitherto derived their incomes from prostitution and gambling moved into drug importation, developing organised heroin trafficking links between Australia and South East Asia. The market was also allowed to grow as a result of continued police protection established during policing of more traditional criminal activities including gambling and prostitution. In the mid 1980s a substantial increase in heroin use and associated harms resulted in the launch of a National Campaign Against Drug Abuse (NCADA).

Another increase in heroin use occurred in the early to mid 1990s. Characterised by increased availability, decreased price and increased quality of heroin it provided a clear indication of an expanding heroin market (Caulkins and Reuter 1998). This was the state of Australian heroin markets in 1999, the year before drug market participants and key informants began to report that heroin had suddenly become very difficult for experienced heroin users to find.

Chapter 4: Documenting the heroin shortage

Carolyn Day

Summary

- In early 2001 heroin supply decreased in NSW, Victoria and South Australia (SA).
- The time taken for regular heroin users to purchase the drug increased in NSW and the proportion of regular drug users reporting heroin as "easy to obtain" decreased in the three states.
- The price of heroin caps increased in NSW and Victoria from 2000 to 2001, but remained stable at $50 in SA.
- The price per gram of heroin also increased in NSW, Victoria and SA in 2001, having decreased steadily (NSW, Victoria) or been stable (SA) since 1996. The price of catti (700gm) also increased in 2001 following decreases since 1998.
- Heroin purity decreased in all States according to the subjective accounts of drug users and State police heroin seizures. The purity of Federal seizures was stable in NSW but was variable, appearing to decrease in early 2001 in Victoria.
- The amount of heroin seized at the border in 2000/2001 was at the lowest level since 1998/1999.
- The peak period of the shortage appears to have been January to April 2001.
- The heroin market appears to have stabilised, though it has not returned to pre-2001 levels.

Introduction

A change in the availability of heroin in Australia was first noted in January 2001 (Day, Topp et al. 2003). This chapter documents those changes by examining changes to the heroin markets as measured by the price, purity and availability of heroin. There are, however, a number of challenges in characterising and documenting changes in the availability or supply of heroin. This chapter commences with a discussion of these challenges. The distinction between data which can be used to determine supply and demand (or consumption) is discussed based on the arguments postulated by Degenhardt and colleagues (2002). Changes in the availability, price and purity of heroin are then outlined. The chapter draws on existing data from the initial research which documented the shortage and data obtained through the Illicit Drug Reporting System (IDRS). Information drawn from the State reports is also assessed to outline the chronology of the shortage. The chapter concludes with a brief discussion of the concept of a heroin "glut" and interpretation of a shortage in this context.

Data issues: detecting a reduction in supply

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

- Self reported data on availability, purity and price among regular drug users;
- Law enforcement data on availability, purity and price of drugs seized;
- Key informant data on availability, purity and price.

When a variety of data pertaining to the same issue are collected, the degree of consistency of the data can be examined. This allows apparent trends to be reported with more confidence. Each of these data sources are subject to biases and flaws (for a detailed discussion see Degenhardt, Topp et al. 2002). As with all data, indicator data is context specific and may not be readily interpreted on its own or without detailed analysis. Thus, KI relying solely on limited indicator data sources when reporting on trends may be limited in their capacity to independently assess and comment on the market. Given that each data source is subject to different biases, a triangulation of the data may overcome these biases (Griffiths, Vingoe et al. 2000). 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 (Griffiths, Vingoe et al. 2000). These systems have been running in Australia since 1996 in the form of the IDRS (Hando, Darke et al. 1998).

Limitations of the use of other data sources

An important issue to consider in any examination of changes in drug availability is to avoid using data that may be confounded by other factors. Of particular importance are those sources that primarily reflect the demand for, or consumption of, drugs (for a detailed discussion see Degenhardt, Topp et al. 2002), such as:

- patterns of drug use, which is influenced by the preferences for, or availability of, other drugs;
- health outcomes of drug use, which is influenced by changes in the patterns of use, risk taking behaviours of drug users and policy (e.g. police attendance at overdose);
- treatment for problematic drug use, this is affected by factors such as changes in funding and availability of treatment places, and changes in the recording practices of treatment agencies; and

- law enforcement data on drug related crime, which is confounded by the effect of law enforcement operations that target specific crimes, and changes in law enforcement funding.

Data used in this analysis

In early 2001, unsolicited reports of a heroin shortage arose from staff of drug treatment agencies and needle and syringe programs, as well as researchers in the field. In response to these reports, timely surveys of IDU were conducted in Sydney and Melbourne to examine their veracity (Miller, Fry et al. 2001; Weatherburn, Jones et al. 2001; Day, Topp et al. 2003). These surveys were small, independent cross sectional studies and relied on the retrospective recall (albeit over less than six months) of IDU, however, their timeliness makes them valuable sources of information for documenting the shortage.

The Illicit Drug Reporting System (IDRS), Australia's strategic early warning system has, since 1996, monitored the price, purity, availability and patterns of use of illicit drugs (Hando, Darke et al. 1998). The IDRS annually collects comparable and detailed information from a sentinel population of IDU regarding their history and patterns of drug use. Consistent with recommendations regarding best practice in the monitoring of drug trends (Griffiths, Vingoe et al. 2000), the IDRS also triangulates a number of data sources against the quantitative IDU survey to ensure the validity of its findings. More information regarding the capacity of the IDRS to monitor in a reliable and valid fashion trends over time in illicit drug use can be found elsewhere (Darke, Kaye et al. 2002; Darke, Topp et al. 2002; Darke, Topp et al. 2002; Topp, Degenhardt et al. 2002).

The IDRS data provide a rigorous examination of changes in patterns of drug use because each year, a comparable sample of a sentinel population of IDU, recruited using the same methods and from the same geographical regions over time, are interviewed regarding their own recent behaviours. These data thus do not rely on retrospective recall to the extent of the studies cited above. The IDRS does, however, represent annual data only, routinely collected mid year, and thus after the peak period of the shortage.

The heroin shortage project

The current project also undertook to examine the context and parameters of the heroin shortage. However, the issue of when the heroin shortage occurred and changes in valid indicators such as price, purity and availability is difficult to examine retrospectively. It was not possible to obtain reliable quantitative information from heroin users given the length of time between the interviews and the initial reports of a reduction in heroin supply (Day, Gibson et al. 2004). Similarly, key informant data is also unreliable given the length of time between the first reports of the shortage (January 2001) and the time of interview (late 2002 - early 2003). Thus, drug users and key informant interviews undertaken as part of the current research were used only to describe the course of the shortage since it commenced.

Documenting the shortage

Availability of heroin

Initial research reports clearly indicated that heroin availability had reduced dramatically in early 2001, as indexed by IDU reports of significantly increased "search time" (the time taken to successfully obtain drugs). Day et al (2003) surveyed 41 IDU in the Kings Cross area of inner city Sydney during mid February 2001, the period now considered the peak of the shortage. Almost all of these IDU reported that heroin was harder to obtain at the time of interview (mid February) than it was before Christmas 2000. The length of time that heroin was reported to have been harder to

obtain ranged from one to 25 weeks. The most frequently reported time was six weeks, suggesting that most users perceived that the shortage began shortly after Christmas 2000 or in early 2001. These initial reports of the shortage were corroborated by eight of the 10 KI interviewed as part of the study (Day, Topp et al. 2003).

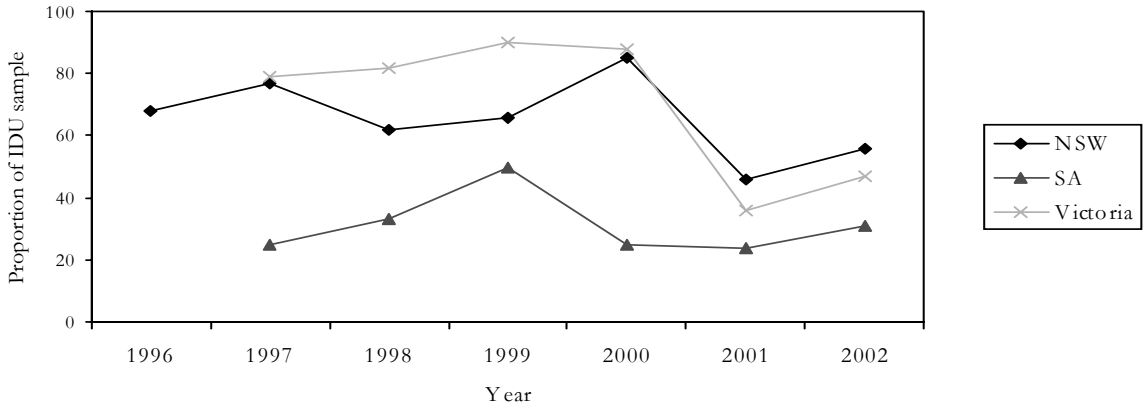
Search time for heroin had increased significantly from a median of 10 minutes before Christmas to 90 minutes at the time of interview, though this was measured retrospectively. The longer search time appeared to produce a shift toward opportunistic purchases, with 42% of IDU reporting street purchases before Christmas, compared to 54% at the time of interview (Day, Topp et al. 2003).

This research was later supported by Weatherburn et al. (2001) who interviewed IDU about the shortage during mid 2001. They reported that 71% of their sample regarded heroin as more difficult to obtain compared to before Christmas. A significant increase in reported search time from 11 minutes prior to Christmas 2000 compared to 15 minutes at the time of interview was also reported (Weatherburn, Jones et al. 2001).

Research undertaken in Melbourne also documented a marked change in the perceived availability of heroin. Eighty nine percent of the IDU interviewed reported heroin as difficult to obtain compared to 88% reporting heroin as easy to obtain in the 2000 IDRS (Miller, Fry et al. 2001).

Data available for the IDRS further supported these claims. IDU recruited for the IDRS describe the availability of heroin[18], and recent changes in availability[19]. Comparison of these results over time (Figure 4.1) demonstrates that the availability of heroin was dramatically reduced in 2001 relative to 2000. There was a marked decline in the proportion of IDU describing heroin as "very easy" to obtain, and a concomitant increase in the proportion of IDU who described heroin as "difficult" or "very difficult" to obtain.

Figure 4.1: Proportion of NSW, Victorian and SA IDU who described heroin as very easy to obtain, 1996-2002



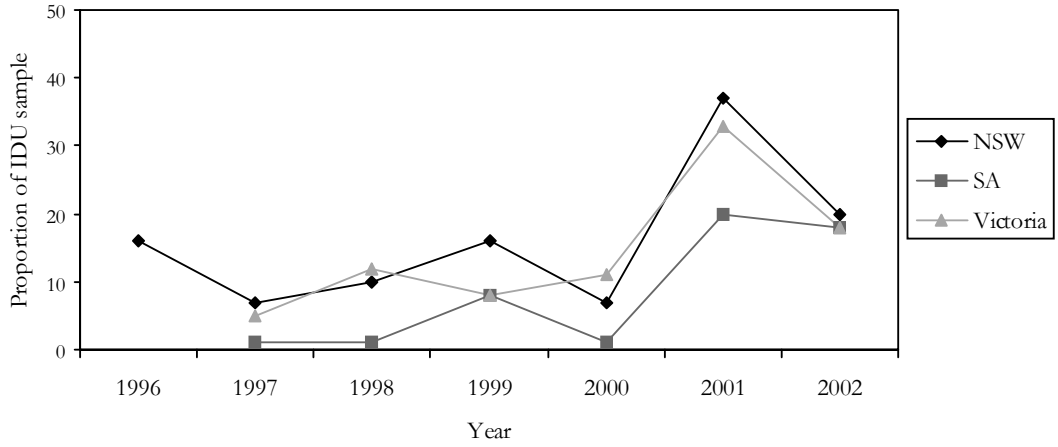
Source: IDRS IDU Interviews.

Likewise, compared to 2000, in 2001 a far greater proportion of the IDU sample reported that heroin had recently been more difficult to obtain (Figure 4.2).

[18] The question asked is: "How easy is it to get heroin at the moment?" with the possible response options of Very easy, Easy, Difficult, Very difficult.

[19] The question asked is: "Has the availability of heroin changed in the last six months?" with the possible response options of Easier, Stable, More difficult, Fluctuates.

Figure 4.2: Proportion of IDU in NSW, Victoria and SA who reported that heroin had recently been more difficult to obtain, 1996-2002



Source: IDRS IDU Interviews.

It should be noted, however, that the majority of IDU interviewed for the IDRS still considered that heroin had been "very easy" or "easy" to obtain in 2001, suggesting that the changes in the availability of heroin did not cause regular, street-based heroin users great problems obtaining heroin. Rather, the changes in availability were relative to the pre-Christmas 2000 period, when heroin appeared to be remarkably freely available.

Heroin price

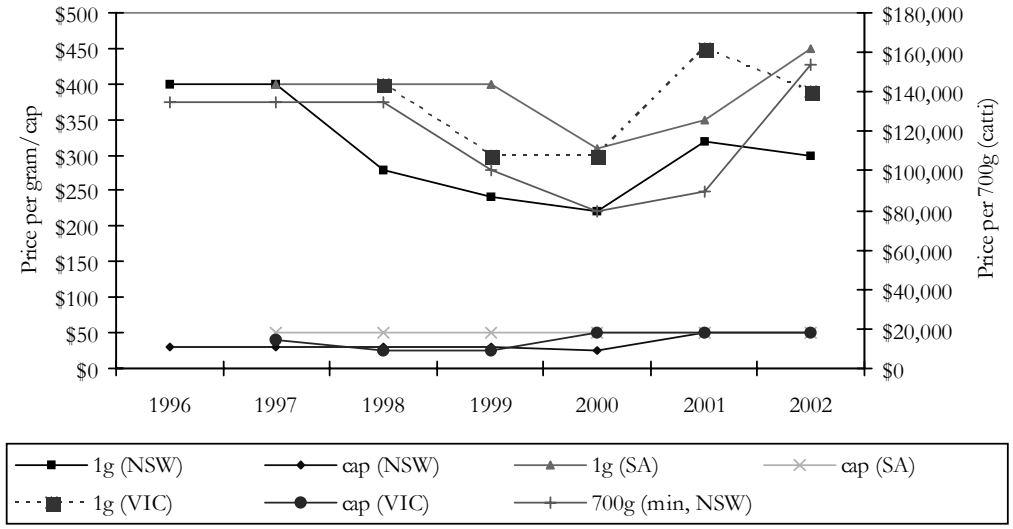
Assuming that demand is relatively stable, decreased availability should increase prices (MacCoun and Reuter 2001). Initial research reports provided evidence of a small increase in the price of heroin. Day et al. (2003) found 41% of IDU reported paying AU$70 per quarter gram of heroin and 32% reported paying AU$80 in February 2001 compared to 89% of IDU who reported paying AU$70 per quarter gram in 2000 (Topp, Darke et al. 2001). Similarly, research undertaken during mid 2001 by Weatherburn and colleagues (2001) indicated that the average price per gram of heroin had risen by 75%, from AU$218 before the shortage to AU$381 after the shortage.

In Melbourne, Miller et al. (2001) reported that the majority (80%) of IDU interviewed reported an increase in the price of heroin during the shortage. They reported an overall increase in the modal price of heroin, with AU$400 per gram being reported at the time of the shortage compared to AU$300 per gram in the 2000 IDRS.

Data from the IDRS was consistent with IDU reports of a heroin shortage in 2001, with the first increases in price recorded since 1996 (Figure 4.3). Figure 4.3 displays the median price paid between 1996 and 2002 for the last purchase of a gram of heroin among IDU interviewed for the IDRS in the three States, and for the wholesale price of a heroin catti (700 gram block) reported by the Australian Bureau of Criminal Intelligence (1996; 1997; 1999; 2000; 2001; 2002; 2003). Following stable or decreased prices every year, in 2001 the price of a gram of street heroin rose from AU$220 to $320 in NSW, AU$330 to $450 in Victoria and AU$310 to $350 in SA. The price per gram then decreased again in 2002 in NSW (AU$300) and Victoria (AU$390), but increased in SA (AU$450).

The price of "caps", the smallest unit of purchase, increased in NSW from a median of AU$25 in 2000 to $50 in 2001 and remained at this price in 2002 (Figure 4.3). The price of heroin in SA (per cap) has remained remarkably stable since 1997: AU$50 was the most frequently reported price in IDRS surveys. The median price per cap of heroin in Victoria was the same for 2000 and for 2001 (AU$50).

Figure 4.3: Estimates of heroin price in NSW, Victoria and SA at the street and wholesale level, 1996-2002

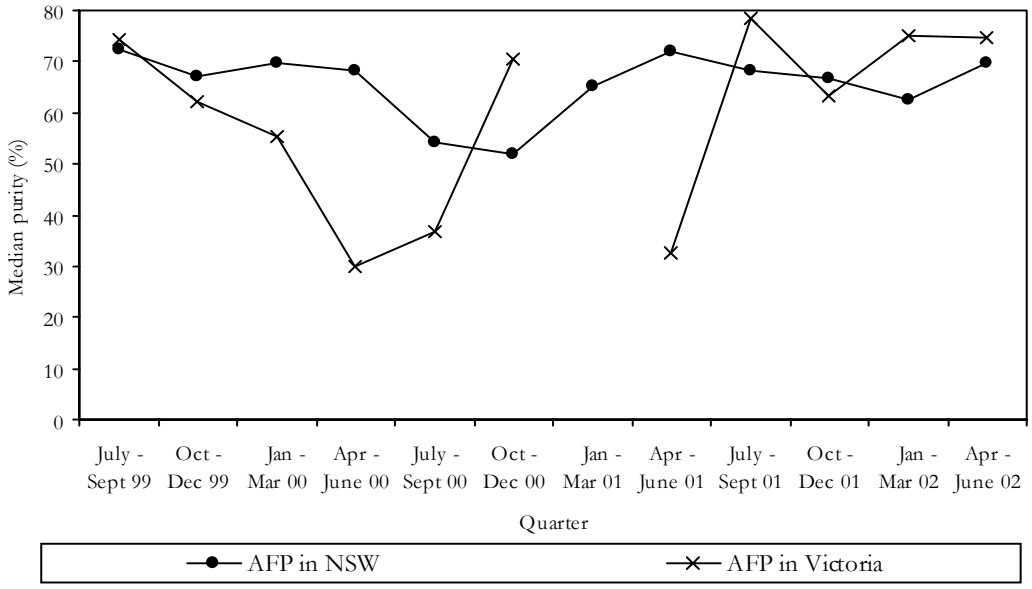


Source: IDRS IDU Interviews; AIDR reports.

Heroin purity

As would be expected during a period of reduced drug availability, the street level purity of heroin declined at around the time of the heroin shortage. Figure 4.4 shows the median purity of heroin seized by the Australian Federal Police (AFP) and Figure 4.5 shows that seized in NSW, Victoria and SA, by State Police. Seizures made by AFP are more likely to be the result of high level intercepts, often at the border whereas State Police seizures result from activities ranging from street level arrests of suspected users to hauls from targeted operations.

Figure 4.4: Purity of heroin seizures by AFP in Victoria and NSW, 1999-2002

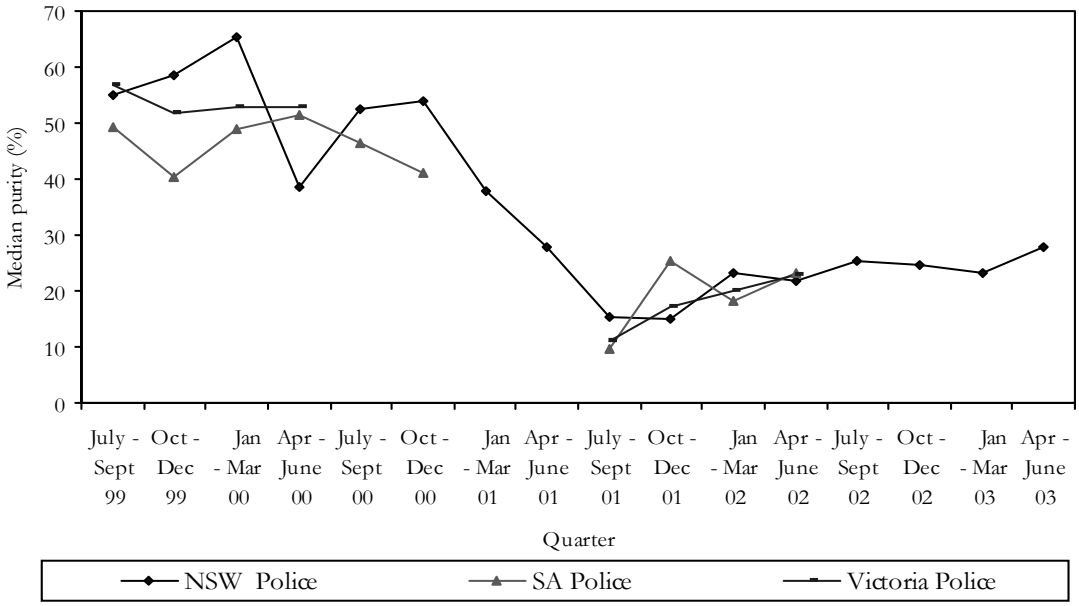


Source: Australian Crime Commission.

The median purity of AFP heroin seizures analysed in NSW has remained relatively stable over time at approximately 70% (Figure 4.4), although the September and December 2000 quarters recorded a decrease to approximately 50%. Data for Victoria is incomplete; however a clear reduction in heroin purity was seen in the second quarter of 2001, which was preceded by very high purity in the last quarter of 2000.

The purity of NSW Police seizures analysed, however, declined from 65% in the March 2000 quarter, to 38% in the June 2000 quarter, dropping as low as 28% in the June 2001 quarter (Figure 4.5). Although the data is incomplete, a similar pattern was evident in Victoria and SA. This lower level of purity has been sustained into 2003 (Figure 4.5).

Figure 4.5: Purity of heroin seizures by State Police, 1999-2003



Source: Australian Crime Commission; NSW DAL (2001-2003 NSW Police data).

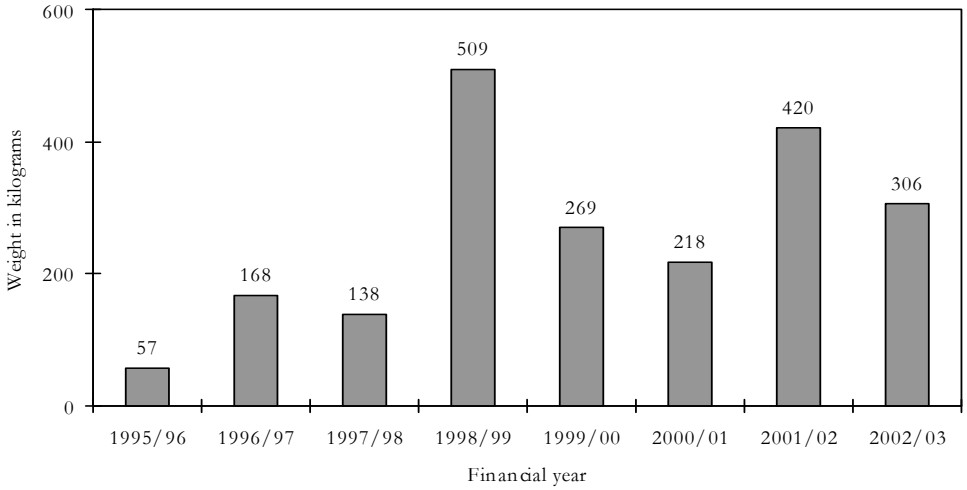
At the peak period of the shortage in Sydney, both IDU and KI believed that the purity of heroin had decreased since Christmas 2000 (Day, Topp et al. 2003). None of the IDU participants reported heroin purity to be high, and 66% reported it to be low. Weatherburn and colleagues (2001) also reported decreased purity: 82% of their sample regarded heroin as less pure after Christmas 2001 compared to that before Christmas 2000.

There were also reports of a change in the type of heroin available since Christmas 2000. Specifically, 34% of IDU reported that the availability of "brown" heroin had increased while that of the usual white or off-white coloured heroin had decreased. Two KI mentioned users reporting that some heroin was more difficult to dissolve (Day, Topp et al. 2003).

Heroin seizures

As an indication of the amount of heroin imported, Figure 4.6 depicts the weight of heroin in kilograms seized by the Customs at the Australian border between 1995/96 and 2001/02. The amount seized in 1998/99 (509 kg) was the largest recorded. By weight, virtually all seizures (98% or more) at the border are detected in NSW. In 2000/01 (encompassing the peak period of the shortage), the amount of heroin seized at the border was at a lower level than proceeding years, with 218 kg seized compared to 269 kg seized in 1999/00. However, to date, 1998/99 was the financial year in which Customs detected the largest amount of heroin at the Australian border.

Figure 4.6: Weight in kilograms of heroin seized at the border by the Australian Customs Service, 1995/96-2001/02



Source: Australian Customs Service.

Chronology of the shortage

The initial reports documenting the heroin shortage clearly demonstrate a sudden reduction in the availability of heroin occurring at the beginning of 2001. Reports of a reduction in heroin availability began to emerge in January 2001 and by the commencement of the first research into the shortage in February 2001 (Day, Topp et al. 2003), it was apparent that supply had dramatically decreased. This time frame was supported by subsequent research investigating the shortage in Sydney and Melbourne (Miller, Fry et al. 2001; Weatherburn, Jones et al. 2001). These dates were confirmed by interviews with key informants and drug users (Day 2004). In Victoria, however, the initial effects of the shortage were first noted in December 2000 (Dietze, Miller et al. 2004). Similarly, this earlier date was also reported by some KI and IDU interviewed in SA, though January 2001 was the commonly reported start date (Harrison, Christie et al. 2004). In summary, although supply remained fractured throughout 2001, based on these early reports, the peak period of the shortage (i.e. the period in which heroin was most difficult to obtain) appear to have been January to April 2001.

A note on the Australian heroin market: "gluts" and "droughts"

The preceding chapter outlined the history of Australia's heroin market, highlighting the paucity of objective data prior to the mid 1990s when heroin availability and purity were reported to increase steadily and price decrease. Some commentators have argued this phenomenon represents a heroin "glut" and that the heroin shortage is a return to the pre-"glut" market (Dietze and Fitzgerald 2002); according to this argument, the heroin shortage is merely a feature of an already aberrant market. The current chapter, however, has documented a sharp decrease in heroin availability and purity and a steep increase in price. Although these decreases may have occurred in an already aberrant market, the sudden and unexpected nature of the decrease represents a unique and unprecedented (in Australia) phenomenon. The concept of a pre-shortage "glut" is therefore important for understanding the causes of the shortage, but not for the course and consequence of the shortage. The issue is therefore addressed in Chapter 5 and Chapter 11.

Conclusions

In early 2001, Australia experienced a sudden and dramatic decrease in heroin availability, in areas with viable heroin markets. These reports were further validated by the 2001 IDRS: in 2001 illicit drug markets in Australia underwent a fundamental shift in which the availability of heroin, the most widely preferred injectable drug, decreased. Concomitant with the decrease in availability was an increase in price, the first recorded since 1996. Purity also decreased, but the available evidence indicates that this occurred only at the street level. The purity of imported heroin seized at the border remained stable.

Reports to date indicate that the shortage peaked in January to April 2001. The price and reported availability of the drug has since increased, but neither the market price nor availability appears to have returned to the level recorded before 2001. Ongoing surveillance is necessary to determine the full impact of the 2001 changes on the heroin market.

Chapter 5: Evaluating factors responsible for the heroin shortage

Louisa Degenhardt, Peter Reuter, Linette Collins and Wayne Hall

Summary

- It is likely that the shortage was due to some combination of factors that operated synergistically to reduce the availability of heroin in Australia in 2001. This has been suggested by many discussants of the reasons for the reduction in heroin supply.
- It is important to understand the market conditions that preceded the shortage. The heroin market in the late 1990s was of an unprecedented scale, and given the scale of the reduction in supply that occurred, it was likely to be in some way related to the decline.
- In the early 1990s, drug Law enforcement (DLE) in Australia received little funding. This probably made it easier for high level heroin suppliers in Asia (who may have needed to offload heroin displaced from the US) to establish large scale importation networks into the country. This led to the increase of street-based illicit drug markets around the country; increased purity of heroin, and decreased price of the drug.
- The heroin market in Australia was well established by the late 1990s, but it had a low profit margin, with high heroin purity, lower than ever before cost, and a large number of seizures that had increased risk. The increased funding of the AFP and Customs as part of the National Illicit Drug Strategy probably increased the risks associated with heroin importation and therefore contributed to a reduction in heroin supply.
- The combination of low profits and increased success of law enforcement, probably led to the reduced dependability of key suppliers of heroin to Australia. This occurred against a backdrop of gradually declining production in South East Asia. These factors may have reduced the attractiveness of Australia as a destination for heroin trafficking.
- It is possible that heroin was sent to other countries instead of Australia, such as Canada or China, but the relatively small scale of the Australian market means that even if *all* heroin was diverted from this country, it would be difficult to observe the effects in another country given the larger scale of those markets.
- The heroin market is clearly still being supplied, but it seems to be more like previous decades than late 1990s: smaller, less consistent levels of supply (see Chapter 6).

Introduction

For a number of reasons, it is difficult to make definitive statements about the causes of the Australian heroin shortage. First and foremost, heroin markets are *illicit* markets. Even people who are integrally involved in these markets will not have a detailed or comprehensive picture of the commodity with which they deal (borne out by research conducted for the Australian Customs Service (Customs) (Beyer unpublished research).

Second, illicit drug markets are dynamic and affected by a multitude of factors. At the broadest level, these include supply and demand for a drug, and both can change within short periods of time. Demand for drugs can sometimes increase sharply, as during the early phase of an epidemic of use; or it may shift downwards, through increases and improvements in drug treatment (Behrens, Caulkins et al. 1999). Downward shifts are less sharp, because dependent users dominate consumption levels, and their use is long lasting and slow to change.

The heroin shortage, however, was clearly an instance of reduced *supply* - not of reduced *demand* - of heroin, as was consistently reported by heroin users and KI around the country. It is supply side factors that we examine in detail in this chapter. Many factors potentially affect supply, and the following are likely to be particularly important:

- Source country conditions: natural conditions, such as rain fall; the availability of stable markets for other crops; the extent of government action against opium farmers; and traffickers' changes due to perceived profit changes;
- Government actions against: drug producers, including precursor control and seizures; source country traffickers; and smugglers, as well as changes in resource levels committed to these programs;
- Important changes resulting from law enforcement corruption investigations;
- Specific personnel changes, such as the removal (retirement, incarceration, death) of a few key figures in drug production or trafficking, given that drug markets may have a small number of key actors at high levels.

It is most likely that a combination of factors combined to give rise to the reduction in supply of heroin. This chapter explores these factors, and reveals the most likely combination of factors that affected the supply of heroin in Australia. A schema of these is discussed below (Figure 5.1).

Method

A range of information sources was examined in evaluating different hypotheses regarding the cause of the reduction in heroin supply. These are mentioned throughout this chapter, but included government reports, security classified police and drug law enforcement documents and briefings, classified briefing documents by Australian agencies, key informant (KI) interviews, examination of indicator data, and the use of existing research data where relevant. In this way, it followed a relatively historical approach. These are listed in detail as follows:

- Interviews at an international level with representatives of:
    - The Royal Thai Police (RTP), Narcotics Suppression Bureau, Bangkok Intelligence Centre, Thailand;
    - Thailand Office of the Narcotics Control Board (ONCB), Ministry of the Prime Minister, Chiang Mai, Thailand;
    - Australian Federal Police (AFP Thailand), based in Bangkok and Chiang Mai, Thailand;

- Interviews in Australia with representatives of:
  - Australian Federal Police;
  - Australian Customs Service;
  - NSW Police;
- Documents from NSW Police. These were jointly written up by NDARC and NSW Police representatives in a document summarising NSW Police documentation of illicit drug market trends, 1999-2002 (Collins, Degenhardt et al. 2003) (available upon request);
- Documents from Commonwealth law enforcement agencies (where use of this material was made in this chapter, it is noted as "law enforcement source")
- Briefings by Commonwealth law enforcement agencies (where use of this material was made in this chapter, it is noted as "law enforcement briefing").

The process for evaluating causes went as follows: (1) generation of candidate explanations from KI and from the professional and popular literature on the causes of the heroin shortage; (2) evaluation of each against the available evidence; (3) examining the overall coherence of the evidence with the most plausible factors that survived point (2).

A brief history of important events prior to the reduction in supply

Before outlining the hypotheses that have been advanced to account for the shortage, it is useful to briefly outline the history of heroin markets prior to the shortage, both in Australia and overseas. This provides a context within which to consider the factors. As noted in Chapter 3, there was a range of factors that were probably influential in leading to the substantial expansion of the heroin market in the 1990s:

- **The existence of demand for heroin among the Australian population**
  - Availability of a drug is not sufficient for use to occur - demand needs to exist. Heroin availability increased in the early to mid 1990s at a time when there was a large population of susceptible youth with limited exposure to heroin, which was prepared to try the drug, often by non-injecting routes, in the absence of efforts to provide information about the risks of heroin dependence and overdose.

- **Corruption in NSW drug law enforcement in the 1980s and early 1990s**
  - This may have been instrumental in maintaining a status quo with some organised crime groups during the period, and conversely, the Wood Royal Commission was important in disrupting this status quo (see Chapter 3). An unexpected result of this disruption to the status quo was the formation of new or expanded organised crime groups taking advantage of the "new opportunities" that opened in the illicit drug market. Furthermore, the capacity and willingness of law enforcement to investigate these new drug networks was seriously compromised following the Wood Royal Commission.

- **Changes to criminal syndicates importing and distributing heroin**
  - South East Asian heroin trafficking groups are thought to have successfully targeted the Australian heroin market to attain significant market share, supplying cheaper, purer, heroin than had previously been supplied, particularly following their displacement from the US market (law enforcement source). Hence, the surplus of South East Asian heroin was shifted to Australia (and, possibly, to Canada)[20]. This was achieved through links with the increasingly influential and numerous members of Asian crime gangs in Australia,

[20] Law enforcement source.

particularly in key areas in Sydney, namely Haymarket and Cabramatta[21] (Lintner 2002). There also appeared to be a shift in the mode of importation of heroin. Specifically, this appeared to move towards the use of "middle men" or *facilitators*, based in South East Asia, who had connections between producers/financiers in South East Asia, and importers/distributors in Australia[22].

- **Funding for national and international drug law enforcement**
  - The early 1990s was a time of scarce resources for the Customs and the AFP border and international operations. This meant that drug law enforcement (DLE) was limited in this country. Increased law enforcement funding was available from 1998 and led to increased resources for Customs, AFP and the establishment of the Joint Asian Crime Group (JACG). This allowed greater and more sophisticated border and international level supply reduction strategies, enhanced State and Federal legislation and policy, expansion of AFP operations overseas, additional AFP liaison officers, overseas law enforcement partners (under the Law Enforcement Cooperation Program, or LECP), and extended operations within Australia in particular with the formation of ten mobile strike teams and increased forensic capacity.

Summary

The Australian heroin market in the late 1990s was characterised by the ready availability of high quality and cheap heroin. High demand existed for the drug and considerable harms were caused by its use. The massive increase in the scale of the market appears to have been affected by movements *out* of the market by some syndicates and a significant shift *into* the market by new groups aiming to establish market share. The status quo of DLE in NSW had been significantly disrupted through the Wood Royal Commission, with little replacing it. Importantly, little funding was available for any DLE in Australia. However, late in the 1990s, significant *relative* improvements were made in the capacity of DLE through increases in funding through The National Illicit Drugs Strategy (NIDS). This meant that by the end of the 20th century, DLE had attained some relative gains in the area.

Considering potential factors affecting heroin supply

We have considered factors from across the opium production, heroin trafficking and distribution levels. These factors have included the following:

1. Changes in source country conditions;
2. Changes among heroin producers;
3. Changes among heroin traffickers;
4. Changes in drug law enforcement; and
5. Other (confounding) variables.

We have presented these different factors and the impact they may have upon different aspects of drug supply in a diagram to aid the reader to consider our evaluation (see Figure 5.1). In Figure 5.1, the supply chain reads from right to left; changes at any one of these levels can affect supply further along the chain. While there is a reciprocal relationship between supply and demand, this is complicated by separate influences (dark arrows) bearing down on these two market elements.

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[21] Law enforcement source.

[22] Key informants from Australian Federal Police and NSW Police.

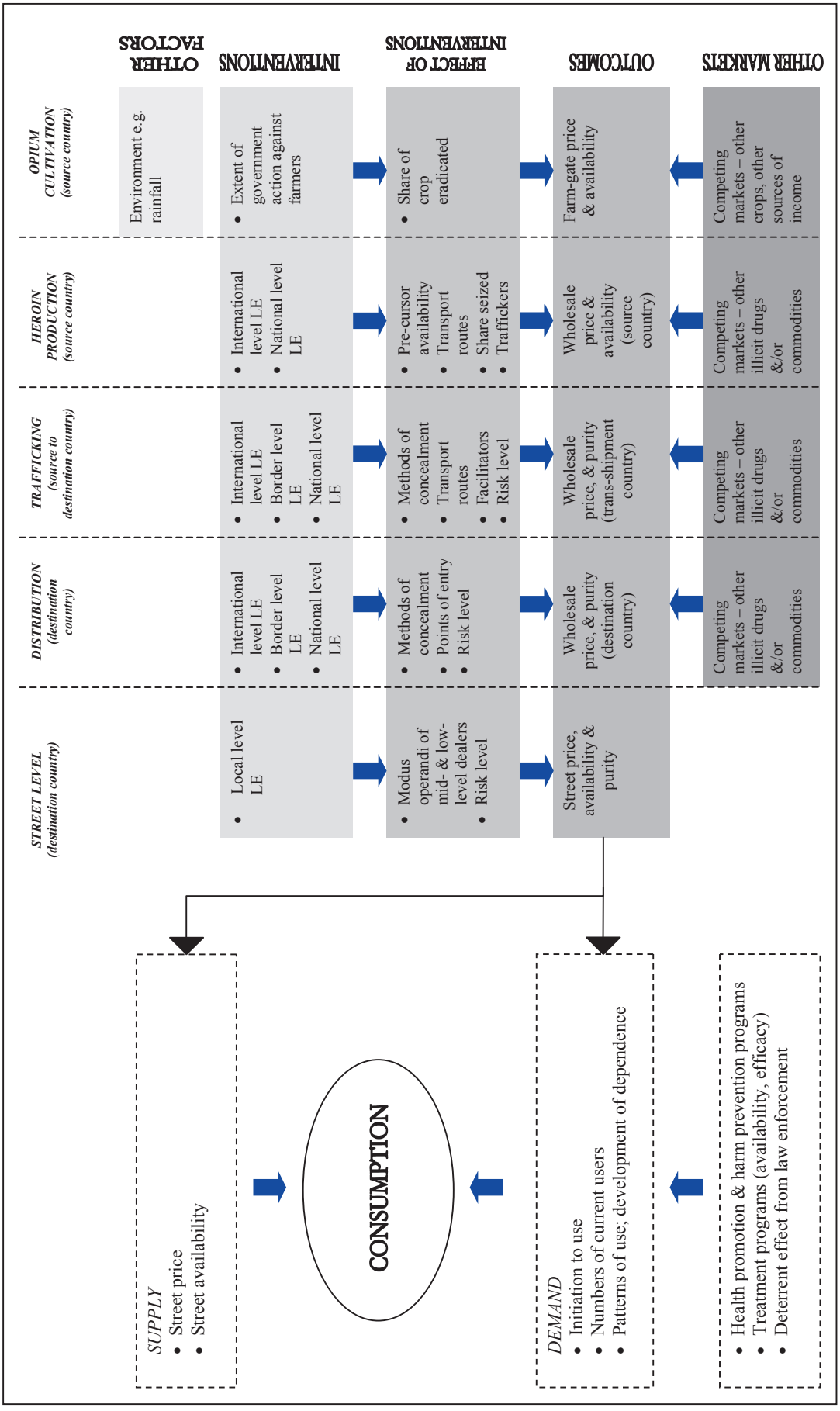

Figure 5.1: Schematic diagram of the factors influencing the trade of illicit drugs

The movement of key people (such as farmers, producers, financiers and facilitators) into and out of the illicit drug trade can be seen to be heavily motivated by profit margins within the market (based on perceived risk ("interventions" row) and commodity price ("outcomes" row)) as well as competing markets which provide better profit margins (either because of higher mark-ups or lower risk).

The following example is provided to help illustrate where an effect might be felt given changes at a particular level in the supply chain. Cultivation levels (far right column) are based on the expectation that a portion of crops will be wiped out, and when eradication destroys a much larger share of crop production than farmers anticipate, a genuine shortage might result until traffickers found new sources of supply, and opium farmers adapted by increasing the total land area cultivated and scattering their plants in smaller, less accessible fields. In the interim, prices might rise across the levels of producer, trafficker and distributor, with users competing for a diminished supply (i.e. all columns to the left of the cultivation column would experience the decreased availability and possibly increased price).

Changes in source country conditions

One hypothesis for explaining the reduction in heroin supply was changes in source country conditions. Source country conditions include political and weather conditions in the countries in which opium is produced and heroin processed (Figure 5.1, opium cultivation level). This type of explanation seems the least plausible explanation of the Australian heroin shortage, because these factors should also have affected heroin supply in other countries (trafficking and distribution levels in Figure 5.1), whereas Australia seems to be the only country affected that sources its heroin from the Golden Triangle (Chapter 2). This strongly suggests that factors specific to Australia must have played the key role in the heroin shortage. Specific forms of the source country hypothesis suffer from additional implausibility that is considered below.

The Taliban's 2001 ban on opium production

As noted in Chapter 2, in the 1990s Afghanistan firmly established itself as the main source of illicit opium and heroin produced, trafficked and consumed in the world. Between 1996 (the year the Taliban took control of most of the country) and 1999, opium production doubled in Afghanistan. The Taliban imposed a total ban on opium cultivation in July 2000, reducing Afghanistan's opium poppy cultivation areas by 91% and production by 94%, resulting in a decrease in 2001 in world opium production of approximately two-thirds (United Nations Office for Drug Control and Crime Prevention 2001). It has been proposed that this in some way affected supply to Australia.

Evaluation

Australia's illicit drug markets have traditionally been almost exclusively supplied by heroin of South East Asian (the "Golden Triangle") origin, rather than heroin originating from the so-called "Golden Crescent" region (see Chapter 2). If the Taliban's ban were to affect the world heroin market, the effects would probably be felt more rapidly and sharply in the markets for which this heroin has traditionally been supplied. Moreover, a detailed report that examined shifts in seizures and prices of opium and heroin (United Nations Drug Control Program 2001) suggested that the effects of the Taliban's ban were reduced by the use of stockpiles, although there is no direct evidence of these stockpiles. Furthermore, the Taliban crackdown affected the 2001 harvest (which was *after* the onset of the Australian heroin shortage).

This explanation also does not account for the absence of any comparable heroin shortage in other countries, particularly China and Canada[23], which are also important destinations for Myanmar heroin (United Nations Office for Drug Control and Crime Prevention 2001; United Nations Office on Drugs and Crime 2003).

Reduced opium production in Myanmar

Throughout the 1990s, Myanmar was South East Asia's most significant opium producer, accounting for about 90% of all opium production in the region (Chapter 2), and hence the majority of heroin in Australia originates from Myanmar. As noted in Chapter 2, opium cultivation and production in Myanmar declined between 1996 and 1999, as a result of increased eradication and control efforts on the part of the government and local authorities, and a severe drought in the area.

Evaluation

For *producers* in a source country, there is no difference in the export price of heroin according to where it is destined; they are paid the same regardless of where it is planned that the heroin will be *trafficked*. Any price increase (such as that seen in Myanmar in the late 1990s; Chapter 1) is passed on by all *heroin producers* in a source country regardless of where the heroin will be *trafficked*[24]. Hence, it would make no difference to producers to whom they sold their heroin; the price increase would be felt by all those down the supply line (i.e. to the left of the production chain in Figure 5.1).

A reduction in opium production due to the Myanmar drought was not thought by any KI to have affected heroin supply to Australia. Large quantities of heroin are stockpiled on the Thai/Myanmar border by producers, then circulated into the market place when demand necessitates[25]. The producers would have drawn on these stockpiles had there been a shortfall in supply from the heroin refineries in Myanmar[26].

It is an appealing hypothesis that unfavourable conditions in the main source country for Australia's heroin contributed to the reduction in heroin supply. This explanation does not account for the fact that there was no heroin shortage in other countries, particularly China and Canada[27], which are also important destinations for Myanmar heroin (United Nations Office for Drug Control and Crime Prevention 2001; United Nations Office on Drugs and Crime 2003). This seems to suggest that the conditions for trafficking heroin to Australia were different (than those for other destination countries such as Canada). If that is the case, then it must be the case that there was something specific about Australia.

Surrender of a key heroin producer in Myanmar

Khun Sa (aka Chang Qifa [Chang Chi fu]) has been described as a "Golden Triangle based drug lord" (Gordon 2001) "heroin warlord" (US Department of Justice Drug Enforcement Administration 1997) and also a "demi-god" who promoted an ideology of liberation of the Shan people from the Burmese government. Khun Sa was a very significant player in the production of heroin in the Golden Triangle, who reportedly had a sizeable amount of heroin stockpiled in South East Asia (supplying the US and Australian markets). He surrendered to the Burmese authorities in 1996[28].

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[23] Personal communication, Coordinator, Drug Unit, Vancouver Police Department, Canada.

[24] Key informant from the AFP Thailand.

[25] Key informant from the Thailand Office of the Narcotics Control Board (ONCB) and the AFP Thailand.

[26] Key informant from the Thailand ONCB.

[27] Personal communication, Coordinator, Drug Unit, Vancouver Police Department, Canada.

[28] His surrender was variously reported to be due to pressure from the DEA and the dismantling of the Mong Tai Army (MTA) by Operation Tiger Trap (1997). DEA Congressional Testimony. Subcommittee on East Asian and Pacific Affairs. Washington., and due to his old age and great wealth and blockading of his smuggling routes by the Burmese Army.

Following his surrender, Khun Sa was reported by one KI to have retained control of heroin activity for about a year. Infighting occurred among the remaining group, with those below him in his organisation mostly ethnic Chinese and not sharing in Khun Sa's cause. After he surrendered, the organisation became less cohesive and his Mong Tai Army (MTA) (aka the Shan United Army) rapidly reduced heroin production (Gordon 2001).

The United Wa State Army, taking advantage of this change, increased their involvement in heroin production. The production of heroin shifted to a Wa Army-controlled area adjacent to the Myanmar Chinese border. There was evidence in 1996 of an increase in the price of opium and heroin as well as an upsurge in heroin and opium trafficking into China at that time (US Department of Justice Drug Enforcement Administration 1997).

Evaluation

The surrender of Khun Sa did not appear to result in reduced production of heroin in Myanmar *in 1996,* even though those producing the opium may have changed; it also did not appear to have had marked effects upon the extent of production in subsequent years. The AFP and DEA reported no significant interruption to heroin production after the surrender of Khun Sa. He was reported to have large amounts of heroin stockpiled in South East Asia, and although an initial increase in the price of opium and heroin was reported in 1996, prices had stabilised by the end of 1996 as other drug groups took over production (US Department of Justice Drug Enforcement Administration 1997). Furthermore, Thai Police report that Khun Sa was thought to have continued his involvement in the heroin trafficking business after his surrender, albeit at a reduced level of involvement and at a lower level of dominance[29].

This hypothesis, as with previous source country variants, is also unable to explain why a reduction in heroin supply was observed only in Australia.

Changes in heroin producers' strategies

A popular theory among both heroin users and law enforcement officials was that the shortage was the result of a strategic decision made by heroin producers to switch from heroin to methamphetamine production (Moor 2001) (Figure 5.1, heroin production level). According to this hypothesis, because methamphetamine production does not depend on crop cultivation (as heroin production does), it is easier to produce methamphetamine for trafficking and hence it is a more attractive and reliable illicit drug commodity than heroin. The lower level of law enforcement, and the greater reliability of the materials necessary to produce methamphetamine, was hypothesised to have encouraged heroin producers to switch to methamphetamine production.

Evaluation

This hypothesis has a number of strengths. First, KI reported that methamphetamine production shifted from 1999 onwards from "small time" operators in Bangkok, Thailand (who were independent of heroin production), to large-scale groups who were already involved in heroin production. These people already had connections, trafficking routes, money and power[30]. The quantity of methamphetamine produced increased in 1999 and again in 2000. Production peaked in Thailand in 2000, as measured by arrests and seizures. In contrast to opium, methamphetamine

[29] Key informant from the Royal Thai Police (RTP).

[30] Key informant from Thailand ONCB.

was subject to much less policing and interdiction in Thailand/Myanmar[31]. In particular, Thai law enforcement agencies reported that they did not initially detect the expansion in methamphetamine production and use in the late 1990s[32].

Second, there was a shift from heroin to methamphetamine among South East Asian organised criminals at the mid level distribution level in Australia (Australian Bureau of Criminal Intelligence 2001; Commission on Narcotic Drugs 2001). Third, it would imply a highly centralised South East Asian heroin trade, which fits with previous analyses of Australia's heroin markets[33] (Australian Crime Commission 2003). Fourth, progressively smaller quantities of heroin have been produced in the Golden Triangle over the past 15 years (Chapter 2).

The main problem with this hypothesis is that it predicts a decrease in heroin production. There have been no reports of dramatic decreases in South East Asian heroin production in recent years concurrent with the massive increases in methamphetamine production (Chapter 2); it seems that heroin producers have *added* methamphetamine to their production cycles.

The second difficulty with the hypothesis is that there are *separate* consumer markets in Thailand for methamphetamine and heroin[34], suggesting that producers of these drugs may be supplying different user groups. Furthermore, methamphetamine produced in Thailand is consumed almost exclusively in Thailand[35], there is no evidence of Thai or Burmese produced methamphetamine tablets being sold in Australia, and a market would be difficult to establish, given the availability of higher quality domestically produced methamphetamine[36].

Finally, heroin is produced about one month after the opium harvest, and the laboratories can then be used for methamphetamine production. Around 50% of the chemicals used in the production of heroin are used in methamphetamine production[37]. One seizure of methamphetamine by Thai law enforcement had the same seals as were used in the packaging of heroin and some samples of methamphetamine showed traces of heroin. This suggested that heroin and methamphetamine were being produced by the same people and/or in the same laboratories[38]. Reports suggest that even the opium farmers may also be diversifying into both heroin and methamphetamine production[39].

In short, the producers in South East Asia appear to have diversified into methamphetamine production *as well as* heroin. There may have been changes in how trafficking capacity was used by South East Asian organisations, with methamphetamine getting an increasing share because of more attractive production conditions; but this has not received clear support.

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[31] Key informants from RTP, Thailand ONCB, AFP Thailand.

[32] Key informants from Thailand ONCB and the RTP.

[33] Key informants from NSW Police.

[34] Key informants from Thailand ONCB.

[35] Key informants from RTP.

[36] Key informants from the AFP.

[37] Key informants from Thailand ONCB.

[38] Key informants from RTP.

[39] Key informants from Thailand ONCB.

Changes in heroin traffickers' strategies

Diversion of heroin to an expanding Chinese market

Since the mid 1990s, traffickers have increasingly moved heroin through Southern China, Laos, Vietnam and Cambodia rather than Thailand (see Chapter 2). The number of opiate dependent people registered in China - 80% of whom are heroin dependent - increased almost ten-fold (United Nations Office for Drug Control and Crime Prevention 2001). Much of the increase in trafficking of opiates out of Myanmar in the late 1990s was directed towards China. This is consistent with the notion of an expansion of that market. Furthermore, Customs noted that seizures of heroin in China have doubled over the past year[40], which is again consistent with an increase in the size of the heroin market in the country (Rossi 2002). It has been suggested that heroin traffickers made a conscious decision to concentrate their efforts on the larger market of China, and that one consequence of this decision was a reduction in supply in Australia (Figure 5.1, trafficking level).

Evaluation

This hypothesis attributes great strategic foresight to traffickers. From discussions with KI, and on review of the evidence, it does not seem to be an overriding factor contributing significantly to the heroin shortage. First, in the absence of other motivating factors, the hypothesis fails to explain why Australia (and not Canada or Hong Kong), experienced a shortage in heroin supply. Second, it is unclear why traffickers who were importing heroin from SE Asia into other countries would replace a lucrative (although smaller scale) Australian market with a much less lucrative market such as China, *in the absence of other motivating factors*. In 2000, the limited price data available indicated that a 700gm block of heroin could be bought in Hong Kong for around US$12,000 (AU$20,000 (Gibson, Degenhardt et al. 2003)). The same amount of heroin was estimated to cost AU$100,000 in NSW. A profit of 500% would seem attractive to most investors *if we assume no other factors were affecting risk and therefore the expected profit margin.* If another factor affected profits (presumably related to the risks of trafficking) then this may have influenced the decision to redirect heroin from the Australian to the Chinese markets.

Decision to reduce heroin availability in Australia to increase profits

As the data presented in Chapter 2 clearly suggested, Australia's heroin markets expanded significantly during the late 1990s, when they were characterised by consistent ready availability of relatively high purity heroin at a decreasing price. These changes in heroin availability during the early 1990s were considered by numerous sources to have been the result of a consciously planned business strategy on the part of large scale heroin traffickers in South East Asia to increase the heroin market in Australia[41].

It has been suggested that towards the end of the 1990s, heroin traffickers made a conscious decision to reduce the availability of heroin in order to increase its price, with the aim of returning to heroin trafficking after the price increased in order to maximise their profits (Figure 5.1, trafficking level).

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[40] Law enforcement source.

[41] Law enforcement sources.

Evaluation

There is some evidence to support this reasoning. The wholesale *and* street price of heroin in Australia dropped considerably over a period of at least seven years (Australian Bureau of Criminal Intelligence 2002; Topp, Kaye et al. 2002). As a consequence, the profits per street gram from trafficking heroin to Australia would necessarily have been reduced. Some have argued that this reduction in profitability was initially tolerated in order to establish a large and profitable market for heroin (Australian Crime Commission 2003), and the shortage was a deliberate cartel-like action designed to return the profitability of heroin trafficking to earlier levels. The heroin shortage did substantially increase the price of heroin around the country and it reduced heroin purity at street level substantially (Topp, Kaye et al. 2002).

This hypothesis has a number of implausibilities. First, it attributes considerable strategic foresight, long term planning and coordination of effort to heroin importers. Second, as with all cartel-like behaviour, it presupposes considerable discipline among the traffickers to prevent any one of them from breaking ranks by selling more than the agreed upon amount of heroin at a slightly lower price in the face of high demand from consumers. Third, the abrupt reduction in heroin supply to Australia would (logically) have meant no income (or very reduced income) from sales of heroin to Australia (in the absence of other income generating activities). This explanation would be more plausible if there had been a steady reduction in heroin supply over a period of time.

A shift from heroin trafficking to methamphetamine trafficking

One suggestion has been that the alternative source of income came from the importation of methamphetamine, and that the traffickers had limited importation capacity.

As indicated above, there has been a significant increase in the trafficking of methamphetamine to Australia[42] and other countries in the Asian Pacific region since around 1996 (United Nations Office for Drug Control and Crime Prevention 2002; Australian Crime Commission 2003). It may have been that the increase in methamphetamine trafficking (Chapter 6) led to a decrease in heroin trafficking by the same individuals.

Some traffickers previously involved in heroin production and trafficking to Australia are now involved in methamphetamine production and trafficking[43]. In September 2000, Operation Octad (in which two containers, one with heroin and one methamphetamine, were interdicted) showed that the *financiers* of the drugs from South East Asia were different, but the *facilitators* were the same individuals[44] (Figure 5.1, trafficking level).

Evaluation

This hypothesis could account for the fact that the shortage was unique to Australia. A shift from heroin to methamphetamine trafficking among South East Asian organised criminals supplying Australia was reported by law enforcement officials prior to the onset of the heroin shortage in Australia (Australian Bureau of Criminal Intelligence 2001; Commission on Narcotic Drugs 2001). This hypothesis also implies a high level of centralisation of the South East Asian heroin trade, which fits with previous analyses of Australia's heroin markets (Australian Crime Commission 2003).

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[42] In July 2001, Operation Wahoo intercepted a small boat from Thailand, moored near to the Sunshine Coast in Queensland. Seizures were made of MDMA (2kg), MDBD 169kg), methamphetamine tablets 91kg), and crystal methamphetamine 152kg). The MDBD and crystal methamphetamine seizures were the largest of these types of amphetamines seized in Australia to date.

[43] Key informants from the Royal Thai Police, and the Thailand Office of the Narcotics Control Board.

[44] Law enforcement source.

The hypothesis has difficulty accounting for the fact that the same methods of concealment were used for both heroin and methamphetamine[45] (Australian Bureau of Criminal Intelligence 2002). Furthermore, there appears to be a global trend towards multiple drug importation, and indeed, multiple criminal involvement (Pearson and Hobbs 2001), with criminal syndicates increasingly diversifying, and ethnic boundaries breaking down. At present, there is no evidence to suggest that there is a finite capacity for traffickers to traffic their commodities - diversification in the drugs that are imported is more likely to occur than replacement of one drug type by another. At high levels of drug trafficking, any shift to methamphetamine trafficking will probably be *an addition to*, rather than a substitute for heroin trafficking.

This hypothesis also has some difficulty accounting for the global trend toward the co-shipment of different drugs (Commission on Narcotic Drugs 2001; Australian Bureau of Criminal Intelligence 2002; Australian Federal Police 2002). Australian authorities have noted the co-shipment of heroin and amphetamine type stimulants (ATS) from Asia[46] (Australian Bureau of Criminal Intelligence 2002; Australian Federal Police 2002). Further, the types of law enforcement successes outlined above have been made before without such a significant impact on the heroin market.

However, it could be that this "co-shipment" reflects diversification at a certain level of trafficking. For example, Operation Octad showed that shipment of the drugs was conducted using the same methods in two consignments a couple of weeks apart. The same people (the facilitators) were responsible for organising the importation from source countries and the higher-level distribution of both shipments, but different syndicates from Asia financed the drugs[47].

A consistent factor noted in interviews with law enforcement officers in both Australia and overseas was that the major figures involved in *financing* heroin importation in Asia were largely independent of those who were responsible for the importation of large shipments of "ice", or crystal methamphetamine[48]. By "major" it is meant those responsible for the financing of shipments from Asia. For example, Chinese importers of crystal methamphetamine from China are reported to be different from (although linked to) those involved in high level importation of heroin prior to the shortage.

This may not be the case at other levels of trafficking. One significant group based in Australia has been involved in both heroin and methamphetamine *importation*[49]. Relatively high level *distributors* in Australia have reportedly shifted to methamphetamine distribution[50] (Collins, Degenhardt et al. 2003).

In summary, it appears that there may have been a change in the sorts of drugs that facilitators are importing into Australia but there is less evidence that the financiers in South East Asia have changed. This suggests that it is plausible that some major financiers may no longer be importing heroin to Australia, while at the same time others could be importing methamphetamine into Australia instead of, or in addition to, heroin.

This hypothesis does not explain *why* some financiers may no longer be financing heroin imports to Australia. This is considered to some extent in the next section.

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[45] Key informants from the Australian Customs Service.

[46] For example, a shipment of 12.8 kg of heroin concealed in pineapple tins detected in a shipping container from China in March 2001 was accompanied by 131 kg MDMA.

[47] AFP briefing July 2003.

[48] Law enforcement source; key informants from the Royal Thai Police and the AFP.

[49] Customs personal communication, July 3rd 2003.

[50] Law enforcement source.

A decision to cease or reduce heroin trafficking to Australia

One popular hypothesis was that major heroin traffickers to Australia decided to decrease heroin importations to this country. Interviews with a variety of law enforcement personnel suggested that in the late 1990s, the heroin trafficking business to Australia was highly centralised, with six major suppliers of heroin to Australia[51]. Three of these were considered "large scale", two were "medium" and one was "small" scale. A decision by of one or more of these high level facilitators to stop or markedly reduce their scale of trafficking (perhaps as a consequence of aging, ill-health or incarceration) could explain a marked reduction in the supply of heroin found in Australia (Figure 5.1, trafficking level).

Evaluation

This hypothesis would explain why Australia, and no other country, experienced a sizeable reduction in the availability of heroin. Information obtained during this study revealed that multiple heroin seizures in 1998-99, totalling around one tonne, resulted in the three small to medium operators ceasing heroin supply to Australia[52]. Further seizures in 1999-2000 of a similar volume[53] reportedly affected the three remaining (large scale) suppliers of heroin to Australia[54]. These syndicates reportedly continued to supply heroin to many other countries, but they were reportedly intimidated by these interdictions, and most were "in hiding now and have been sitting back for some time", having "pulled back" rather than "pulled out"[55] (Australian Crime Commission 2003). In 2003, Australian law enforcement agents in Thailand reported that they were still monitoring the activities of these former major importers who were now predominantly involved in money-laundering[56]. *This change may therefore be attributable at least in part to successful international and/or border level law enforcement.*

A range of briefings received for this study suggested that by the end of 2000, high level heroin distributors were organising alternative sources of heroin in South East Asia through other contacts (see also Chapter 6), possibly because the major importers who had been supplying them were no longer doing so. In short, it would seem that changes in traffickers' importation patterns to Australia could account for some of the reduction noted in heroin supply.

Changes in drug law enforcement

Drug law enforcement may have contributed to the reduction in supply of heroin in Australia. This could have occurred at a number of levels (Figure 5.1, "interventions" row). It is difficult to decide which level of law enforcement may have been responsible for any effects upon heroin traffickers (if any) because of the collaboration between different law enforcement agencies in some operations and the sharing of information. For the purposes of clarity, however, the contribution of law enforcement has been discussed according to the following three strata: international, border level and Australian.

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[51] Law enforcement sources; key informants from the Royal Thai Police, the Thailand ONCB, and NSW Police.

[52] Law enforcement source; key informants from the Royal Thai Police and the AFP.

[53] Operation Logrunner.

[54] Key informants from the Royal Thai Police and the Thailand ONCB.

[55] Key informants from the Royal Thai Police and AFP Thailand.

[56] Key informant from the AFP Thailand.

International

A common factor thought to have affected heroin supply in Australia relates to successful interdiction efforts reducing the flow of heroin from the Golden Triangle to Australia (Australian Bureau of Criminal Intelligence 2002). Cooperation between governments and law enforcement agencies increased in the 1990s across countries in the Asian Pacific region. There were a number of large seizures in 2000[57], along with "important arrests" of persons thought to have played a key role in facilitating large shipments of heroin from South East Asia to Australia. These were thought by law enforcement KI to have decreased the amount of heroin supplied to Australia. The ABCI hypothesised that trafficking networks that were thought to have operated for years were disrupted and perhaps dismantled (Australian Bureau of Criminal Intelligence 2002).

Four factors might therefore be at least partly responsible for the heroin shortage: a) the development since 1998 of a capacity to work offshore with other law enforcement agencies; b) increased weight of heroin seizures; c) the identification of many of the importation methods used by Asian heroin syndicates; and d) the disruption of a major heroin syndicate in mid-2000 by an Australian led international task force.

Evaluation

These are plausible explanations. As noted previously, Federal DLE in Australia was poorly funded in the 1990s, making effective policing of drug importation at high levels difficult. Increases in funding and the shift towards a more international focus of the AFP and Customs (Australian Federal Police 2002) led one international level KI to state that Australia had become the most successful of the many countries he had worked with[58], because of: good strategic intelligence; strong Customs enforcement; strengthened law enforcement capacity; and the movement into the AFP of Customs officers. These improvements *relative to the previous level of functioning of drug law enforcement* may have improved the ability of the AFP and Customs to interdict large shipments of illicit drugs and to disrupt the activities of organised criminal networks involved in high level drug importation.

A large proportion of the heroin supply is thought to have relied on a centralised network based around a small number of key wholesale suppliers (Australian Crime Commission 2003). These wholesalers relied on large sea cargo shipments. Despite the centralised collaborative networks that provided organisational support and security, there was an increased risk of detection as a result of the coordinated action of Australian law enforcement (Australian Crime Commission 2003). It is considered likely that the "major players" responsible for financing heroin imports to Australia may have withdrawn their involvement to some extent because of these changes[59] (see previous Section).

Consistent with the possibility that large scale heroin importers reduced the number of large heroin imports into Australia with this change, smaller importations of heroin have been interdicted since 2001 (Chapter 6). Recent evidence suggests that these traffickers may still be bringing heroin into Australia, but are using alternative, smaller scale methods such as bodypacking (Chapter 6). There is also evidence of smaller, uncoordinated, entrepreneurial importations by less experienced groups who were not previously involved in importation. This potential factor is also consistent with the fact that the reduction in heroin supply has been specific to Australia.

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[57] In October 2000, Fijian authorities seized 357kg of heroin in Suva following a joint investigation involving Australia, Canada, the US, New Zealand and Fiji. In December 2000, Customs made the third largest border detection of heroin to date: 184kg concealed in the structure of a sea cargo container entering Sydney, following an investigation involving law enforcement authorities in Australia and Hong Kong.

[58] Key informant from the Royal Thai Police.

[59] Law enforcement sources; key informants from the Royal Thai Police, the AFP and the Australian Customs Service.

It is doubtful whether seizures of illicit drugs *alone* are sufficient to affect supply in the destination market (Weatherburn and Lind 1997; Wood, Tyndall et al. 2003). However, it appears that these large seizures of heroin were also accompanied by the arrests of key people involved in heroin importation to Australia. These persons were thought to be key facilitators between South East Asian financiers and Australian importers[60]. This factor may have had an effect in either of two ways: a) disrupting the ability of criminal networks to continue to import large amounts of heroin into Australia; or b) deterring groups in South East Asia from bringing large shipments of heroin into Australia. These possibilities are not mutually exclusive so both could have occurred.

Commonwealth border agencies

If it was the case that increased success of law enforcement at the Australian border had an impact on heroin supply, then we might expect a number of things. First, the number of importation attempts made might change due to an increase in the perceived level of risk for importers; second, there would be increases in the difference between the export and import prices.

Evaluation

The hypothesis receives some support from the fact that heroin seizures at the border did increase substantially in the year prior to the onset of the shortage (Chapter 4). It is possible that these seizures had an impact on the heroin shortage more than 12 months later by reducing the number and capacity of importation attempts in the following years.

Profits from trafficking also appeared to be declining as a result of increased costs of importing to Australia (due to losses in seizures, the high purity of street level heroin, and the decreasing wholesale price of heroin in NSW; see Chapter 4). The increases in price of wholesale amounts of heroin in NSW were consistent with this.

However, the number of border seizures of heroin by itself is not proof of the success of law enforcement at the border. A small number of large heroin seizures can have a much greater impact on the disruption of supply than numerous numbers of small heroin seizures. Therefore, it may be argued that a more accurate measure of the impact of law enforcement would be a decrease in seizures following a period of either increased detections or a number of significant seizures (i.e. large amounts of heroin seized).

It is difficult to separate the effects of border level law enforcement from international cooperation between law enforcement officials, as both levels worked together in a similar fashion.

Domestic law enforcement

Local level law enforcement was suggested as an explanation by some KI working in the Cabramatta area. If local level law enforcement had had some involvement in the disruption to the heroin market, we might expect to see differential impacts across different drug markets in Sydney.

Evaluation

Different local level strategies had been introduced in many areas. It has been suggested that the Anti Drug Strategy in Cabramatta, Sydney had a significant impact on the supply of heroin (Cabramatta is the main distribution point for heroin supply in NSW). However, this strategy was only introduced after the reduction in heroin supply had occurred (see also Collins, Day and Degenhardt (2004)). Moreover, the reduction in the number of heroin-related arrests was similar across the different Sydney drug markets.

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[60] Law enforcement sources.

Nevertheless, KI reported that the disruptions caused to the Cabramatta heroin market by NSW Police might have been important in *extending* the effects of the heroin shortage in this area. Specifically, the disruption of mid-level heroin distribution may have affected an already disrupted market (see Degenhardt, Collins and Conroy (2004)). The apparent displacement of users from the Cabramatta market may have resulted in further disruption to supply networks in the area, a possibility that was given some support in the indicators examined (Degenhardt, Collins et al. 2004).

Other variables

The following factors are briefly discussed as confounding factors that may have affected indicators of heroin use in a similar way to the heroin shortage (Figure 5.1, top left hand box). They are unlikely to explain the heroin shortage for reasons given below.

The fall in $US of the Australian dollar

The timing of the decrease in the value of the Australian dollar did not coincide with the Australian heroin shortage. In any case, the value of the Australian dollar dropped in parallel to the value of the relevant South East Asian currencies, with the result that Australian and the Asian currencies maintained their relative value throughout the period before and after the heroin shortage.

Increased provision of treatment for heroin dependence

There was a suggestion from some persons in NSW that the reduction in heroin supply was the result of increased provision of treatment places for heroin dependent persons. It is unclear how an increase in heroin treatment places alone could lead to a sharp decrease in supply of heroin, *in the face of continuing demand for the drug*. Indeed, a reduction in demand is more likely to lead to a fall in price, unless those who entered treatment were all drug sellers. Furthermore, although increased funding for treatment had been promised by the NSW Government in mid 1999, key informants reported no increase in the number of treatment places until the year of the onset of the heroin shortage, i.e. 2001.

Public health campaigns

Another suggested explanation of the heroin shortage was the introduction of public health campaigns to reduce harms associated with heroin use. However, such policies, if they had an effect, would be most likely to affect the particular regions in which they were implemented. Since the reduction in supply was felt throughout Australia around the same time, this is an unlikely explanation for the shortage. Moreover, there was no evident reduction in demand for heroin.

Increased availability of stimulants

A final possibility is that the reduction in heroin supply was the result of an increased availability of stimulants. This has been suggested in terms of a change in the relative markets for stimulant drugs and away from heroin. This hypothesis is *not* consistent with reports around the country of a *continued high demand for heroin*. Data suggests that the methamphetamine market in Australia has been increasing steadily over the past five years, but there was no evidence of an abrupt "switch" from heroin to methamphetamine even in NSW after the heroin shortage. Demand continued for heroin, so any *additional* demand for methamphetamine or cocaine could be filled without removing heroin supply.

Summary of plausible explanations

As noted in the introduction to this chapter, although the hypotheses advanced as to the causes of the heroin shortage were evaluated separately in the preceding discussion, it is likely that the shortage was due to some combination of these factors that operated synergistically to reduce the availability of heroin in Australia in 2001. This has been suggested by many discussants of the reasons for the reduction in heroin supply.

The heroin market in Australia was well established by the late 1990s, but it had a low profit margin, with high heroin purity, lower than ever before cost, and a large number of seizures that had increased risk. The increased funding of the AFP and Customs as part of the National Illicit Drug Strategy probably increased the risks associated with heroin importation and therefore contributed to a reduction in heroin supply. The combination of low profits, increased success of law enforcement, probably led to the reduced dependability of key suppliers of heroin to Australia. This occurred at a time when seized heroin was becoming more difficult to replace because of reduced supplies in the Golden Triangle. These factors may have reduced the attractiveness of Australia as a destination for heroin trafficking.

It is possible that heroin was sent to other countries instead of Australia, such as Canada or China, but the relatively small scale of the Australian market means that even if *all* heroin was diverted from this country, it would be difficult to observe the effects in another country given the larger scale of those markets. Nevertheless, it seems that major importers significantly reduced or ceased large importations of heroin, so the previous status quo of the market was disrupted. The heroin market is clearly still being supplied, but it seems to be more like previous decades than late 1990s: smaller, less consistent levels of supply (Chapter 6).

Conclusions

In considering the causes of the heroin shortage in Australia, it is important to understand the market conditions that preceded them - the heroin market in the late 1990s was of a scale unprecedented in this country previously, and given the scale of the reduction in supply that occurred, it was likely to have been in some way related to the decline.

In the early 1990s, DLE in Australia received little funding (indeed, there was limited funding for many programs related to illicit drugs: drug treatment, harm reduction and demand reduction). This probably made it easier for high level heroin suppliers in Asia (who may have needed to offload heroin displaced from the US) to establish large scale importation networks into the country. This led to the increase of street based illicit drug markets around the country; increased purity of heroin, and decreased price of the drug.

In the late 1990s, there were considerable relative improvements in the ability of DLE to police high level heroin importation networks, which led to a number of arrests of key people in drug supply networks and of significant seizures of heroin that probably affected the risk of importing heroin in large shipments in Australia enough to affect either the decision a) to import heroin to the country, or b) at least to use smaller, different methods of importation than the large scale ones. It is unlikely that large shipments will return except if a) new groups try it or b) same groups develop new methods of concealment using technology, or c) DLE capacity to police high level networks is again reduced.

This means that there is no "end" in sight for DLE. While there is a demand for heroin and other drugs, criminal syndicates will probably adapt to the success of DLE in interrupting supply by looking to different markets, different methods of drug importation, and different types of illicit drugs and other commodities. DLE will in turn adapt to these changes and make some gains. In order to reduce the harm caused by heroin use, efforts to reduce supply need to be accompanied by efforts to reduce demand for illicit drugs. While drug supply and demand continue to exist, however, efforts need to be made to reduce the harms associated with use.

Chapter 6: Changes accompanying the reduction in the availability of heroin

Linette Collins, Carolyn Day, Louisa Degenhardt, Adam Harrison and Paul Dietze

Summary

- The reduction in the supply of heroin led to significant changes in patterns of drug use.
- There was good evidence that some drug users switched to cocaine, methamphetamine, and benzodiazepines.
- The magnitude of changes differed across jurisdictions. Large or detectible changes tended to be observed in NSW and Victoria, but were less evident in SA, which had a much smaller population of heroin users.
- There was evidence to suggest that the extent (or frequency) of injecting drug use decreased. There may have also been a reduction in the number of injecting drug users in NSW which had the largest heroin market.
- There was a sustained reduction in the number of heroin overdoses in all States.
- Increases in psychosis and violence, associated with stimulant use were reported in all jurisdictions.
- Demand for opioid treatment reduced in the three States, but varied by different types of users. The demand for psychostimulant treatment was reported to increase.
- Following an initial increase, acquisitive crime decreased across the jurisdictions.
- There was evidence of changed drug distribution and importation methods.
- Health drug treatment agencies in all three States reported the heroin shortage impacted on their services, by way of increased client aggression and greater demand for the treatment of drugs other than heroin. Most services were able to adapt well.
- State police services reported a shift in focus away from heroin, but there was no fundamental change in strategies and approaches with regard to drug law enforcement.

Introduction

This chapter will give a brief summary of the changes documented in the three jurisdictions examined in this study. In short, the following areas were examined:

- Types and patterns of heroin and other drug use;
- The extent and frequency of injecting drug use and related harms;
- The number of regular heroin users[61];
- The health effects of heroin and other drug use;
- Treatment for heroin and other drug use problems, particularly psychostimulants;
- Drug crime, defined as production, trafficking, distribution, and drug use offences;
- Crime associated with drug use or groups involved in drug distribution;
- The impact upon law enforcement agencies;
- The impact upon health services.

The section on drug crime was compiled from:

- Interviews at a national and international level with representatives of the following agencies:
  - Australian Federal Police (AFP);
  - Australian Customs Service (ACS);
  - The Royal Thai Police (RTP), Narcotics Suppression Bureau, Bangkok Intelligence Centre, Thailand;
  - Thailand Office of the Narcotics Control Board (ONCB), Ministry of the Prime Minister, Chiang Mai, Thailand;
  - Australian Federal Police (AFP Thailand), based in Bangkok and Chiang Mai.
- The use of documents from NSW Police, jointly written up by NDARC and NSW Police representatives (available upon request, Collins, Degenhardt et al. 2003);
- Use of briefings and documents from Australian Government law enforcement agencies ("law enforcement briefing" or "law enforcement source").

A great deal of information was collected and analysed for each jurisdiction. For particulars, the reader is strongly advised to refer to the NSW (Degenhardt and Day 2004), Victorian (Dietze, Miller et al. 2004) and South Australian (Harrison, Christie et al. 2004) reports. The purpose of this chapter is to provide a broad overview of the findings in each State. The work conducted to produce estimates of the number of heroin users was completed for projects funded by NSW Health (Degenhardt, Rendle et al. 2004) and the Office of Drug Policy, The Cabinet Office, NSW (Degenhardt, Rendle et al. 2004), but is included here in summary. For details of this work, please refer to the full reports.

Drug use

All States were able to document reductions in the frequency of heroin use among regular injecting drug users (IDU). In NSW, it also appeared that the use of heroin in the broader community was reduced. As evidenced in the section "Number of regular heroin users" below, the number of regular heroin users was estimated to have decreased across the country. These changes appear to have been sustained.

[61] Taken from other work completed at NDARC: Degenhardt, L., V. Rendle, et al. (in preparation). Estimating the number of heroin users in NSW and Australia, 1997-2002. NDARC Technical Report Sydney, National Drug and Alcohol Research Centre, University of NSW.

The reduction in heroin use did not imply, however, that the overall level of drug use among former heroin users decreased. In contrast, there was strong evidence that many heroin users used other drugs (both licit and illicit) when heroin was less available. In NSW, heroin users particularly seemed to substitute cocaine. This change did not appear to be sustained, but there was evidence suggesting that the supply of cocaine was reduced in 2002, which may have affected use among this group. There was some evidence that more entrenched heroin users may have also increased the injection of benzodiazepines.

In Victoria, it also appeared that heroin users increased their use of benzodiazepines, and the injection of methamphetamine. The injection of pharmaceutical opioids (Kapinol and MS Contin) also increased. The use of alcohol and cannabis among IDU may have increased. These changes appear to have been sustained since that time.

An increase in methamphetamine use was also apparent in SA. This commenced prior to the shortage but may have been exacerbated by the shortage. It appears that polydrug use may also have increased, both in frequency and in the range of drugs consumed. This change was sustained, although at a reduced rate, even when heroin became more available. The switch to pharmaceutical use may have been sustained in Victoria, and NSW has seen a similar trend. An increase in injection of pharmaceutical opioids appeared to have been sustained in SA. There was no clear change in benzodiazepine use among IDU in SA. Changes in cocaine use were not reported in SA or Victoria.

The changes may have been age specific, with some suggestion from NSW data that younger users may have been more likely to switch to psychostimulants, whereas older users were more likely to switch to benzodiazepines.

Injecting drug use

Across all jurisdictions, there appeared to have been a reduction in the extent of injecting drug use following the heroin shortage, as evidenced by the number of needles and syringes distributed. In NSW, a definite and sustained decrease occurred. In Victoria a 26% decrease in NSP numbers occurred, followed by small increases in the following years. In SA, the number of needles and syringes distributed levelled off at the time of the heroin shortage, and subsequently increased in 2002-2003. This difference from other jurisdictions may be explained by the sustained increase in methamphetamine use and in the injection of benzodiazepines (Temazepam gel caps) and other oral medications in SA.

There are issues with the use of such data to infer the level of injecting drug use, but the consistency of the change across States would suggest that it can *not* be explained by local level factors nor by State specific changes in drug use (such as the increase in cocaine use in NSW, which was not observed elsewhere). There were reports in all jurisdictions that some users ceased heroin use; it was certainly the case that many switched to the use of other drugs, and notifications of blood borne viruses may have decreased. It may be that some users stopped injecting drugs altogether (probably the less frequent users). Within NSW the changes were consistent with a decrease in the number of IDU. There was some suggestion from street-based samples of IDU in Victoria that the frequency of injecting may have decreased.

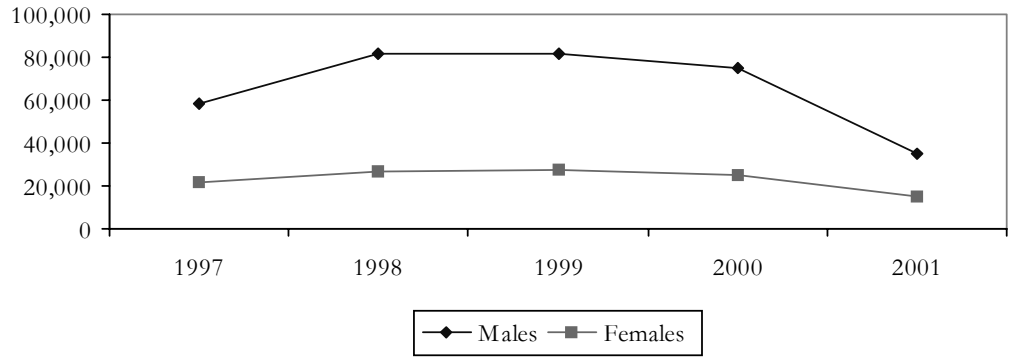
It was difficult to obtain sensitive measures of harms related to the changes in injecting. Less injecting may suggest less harm at a population level. Intravenous use of drugs other than heroin may increase harm, cause new harms or result in no change. In all States however, there were increases in reported harms associated with injecting drug use among those who continued injecting. In NSW, there were increased reports of problems related to cocaine and benzodiazepine injection; cocaine related problems were not sustained and benzodiazepine

related problems appeared to affect only a small, albeit visible group. Similarly in SA and Victoria, there were reports of an increase in vascular problems associated with the injection of benzodiazepines, methamphetamine and other oral medications. No information as to whether changes in harm have been sustained (although use reportedly continued) is available in SA. No change was observed in any other available quantitative data.

Number of regular heroin users

Other work being completed at NDARC suggested decreases in the number of regular heroin users following the reduction in heroin availability (the estimates of "regular heroin users" were derived using indirect estimation methods, from data including opioid overdoses, heroin arrests, opioid pharmacotherapy and ambulance calls to overdoses)[62]. Figure 6.1 shows the median estimates in Australia by gender over the period 1997-2001. The number of active regular users was estimated to have peaked in 1999, and dropped substantially in 2001. The relative magnitude of the change was estimated to have been similar for males and females.

Figure 6.1: Median estimates of the number of active regular heroin users in Australia by gender, 1997-2001

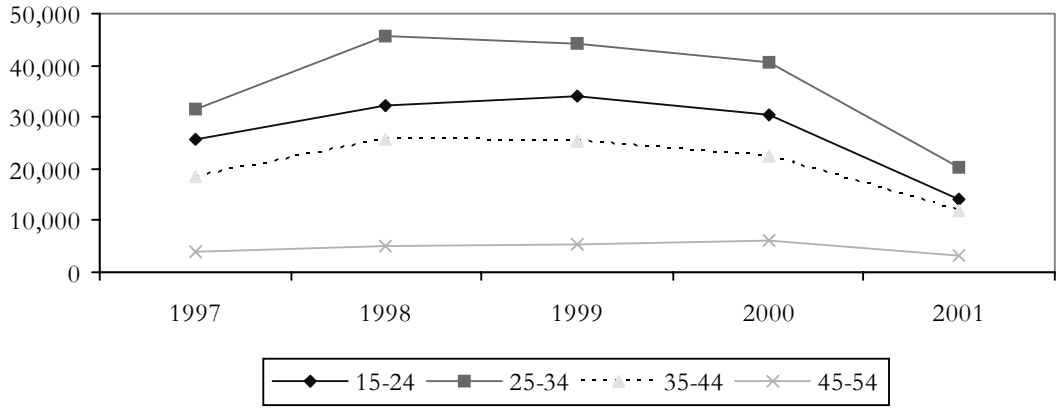


Source: Degenhardt, Rendle, Hall, Gilmour and Law.

Figure 6.2 shows the median estimates of the number of active regular heroin users in Australia according to different age groups. In contrast to similar gender trends, different trends in the age groups are apparent: reductions in the number of regular heroin users were relatively more marked among younger age groups than they appeared to be among older ones (Figure 6.2).

[62] These estimates are the result of several indirect estimation exercises conducted, which each provide an imperfect estimate of the size of the population. The numbers produced are not to be taken as exact or precise. Please see Degenhardt, Rendle, Hall, Gilmour and Law (Degenhardt, L., V. Rendle, et al. (in press). Estimating the number of heroin users in NSW and Australia, 1997-2002. NDARC Technical Report Sydney, National Drug and Alcohol Research Centre, University of NSW.

Figure 6.2: Median estimates of the number of active regular heroin users in Australia by age, 1997-2001



Source: Degenhardt, Rendle, Hall, Gilmour and Law.

Median estimates of the number of regular heroin users were also made across States[63]. The estimates showed a reduction in the number of regular heroin users in NSW, Victoria and across Australia. The reduction in South Australia, was however, less pronounced, which was not surprising given the small size of the market in that State.

These results do not imply that the reductions led to fewer *illicit drug users* - on the contrary, reports consistently suggested that those who reduced or ceased heroin use began or increased using a range of other drug types. Figures have shown increased numbers in opioid replacement therapy, suggesting that the number of *opioid dependent* persons in total may not have changed in the same way as *current heroin use* did.

Health effects

To some extent, the health effects of the reduction in heroin supply were evident. At the aggregate level, there were significant reductions in the harms associated with heroin use, for example, reductions in overdose deaths and non-fatal overdoses. These reductions paralleled a reduction in the number of new entrants to heroin treatment. These reductions appeared to have been sustained until the end of the study period.

The magnitude of these reductions appeared to differ across jurisdictions. Dramatic reductions (specifically in fatal and non-fatal overdose) were observed in Victoria and NSW; the reductions were less evident in SA, with a much smaller population of heroin users.

It also seemed that the reduction in heroin supply affected different heroin users differently. Reductions in some heroin related harms appeared to be most marked for younger groups; there were less obvious reductions for older, more entrenched users. Indeed, it seemed that the health of more entrenched users probably declined following the reduction in heroin supply.

The effects of a reduction in supply of heroin appeared to differ over time, across States, and across different user groups. This is not surprising given the wide range of factors that affect drug use and its consequences.

[63] These estimates were based upon jurisdictional breakdowns of opioid induced deaths. It was recommended that individual States conduct their own estimation exercises using local data to ensure the estimates were accurate.

Overdose

In Victoria a significant decline in the number of fatal heroin overdoses (heroin related deaths) occurred as a result of the shortage. A substantial reduction in non-fatal heroin overdoses occurred across the Melbourne metropolitan area but was most marked in the most active street-based drug market that operated in the Central Business District. There was no difference in mean age of cases of non-fatal overdose in Melbourne before and after the shortage. The proportion of these cases that were male decreased by 69%. In NSW, the decreases in both fatal and non-fatal heroin overdoses were of a similar magnitude for males and females, but there was a large decrease among younger age groups, and no detectable change among those aged 45 years and older. The overall number of heroin overdoses and opioid related deaths decreased in SA. A slight increase in non-fatal overdose associated with the use of opioids *other than heroin* was reported in SA, commencing shortly after the onset of the shortage, but the evidence was equivocal.

An increase in Emergency Department (ED) admissions for cocaine overdose was recorded in NSW, which was most concentrated in the Kings Cross area. There was no detectable change associated with the heroin shortage in the number of non-fatal drug overdoses recorded in ED data associated with other drugs. This was also the case in ambulance data available in Melbourne.

Heroin withdrawal

An increase in the use of diverted benzodiazepine to assist with heroin withdrawal was reported by key informants in SA, though treatment uptake did not appear to increase. In NSW withdrawal symptoms were also associated with the use of other drugs and with presentation for treatment, though as in SA, this did not appear to result in uptake of treatment as a response. A decline in the number of people presenting for heroin withdrawal was reported in Victoria.

Psychosis

There appeared to be increased number of adverse events associated with the use of other drugs. Increases in psychosis and violence, associated with stimulant use were reported in all jurisdictions. This was borne out in the NSW data, with a short term increase in presentations for drug induced psychosis to hospital ED. The increase was not sustained, with this effect probably due to a decrease in the availability (and use) of cocaine.

In SA, health and law enforcement KI frequently reported a rise in mental health problems linked to the increased use of methamphetamine. Small numbers in SA make interpretation difficult but there appeared to be a small, though variable increase in the number of drug related psychosis presentations to Royal Adelaide Hospital ED from around July 2001 to the end of the study period. This was not reflected in State data where a decrease commencing in mid 1999 was apparent.

A number of mental health terms were used interchangeably by some KI. However, a decline in overall mental health social functioning was reported by many KI, and this was the most frequently reported harm associated with the shortage reported by KI in SA.

Physical health

KI reports in all jurisdictions indicate that among IDU who continued to use drugs, in particular stimulants and benzodiazepine, physical health declined. This was signalled by poor condition of veins associated with injection of oral medications and general deterioration associated with poor nutrition, lack of sleep and stress as a result of other drug use. In NSW skin lesions associated with cocaine were noted. Reports of thromboses among IDU in Victoria continued to appear some time after the shortage in 2002.

Reports of polydrug use among pregnant women were noted in NSW and Victoria. Victoria reported an increase in the numbers of pregnant women attending drugs in pregnancy services with stimulant related problems and an associated increase in problems for neonates. In NSW an increase in presentations for cocaine use in addition to heroin use by this population was reported.

Hospital presentations/separations for drug related conditions

Victoria reported a 61% decrease in the number of heroin/opioid related inpatient hospital separations two months following the shortage. Numbers in SA were very small, making it difficult to detect a difference, but there did appear to be a reduction in the number of opioid hospital separations compared to the pre-shortage period. NSW showed similar changes, with a decrease of around 40% in hospital ED admissions for heroin overdose. This change was maintained until the end of the study period.

There was a 16% permanent increase in the number of "other drug" inpatient hospital separations/ presentations after the onset of the heroin shortage in Victoria, though this was not significant. 'Other drug' related hospitalisations are usually related to injecting drug use, indicative of an emergence of other health issues as a consequence of the heroin shortage. Small numbers of presentations precluded detection of any trends in SA.

Treatment

There was a short term increase in treatment seeking among heroin dependent people who had been previously involved in treatment. These people were reported to be more compliant with treatment during the height of the shortage than before it. Treatment data suggests that there was also a possible decline in the number of dependent heroin users, especially younger users, in Sydney.

Heroin

In Victoria the number of courses of treatment (COT) for opioids declined by around 25% following the onset of the shortage, largely among the 15-24 and 25-34 year old age groups. The decline did not differ by gender. A similar pattern was seen in NSW, where there was a reduction in the number of closed treatment episodes in which heroin was the primary drug of concern. This reduction was most apparent for the younger age groups.

An apparent reduction in demand for heroin treatment in SA was sustained until at least April 2002. There was also a brief, though marked spike in informal contacts regarding heroin to DASC from people in rural areas. This was not sustained.

Pharmacotherapy

Methadone and more recently buprenorphine pharmacotherapies are the primary treatment modality for heroin dependence in all States. In NSW, following the shortage there were fewer *new* opioid pharmacotherapy treatment registrations, i.e. treatment naive persons, and no observable effect on treatment seeking among those who had previously been in treatment.

In Victoria there was no significant interruption to an increase, commencing in March 1995, in the number of people on the opioid pharmacotherapy program. Numbers did decrease slightly between September 2001 and March 2002 and then returned to the previous trend. The interpretation of data is confounded by the introduction and uptake of buprenorphine around August 2001. There was no evidence of change in the number of people seeking opioid pharmacotherapy in SA, though this result may have reflected a lack of vacancies on the program.

Psychostimulants

In NSW there was an increase in the number of younger users seeking treatment for psychostimulants (cocaine and methamphetamine). This increase was also apparent in Victoria where the number of COTS where methamphetamine was the principal drug of concern, increased for people aged 15-24 years and 25-34 years. Changes among older drug users were not apparent in either State. The change in Victoria (as well as changes in other drug types) in part accounted for the decline in opioid COTs in that State. It was probable that primary opioid users in Victoria presented with problems related to other drugs.

SA reported an increase in demand for inpatient services at DASC at the start of the shortage. Time Series Analysis (TSA) revealed a 60% increase in the number of methamphetamine related inpatient contacts through DASC, but this was not seen in rural outreach contacts.

Drug crime

Drug production

As noted in Chapter 2, heroin is not produced in Australia, and most of the heroin imported to Australia originates from South East Asia. It was therefore of interest to examine changes in the production of opium and heroin and other drugs in the region, before and around the time of the Australian heroin shortage.

International

There have not been any reports of sudden changes in opium production in South East Asia in recent times. Instead, there has been a steady but small decline in the region's opium production. (United Nations Office on Drugs and Crime 2003). Opium production in South West Asian countries (predominantly Afghanistan) has fluctuated, mainly due to political instability. After action by the Taliban ruling party, the 2001 harvest was reduced by 94%, but production returned to previous levels in 2002 (United Nations Office on Drugs and Crime 2003).

Production of amphetamine type substances (ATS) has increased, particularly in Asia. From 1998 to 2000 there was a large increase in ATS seizures, driven by large Chinese methamphetamine seizures in 1999 and 2000 of 16 and 20 tons respectively[64]. The level of Chinese ATS seizures in 2001 decreased to 4.8 tons, although ATS seizures in other South East Asian countries continue to rise (Commission on Narcotic Drugs 2003).

In summary, the expansion in the ATS production market in South East Asia seems to be occurring alongside the existing heroin market, which is *gradually* declining, while the South West Asian heroin market has remained a dominant (although more volatile) producer.

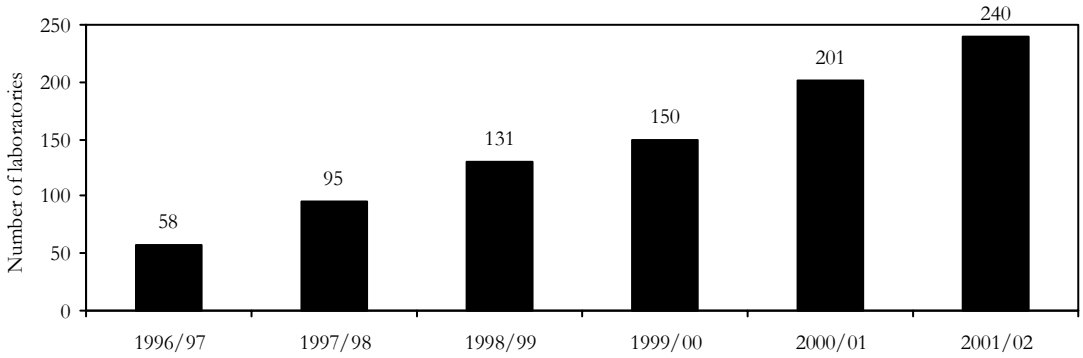
Australia

There has been a sizeable increase in ATS production in Australia over the past few years. A police officer involved in the coordination of drug investigations by NSW Police reported increases in the number of clandestine methamphetamine laboratories detected across Australia despite little change in resources targeting these laboratories. Data on the number of clandestine methamphetamine laboratories detected shows a consistent increase in the number of detections between 1996 and 2002 (Figure 6.3). In their intelligence reports, NSW Police had been noting

[64] Seizure rates do not necessarily equate to production rates, but they can indicate trends. Gordon, S. (2001). Technology impacts on drug production in Asia: The role of amphetamines in Asia's growing drug problem. Platypus Magazine: Journal of the Australian Federal Police. 72: 17-22..

that outlaw motorcycle gangs (OMCG) were involved in production (Collins, Degenhardt et al. 2003). These indicators suggest a steady growth in methamphetamine production in Australia from the mid 1990s, perhaps dominated by OMCGs.

Figure 6.3: Clandestine methamphetamine laboratory detections in Australia, 1996-2002



Source: ABCI 1996-2002, ACC 2003.

The majority of KI who commented on the production of ATS reported that the heroin shortage *might* have been a factor in the *continued* increase in production. The movement of some South East Asian crime groups, previously involved in heroin distribution, into the production and distribution of ATS, supported this:

> *"…if the Asians and others couldn't access heroin for sale, they'd be looking for another product…the other product that is readily available in Australia is amphetamine based stuff. So…you have greater market, you have a greater network of distributors, so it's very worthwhile manufacturing it."* (Commissioned Officer, State Command)

Drug importation

One possible change that could have been observed as a result of the reduction in heroin supply was a change in the type or number of drug importations made to Australia. Importations of heroin appeared to have changed in *both* the method of concealment and size. The amount of other drugs being imported also appears to have increased.

Drug types imported

Figure 6.4 shows the amount of heroin and the number of heroin seizures made at the Australian border by the Australian Customs Service from 1990 to 2003[65]. Clearly, the weight of heroin seized dropped in the year preceding the reduction in heroin supply, and dropped to a lower level again in 2000-2001; but overall, the seizures of heroin have been greater since 1998 than previously (Figure 6.4). A NSW Police KI involved in joint Federal/State drug investigations described this change:

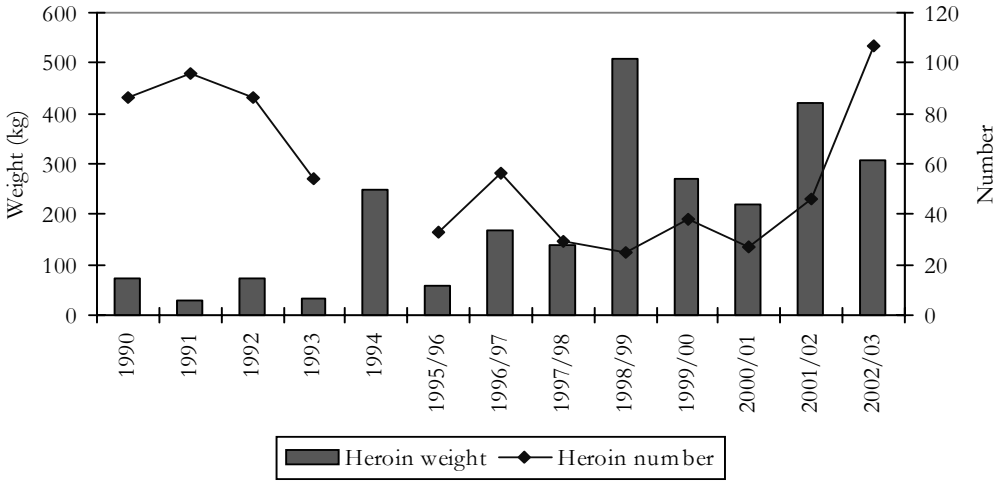
> *"I suppose in the early nineties (1990s) it wasn't unusual to do a job where you'd get sixteen units[66], twenty units. And you had those importations of a couple of hundred units. They just seemed to die."* (Commissioned Officer, State Command)

[65] It is difficult to say how much an increase in seizures reflects an increase in the amount being imported, compared to an increase in law enforcement's capacity to identify the importers and the imports. Data is also strongly influenced by single large seizures (law enforcement briefing). Interpretation of such data needs to be coupled with other sources of information.

[66] A "unit" or "cattie" is 700grams of heroin usually in block, not powder, form.

It is of note that this reduction occurred at a time when Customs report their capacity to identify illicit cargo at the border was *greater* than in previous years. Surveillance had increased since 1998 due to: increased drug law enforcement funding, security measures introduced for the Sydney Olympics, improved quarantine intervention and increased efforts to reduce people smuggling and firearms trafficking (law enforcement briefing). The increase in weight of heroin seized in 2002 reflects the impact of a large seizure of heroin in Brisbane in March 2002.

Figure 6.4: Heroin seized at the Australian border by the Australian Customs Service, 1990-2003



Source: Australian Customs Service.

KI interviews suggested that *prior* to the reduction in heroin supply, the number of importations of cocaine and ATS were increasing (Commissioned Officer, State Command). A Federal officer involved in drug intelligence work commented:

> *"…in the few years before that [the heroin shortage], cocaine was the big issue and it was quite obvious from seizures that at the time the cocaine market was growing…."* (Senior Federal law enforcement officer)

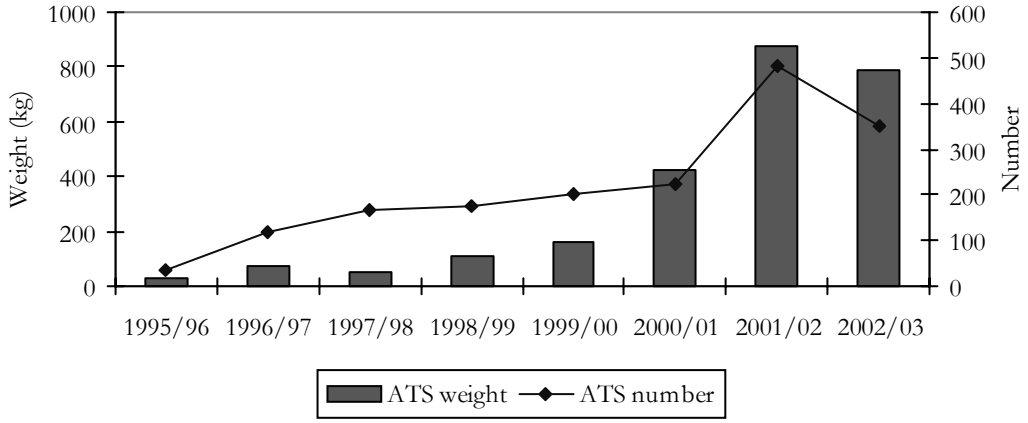
These increases continued after the reduction in heroin supply. One law enforcement KI responded:

> *"…known traffickers appeared to increasingly import other drugs such as ATS, MDMA and cocaine."* (Senior Federal law enforcement officer)

These reports were clearly supported by an examination of data from the Australian Customs Service on cocaine and ATS[67] seized at the Australian border (Figure 6.5, 6.6). Some South East Asian crime groups, previously involved in heroin importation, were identified as importing ATS and cocaine following the onset of the heroin shortage (Collins, Degenhardt et al. 2003).

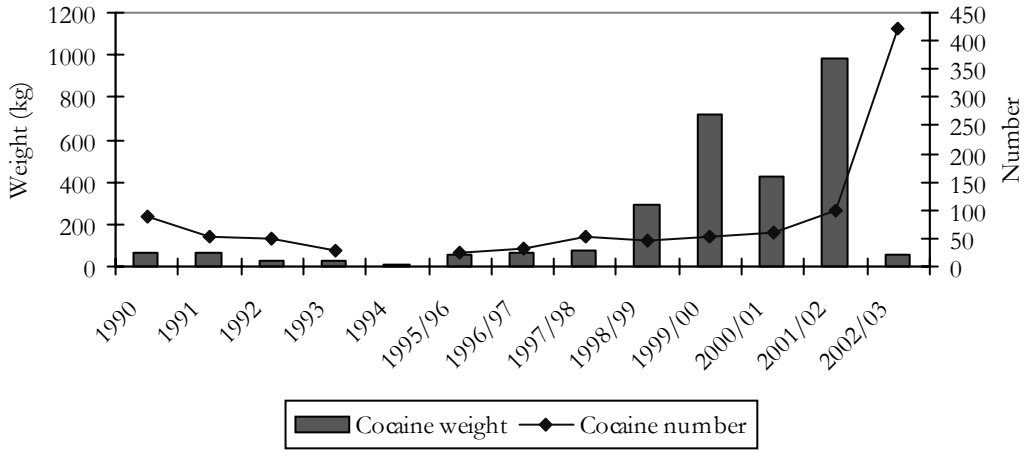
[67] Includes seizures of methamphetamine "ice" and ecstasy (MDMA).

Figure 6.5: ATS seized at the Australian border by the Australian Customs Service, 1995-2003



Source: Australian Customs Service; data not recorded prior to 1995/6.

Figure 6.6: Cocaine seized at the Australian border by the Australian Customs Service, 1990-2003



Source: Australian Customs Service.

Trafficking routes

The points of entry of drug imports into Australia may have changed, or at least diversified to some degree, since the heroin shortage. One KI reported that the major locations of supply might have shifted from NSW (Cabramatta) to Queensland (Brisbane) and Victoria (Melbourne) because of perceived increased law enforcement presence in Sydney[68]. Other information from interdictions suggested that some heroin couriers were being instructed to fly into Brisbane or Melbourne, and *not Sydney*, because those financing the importation believed that policing in Sydney was more stringent (law enforcement document).

[68] This was supported by a seizure in early 2002 in Brisbane of a 380kg shipment of heroin from China, originating from the Golden Triangle, thought to reflect a change in tactics by this group (law enforcement document).

Trafficking groups

KI consistently reported that a small number of key groups had traditionally financed major heroin imports to Australia in the 1990s, and these groups had withdrawn from the financing and facilitating these imports in the late 1990s[69]. There was some suggestion that these traditionally dominant groups had shifted their activities to areas considered to be of lower risk, such as money laundering and heroin trafficking in other countries[70].

The withdrawal of these dominant groups may have allowed new people to enter the market[71]. Some Australian based heroin distributors with links in the South East Asian region were thought to have sourced their own heroin supplies from groups in Vietnam and Cambodia[72]:

> *"…it seemed to be the [Australian Indo-Chinese] coming more into it as suppliers. [They] seemed to have determined their own sources of supply where previously they would rely on Chinese suppliers. Chinese are still the bulk supplier, but the [Indo-Chinese] have gradually increased activities. Vietnam, Cambodia and Lao seem to be opening up more…"* (Commissioned Officer, State Command)

> *"Now you will get entrepreneurial importers importing smaller amounts using different networks i.e. Cabramatta. You find nothing on the streets then it's there for 24 hours then it goes again."* (Commissioned Officer, regional command)

Method of drug importation

A change that was consistently noted by law enforcement was the shift in methods of heroin importation. This was attributed to the disruption of large scale importations and the emergence of new trafficking routes. One respondent mentioned that this modus operandi had "gone back to the 60s or 70s", referring to a shift from large scale importations back to the "entrepreneurial" approach of smaller importers (Commissioned Officer, Region Command). An officer involved in high level drug investigation commented;

> *"..if you go back ten or fifteen years it was mainly small amounts, body packing and internal, then it went to large containers, air cargo shipments, multi kilos, you know, hundred kilo shipments. Now at the moment it has gone back to the body packing kind of thing."* (Commissioned Officer, State Command)

From 2002, there was a reported rise in exportation of heroin through body packing, among Chinese Malaysians and Chinese Indonesians[73]. NSW Police implicated Chinese syndicates (in South East Asia) and Indo-Chinese distribution networks (in NSW) in this activity[74] (Collins, Degenhardt et al. 2003). There was also an increase in the use of airline passenger and postal streams as methods of trafficking[75] (Collins, Degenhardt et al. 2003). These methods were not new, but the frequency of their use was reported by KI to be increasing.

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[69] Key informants from Royal Thai Police; Thailand ONCB; AFP Thailand; law enforcement source.

[70] Key informants from AFP Thailand; law enforcement source.

[71] Key informants from Royal Thai Police; Thailand ONCB; AFP Thailand.

[72] Key informants from Thailand ONCB; RTP, NSW Police.

[73] KI Thailand ONCB.

[74] KI Commissioned Officer, State Command.

[75] Law enforcement source; key informant reports from Commonwealth law enforcement.

> *"Yeah well the profits are so high now, so it's well worth your while to pay half a dozen people's tickets to…fly over to Australia, to go to Vietnam, fill their shoes up with say a couple of hundred grams of heroin and bring it back."* (Commissioned Officer, State Command)

NSW Police and Federal law enforcement also noted an increase in importations of heroin in packages sent by international courier businesses, in which use was made of parcel tracking services offered by courier companies (Collins, Degenhardt et al. 2003). Drug importers used this method to "track" their shipment of illicit drugs and hence be informed of any delay in delivery created by a law enforcement agency[76]. These were less likely to be detected and the importer could track their progress, allowing them to be abandoned if inspected or seized.

NSW Police reported an increase in the quantity of heroin seized in NSW in early 2003, with importation of half units (350g) and whole units (700g). This was an increase from size of seizures during the heroin shortage (Commissioned Officer, State Command) and could suggest some return to larger level importations by some groups.

Changes in distribution

Reports from KI and drug users revealed that new patterns of drug dealing emerged in all the States during and following the shortage. Across all three markets a shift away from street-based dealing occurred. In NSW there appeared to be a reduction in the number of street level user/dealers, and a move from overt dealing by middle level dealers, to mobile methods of delivery and dealing from "drug houses".

Similarly in SA a decline in home and street-based dealing was reported by KI. During the shortage drug users made contact with dealers by mobile phone and purchased drugs at arranged meeting places. Dealers also rang users: this dealer initiated contact had not been seen before and was reported to have been in response to threats to dealers as heroin supplies reduced.

In Victoria this shift appeared to commence prior to shortage but may have been exacerbated by the shortage. Also reported by KI was a shift away from dealing from premises, to mobile phone dealing with transactions taking place at an arranged location. Generally, the changes reported by KI in Victoria seemed to commence before the shortage and may have been related to law enforcement activity.

The changes in dealing described above led, in some cases, to increases in small, hidden markets. For example in SA, the market was reported by KI to be less visible and street dealing less evident. In Victoria, substantial reductions in the number and size of heroin street markets were noted by KI. NSW KI reports also suggested a reduction in the overt presence of the large drug market, but this was preceded by an initial increase in the overt presence of the market at the height of the shortage. An increase, following the shortage, in the number of locations in Sydney where heroin could be purchased was reported by a number of KI (both law enforcement and health) and drug users.

Higher level dealers diversify into other crime types

The heroin shortage was implicated in a number of changes to high level drug distribution. In NSW, KI reported traffickers switched to other drug types such as methamphetamine and other commodities such as credit card fraud. New network links were also observed namely unprecedented links between different ethnic groups.

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[76] Law enforcement source.

In Victoria, some heroin suppliers were reported by KI to have switched to production of cannabis. Some heroin suppliers moved from heroin to importation of "ice". Two law enforcement KI in SA reported changes to the "trade" in cannabis: prior to the shortage cannabis was "traded" with criminals in the Eastern States for heroin, this apparently had changed to trading for ecstasy and cocaine. Street level heroin suppliers in SA were reported by KI to have commenced sale of methamphetamine and in some cases oral pharmaceuticals.

Changes in drug possession/use

In NSW there were significant decreases in incidents of heroin possession/use reported by police that could be attributed to the heroin shortage. These decreases were more marked among males and those aged 20-29 years in one of the key drug market areas. In Victoria, there was a 40% reduction in the number of heroin related incidents in the local government areas (LGAs) that contained the most active street-based drug markets attributable to the heroin shortage. The shortage did not appear to affect a State-wide decrease in heroin related incidents in Victoria which had commenced in 1998. In SA the number of incidents for possession/selling opioids post-shortage is much lower than pre-shortage but it is not possible to directly attribute this difference to the heroin shortage. Offences for possession of heroin or other opioids and possession of implements appeared to decrease from early 2000, which may have been accelerated by the shortage.

At the same time, increases were observed in incidents for cocaine possession/use in NSW. These primarily occurred among younger males, particularly in the inner Sydney area, which may have been related to drug market displacement. In Victoria a possible increase in stimulant related incidents that appeared related to the heroin shortage was not significant either at a State-wide level or in the areas of Melbourne with the most active street-based drug markets.

The reader is referred to the jurisdictional reports for more detailed information on these changes.

Crime associated with drugs

It was difficult to document changes in the criminal activity of those involved in drug distribution, particularly organised crime groups. NSW KI reports and police documents suggested that some groups diversified into, or increased their activity in other crime types such as motor vehicle re-birthing, factory break-ins for saleable goods, credit card fraud and distribution of firearms.

A short term increase in acquisitive crime (in SA robbery without a weapon, in Victoria robbery and aggravated burglary and in NSW robbery with a weapon not a firearm) was noted across the three States. These increases were not sustained. In NSW this increase was most noticeable around the areas of the two inner city key drug markets.

An increase in violence was observed across the three States. It is probable that police data on violent crimes such as assault, underestimates the true extent of such crimes, including that perpetrated among hidden populations such as drug users and dealers. This general increase in aggression was most likely associated with increased desperation among those attempting to acquire heroin and the behavioural effects of other drug use, such as psychostimulants and benzodiazepines.

Data from the Drug Use Monitoring in Australia (DUMA) project was reflective of the trends found in the current study. DUMA involves the (voluntary) interviewing and (voluntary) urine testing of persons detained in custody[77]. In 2001, DUMA was operational in four sites - Bankstown and Paramatta (NSW), East Perth (WA), and Southport (QLD). In 2001, NSW (the site most relevant to the present study) reported a decrease in the proportion of those committing violent offences who tested positive for opioid drugs, and an increase in the proportions testing positive for methamphetamine and cocaine (see NSW Report).

In both NSW and Victoria, there were reports from KI of increases in street-based sex work. In NSW, many of these sex workers were reported to have used cocaine when heroin supply was reduced. In NSW, this was supported by a statistically significant increase in police incidents for illicit sex work that was not found in Victoria. In SA no such trends were detected. However SA data relating to sex work is heavily influenced by changes in police practices and this result should be treated with caution. (For more detailed information, see the relevant jurisdictional report.)

Impact upon law enforcement operations

Jurisdictional law enforcement agencies

No fundamental change occurred in the aims or methods of drug law enforcement as reported by KI at a local or State level.

In NSW some resources previously committed to heroin were reallocated to the policing of other illicit drugs and associated crimes. Overall, police knowledge of the drug markets was reported to have increased. In NSW, outcome and monitoring tools were developed, allowing police to be more predictive of heroin market changes and which were more indicative of impact of law enforcement on the market than the traditional measures of seizures and arrests. More emphasis was placed on research and multi agency approaches to gain knowledge about the illicit drug market.

NSW Police reported the increased violence and unpredictability associated with stimulant use was stressful for police, particularly younger less experienced police. These effects may have been reduced had police received more information regarding the shortage and its effects. An increase in morale was reported amongst some police as apprehension of drug suppliers increased and the level of activity in the Cabramatta drug market decreased.

In Victoria a reduction in number of heroin incidents allowed police, particularly those in squads and stations where heroin had been of significant concern, to focus on other crime. Reallocation of resources meant improved outcomes in these areas and an opportunity to focus on crime prevention. Police and health KI reported improvements in links across disciplines arising from the shortage. It was suggested that these changes contributed to an overall improvement in job satisfaction amongst police.

In SA, the shortage allowed resources allocated to policing of heroin to be directed toward other drugs, in particular methamphetamine. Police also increased their focus on organised crime associated with drugs other than heroin; in particular methamphetamine. As reported in other states, SA Police experienced increased levels of violence and unpredictability amongst IDU as a

[77] Not all arrestees in the study agree to be interviewed, and not all those interviewed agree to submit to a urine sample. These samples therefore refer to a subpopulation of all those arrested and detained in the designated data collection sites. Makkai, T. and K. McGregor (2002). Research and Public Policy Series Report No. 41: Drug Use Monitoring in Australia: 2001 annual report on drug use among police detainees. Canberra, Australian Institute of Criminology.

result of increased use of methamphetamine. In response to this, training was provided to police in dealing with these behaviours. Police reported an increase in detections of clan labs during the shortage and in training to deal with these.

Federal law enforcement agencies

The heroin shortage did not result in any change in the aims of drug law enforcement at a Federal level. KI reported the shortage served to confirm the validity of their approaches, in particular the focus on overseas markets and their relationship to the Australian situation. One KI described the response of his agency to the shortage:

> *"…it gave us confidence in the track we were taking and encouraged us to continue down that track…..and I think it gave us confidence that the only way to impact on the international drug market is to work outside Australia. Really you are only touching the edges if you're simply worried about seizures here."* (Senior Federal Law Enforcement Officer)

Similarly, where heroin was only one of a number of illicit commodities that agencies were responsible for targeting, they reported no fundamental change in operations.

The shortage did however present some new risks and opportunities for law enforcement. As market activity changed and for example the number of large importations of heroin reduced, agency activity increased in relation to other methods of drug importation such as by postal stream or airline passengers. The reduction in heroin importation raised a need to address the possibility that other drugs may replace heroin. Initiatives such as a Precursor Working Group were established to address such threats.

Other market changes, such as less experienced but more numerous players involved in the importation of drugs and a shift from Sydney to other ports as a point of entry for drugs, presented Federal law enforcement agencies with a chance to capitalise on a disrupted market as well as manage emerging problems.

KI reported that at the time of the shortage communication and the flow of information between Federal agencies and across jurisdictions was not as effective as it could have been. The shortage emphasised the need for a free flow of information and flexibility to use that information. KI reported there are now structures in place that have overcome some of these problems.

One officer also reported that the changes in the market had highlighted the need for multi agency approaches to drug law enforcement:

> *"The market has a diversity now that it never had before and I think it underlines in a way how law enforcement, research, everyone has to work a lot closer…It's no longer suitable to just know about amphetamines you have to know about the various forms of amphetamines and the same with cocaine…it's not a simple market any more."* (Senior Federal Law Enforcement Officer)

The shortage was reported by one Federal agency to prompt an increased investment in research. This was prompted by the diversification of drug suppliers into drug types other than heroin and to trade in other commodities:

> *"…the main change was we needed to have a better understanding of drug markets…it [the heroin shortage] put some impetus behind some ideas and concerns that we'd had for a while and actually allowed us to get some money for conducting research in these areas."* (Senior Federal Law Enforcement Officer)

There had been some momentum prior to the heroin shortage in Federal agencies to review drug law enforcement measures (traditionally seizures and arrests). Following the heroin shortage, these agencies were given greater momentum to develop improved performance measures and monitoring tools based on a better understanding of drug markets including jurisdictional differences and of community views regarding what constituted success in drug law enforcement.

Impact upon health agencies

KI from health services and drug treatment agencies in all three States reported the heroin shortage impacted on their services. There were increases in the numbers of clients presenting for problems other than heroin withdrawal. This increased the levels of aggression and violence and there were more incidents of drug induced psychosis. These changes resulted in increased levels of stress and anxiety for staff, greater contact with mental health services and with police in managing violence or threatened violence.

Services' response was similar across the three jurisdictions, including improved protocols, staff training, debriefing, and in some cases, building modifications. All three States reported the shortage led to a greater awareness of drugs other than heroin. For example in NSW, more staff training focused on cocaine and benzodiazepine abuse. In SA more services were provided for methamphetamine users.

Increase in methamphetamine use led to some treatment agencies identifying gaps in knowledge and treatment options and the need to increase capacity (including research knowledge). Some agencies reported refocusing resources toward providing more services for methamphetamine users. Lack of effective treatment for methamphetamine abuse was frequently reported. A paucity of knowledge and programs regarding drugs other than heroin and a need for capacity building was also reported.

A number of significant changes also occurred at the policy and service level. In NSW and Victoria health promotion campaigns were implemented dealing with a variety of issues. These included initiatives around the health effects associated with changes in drug use, warnings for drug users regarding the risk of heroin overdose in the event of an unexpected return of heroin and advocacy strategies in Victoria and NSW to reduce injection of benzodiazepines, in particular Temazepam gel caps.

Despite these changes, a general paucity of services for drugs other than heroin was reported by KI in varying degrees across the three States. In Victoria, many workers' skills were reported to be geared toward provision of opioid related treatment and many services found themselves ill-equipped to deal with problematic use of other drugs. Demand for methamphetamine treatment had already been increasing in SA prior to the heroin shortage; however staff experienced similar problems to those reported by other jurisdictions. NSW KI reported that there were sufficient treatment vacancies for other drug types and organisations had the capacity to alter admission criteria when required. All States however, noted the dearth of treatment options for psychostimulant misuse. Finally, in SA and NSW interagency links were reported by KI to have increased, though this did not appear to have occurred in Victoria.

Conclusions

The reduction in the supply of heroin led to significant changes in drug use patterns across the community, more markedly where established heroin markets had existed. It is unlikely that those who ceased heroin use ceased the use of all drugs: there was good evidence that users switched to cocaine, methamphetamine, and benzodiazepine use. There was also evidence to suggest that the extent of injecting drug use decreased across the community. It is difficult to state definitively whether there was a reduction in the number of injecting drug users, but it seems plausible that less frequent injectors may have ceased injecting, just as some heroin users probably ceased use.

The heroin shortage resulted in changes in health and drug treatment, drug crime and other associated crime such as robbery and violence that were reported across the three States. There were also changes associated with policing and the provision of health and drug treatment services. Many of the changes reported were consistent across States, though not always found in the variety of data analysed in this study. This was particularly true for SA, where small numbers often precluded data analysis. The effects tended to be clearest for NSW, which traditionally had the largest heroin market, whereas many of the changes were not evident in SA, which had a much smaller market.

Chapter 7: Implications for health

Louisa Degenhardt and Carolyn Day

Summary

- The population level harms associated with heroin use decreased following the reduction in heroin supply. However, supply reduction appeared to have mixed health effects upon different groups of heroin users.
- Younger (less entrenched) heroin users appeared to be particularly affected by the reduction in heroin supply, with many indicators suggesting that they might have ceased (or substantially reduced) heroin use. There were indications that this younger group may have switched to psychostimulants, but may not have been injecting these drugs. This probably led to decreased aggregate harms related to heroin *and* injecting drug use among younger age groups.
- Older, more entrenched users did not seem to be as affected, with smaller reductions in harms related to heroin use and possibly the addition of other risky forms of drug use to their repertoire. There is a need for harm reduction initiatives among this group given that they may experience significant harms associated with (for example) the injection of benzodiazepines and pharmaceutical opioids, as well as of cocaine and methamphetamine. There may also be a need for demand reduction through this group, which might be achieved through the development and delivery of effective treatments for these other drug problems.
- There was suggestive evidence (in NSW) that users in opioid pharmacotherapy may have increased their adherence to treatment when heroin supply was reduced.
- The heroin shortage placed many changed demands upon health and drug treatment services, and highlighted the need for such services to be flexible to changes in drug markets, as well as skilled to deal with an increasing range of drug use problems among their client base.

In this chapter, we consider the health implications of the reduction in heroin supply, considered from the perspective of the user, treatment services, and in terms of treatment approaches for drug use problems. This discussion is meant to provide a brief overview only of some of the major issues that seemed to be presented by the findings of the current study, and the changes we documented as part of it.

The health of users

As summarised in the previous chapter, not all heroin users appeared to be affected by a reduction in the supply of their drug of choice in the same way. This related largely to age or perhaps (by proxy) the extent to which users were entrenched in a pattern of dependent heroin use.

Older, more entrenched users were probably less affected by the change than younger users. Among older age groups, little decrease was documented following the heroin shortage in the numbers entering treatment for heroin dependence, overdosing on heroin (fatally and non-fatally), or being arrested for heroin possession or use. At the same time, little *increase* was noted among older groups in numbers entering treatment for cocaine or methamphetamine use problems, cocaine overdose or drug induced psychosis, or in police apprehension of possession of cocaine. There was some evidence, however, that these users may have switched to substitute drugs that included benzodiazepines.

In contrast, younger users had significant decreases in fatal and non-fatal heroin overdose, new entrance to heroin treatment, and police apprehension for heroin use, suggesting that this group was relatively more affected by the reduction in heroin supply. Younger users had increases in the numbers entering treatment for cocaine and methamphetamine dependence, and police apprehensions for cocaine use were higher. In short, it seemed that younger users, when faced with a reduction in the supply of their drug of choice, may have switched to other easily available illicit drugs.

Overall, however, it seemed that the aggregate harms related to heroin decreased, in terms of lives lost due to overdose on the drug. There was no comparable increase in harms related to other drugs, in that deaths related to other drugs did not increase when heroin related deaths decreased, although morbidity related to other drug use increased. For others, they may have been assisted to cease heroin use (not surprising given stimuli was absent). This must be considered an overall social gain in that the massive scale of mortality in the late 1990s due to illicit drug use has been reduced. This is not to say that the reduction in heroin availability was not accompanied by negative outcomes. It is likely that considerable public health burden may be caused by persons who have begun the injection of benzodiazepines; persons who may already have been particularly disadvantaged. The latter change, in addition to reducing health care costs attributable to heroin use, may also have benefited users by reducing cognitive impairment and other morbidity related to non-fatal overdoses.

The data from this study suggested that supply reduction might have led to reduced use among younger users, which may have decreased the harms among this younger group. This study *also* suggested that older, more entrenched users may *not* have ceased use, and indeed, may have used other drugs in a risky fashion; this suggested that reducing supply was not sufficient, since some users switched to other drugs that may have led to riskier and more harms associated with drug use. There is a need for harm reduction initiatives among this group given that they may experience significant harms associated with (for example) the injection of benzodiazepines and pharmaceutical opioids, as well as of cocaine and methamphetamine. There may also be a need for demand reduction through this group, which might be achieved through the development and delivery of effective treatments for these problems. This gives support for such multifaceted drug

policies as the Australian National Illicit Drug Strategy (NIDS), which incorporates demand, harm and supply reduction as the three core components of effective drug policy.

Drug treatment

The findings of this study also had implications for drug treatment, particularly resulting from the changes documented in NSW, which had the largest heroin using population and potentially greater power to examine more finegrained issues. In NSW, it appeared that persons in treatment for heroin dependence might have had better adherence to their treatment (Conroy, Degenhardt et al. 2004).

Consider treatment within the context of drug availability - when drugs are easily available, clients may find it harder to adhere to treatment. This possibility was given support particularly in NSW, which has the most well established heroin market and the greatest number of heroin users, and where the data allowed examination of this issue: there seemed to be a move for some users in treatment to maintain better adherence to their treatment when heroin was less available.

It would be a mistake to consider drug treatment within a vacuum - as with other interventions; we need to remember the environment within which drug users who request help live. Drug use is a behaviour that is affected by a range of factors, one of which is the supply of the drug. A range of research suggests that problematic alcohol use is greater in an environment where the availability is greater (Moskowitz 1989), and it would seem logical to assume the same principles apply for illicit drugs such as heroin. Any treatment for problematic drug use needs to take into consideration the strategies the user has in place to reduce the likelihood of returning to use when this is easy to do.

The data from this study suggested that demand reduction (in the case of drug treatment) may be improved when supply is reduced. This supports multifaceted policies, as mentioned previously.

Health services

For many years, health services dealt with a client base predominantly comprising clients with primary heroin problems. This predominance had led to the expansion of methadone and other treatment options for heroin dependent persons, and treatment staff had developed good skills to deliver these services.

This context may conversely have led staff working in such services to lack the skills to deal with other types of drug use problems. The heroin shortage in Australia meant that health and drug treatment services were forced to quickly respond to a dramatic change in the profile of their clients. Key informants from a range of health services reported they were ill-prepared for the change in client presentations, lacking the skills and knowledge to effectively deal with the psychological and behavioural effects of drugs other than heroin. The increase in methamphetamine and cocaine use among IDU led to an increase in challenging behaviours such as aggression, paranoia and delusional thinking, with a need for health services to revise protocols and procedures and organise staff re-training.

Most importantly, the change in the profile of the clients meant that the role of behavioural management and psychological therapies for drug dependence needed to be reconsidered. This is largely due to a distinct lack of effective pharmacotherapy for cocaine or methamphetamine dependence. It is also probably due to the increased level of problems with multiple drugs among a client base that may now have more serious problems due to increased harms associated with use of such drugs as cocaine, methamphetamine and benzodiazepines.

The findings of the current study suggest that it is important for health services to maintain skills across a number of domains to ensure that changing drug market conditions may be dealt with effectively. While the treatment of addiction is based on a number of premises generalisable across a range of drugs, the intoxication and withdrawal states differ across the different drug types and the behavioural management of these states require different skills that are not necessarily transferable. The experience in this situation suggested that services were able to respond quickly to develop protocols and procedures to deal with clients, but it may take more time to develop the skills for delivering effective treatments.

Communication and cooperation with other agencies - mental health and police - might also improve knowledge and awareness of the situation, and assist with effective responses to changes in use and harms of illicit drugs.

Conclusions

The reduction in heroin supply had a number of health implications, most notably the reduction in heroin overdose, especially among younger users. Although there was an aggregate decrease in harms, the impacts on older and more entrenched users should not be dismissed, nor the increased psychostimulant and subsequent problems among younger users. The full impact of these changes may not be borne out for some time and thus requires monitoring; in particular the harms associated with increased psychostimulant use and the impact this will have on treatment health services.

Treatment services appeared to be flexible to the change in drug use markets, but there is a need for effective treatments for methamphetamine and cocaine to be developed and delivered. Communication between health services and other pertinent agencies may also assist in the swift identification of changes in the drug market, and increase services' capacity to cope with any resulting changes accordingly.

Chapter 8: Implications for law enforcement

Louisa Degenhardt and Linette Collins

Summary

- The behavioural consequences of use of cocaine and methamphetamine had significant implications for police, who needed to deal with an increase in incidents involving violent and aggressive individuals and in NSW short term increases in illicit sex work and acquisitive crime.
- Police were not always aware of the reason for the change in the behaviour of drug users or the change in drug use patterns amongst drug users, signalling the need for improved communication across all levels of policing.
- The decline in heroin use reduced media attention and political pressure on the policing of illicit drugs at Federal, State and local levels.
- The apparent addition of other drug types to some users' repertoires may need to be considered by those in law enforcement who will come into contact with this group.
- It is difficult to clearly document changes in criminal activity among organised crime groups; however, heroin distributors in Australia appeared to be flexible and possibly adapted to the reduction in heroin availability by switching to other drug distribution and/or other crime types.
- Some low level dealers may have shifted in the short term from heroin to other drug distribution around the time of the heroin shortage.
- In the absence of assistance from skilled facilitators there may be opportunities for law enforcement to apprehend less experienced high level distributors.
- Street level policing may have some deterrent or displacement effect and improve public amenity, but drug supply was not significantly affected through policing at this level.
- Law enforcement at Federal and jurisdictional levels (in particular NSW) have increased the number of monitoring tools, increased the number and the size of drug units.

This chapter briefly discusses some of the implications for law enforcement that have resulted from the current study. In particular, the changes that appeared to occur among users are considered - with respect to their patterns of drug use (and the implications this has for law enforcement) *and* to the criminal activity that users may commit.

This chapter also considers the implications of the changes in drug distribution that this study found. These changes are likely to have implications for those involved in drug law enforcement because the changed nature of drug distribution may affect the methods used to apprehend those involved in the sale of illicit drugs.

Finally, the implications for the conduct of law enforcement are briefly discussed. In particular, some of the changes that were documented in this study may have implications for methods used in law enforcement.

Drug users

There are a number of implications of the current study for law enforcement with respect to drug users - and it is important to note that the group being considered here are those persons who are regular (possibly dependent) users *who are also involved in criminal activity other than illicit drug use*.

As noted in Chapter 6, changes in drug crime, and crime associated with drugs, were more readily detected in the States with the larger heroin markets, namely NSW and Victoria. In all States, it appeared that reducing heroin supply led to the use of other drug types by some (probably dependent) heroin users, in particular psychostimulants, benzodiazepines and other opioid pharmaceuticals. The behavioural consequences of use of cocaine and methamphetamine had significant implications for police, who needed to deal with an increase in incidents involving violent and aggressive individuals. Health effects such as skin lesions from injection of these substances were also of concern to police (for occupational health and safety reasons as well as for the health of the users themselves).

It is possible that the use of other drugs could continue even if heroin becomes more available. This study found evidence of continued injection of Temazepam in NSW and oral opioids in SA as heroin availability returned. Continued occasional use of drugs substituted during a cannabis shortage as cannabis availability increased has been reported in the US (Gooberman 1974).

The reduction in heroin availability was also linked with increases in acquisitive crime, and illicit sex work in NSW. This suggested that in the short term, illicit drug users may go to increased lengths to obtain money for more expensive heroin and/or the increased cost of their other drug use such as cocaine. Increases in psychostimulant use were linked in all States to more violent crime, which needs to be considered in the light of reductions in heroin related harms.

The utility of traditional measures of police activity and effectiveness as well as communication channels were tested by the shortage. Trends in crime data, in particular arrests for drug offences, reflected the decline in heroin use but not drug substitution or change in harms. Police were not always aware of the reason for the changes in the behaviour or drug use patterns of drug users. Some police had established links with local heath/welfare agencies but overall information from health services regarding the changes in drug use were not routinely available.

The impact of drug users on community amenity, particularly in areas of visible drug supply and use, varied throughout the period of the shortage. An initial increase in the number of users was reported, which increased community concern and complaint. Overall, however, the behaviours

associated with psychostimulant and pharmaceutical use and sale appear to have had less impact on community amenity and community complaint has reduced. With the decline in heroin use, media attention and political pressure on the policing of illicit drugs has also reduced at Federal, State and local levels.

Little is known about those who left the market or who did not begin the use of other drugs. It is most likely that these were younger, less entrenched users; previous research has suggested a similar change with respect to cannabis users (Gooberman 1974). The apparent decrease in the number of regular heroin users following the heroin shortage suggests that reducing supply may also reduce the number of users; and the overall decreases in acquisitive crime that have occurred since the heroin shortage suggest that the criminal activity associated with heroin use may also decrease.

Nevertheless, it would still appear to be the case that older, more entrenched heroin users continue to use heroin, enter treatment, and commit crimes despite a reduction in the availability of heroin use. The apparent addition of other drug types to some users' repertoires may need to be considered by those in law enforcement who will come into contact with this group.

Drug distributors

It was more difficult to clearly document changes in criminal activity among organised crime groups, who are thought to have been responsible for the bulk of heroin imported and distributed in Australia, than it was to document changes among heroin users. However, heroin distributors in Australia appeared to be flexible and possibly adapted to the reduction in heroin availability by switching to other drug distribution and/or other crime types. This apparent shift was best documented in NSW, and appeared to differ across the different levels of drug distribution.

As the traffickers of multi-kilogram quantities of heroin ceased to supply to Australia, high level distributors of heroin with links to the sources of supply in South East Asia were reported to have become active in the importation of heroin. Prior to the heroin shortage, high level distribution of heroin, cocaine, and methamphetamine may have been discretely managed by different organised crime groups, but this may have changed to more collaborative links between these groups following the reduction in heroin supply. Among mid level distribution (in NSW), there appeared to be a shift in emphasis from heroin to methamphetamine, ecstasy and cocaine distribution. In SA, similar adaptability was apparent as distributors involved in the 'trade' between the Eastern States and SA of cannabis for powder drugs (heroin, cocaine, and methamphetamine) were reported to switch from heroin supply to ecstasy (MDMA).

Some low level dealers may have shifted in the short term from heroin to other drug distribution around the time of the heroin shortage (cocaine in NSW, methamphetamine in SA). However, the nature of low level drug dealing ('street' level or user/dealer distribution) also appeared to shift following the heroin shortage, with fewer low level dealers (some of these went into treatment, some continued criminal activity as the commodities traded by their employers changed i.e. credit card fraud).

These changes in market dynamics provide both opportunities and threats for law enforcement. As high level distributors acquire heroin in smaller quantities without the assistance of skilled facilitators used in the multi-kilogram imports prior to the shortage, the opportunity of law enforcement to apprehend these less experienced operators may be increased. Conversely, the increase in the numbers of individuals involved in importation (many individuals smuggling small quantities) will require different strategies to those employed to disrupt the multi-kilogram

syndicates. The reduction in the number of street dealers allowed police in some drug markets to identify individuals and groups involved in mid level supply, because drug users accessed these people directly; however, the resources needed to apprehend these distributors were not always available to police. Changes in cocaine markets, in particular increased numbers of injecting drug users purchasing this drug, caused this previously 'hidden' market to open up, resulting in a substantial increase in the ability of law enforcement to arrest suppliers.

The heroin shortage had clear effects upon street drug market visibility, particularly in Sydney and Melbourne, with increases in visibility in the short term, but more covert dealing occurring over the longer term, leading to *decreased* visibility of the drug markets, as dealing appeared to shift to more covert methods. This change has been documented previously in shrinking drug markets (Bowling 1999), and suggests that in the context of a smaller, less well supplied heroin market, distribution occurs in less obvious ways that would therefore require different forms of policing.

Drug law enforcement

In Chapter 5, the likely factors affecting heroin supply in Australia were explicated - the reduction in supply probably most affected by targeting of key high level players (rather than lower level dealers or users). This strategy is probably the most effective way of policing illicit drug markets to effect major changes in, with a relatively smaller cost. Street level policing may have some deterrent or displacement effect and improve public amenity, but drug supply was not significantly affected through policing at this level.

Given that there now appear to be new, smaller scale, heroin traffickers, it may be difficult for law enforcement in that they are now required to monitor possibly greater numbers of persons; conversely, the fact that they are less experienced may be positive for DLE. In the longer term, the ways in which drug importation networks may adapt to improved DLE capability need to be considered. It is possible that the amount of heroin supplied to Australia through small scale importation may increase as new (or, indeed, established) heroin importation groups gain credibility (and skill).

There appears to be a global trend towards multiple drug importation, and indeed, multiple criminal involvement (Pearson and Hobbs 2001), with criminal syndicates increasingly diversifying, and ethnic boundaries breaking down. It is likely that the future will see an increase in flexible entrepreneurial networks, which means that law enforcement (of which DLE is only one part) needs to adapt to these changes. If other heroin markets (such as China) become unconducive to heroin dealing, there could be a need for heroin supplied to other countries to (once again) be dumped elsewhere - and Australia, with its continued demand for the drug, could once again become a target for such supply.

It would appear that good communication between and across levels of law enforcement allows better understanding of drug markets, and of changes to supply in these markets. Swift communication between different levels of policing ensures that appropriate persons are aware of important changes in drug markets, and may assist in the identification and formulation of timely responses to these changes.

The use of a range of indicators to monitor the illicit drug environment may be of greater use to law enforcement than simply the number of arrests or the amount of drugs seized. There are many sources of information about illicit drug use and harms, and these can provide important information about the illicit drug environment to police. Law enforcement at Federal and jurisdictional levels (in particular NSW) have introduced such changes - increased monitoring tools, increased the number and the size of drug units. This represents progressive and positive change.

Independent evaluations of the effects of DLE interventions (both at the local and national level) may be of use in the future, particularly with respect to the ability of independent evaluators to consider the broader context within which changes (or otherwise) are noted.

At the bottom line, it seems probable that criminal groups will attempt to adapt and innovate in responses to increased DLE capacity (Krebs, Costelloe et al. 2003). It would seem unwise to reduce the vigilance currently associated with DLE in Australia, as some groups may take advantage of this should it occur. Continued monitoring and policing of heroin and other drug markets may ensure that a repeat of the increase in supply seen in the 1990s does not recur.

Conclusions

The reduction in heroin supply had numerous implications for law enforcement at all levels. Substitution with psychostimulants and benzodiazepines resulted in local level police dealing with increases in violence and aggression and, in the short term, increases in illicit sex work and acquisitive crime. Drug markets became less overt, following an initial increase in visibility, resulting in decreased community and media pressure on police.

Street level dealers (often user dealers) switched to dealing in other drugs and some moved to dealing in other commodities; some ceased dealing altogether. It was more difficult to document changes in criminal activity among organised crime groups, though the available evidence suggested a shift toward other crime, for example credit card fraud.

The evidence amassed in this report suggests that policing of high level drug markets probably has a greater impact on overall drug supply than street level policing which typically results in market displacement. Finally, good communication across the levels of law enforcement and greater use of existing monitoring systems is essential for better understanding of the drug market at all levels.

Chapter 9: Policy implications of the reduction in heroin supply in Australia

Wayne Hall, Louisa Degenhardt and Peter Reuter

Summary

- Reducing the availability of heroin in Australia appears to have produced significant reductions in the aggregate harm caused by illicit heroin use by substantially reducing fatal and nonfatal overdose. There has probably also been a reduction in the number of regular heroin users, most markedly among younger age groups. More entrenched heroin users probably have *not* ceased heroin use, and some may have also begun using other drugs in a risky fashion. Some younger drug users may have shifted to stimulant drugs.

- The heroin shortage was probably caused by changes in heroin supply to Australia related to Australian drug law enforcement (DLE) rather than to natural events (such as changes in heroin production).

- The most important implication of the heroin shortage is that it is possible *under some circumstances* for law enforcement to substantially reduce the availability of imported drugs like heroin. It is most likely the result of actions aimed at the very high levels of drug trafficking. This suggests the importance of maintaining programs at that high level and of developing a better understanding of how such interventions affect supply.

- It is uncertain to what degree the reduction achieved in heroin supply in Australia in 2000 could be easily reproduced by an act of policy. Such events have been rare in the history of Australian heroin markets and the 2000 event may have arisen from a confluence of events. These included a marked increase in heroin availability in the 1990s followed by a sharp decrease in supply at the beginning of 2001 that was produced by a major increase in Federal resources for DLE in 1998-1999.

- Supply reduction is an important part of drug policy but is important to also have policies that aim to reduce *the* demand for drugs, as well as the harms among those who use drugs despite our best efforts to discourage use.

Introduction

In this chapter, we summarise the results of earlier analyses of the consequences and causes of the Australian heroin shortage before discussing the possible implications for policy. We begin with a summary of the effects of the heroin shortage on heroin use and heroin related harm in Australia. We then consider the likely impact of the Australian heroin shortage on the global heroin market before discussing the possible and probable causes of the heroin shortage. We then consider the implications that may be drawn for drug policy in Australia and other countries.

The effects of the heroin shortage in Australia

The Australian heroin shortage had a number of positive consequences that can be briefly summarised as follows. There was a reduction of 200-300 opioid overdose deaths nationally after the onset of the heroin shortage, by comparison with the number of deaths that occurred in the two preceding years. These averted deaths were concentrated among younger heroin users, producing an even more marked reduction in life years lost from heroin use. There was also a substantial reduction in non-fatal opioid overdoses that were treated by ambulance officers and hospital emergency departments. The latter change, in addition to reducing health care costs attributable to heroin use, may also have benefited users by reducing cognitive impairment and other morbidity related to non-fatal overdoses.

The heroin shortage was followed by a short term increase in drug related crime but in the longer term crime did not increase. There was a short-term increase in treatment seeking among heroin dependent people who had been previously involved in treatment; they were also reported to be more compliant with treatment demands during the height of the shortage than before it. Although it is more difficult to be sure, there was also a probable decline in the number of dependent heroin users, especially younger users, in Sydney. It is also possible that the number of initiates into heroin use may have similarly declined.

On the debit side, the heroin shortage had some adverse effects on older more entrenched heroin users. They were more likely to remain in the illicit drug market and they were also more likely to substitute other drugs for heroin or use other drugs in more hazardous ways. There was, for example, evidence of an increase in the injection of cocaine in the Kings Cross area and increased injection of benzodiazepines elsewhere in Sydney and Melbourne. Key informants and users reported that these changes in drug use led to a deterioration in the health of these older more entrenched users and there may have been more violence around drug markets.

It is not possible to make a detailed accounting of the aggregate effects of the heroin shortage but it is likely that the positive effects outweighed the adverse effects. The main reasons for saying this is that saving the lives of 200-300 young adults and a substantial reduction in expenditure on treatment of nonfatal overdose in the absence of any compensatory increase in the use of other health services would need to be outweighed by a huge increase in the harm experienced by older entrenched heroin users who engaged in more hazardous patterns of drug use. *Prima facie,* then, it would seem to be desirable for governments to pursue policies that reproduced these effects.

What implications then does the reduction in heroin supply documented in this study have for drug policy? What can Australia and other countries learn from this event about how to reduce the public health burden attributable to heroin (and other illicit drug) use? Answers to these questions depend critically upon what we believe was the *cause* of the reduction in supply.

The global implications of the Australian heroin shortage

What is the likely effect of the reduction in heroin supply to Australia on the global heroin market? The answer, in short, is comparatively small because although lucrative compared to other South East Asian markets, the Australian heroin market is very small in size. This can be shown by making some estimates of the size of the Australian heroin market and the global heroin market.

In 1997 it was estimated that there were between 67,000 and 92,000 dependent heroin users in Australia, with a median figure of 74,000 such users; and twice or three times as many "recreational" users (Hall, Ross et al. 2000). Based on the assumptions of Weatherburn and Lind (1995), Hall and colleagues estimated that the weight of heroin consumed in Australia each year ranged between 2.1 and 2.4 tonnes (Hall, Ross et al. 2000).

Higher estimates have been produced by law enforcement agencies. In 1999, Interpol estimated that 3 to 4 tonnes of heroin enter Australia per annum, assuming that this equated to amount consumed (Interpol 1999). In 2001, Australia's NCA used the figures of Hall et al. (2000) as a basis for estimating the total amount of heroin consumed in Australia (National Crime Authority 2001). They estimated that heroin consumption in Australia was between 6.7 and 8 tonnes per year (National Crime Authority 2001).

There are two different methods for estimating the proportion of the global heroin market accounted for by Australian heroin users. These produce similar estimates. First, we can examine what proportion of global heroin seizures are accounted for by Australia. Although seizures reflect law enforcement activity, they also reflect, at least in part, trafficking and distribution (Rossi 2002). The UNDCP reported that in 1999, the total weight of heroin seized throughout the world was 36,200kg (United Nations Office for Drug Control and Crime Prevention 2001). Seizures of heroin in the Oceania region (the majority of which is accounted for by Australia) comprised 1.1% of global heroin (and morphine) seizures.

The second method of estimation assumes that the total of heroin imported is equivalent to total consumed. Using this method, Australia accounts for somewhere between less than 1% (Hall, Ross et al. 2000) and a maximum of 3.3% (National Crime Authority 2001) of total world heroin consumption.

In short, both methods indicate that Australian heroin users consume only a small amount of the global heroin production. Hence, diversion of the heroin previously destined for Australia to markets in Europe, Asia and North America is not likely to produce any easily detected effects on heroin use or heroin related harm in any of these markets.

The probable causes of the Australian heroin shortage

We can be confident about what did *not* contribute to the shortage, namely changes in heroin production in the source country, or changes in the demand for heroin. The following is a necessarily speculative account of factors that may have contributed to the increased availability of heroin at the beginning of the 1990s and the acute onset of shortage at the end of 2000 or beginning of 2001.

In looking for possible causes of the Australian heroin shortage in 2001 we need to look back to changes in heroin supply to Australia that developed during the preceding decade. As documented in Chapter 2 and 4, the 1990s was a time when the importation and distribution of heroin in Australia increased dramatically. This probably reflected a number of factors: increasingly centralised and more efficient criminal syndicates involved in heroin trafficking between source

countries and Australia; and the displacement of South East Asian heroin from the US market in 1994 by the move of Colombian drug cartels into heroin production.

More conjecturally and much less certainly, other factors may have been involved. These include declining resources for drug law enforcement at an Australian Government level (AFP and ACS) in Australia in the mid 1990s; and a lack of political interest in heroin in Australia at this time because of concern about other illicit drugs (such as MDMA or ecstasy) sparked by widely publicised deaths (for example, the MDMA related death of Anna Wood). In NSW (the central point of heroin importation for much of the period), the Wood Royal Commission of 1994-1997, and the consequent reorganisation of specialist police squads, may not only have reduced police corruption but also disrupted drug law enforcement (DLE) efforts in the major Australian heroin market at a time when importation was growing. This may have contributed to a greater increase in heroin use although this possibility is reduced by the fact that heroin use has risen in other countries (e.g. Europe) in the 1990s (EMCDDA 2000) in the absence of well publicised police corruption.

Whatever the causes, there was a large increase in the availability of heroin in Australia from the early to the late 1990s. This was reflected in increased street level heroin purity and decreased price in Sydney and other cities.

The increased availability of cheap and pure heroin in Australia did not guarantee that there would be an increase in heroin use in Australia. Cocaine use declined in the US in the 1990s despite similar changes in cocaine price and purity during the period. What was perhaps unique about Australia in the early 1990s was that heroin availability increased at a time when there was a large population of susceptible youth, with limited exposure to the harms of heroin use (Musto 1987), who were prepared to try the drug, often by non-injecting routes. It had been almost a decade since the previous heroin "epidemic" in the early to mid 1980s had produced concerted media publicity about the risks of heroin use (Musto 1987), and the media was more concerned at that time about MDMA and dance party drugs.

The combination of an increased supply of heroin in the early 1990s and an increased demand for heroin among new users produced a steep increase in recruitment to heroin use among young Australians during the early 1990s. This increased recruitment was especially pronounced among new populations of young people who had no previous experience of heroin and who lived in areas that were outside the traditional drug markets - Cabramatta in Sydney and Fitzroy in Melbourne. The most visible adverse consequences of this increased heroin use (rising overdose deaths and public injecting) began to be noticed in Melbourne in late 1995 and early 1996. By mid 1997, heroin use had become a significant political issue in Australia because of media debate about the most appropriate policy response to these visible consequences of increased heroin use.

This brief summary is intended to make the point that the causes of the increase in heroin supply in Australia are not well understood but were probably manifold, reflecting a convergence of events in source countries, in Australian law enforcement, and the existence of susceptible populations within Australia.

It is equally likely that there were multiple factors contributing to the sharp reduction in heroin supply in late 2000 early 2001. There is some indication that there were gradual decreases in importation of heroin from the source country preceding the shortage. This reduction in heroin supply was probably accelerated by a substantial increase in the efficiency of Australian DLE at Federal and State levels. This was due in part to the successful collaboration between Australian Government law enforcement and law enforcement officials from source and transhipment countries to disrupt major syndicates involved in importing large quantities of heroin into Australia.

These improvements in interdiction probably deterred major heroin syndicates from continuing to import the large amounts of heroin to Australia that they had imported in the preceding period. This success in DLE probably reduced the amount of heroin entering Australia in two ways. First, there was a shift towards importing smaller quantities of heroin and other drugs using more diverse methods of importation by smaller criminal syndicates. Second, heroin that had been previously imported into Australia may have been diverted to other markets, perhaps in Asia.

Policy implications of the Australian heroin shortage

The fact that the Australian heroin shortage had good short to medium term consequences does not guarantee that these effects will continue into the future. Nor does it mean that governments can easily reproduce this outcome in the future. The implications that the shortage has for drug policy depends upon how unique and reproducible the events and circumstances are that produced (a) the increase in heroin use during the early 1990s; and (b) the sharp reduction of heroin supply at the close of the decade.

All knowledgeable commentators, including the UNDCP, are agreed that the Australian heroin shortage was a unique international event at the time of its occurrence (United Nations Office on Drugs and Crime 2003). It is not a unique event in the history of drug policy because there have been other examples of illicit drug shortages although these have been much less well documented than the Australian heroin shortage.

For example, there seems to have been a shortage of illicit morphine and heroin in the US during World War II, because the US supply of licit opiates (which were diverted for illicit use at that time) was fully committed to military use to deal with wartime casualties and illicit trade in pharmaceutical opiates between Europe and the USA was disrupted by the war (Courtwright 1982; Courtwright, Joseph et al. 1990; Jonnes 1996; Massing 2000).

There was another heroin shortage in the US in the early 1970s when concerted action against opium cultivation in Turkey and processing in Marseilles reduced the supply of heroin to the US East Coast (Jonnes 1996; Massing 2000). Efforts to interdict heroin supply were combined with a major federally funded expansion of methadone maintenance treatment (Joseph and Woods 1995; United Nations Economic and Social Council Commission on Narcotic Drugs 2003). The two policies reduced heroin supply and demand for illicit opiates that was reflected in sharply falling crime rates and overdose deaths (Joseph and Woods 1995; Massing 2000).

Even if the Australian heroin shortage is not unique, such abrupt, substantial and sustained reductions in heroin supply are a *very* rare occurrence in the history of illicit drug use in developed countries. This fact cautions against drawing far reaching conclusions about the policy implications of the shortage for Australian drug policy, or drug policy more generally.

Implications for Australian drug policy

A number of possible inferences might be made about Australian drug policy if our analysis of the causes of the increase in heroin supply during the early 1990s is correct. First, if border level DLE to interdict heroin supply is not properly funded, if the efficiency of domestic law enforcement is disrupted by corruption and organisational change (that includes disbanding specialist drug LE squads), and if there is a strong demand for heroin, then criminal groups may take advantage of the opportunity to increase the scale of heroin importation.

Second, against a background of increased heroin importation by a small number of well organised criminal syndicates, increased funding for DLE may be effective in reducing supply. This may be especially true for funding collaboration with law enforcement officials in source and transshipment countries. The effect of this investment may have been to reduce the competitive advantage enjoyed by some criminal syndicates that imported large quantities of heroin into Australia during the early 1990s. In the face of continuing demand for heroin by entrenched dependent users, more effective forms of interdiction may reduce heroin supply, but are unlikely to eliminate it. Given Australia's proximity to heroin source countries, one may expect to see a resurgence of the smaller entrepreneurial suppliers who met the demand for heroin in the 1980s.

Third, the Australian experience with heroin has limited relevance to DLE efforts to reduce the supply of other illicit drugs *within Australian borders*. Heroin is solely sourced from other countries. This is also true of cocaine but it is not true of cannabis or illicit psychostimulant drugs. We cannot therefore assume that the methods that have reduced heroin supply will be successful in reducing the availability of other illicit drugs on the domestic market. This is borne out by the dramatic increase in recent years in the domestic manufacture of illicit methamphetamine, and more recently, of MDMA. This has been undertaken by persons who have sourced precursor chemicals locally and internationally through legitimate channels (Australian Crime Commission 2003).

Fourth, all else being equal, the scale of heroin use will depend upon the availability of new cohorts of potential users willing to use heroin (perhaps with limited experience of the harms caused by heroin use). The coincidence of this with a dramatic increase in heroin availability is what probably fuelled the Australian heroin epidemic of the 1990s. There may be little that a government can do about the facts of demography, but it suggests a need for governments to have early warnings of emerging trends in illicit drug use, such as is provided by the Illicit Drug Reporting System in Australia (Darke, Hall et al. 2000). Data from such early warning systems, if linked to policy processes, may enable more active policies to be pursued earlier in drug epidemics to reduce initiation to drug use, or to reduce the number of users who move from infrequent to dependent use. It may also assist in shifting DLE resources towards reducing the availability of the most harmful types of illicit drugs.

Fifth, achieving a reduction in heroin supply is not a sufficient policy response. The heroin shortage did not affect all heroin users in the same way. More entrenched, disadvantaged dependent heroin users were more likely to shift to riskier patterns of injecting drug use, experiencing greater harm. We therefore need to also fund appropriate demand reduction measures to discourage new users and harm reduction interventions to reduce the harm experienced by existing heroin users.

Sixth, it is uncertain how long the reduction in heroin supply can be sustained, and what its long run effects may be. One plausible hypothesis is that a one to two year gap in the initiation of new heroin users may have a large positive cumulative effect. This should be evaluated in research that monitors trends in heroin use and heroin related harm over the next half decade or so.

Implications for drug control policy in other countries

An event such as the Australian heroin shortage is *prima facie* more relevant to countries in which heroin is a major illicit drug problem. It seems to be less relevant to drug policy in countries with large illicit stimulant markets. Even in the case of heroin markets, there are a number of reasons for being cautious about its relevance.

First, given the history leading up to the reduction in supply, it is unlikely that DLE in another country could achieve as substantial a reduction in heroin supply over so short a period: as outlined earlier, some of this reduction was possibly a fortunate coincidence of events (as the preceding excess of supply was an unfortunate occurrence), some of it related to our border, which others countries may find difficult to replicate.

Second, an event such as this is most relevant to illicit drug markets *that are primarily sourced from other countries*. Australia is unusual in that it is surrounded by a natural barrier - water. This is not the case for most other countries, and may aid attempts at comprehensive border monitoring that are less feasible (if not impossible) for countries with common borders such as the USA (Reuter 1988). Countries with domestically sourced illicit drug markets could not draw many policy conclusions from this event.

Third, no illicit drug shortage is likely to last forever. Criminal syndicates will adapt to the success of DLE in interrupting supply by looking to different markets, different methods of drug importation, and different types of illicit drugs. DLE will in turn adapt to these changes and make some gains. But, as in all forms of human endeavor, this will be a never ending process while there is a demand for heroin and other drugs in developed countries. In order to reduce the harm caused by heroin use, efforts to reduce supply need to be accompanied by efforts to reduce demand for illicit drugs. While drug supply and demand continue to exist, however, efforts need to be made to reduce the harms associated with use.

Conclusions

- Reducing the availability of heroin in Australia appears to have produced significant reductions in the aggregate harm caused by illicit heroin use. Most noticeably, it has reduced heroin overdose deaths, non-fatal overdoses, and crime in Sydney.
- There has also been a substantial decrease in the number of regular heroin users, particularly in the case of younger heroin users. More entrenched heroin users probably have *not* ceased heroin use, and some may have also begun using other drugs in a risky fashion. There may also have been an increase in the number of younger drug users who have shifted to stimulant drugs, as indicated by increased numbers requesting assistance for problematic methamphetamine and cocaine use.
- The heroin shortage was probably caused by changes in heroin supply that were most likely related to Australian law enforcement rather than to natural events like growing conditions, actions against growers and refiners in the source country, or cartel behaviour of importers seeking to raise the price of heroin in Australia.
- Given the dearth of evidence in the last two decades that high level DLE is effective in reducing drug use, the most important implication of the heroin drought is that it is possible under some circumstances for DLE to accomplish a substantial reduction in the availability of imported drugs like heroin. Although it is impossible to be sure about the specific actions that produced the shortage, it is most likely to be the result of actions aimed at the very high levels of drug trafficking. This suggests the importance of maintaining programs at that level and of developing a better understanding of how they affect supply.
- Although reducing heroin supply in Australia probably reduced the aggregate harm caused by heroin use in Australia (a welcomed outcome), it is uncertain how easily such an event can be reproduced by an act of policy in future. This is because it was a rare event in the history of Australian heroin markets that was the result of a confluence of poorly understood events that produced a dramatic reduction in supply after a preceding period of ready availability of very pure heroin in Australia in the early 1990s.

Chapter 10: Research strengths and limitations

Carolyn Day and Louisa Degenhardt

Summary

- There were inherent problems with the retrospective research required in this study.
- Researching an event such as the shortage necessitated an "historical" approach and use of data that existed at the time, rather than data collected to a pre existing plan.
- The available indicator data was sometimes incomplete, unreliable, inconsistent across jurisdictions and often took considerable time to obtain.
- Key informant data offered valuable insights but was subject to recall bias.
- There were significant problems associated with recruitment of IDU and the use of information gained from these interviews. This included recall and selection bias as those recruited were from treatment agencies and not representative of the overall population of IDU.
- Obtaining information about illicit drug markets is difficult particularly as a result of their illicit and often clandestine nature. In light of this, evidence from a wide range of sources was used to infer events.
- The project has highlighted the need for ongoing prospective cohort studies of illicit drug users in Australia.
- Given these concerns, the project demonstrated considerable strengths. These included triangulation of numerous data sources to confirm findings, close collaboration with agencies and individuals providing data to ensure accurate interpretation and use of classified data providing new insights into drug market activity.

Introduction

The heroin shortage was first reported in early 2001, more than 12 months before the current project commenced. Following the necessary instrument development, ethics approval and piloting, data collection commenced in June 2002, some 18 months after the onset of the shortage. This time lag resulted in retrospective research with participants asked to recall behaviour related to an event a considerable time in the past. As a result, data from existing indicators and interviews with key informants were the main sources of information, providing the research with a number of limitations and strengths. These are outlined in the proceeding chapter.

Limitations

Retrospective research

One of the most striking issues about this research is that it is an examination of an event. This necessitated a more "historical" approach to the conduct of the project, and much work was undertaken to attempt to identify sources of information that may have existed *at the time of the event,* rather than (as usually happens) being able to plan which information would be collected.

This retrospective approach to the research meant that a) the research was dependent on the information sources that could be identified; b) in some instances, the sources identified did not provide reliable information, for example, the timeline follow back method trialled with heroin users (Day, Gibson et al. 2004); c) when such information was not accessible, no alternative methods were available; d) identifying available data sources required exhaustive searches of contacts and networks available to the researchers. This was often extremely time consuming and sometimes fruitless; and e) some data was incomplete, had not been analysed by custodians and had not been sourced previously for research purposes; f) considerable time was sometimes required to negotiate mutually acceptable arrangements with government representatives for release and use of data.

Indicator data

Extant indicator data was the primary data source for this study. Reliance on indicator data restricted the type of research questions that could be asked, and did not allow *a priori* planning of research questions. As a result the project had to "make do" with what data were available and the subsequent limitations. This also meant that a number of questions could not be answered with great confidence, for example whether the heroin shortage increased risky injecting practices among heroin users, as was proposed by some commentators (Maher 2002) and key informants (KI).

Many indicators of drug use and related harms are collected differently in different States (e.g. ambulance calls to suspected drug overdoses, see Dietze, Jolley et al. 2003), so there were differences across the States in terms of the way in which research questions could be answered. The amount of data collected and the level of detail that could be obtained (e.g. unit record files) also varied by State. For example, NSW was able to secure a greater number of datasets than the other two States, and SA was most limited. As a result, it was not always possible to make direct comparisons between the jurisdictions.

Key informant data

Key informant (KI) interviews can offer valuable insights into the drug market, but are also subject to a number of limitations (Degenhardt and Day 2004). A number of limitations were particularly relevant to the current study, but many of the issues were addressed during data analysis and, wherever possible, KI reports were triangulated against other forms of data.

The heroin shortage was a well-publicised phenomenon and one that impacted on a number of services; it had also occurred two years prior to KI interviews. These two factors undoubtedly produced a high degree of recall bias amongst KI. Some KI also relied upon information derived from indicator data they routinely collect or access. One of the main problems with this is that the data is often context specific and may not be readily interpreted on its own or without detailed analysis. Reports from KI using data in this way were sometimes incomplete, made out of context, or not relevant to the issue in question.

The reports of KI were sometimes marred by confounding factors, such as events that occurred at or around the time of the heroin shortage (e.g. the Cabramatta Anti-Drug Strategy, see (Collins, Day et al. 2004)). Although a number of KI readily conceded these confounders, others were unaware of their potential impact.

Interviews with drug users

More than 200 current and in-treatment heroin users were interviewed for the project. Initial research revealed a variety of problems with interviewing drug users retrospectively (for more detail on this process see (Day, Gibson et al. 2004)). Plans to interview drug users retrospectively were abandoned because recall was not reliable *enough* to examine changes in the patterns of drug use at the level required for this project (Day, Gibson et al. 2004). Interviews with opioid maintenance pharmacotherapy clients were also problematic; despite concerted attempts at participant recruitment, the study failed to recruit a large sample. The reasons for these problems were numerous and differed across the States (Day, Gibson et al. 2004). The restrictions on access to these persons also led to an unavoidable selection bias: only those remaining in treatment approximately two years following treatment entry were able to be recruited into the study (Day, Gibson et al. 2004). The sample therefore represents a group of "treatment successes", which may be different from heroin users who entered treatment at the time of the shortage but subsequently ceased treatment.

A number of quasi-qualitative interviews were conducted with heroin users, and although these interviews provided a valuable insight into the impact of the shortage on heroin users lives, they were also subject to bias. Data were collected retrospectively; therefore the accuracy of comments was dependent on the participants' recall ability. As with key informants, the data was also likely to be influenced by recall bias, with more dramatic and therefore salient events being recalled more readily.

Obtaining information about illicit drug markets and their organisation

Studying illicit commodities and the people involved in their trade is difficult. Gaining access to high level drug dealers and importers is also difficult - there are few incentives for high level drug dealers and traffickers (including those who have been convicted and incarcerated for such crimes) to discuss their business with researchers. Some research with high level heroin distributors has been carried out in Australia[78]; but it may not have captured those criminally active at the time of the shortage or affiliated with major importation networks of interest to this project. This was concluded by a previous study in the US using a similar methodology (Reuter and Haaga 1989).

[78] Research conducted by Ms Lorraine Beyer and funded by NDLERF; it involved interviews with detainees who had been charged with trafficking or dealing at least 5kg of heroin.

As a result of these limitations, evidence from a range of sources was needed to infer events. These sources included law enforcement documents, briefings and interviews with international law enforcement agencies. The method of research was therefore much more inferential than conventional research.

The need for prospective cohort studies

A number of the limitations outlined above were unavoidable, though rapid research support procedures are necessary if the trends detected by early warning systems are to be adequately investigated (Topp, Degenhardt et al. 2003). Indeed the current project has highlighted the need for ongoing prospective cohort studies of illicit drug users in Australia. There are currently few cohorts of this population and existing cohorts, such as the Australian Treatment Outcomes Study (Ross, Teesson et al. 2003) have specific aims and thus unable to measure the natural history of heroin (and other drug) use among users in Australia.

Potential data obtained from such a cohort would be valuable in providing information on the rates of overdose, blood borne viral infections and other related problems, treatment entry, criminal activity, incarceration and, as Wood and colleagues have demonstrated, the impact of law enforcement efforts. Although ongoing research programs such as the Illicit Drug Reporting System (IDRS) and National Needle and Syringe Program survey are useful in providing estimates of some of these phenomena, they provide cross-sectional data and are designed to answer specific questions, limiting their ability to address many of the issues outlined above.

Strengths

The project has a number of notable strengths. Given the concerns outlined above, data were scrutinised throughout the collection and analysis phase. Existing datasets were used extensively, and in many cases the analyses attested to their utility. The research was undertaken collaboratively with a range of law enforcements and health agencies. In the case of law enforcement this also resulted in the use of classified information, which provided useful data on drug trafficking not usually accessible. Despite the limitations outlined earlier, the triangulation of the various data sources meant more robust conclusions could be drawn around some of the inferred results. These strengths are detailed below.

The use of existing data

A number of existing datasets were useful in determining trends over time, in particular the IDRS. The IDRS provided the necessary data to examine trends over time and demonstrated its strength as both an early warning system and valuable indicator. These were validated by similar trends based on positive urine drug screens from the DUMA project, in those States where DUMA is conducted.

There is an abundance of data collected both Nationally and at the State level that can inform us about drug use and harms. Many of these data sets were brought together for this project, much of which appears in the one report. Moreover the gains made through this study, with regard to the development of protocols for data access and use could be sustained in other studies.

Collaborating with law enforcement and health agencies

This project enhanced collaboration between researchers and law enforcement and between researchers and health agencies. To date there has been limited interaction between law enforcement and research, and throughout the project agencies that had not dealt with researchers previously provided a great deal of cooperation and assistance. Many people with limited experience of the research process were generous in terms of their time, knowledge and data. This enhanced the quality of the research and strengthened opportunities for future work.

The use of classified information

The use of classified information provided an important insight into drug trafficking and production, and gave the project and hence the findings further scope. The cooperation of law enforcement agencies with this process, and their willingness to consider security clearances to enable researchers to view classified material, was appreciated and entailed considerable efforts on their part. The use of multiple sources also meant that reports could be verified.

The use of time series analysis

Statistical models of changes over time that do not adjust for serial correlation can contain significant inconsistency, and can have large errors which lead to erroneous conclusions. The time series analysis methods used in this study were an effective method for analysing such data with evenly-spaced time points. They have been well researched and understood, and provide a wide variety of tools for regression problems. They give some evidence of the *type* of time relationships that affect the data and enable conclusions to be tempered by those findings; and they enable the shape, time delay and length of an effect (in this case, the heroin shortage) to be modelled. These properties have allowed us to describe the specific nature of the effect of the heroin shortage on heroin markets in an unbiased and consistent way.

The modelling process also ensured that the data analyses were comparable between different series (e.g. overdose and arrest), and that the conclusions based on the interpretation of the analyses of multiple time series were valid.

Triangulation of data sources

Despite the limitations associated with the project, the numerous data sets meant that data could be triangulated. This created a number of challenges when data were ambiguous and did not fit well together. These challenges have resulted in thoroughly scrutinised data and a rigorous report.

Conclusions

This study revealed limitations most strongly associated with the use of retrospective research methods, the lack of prospective cohorts of active heroin (and other drug) users in Australia, and by the fact that much of the data used in the study relied on routine collection systems.

Nevertheless, the use of these routine data collection systems clearly demonstrated that there are impressive arrays of data collected within these systems, which are able to provide an indication of trends across a wide number of domains.

Chapter 11: Conclusions

Louisa Degenhardt, Carolyn Day, and Wayne Hall

The heroin shortage followed a period of unprecedented availability in Australia. This level of availability probably reflected a number of factors, including the expansion of high level heroin suppliers to Australia, a relative lack of funding for high level drug law enforcement at the National level, and the disruption of drug law enforcement in NSW that may have allowed some high level suppliers to distribute heroin more easily in NSW at increased purity, decreased price.

The causes of the shortage were most likely manifold, and interrelated. Gradual declines in heroin production in SE Asia, a number of high level arrests and significant seizures of heroin within a short period of time, and the performance of drug law enforcement was improved through relative increases in funding and cooperation across countries and within law enforcement agencies within Australia. These changes may have deterred some high level suppliers to Australia from importing heroin using the previous large scale methods, changing instead to more sporadic, smaller importations.

Regardless of the causes of the reduction in supply, there were clear effects across a wide range of domains. Heroin related harms dropped dramatically, the substitution of other drugs was noted, and harms related to other drugs increased. Short term increases in acquisitive crime were noted, with reports of increased aggression and violence linked largely to psychostimulant use. Health and police services were required to respond to this dramatically altered drug market, with changes in treatment needs and in the behaviour of those involved in criminal activity. There was some evidence that drug distribution networks were altered, with switching of drug types supplied and greater collaboration between organised crime groups in the sourcing and distribution of drugs.

Different groups within the community were affected differently. Older, more entrenched users appeared to have been less affected by the change in supply, continuing to use heroin and other drugs, perhaps in more risky ways. Younger users seemed to have been more affected by the changes, as evidenced by decreases in harms related to heroin, and may have switched to psychostimulant drug use, which may have occurred in the face of an already increasing market for these drug types.

It appeared clear that the reducing supply of heroin had significant effects. However, it did not appear to have been all positives: there needs to be concomitant pushes towards the reduction in the demand for the drug, as well as in the harms associated with the use of heroin and other drugs that continues in the face of reduced supply, but with continued demand for their use.

References

(1997). DEA Congressional Testimony. Subcommittee on East Asian and Pacific Affairs. Washington.

Ali, R., J. Jittiwutikarn, et al. (2000). Tincture of opium and the use of heroin in Adelaide's Vietnamese community. DASC Monograph No. 7, Research Series. Adelaide, Drug and Alcohol Services Council.

Australian Bureau of Criminal Intelligence (1996). Australian Illicit Drug Report 1995/96. Canberra, Commonwealth of Australia.

Australian Bureau of Criminal Intelligence (1997). Australian Illicit Drug Report 1996/97. Canberra, Commonwealth of Australia.

Australian Bureau of Criminal Intelligence (1999). Australian Illicit Drug Report 1997/98. Canberra, Commonwealth of Australia.

Australian Bureau of Criminal Intelligence (2000). Australian Illicit Drug Report 1998/99. Canberra, Commonwealth of Australia.

Australian Bureau of Criminal Intelligence (2001). Australian Illicit Drug Report 1999/00. Canberra, Commonwealth of Australia.

Australian Bureau of Criminal Intelligence (2002). Australian Illicit Drug Report 2000/01. Canberra, Commonwealth of Australia.

Australian Crime Commission (2003). The Australian heroin shortage 1998-2001 - NDARC coordinated research project March 2003: ACC submission re: former NCA holdings March 2003. Canberra, Australian Crime Commission.

Australian Crime Commission (2003). Australian Illicit Drug Report 2001/02. Canberra, Australian Crime Commission.

Australian Federal Police (1980). Drugs in Australia 1979/80. Canberra, Australian Federal Police.

Australian Federal Police (2002). Australian Federal Police, Annual Report 2000/01. Canberra, Commonwealth of Australia.

Behrens, D. A., J. P. Caulkins, et al. (1999). "A dynamic model of drug initiation: implications for treatment and drug control." Mathematical Biosciences **159**(1): 1-20.

Berridge, V., Edwards, G. (1987). Opium and the People: Opiate Use in Nineteenth Century Britain. New Haven, Yale University Press.

Beyer (unpublished research). Excerpt from "A study of the mechanics of cross-border heroin trafficking", Research funded by the National Drug Law Enforcement Research Fund.

Bowling, B. (1999). "The rise and fall of New York murder: zero tolerance or crack's decline?" British Journal of Criminology **39**(4): 531-554.

Caulkins, J. P. and P. Reuter (1998). "What price data tell us about illicit drug markets." Journal of Drug Issues **28**: 593-612.

Collins, L., C. Day, et al. (2004). Impact upon law enforcement operations. The course and consequence of the heroin shortage in New South Wales. L. Degenhardt and C. Day. Adelaide, Australasian Centre for Policing Research.

Collins, L., L. Degenhardt, et al. (2003). Drug supply and distribution in NSW, January 1999 to September 2002. Sydney, National Drug and Alcohol Research Centre, UNSW.

Collins, L., L. Degenhardt, et al. (2003). Drug supply and distribution in NSW, January 1999 to September 2002. Sydney, National Drug and Alcohol Research Centre.

Commission on Narcotic Drugs, U. N. E. a. S. C. (2001). World situation with regard to illicit drug trafficking and reports of subsidiary bodies of the Commission on Narcotic Drugs. Vienna, United Nations.

Commission on Narcotic Drugs, U. N. E. a. S. C. (2003). World situation with regard to illicit drug trafficking: Report of the Secretariat. Vienna, United Nations.

Conroy, E., L. Degenhardt, et al. (2004). Changes in drug treatment. The course and consequence of the heroin shortage in New South Wales. L. Degenhardt and C. Day. Adelaide, Australasian Centre for Policing Research.

Courtwright, D. (1982). Dark Paradise: Opiate Addiction in America before 1940. Cambridge, Mass., Harvard University Press.

Courtwright, D., H. Joseph, et al. (1990). Addicts Who Survived: An Oral History of Narcotic Addiction in America 1923-1965. Knoxville, University of Tennessee.

Cowell, A. (1997). The Opium Kings. A. Cowell, WGBH Educational Foundation.

Darke, S., W. Hall, et al. (2000). The Illicit Drug Reporting System (IDRS) 1996-2000. Sydney, National Drug and Alcohol Research Centre.

Darke, S., W. Hall, et al. (2000). The Illicit Drug Reporting System (IDRS) 1996-2000. NDARC Technical Report 101. Sydney, National Drug and Alcohol Research Centre, University of NSW.

Darke, S., S. Kaye, et al. (2002). "Cocaine use in New South Wales, Australia, 1996-2000: 5 year monitoring of trends in price, purity, availability and use from the Illicit Drug Reporting System." Drug and Alcohol Dependence **67**: 81-88.

Darke, S., L. Topp, et al. (2002). "Heroin use in New South Wales, Australia, 1996-2000: 5 year monitoring of trends in price, purity, availability and use from the Illicit Drug Reporting System." Addiction **97**: 179-186.

Darke, S., L. Topp, et al. (2002). "The injection of methadone and benzodiazepines among Sydney injecting drug users 1996-2000: 5-year monitoring of trends from the Illicit Drug Reporting System." Drug & Alcohol Review. **21**(1): 27-32.

Day, C. (2004). Documenting the heroin shortage. The course and consequences of the heroin shortage in New South Wales. L. Degenhardt and C. Day. Adelaide, Australasian Centre for Policing Research.

Day, C., A. Gibson, et al. (2004). Research methodologies used to obtain retrospective self-reports of the impact of changes in heroin supply on regular users in and out of treatment. Sydney, National Drug and Alcohol Research Centre, University of New South Wales.

Day, C., L. Topp, et al. (2003). "Decreased heroin availability in Sydney in early 2001." Addiction **98**: 93-95.

Degenhardt, L., L. Collins, et al. (2004). Changes in drug crime. The course and consequences of the heroin shortage in NSW. L. Degenhardt and C. Day. Adelaide, Australasian Centre for Policing Research.

Degenhardt, L. and C. Day, Eds. (2004). The course and consequences of the heroin shortage in New South Wales. Adelaide, Australasian Centre for Policing Research.

Degenhardt, L. and C. Day (2004). A note on methods used in the study. The causes, course and consequences of the heroin shortage in Australia. L. Degenhardt, C. Day and W. Hall. Adelaide, Australasian Centre for Policing Research.

Degenhardt, L., V. Rendle, et al. (2004). Estimating the number of heroin users in NSW and Australia, 1997-2002. NDARC Technical Report No. Sydney, National Drug and Alcohol Research Centre, University of NSW.

Degenhardt, L., V. Rendle, et al. (2004). Estimating the size of a drug using population after a marked reduction in drug supply. NDARC Technical Report No. Sydney, National Drug and Alcohol Research Centre, University of NSW.

Degenhardt, L., V. Rendle, et al. (in preparation). Estimating the number of heroin users in NSW and Australia, 1997-2002. NDARC Technical Report No. Sydney, National Drug and Alcohol Research Centre, University of NSW.

Degenhardt, L., V. Rendle, et al. (in press). Estimating the number of heroin users in NSW and Australia, 1997-2002. NDARC Technical Report No. Sydney, National Drug and Alcohol Research Centre, University of NSW.

Degenhardt, L., P. Reuter, et al. (2004). Evaluating factors responsible for the heroin shortage. The causes, course and consequence of the heroin shortage in Australia. L. Degenhardt, C. Day and W. Hall. Adelaide, Australasian Centre for Policing Research.

Degenhardt, L., L. Topp, et al. (2002). "Issues surrounding the detection of a reduction in drug supply: The case of the heroin shortage in Australia, 2001." Bulletin on Narcotics **LIV**(2).

Dietze, P. and J. Fitzgerald (2002). "Interpreting changes in heroin supply in Melbourne: Droughts, gluts or cycles?" Drug and Alcohol Review **21**: 295-303.

Dietze, P., D. Jolley, et al. (2003). The prevalence and selected characteristics of non-fatal opioid overdoses attended by ambulance in Australia. IDRS Drug Trends Bulletin June 2003. Sydney, National Drug and Alcohol Research Centre, UNSW.

Dietze, P., P. Miller, et al. (2004). The course and consequences of the heroin shortage in Victoria. Sydney, National Drug and Alcohol Research Centre, UNSW.

Dolan, K., J. Kimber, et al. (2000). "Drug consumption facilities in Europe and the establishment of supervised injecting centre in Australia." Drug and Alcohol Review **19**: 337-346.

Doyle, A. C. (1983 (1892)). The Adventure of the Beryl Coronet. Republished in The Complete Adventures and Memoirs of Sherlock Holmes. New York, Chatman Avenue Press.

EMCDDA (2000). Annual report on the state of the drugs problem in the European Union. Lisbon, European Monitoring Centre for Drugs and Drug Addiction.

European Monitoring Centre for Drugs and Drug Addiction (2002). Annual Report on the State of the Drugs Problem in the European Union and Norway. Lisbon, European Monitoring Centre for Drugs and Drug Addiction.

Feacham, R. G. A. (1995). Valuing the past … Investing in the future: Evaluation of the National HIV/AIDS Strategy 1993-94 to 1995-96. Canberra, Australian Government Publishing Service.

Fernandez, H. (1998). Heroin. Minnesota, Hazelden.

Fitzgerald, J., S. Broad, et al. (1999). Regulating the street heroin market in Fitzroy, Collingwood. Melbourne, University of Melbourne.

Fitzgerald, J. and A. Hope (1999). Regulating capital: A report on the social and economic impact of injecting drug use in the city of Melbourne. Melbourne, University of Melbourne.

Fry, C. and L. Topp (2002). Illicit drug trends in Australia. Global Workshop on Drug Information Systems: Activities, Methods and Future Opportunities. United Nations ODCCP. Vienna, United Nations**:** 38-41.

Gibson, A., L. Degenhardt, et al. (2003). Global and Australian heroin markets. NDARC Technical Report No. 167. Sydney, National Drug and Alcohol Research Centre, University of NSW.

Gooberman, L. (1974). Operation intercept: the multiple consequences of public policy. New York, Pergamon Press.

Gordon, S. (2001). Technology impacts on drug production in Asia: The role of amphetamines in Asia's growing drug problem. Platypus Magazine: Journal of the Australian Federal Police. **72:** 17-22.

Gray, J. (1995). "Operating needle exchange programmes in the hills of Thailand." AIDS Care **7**: 489-499.

Griffiths, P., L. Vingoe, et al. (2000). "Drug information systems, early warning and new trends: Can drug monitoring systems become more sensitive to emerging trends in drug consumption?" Substance Use and Misuse **35**: 811-844.

Hall, R. (1981). Greed. Sydney, Pan Books Australia.

Hall, W., M. Lynskey, et al. (1999). Heroin use in Australia: Its impact on public health and public order. Sydney, National Drug and Alcohol Research Centre.

Hall, W., J. Ross, et al. (2000). How many dependent heroin users are there in Australia? NDARC Monograph No. 44. Sydney, National Drug and Alcohol Research Centre, UNSW.

Hall, W. D., J. E. Ross, et al. (2000). "How many dependent heroin users are there in Australia?" Medical Journal of Australia **173**: 528-531.

Hando, J., S. Darke, et al. (1998). "The development of an early warning system to detect trends in illicit drug use in Australia: the Illicit Drug Reporting System." Addiction Research **6**: 97-113.

Harding, G. (1988). Opiate Addiction, Mortality and Medicine: From Moral Illness to a Pathological Disease. Hampshire, MacMillan Press.

Harrison, A., P. Christie, et al. (2004). The course and consequences of the heroin shortage in South Australia. Sydney, National Drug and Alcohol Research Centre, UNSW.

Hirst, D. (1979). Heroin in Australia. Melbourne, Quartet Books Australia.

Information Office of the State Council of the People's Republic of China (2000). Narcotics Control in China. Beijing.

Interpol (1999). Heroin World Report 1999. Lyon, France, Interpol.

Jonnes, J. (1996). Hep-Cats, Narcs and Pipe Dreams: A History of America's Romance with Illegal Drugs. New York, Scribner.

Joseph, H. and H. S. Woods (1995). "A point in time: the impact of expanded methadone maintenance treatment on citywide crime and public health in New York City 1971-1973." Archives of Public Health Belgium **53**: 215-131.

Krebs, C., M. Costelloe, et al. (2003). "Drug control policy and smuggling innovation: A game-theoretic analysis." Journal of Drug Issues: 133-160.

Lintner, B. (2002). Blood Brothers: Crime, Business and Politics in Asia. Sydney, Allen and Unwin.

Longo, M., R. Humeniuk, et al. (2002). South Australian Drug Trends 2002: Findings of the Illicit Drug Reporting System. Sydney, National Drug and Alcohol Research Centre.

MacCoun, R. J. and P. Reuter (2001). Drug war heresies: Learning from other vices, times, and places. Cambridge, UK, Cambridge University Press.

MacDonald, M., M. Robotin, et al. (2001). Drug use trends among injecting drug users (IDU): Findings from the Australian Needle and Syringe Program (NSP) Survey, 1995-2000. Drug Trends Bulletin. Sydney, National Drug and Alcohol Research Centre.

MacDonald, M., S. Rutter, et al. (1999). K2 and Kings Cross: Community attitudes to the needles syringe program, discarded syringes and public injection. Sydney, NSW Health.

Maher, L. (2002). "Don't leave me this way: ethnography and injecting drug use in the age of AIDS." International Journal of Drug Policy **13**: 311-325.

Maher, L., D. Dixon, et al. (1998). Running the Risks: heroin, health and harm in South West Sydney. Sydney, National Drug and Alcohol Research Centre.

Makkai, T. and K. McGregor (2002). Research and Public Policy Series Report No. 41: Drug Use Monitoring in Australia: 2001 annual report on drug use among police detainees. Canberra, Australian Institute of Criminology.

Manderson, D. (1993). From Mr Sin to Mr Big: A History of Australian Drug Laws. Melbourne, Oxford University Press.

Massing, M. (2000). The Fix. Berkeley, University of California Press.

Mattick, R. P. and W. Hall (1993). Treatment Outline for Approaches to Opioid Dependence: Quality Assurance Project. Canberra, Australian Government Publishing Service.

McCoy, A. W. (1980). Drug Traffic: Narcotics and Organised Crime in Australia. Sydney, Harper and Row.

McKetin, R. (1999). "Use of RAM to monitor illicit drug use in developed countries: Can rapid assessment result in a rapid response?" Drug and Alcohol Review **18**: 333-335.

Miller, P., C. Fry, et al. (2001). A Study of the Impact of the Heroin "Drought" in Melbourne: Results of the Drug Availability Monitoring Project (DAMP). Melbourne, Turning Point Alcohol and Drug Centre, Inc.

Moor, K. (2001). Drug lords push deadly new deals. Herald Sun. Melbourne: 1 and 4.

Morgan, L. and A. Sleigh (1986). Aboriginal Heroin Addiction in Sydney; Anatomy of a Crisis and a Program for Action. Sydney, Aboriginal Medical Service Co-operative Ltd.

Morrison, S. (1997). "The dynamics of illicit drug transhipment and potential transit points for Australia." Transnational Organised Crime **3**: 1-22.

Moskowitz, J. (1989). "The primary prevention of alcohol problems: A critical review of the research literature." Journal of Studies on Alcohol **50**(1): 54-88.

Munro, J. (1986). Aboriginal drug and alcohol abuse in the inner city area of Sydney. Sydney, Redfern Aboriginal Education Consultative Group.

Musto, D. (1987). The American disease: origins of narcotic control. New York, Oxford University Press.

National Crime Authority (2001). National Crime Authority Commentary 2001. Canberra, National Crime Authority.

Office of the Narcotics Control Board (2002). Thailand Narcotics Annual Report. Bangkok, Office of the Prime Minister.

Pearson, G. and D. Hobbs (2001). Middle market drug distribution. London, Home Office.

Penington, D. (1999). An international perspective on drug use in Australia. Heroin Crisis: Key Commentators Discuss the Issues and Debate Solutions to Heroin Abuse in Australia. K. van den Boogert and N. Davidoff. Melbourne, Bookman Press.

Reid, G. and G. Costigan (2002). Revisiting "The Hidden Epidemic": A Situation Assessment of Drug Use in Asia in the context of HIV/AIDS. Melbourne, The Centre for Harm Reduction

The Macfarlane Burnet Institute for Medical Research & Public Health.

Reuter, P. (1988). "Can the borders be sealed?" The Public Interest **Summer**(92): 51-65.

Reuter, P. and J. Haaga (1989). The organization of high-level drug markets: An exploratory study. A RAND note., National Institute of Justice, US Department of Justice.

Robins, L. N., J. E. Helzer, et al. (1975). "Narcotic use in Southeast Asia and afterward: An interview study of 898 Vietnam returnees." Archives of General Psychiatry **32**: 955-961.

Rolls, E. (1992). Sojourners: The Epic Story of China's Centuries Old Relationship with Australia. St Lucia, University of Queensland Press.

Ross, J., M. Teesson, et al. (2003). Characteristics of heroin users entering three treatment modalities in New South Wales: Baseline findings from the Australian Treatment Outcome Study (ATOS). NDARC Technical Report No. 139. Sydney, National Drug and Alcohol Research Centre, UNSW.

Rossi, C. (2002). "A critical reading of the World Drug Report." International Journal of Drug Policy.

Rouen, D., K. Dolan, et al. (2001). Changes in heroin availability in Sydney, Australia in early 2001. Sydney, National Drug and Alcohol Research Centre, University of NSW.

Royal Canadian Mounted Police (2002). Drug Situation in Canada - 2001. Ottawa, Criminal Intelligence Directorate.

Rumbold, G. and P. Dietze (1999). Illicit drug data trends and data needs in Victoria: Final Report. Melbourne, Drugs and Crime Prevention Committee of the Parliament of Victoria.

Rutter, M. and D. J. Smith, Eds. (1995). Psychosocial disorders in young people: Time trends and their causes. Chichester, John Wiley & Sons.

Rutter, S., K. Dolan, et al. (1997). "Rooms for rent: injecting and harm reduction in Sydney." Australian and New Zealand Journal of Public Health **21**(1): 105.

Shand, F., L. Topp, et al. (2003). "The monitoring of drug trends in Australia." Drug and Alcohol Review **22**: 63-74.

Smith, A. S. and T. Noble (1993). Neddy: The Life and Crimes of Arthur Stanley Smith. Sydney, Kerr Publishing.

Southgate, E., C. Day, et al. (2003). Dealing with risk: A multidisciplinary study of injecting drug use, hepatitis C and other blood borne viruses in Australia. Canberra, Australian National Council on Drugs and the Australian National Council on AIDS, Hepatitis and Related Diseases.

Stewart, D. G. (1983). Royal Commission of Inquiry into Drug Trafficking, Commonwealth of Australia, Governments of NSW, Victoria and Queensland.

Stimson, G., C. Fitch, et al. (1999). "Rapid assessment and response: Methods for developing public health responses to drug problems." Drug and Alcohol Review **18**(317-325).

T Anechiarico, J. J. (1996). The Pursuit of Absolute Integrity: How Corruption Control Makes Governments Ineffective. Chicago, University of Chicago Press.

Topp, L., S. Darke, et al. (2001). Australian Drug Trends 2000: Findings from the Illicit Drug Reporting System (IDRS). Sydney, National Drug and Alcohol Research Centre.

Topp, L., C. Day, et al. (2003). "Changes in patterns of drug injection concurrent with a sustained reduction in the availability of heroin in Australia." Drug and Alcohol Dependence **70**: 275-286.

Topp, L., L. Degenhardt, et al. (2003). "Contemplating drug monitoring systems in the light of Australia's heroin shortage." Drug and Alcohol Review **22**: 3-6.

Topp, L., L. Degenhardt, et al. (2002). "The emergence of potent forms of methamphetamine in Sydney, Australia: A case study of the IDRS as a strategic early warning system." Drug and Alcohol Review **21**: 341-348.

Topp, L., S. Kaye, et al. (2002). Australian Drug Trends 2001: Findings from the Illicit Drug Reporting System (IDRS). Sydney, National Drug and Alcohol Research Centre.

Topp, L. and R. McKetin (2003). "Supporting evidence-based policy-making: A case study of the IDRS." Bulletin on Narcotics **LV (Vols 1 and 2)**: 23-30.

Topp, L. and R. McKetin (in press). "Supporting evidence-based policy-making: A case study of the IDRS." Bulletin on Narcotics.

United Nations Drug Control Program (2001). Global impact of the ban on opium production in Afghanistan.

United Nations Economic and Social Council Commission on Narcotic Drugs (2003). World situation with regard to illicit drug trafficking: Report of the Secretariat. Vienna, United Nations.

United Nations Office for Drug Control and Crime Prevention (1997). World Drug Report 1997. Great Britain, Oxford University Press.

United Nations Office for Drug Control and Crime Prevention (2001). Global Illicit Drug Trends 2001. New York, United Nations.

United Nations Office for Drug Control and Crime Prevention (2001). Global Impact of the Ban on Opium Production in Afghanistan. Vienna, United Nations.

United Nations Office for Drug Control and Crime Prevention (2002). Global Illicit Drug Trends 2002. New York, United Nations.

United Nations Office for Drug Control and Crime Prevention (2002). Myanmar Opium Survey 2002, United Nations.

United Nations Office on Drugs and Crime (1998). Supply of and trafficking in narcotic drugs and psychotropic substances 1996, UNODC.

United Nations Office on Drugs and Crime (2003). Global Illicit Drug Trends 2003. New York, United Nations.

United States Department of State (1993). International Narcotics Control Strategy Report 1992. Washington D.C., Bureau for International Narcotics and Law Enforcement Affairs.

United States Department of State (1997). International Narcotics Control Strategy Report 1996. Washington D.C., Bureau for International Narcotics and Law Enforcement Affairs.

United States Department of State (1999). International Narcotics Control Strategy Report 1998. Washington D.C., Bureau for International Narcotics and Law Enforcement Affairs.

United States Department of State (2001). International Narcotics Control Strategy Report 2000. Washington D.C., Bureau for International Narcotics and Law Enforcement Affairs.

United States Department of State (2003). International Narcotics Control Strategy Report 2002. Washington D.C., Bureau for International Narcotics and Law Enforcement Affairs.

United States Drug Enforcement Administration (2000). The Mexican Heroin Trade. Washington D.C., Office of International Intelligence.

US Department of Justice Drug Enforcement Administration (1997). Drug Enforcement Agency Congressional Testimony. Washington, Drug Enforcement Agency.

US Department of Justice Drug Enforcement Administration (2001). Drug Intelligence Brief: Thailand, country brief. Washington D.C., US Department of Justice.

US Department of Justice Drug Enforcement Administration (2001). Drug Intelligence Brief: The Price Dynamics of Southeast Asian Heroin. Washington D.C., US Department of Justice.

US Department of Justice Drug Enforcement Administration (2002). Drug Intelligence Brief: The Evolution of the Drug Threat: the 1980's through 2002. Washington D.C., US Department of Justice.

US Department of Justice Drug Enforcement Administration (2003). 2001 Domestic Monitor Program: Heroin. Washington D.C., US Department of Justice.

Weatherburn, D., C. Jones, et al. (2001). "The Australian heroin drought and its implication for drug policy." Crime and Justice Bulletin(59).

Weatherburn, D. and B. Lind (1995). Drug Law Enforcement Policy and Its Impact on the Heroin Market. Sydney, NSW Bureau of Crime Statistics and Research.

Weatherburn, D. and B. Lind (1997). "The impact of law enforcement activity on a heroin market." Addiction **92**(5): 557-569.

Westermeyer, J. (1976). "The pro-heroin effects of anti-opium laws in Asia." Archives of General Psychiatry **33**: 1135-1139.

Williams, E. S. (1980). Australian Royal Commission of Inquiry into Drugs. Canberra, The Government of The Commonwealth of Australia and the Governments of the States of Victoria, Queensland, Western Australia and Tasmania.

Wood, E., M. Tyndall, et al. (2003). "Impact of supply-side policies for control of illicit drugs in the face of the AIDS and overdose epidemics: investigation of a massive heroin seizure." Canadian Medical Association Journal **168**(2): 165-169.

Wood, J. J. (1997). Royal Commission into the New South Wales Police Service. 8th International Anti-Corruption Conference, Lima, Peru.

Appendix A: Time Series Analysis

Introduction

Data representing a process over time can show evidence of *serial dependence* which needs to be adjusted when performing statistical analysis. Usually this serial dependence takes the form of a relationship to the data observed in the previous month or the previous year. The main effect of this serial dependence is on the standard errors of estimates of linear predictors in regression models.

This problem applies in the time series data for the heroin shortage project. Two modelling processes were chosen to account for serial dependence while estimating the effect of the shortage: *intervention models* and *linear models*. These models (as they are applied to the event of the heroin shortage) will be discussed in the sections following.

Estimating the effect of the heroin shortage

The heroin shortage was represented as either 1) a permanent effect (step) or 2) a brief effect (pulse). In some instances it was possible to consider a third effect, a *change in slope*, though this was only attempted explicitly for intervention models.

If time is considered as an integer variable between 1 (the beginning of the series) and T (the end of the series), we set the onset of the shortage at t_0, and write the step and pulse effects as:

$$S_t = \begin{cases} 0 & \text{if } t < t_0 \\ 1 & \text{if } t \geq t_0 \end{cases} \qquad (1)$$

$$P_t = \begin{cases} 0 & \text{if } t \neq t_0 \\ 1 & \text{if } t = t_0 \end{cases} \qquad (2)$$

The purpose in both models is to regress the outcome variable Y_t on these predictor variables (or combinations of them) to identify the size and magnitude of their effects, and any delay between the onset of the shortage and their effects. The most effective method for this is the intervention model, though in some instances the linear model is better.

Intervention models

The intervention model considers only the effect of the heroin shortage on the outcome variable and does not explicitly include the time variable *t*. The fundamental equation for this model is:

$$Y_t = \mu_t + f_1(B)S_t + f_2(B)P_t + \varepsilon_t \qquad (3)$$

where

μ_t	is a (time-independent) mean or intercept term
$f_1(B), f_2(B)$	are *transfer functions*
ε_t	are the error-terms in the regression model.

The error-terms may exhibit serial dependence. The transfer functions are used to change the shape and form of the effect of the step or pulse function on the outcome variable. Descriptions of their effects and catalogues of appropriate transfer functions are available in Box and Ljung[79]. In all cases the transfer functions might include a "shift term" which acts to delay the effect of the heroin shortage on the outcome variable. In some analyses one of the transfer functions may be set to zero (due to an inspection of the graph of the response).

The estimation process for this model was:

- Use a linear ordinary-least squares model to estimate the relative significance of the pulse and step terms, and the structure of the transfer functions;
- Estimate the auto-correlation structure (if any) of the error terms;
- Re-estimate the pulse, step and transfer function terms given the known auto-correlation structure.

Goodness-of-fit tests (AIC, SBC) were used to choose between competing models. The main considerations in model-building were:

- Significance of all estimates
- Lowest AIC and SBC statistics
- Parsimony
- Low standard error of all estimates
- Sensible and meaningful results

The time series is required to be stationary in order for the auto-correlation structure of the errors in (3) to be consistently estimated. For this reason the equation (3) was sometimes differenced:

$$Y_t - Y_{t-k} = \mu_t - \mu_{t-k} + f_1(B)\left[S_t - S_{t-k}\right] + f_2(B)\left[P_t - P_{t-k}\right] + \varepsilon_t - \varepsilon_{t-k}$$

or

$$(1-B^k)Y_t = (1-B^k)\left[\mu_t + f_1(B)S_t + f_2(B)P_t + \varepsilon_t\right]$$

where *B* is the backshift operator $BY_t = Y_{t-1}$, giving the differenced series

$$Y_t^* = \mu_t^* + f_1(B)S_t^* + f_2(B)P_t^* + \varepsilon_t^* \qquad (4)$$

This differenced series is chosen to be stationary and can be analysed in the same way as (3). Note that the structure of the step and pulse functions is different when they are differenced. A full discussion of stationarity, auto-correlation and the estimation process is available in Brockwell and Davis[80].

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[79] Box G, Jenkins G (1976).Time series analysis: forecasting and control. San Francisco: Holden-Day.

[80] Brockwell P, Davis R.(2002). Introduction to time series and forecasting, 2nd ed. New York : Springer-Verlag.

A non-constant term in (4) indicates that the series is increasing or decreasing over time. If this was the case and there was evidence (by inspection) that the slope of this process had perhaps changed at the time of the heroin shortage, a second simple step function was inserted into (4), again occurring at the time of the shortage. This step if significant would represent a change in the magnitude of the constant term in (4), and thus a change in slope in the undifferenced series (3). This slope was only tested in situations where it was considered likely to have an effect, since its inclusion increases the prediction variance and reduces the significance of all parameter estimates.

For well-fitting models with significant estimates, results were reported as:

1) A table of estimates;
2) A plot of the transfer function (in the undifferenced series) with the observed values for comparison, and a vertical line at the point of the heroin shortage;
3) Any shifts in the onset of the shortage (representing delayed effects).

Step and pulse terms were also reported as the percentage change in level relative to either the last observation before the shortage (for increasing or decreasing series) or the pre-shortage mean (for static series).

Intervention models were fit using SAS v 8.2.

Linear models

There were several instances where the intervention model was not appropriate:

- Poisson distributed errors where transfer functions could not be estimated;
- Increasing or decreasing series which required several different intervention models to adequately describe them.

In these cases a linear model was fitted using generalised least squares. Most such models required a set of natural spline smoothers with a step term for the heroin shortage. In this case the spline coefficients could not be interpreted, but the step could still be interpreted as a standard regression term. The fitting method for linear models was:

- Fit the expected model using ordinary least squares regression;
- Estimate the auto-correlation of the errors;
- Re-estimate the model using generalised least squares and the estimated error structure.

Standard model-building methods were used here (i.e. remove non-significant terms, re-estimate the model, test goodness of fit and choose the simplest model with the most appropriate residual structure). The same output was provided as for the intervention models. Plots for this output were the fitted values with the observed values.

Where natural spline smoothers were used several models had to be built. These may have included:

- Several models with different numbers of equally-spaced knot points;
- A model with basis points chosen by the researcher.

The second type of model was required where the point of the heroin shortage did not coincide with equally-spaced knot points and the post-shortage behaviour was very different to the pre-shortage behaviour. Model fitting for these types of smoothers is described in Venables and Ripley[81].

Linear models were fit using S-Plus 6.1.

Auto-correlation in Poisson processes

Auto-correlation can also occur in Poisson processes and other non-Gaussian random variables, but is more difficult to detect[82]. Data series drawn from a Poisson process (such as overdose deaths) can be treated as non-linear models with an auto-correlated latent process affecting the mean. It has been shown that estimates of auto-correlation in the observed series will underestimate the magnitude of the auto-correlation due to the latent process. Computational methods have been developed for estimating the auto-correlation of the latent process[83] and these were used here on the assumption of an observation-driven model[84]. Where auto-correlation was minimal or absent, generalised linear models were used to regress observations on time as these are simpler to fit and the parameter estimates easier to interpret. Auto-correlation was estimated in S-Plus 6.1 using procedures developed by William Dunsmuir (School of Mathematics, University of New South Wales). Generalised linear models were also fitted in S-Plus 6.1.

Because the processes developed for count data are still experimental and the model-building process less clearly described than for Gaussian data, use of these new computational methods was restricted to the study of overdose deaths in Victoria and NSW. If other series showed evidence that they could not be estimated by Gaussian methods (such as negative confidence limits on predicted values) the series were not modelled.

The problem of multiple non-random shocks

The time series models used for the heroin shortage present the shortage effect as a brief or ongoing non-random shock affecting the data series at an identifiable point. Some of the series showed some evidence of another non-random shock at an earlier point in time. It is possible that there are more than one such non-random shock and that some of these are not identifiable by visual inspection. Additional non-random shocks identified by visual inspection were generally *not* modelled except in the case of the fatal heroin overdose deaths and ADIS heroin-related calls, where spline smoothers were used. These non-random shocks were not modelled for other series because there was no prior information to suggest their existence or the cause of the shock, and as a consequence there was no basis on which to suggest a preferred modelling process. The overdose deaths and ADIS series were modelled with spline smoothers because they were considered to be important series and because the smoothing process did not make any assumptions about the structure of this previous shock. Spline smoothers may not be the best-fitting model in the presence of these random shocks (for example, piecewise linear regression might fit better) and so were not used as a general method across all series which might be judged to have such effects. Other series with possible evidence of non-random shocks were not modelled if it was considered possible that the presence of these shocks would affect the results of the standard intervention methods.

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[81] Venables, W, Ripley R (2002). Modern applied statistics with S, 4th ed. New York: Springer-Verlag

[82] Davis, R, Dunsmuir W, Wang Y. On autocorrelation in a Poisson regression model. Biometrika (2000): 87(3), 491-505.

[83] Davis, R, Wang, Y, Dunsmuir, W (1999). Modeling Time Series of Count Data. In: Asymptotics, Nonparametrics and Time Series, Ed. Subir Ghosh, New York:Marcel-Dekker.

[84] Davis, R, Dunsmuir W, Streett, S. Observation-driven models for Poisson counts. Biometrika (In Press).

The initial model selection process and type-I error

In order to minimise the type I error associated with the analyses, a process of model selection was developed which minimised the number of significance tests required. This was:

1. Examine the data graphically for signs of an effect. An effect had to be clearly visible and physically significant in order to qualify for modelling.
2. Test for the delay between the onset of the shortage and the effect. If the effect was significant the delay had to be less than 3 months for the modelling process to continue. For example, a sudden change in level occurring 6 months after the shortage was eliminated from further modelling.
3. Fit the model using a significance level of 0.01 for all estimates and 0.05 for portmanteau tests for auto-correlation. In instances where one coefficient of a transfer function was of significance between 0.01 and 0.05 but all other coefficients were highly significant (<0.0001), the model would be retained if the effect being modelled was significant.
4. Reject the model if it required any of the following:
    a. Auto-correlation terms at unusual lags unless those lags had a clear theoretical explanation;
    b. Auto-correlated residuals (at the 0.05 level) due to an inability to adequately model them;
    c. Terms of higher than 2nd order in either numerator or denominator of the transfer functions.
5. Narrow standard errors. Specifically, the 95% confidence interval about the post-shortage data had to be clearly separate from the pre-shortage data series for at least a large part of the data set. In most cases this was equivalent to requiring a simple model with few terms.
6. A clear and sensible theoretical explanation for the behaviour of the model.

If the model met all of these conditions then it would be retained as the preferred model. This process enabled the minimum number of significance tests to be conducted. Type 1 error could then be estimated as $1-(0.99)^k$ where k is the number of *intervention terms* tested. Given the large number of models tested this still leads to a potentially very high type 1 error, which should be considered when assessing the importance of the various models presented here.