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Benzodiazepine and pharmaceutical opioid  
misuse and their relationship to crime

An examination of illicit prescription drug markets in  
Melbourne, Hobart and Darwin

Monograph Series No. 21

Funded by the National Drug Law Enforcement Research Fund  
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# **Benzodiazepine and pharmaceutical opioid misuse and their relationship to crime**

**An examination of illicit prescription drug markets in Melbourne, Hobart and Darwin**

## **NATIONAL OVERVIEW REPORT**

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an initiative of the National Drug Strategy**

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## Abbreviations

A & E	Accident and Emergency
ABCI	Australian Bureau of Criminal Intelligence
ABS	Australian Bureau of Statistics
ACC	Australian Crime Commission
ACID	Australian Criminal Intelligence Database
ACPR	Australasian Centre for Policing Research
ADCA	Alcohol and Other Drugs Council of Australia
AIC	Australian Institute of Criminology
AIHW	Australian Institute of Health and Welfare
AMA	Australian Medical Association
ANSAP	Australian Needle and Syringe Program
AODPTS	Alcohol and Other Drugs Program Treatment Services
APSU	AIDS Prevention and Support Unit
ATSI	Aboriginal/Torres Strait Islander
BOCSAR	Bureau of Crime Statistics and Research
CBD	Central Business District
CBO	Community Based Order
CI	Confidence interval
COTSA	Clients of Treatment Services Agencies
DHS	Department of Human Services
DRUMS	Drug Monitoring System
DUCO	Drug Use Careers of Offenders
DUMA	Drug Use Monitoring Australia
DUSC	Drug Utilisation Sub-Committee
HIC	Health Insurance Commission
ICO	Intensive Corrections Order
IDRS	Illicit Drug Reporting System
IDU	Injecting Drug User/s (used interchangeably with PWID)
INCB	International Narcotics Board
IV	Intra-venous
KI	Key Informants
LEAP	Law Enforcement Assistance Program
LGA	Local Government Area
MAS	Metropolitan Ambulance Service
MDID	Major Drug Investigation Division
MMT	Methadone Maintenance Treatment
MSO	Most Serious Offences

MTIR	Medical and Toxicological Information Review
NDARC	National Drug and Alcohol Research Centre
NDLERF	National Drug Law Enforcement Fund
NDSCWPPDA	National Drug Strategy Committee Working Party on Prescription Drug Abuse
NDSHS	National Drug Strategy Household Survey
NH&MRC	National Health and Medical Research Council
NHS	National Health Survey
NSP	Needle and Syringe Program
NSW	New South Wales
NT	Northern Territory
ORA	Other Route of Administration
PBS	Pharmaceutical Benefits Scheme
PWID	People Who Inject Drugs (used interchangeably with IDU)
QLD	Queensland
RPBS	Repatriation Pharmaceutical Benefits Scheme
SA	South Australia
SACACWG	South Australian Coalition Against Crime Working Group
SCAU	Strategic Crime Analysis Unit
SD	Standard Deviation
SDS	Severity of Dependence Scale
SHARPS	Southern Hepatitis/HIV/AIDS Resource and Prevention Service
SPSS	Statistical Package for the Social Sciences
SUSDP	Standard for the Uniform Scheduling of Drugs and Poisons
TAS	Tasmania
TGA	Therapeutic Goods Administration
TUPI	Temazepam Injection Prevention Initiative
VAED	Victorian Admitted Episodes Dataset
VDHS	Victorian Drug Household Survey
VDJ	Victorian Department of Justice
VIC	Victoria
VIFM	Victorian Institute of Forensic Medicine
WA	Western Australia
WRAP	Western Region AIDS & Hepatitis Prevention (now Health Works)
YTC	Youth Training Centre

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## Executive summary

This National Overview Report presents a review of the literature, an overview of study methodology, key findings and jurisdiction-specific discussion points. It should be read in conjunction with each of the companion Jurisdiction Reports for Melbourne (Smith et al. 2004), Hobart (Bruno, 2004) and Darwin (O'Reilly et al. 2004), which contain detailed data content, and discussion of the findings and issues of local relevance to those study sites.

This report avoids duplication of the data content of each Jurisdiction Report, in preference for summary and discussion of the main important findings and themes that have emerged from this comprehensive study. Specifically, the report focuses upon:

- Salient issues that have emerged from the review of relevant national and international literature (current knowledge and gaps in the literature);
- Comparison of key findings across study sites (descriptive and explanatory/statistical comparisons concerning market characteristics, diversion and links to crime); and
- Discussion of the implications of these findings for law enforcement and health services (including implications for front line workers, options for intervention within the market, and future directions).

## Background and rationale

The National Drug Law Enforcement Research Fund (NDLERF) sought tenders in 2002 for research to enhance law enforcement sector understanding of the structure and functioning of illicit drug markets in Australia – with a particular focus on illicit markets for prescription pharmaceuticals namely benzodiazepine and pharmaceutical opioids, their misuse and impact on crime in Victoria, Tasmania and the Northern Territory.

One important area of investigation indicated relates to the law enforcement implications of benzodiazepine and pharmaceutical opioid diversion and misuse<sup>1</sup>. The 'drugs and crime' literature is of questionable generalisability beyond the illicit drugs (e.g. heroin, cocaine, amphetamine) upon which it has largely been developed. A number of important research questions concerning the relationship between prescribed pharmaceutical misuse and crime remain unanswered.

A second important area of investigation indicated relates to the health implications of benzodiazepine and pharmaceutical opioid diversion and misuse through injection. A large international literature exists on the public health implications of prescription pharmaceutical diversion<sup>2</sup> and injecting, with reports from a number of countries concerning associations between misuse, significant health harms and dependence. However, there is less available data concerning the detailed dimensions and characteristics of such illicit markets or how law enforcement and public health concerns may intersect in these settings when contemplating responses to prescription pharmaceutical diversion and misuse. These issues warrant further investigation.

<sup>1</sup> For the purpose of this study 'misuse' is defined as the use of a prescribed drug in harmful quantities or in quantities other than the prescribed dosage. 'Illicit use' (or 'non-medical use') of prescribed drugs is defined as use of a drug in a way not prescribed and/or not medically condoned; e.g., injecting of oral preparations, combining a prescribed drug with an illicit drug, use of multiple drugs/doses of a drug without medical supervision. (see Zacny et al. 2003).

<sup>2</sup> 'Pharmaceutical diversion' has been defined as the channeling of licit controlled substances or other pharmaceuticals for illegal purposes or abuse, including through: theft, burglary and robbery; tampering; stealing, forging and counterfeiting prescriptions; doctor-shopping; indiscriminate prescribing; and illicit sales (Alliance of States with Prescription Monitoring Program, <http://www.nascsa.org/monitoring.htm>)

A necessary step in devising appropriate responses around issues such as benzodiazepine and pharmaceutical opioid diversion and injection is to gather reliable local evidence regarding the nature and extent of the problem. Stakeholder perspectives are also of core importance when the responses may necessitate incorporation of regulatory interventions. In this regard the current lack of understanding of a number of key issues of relevance to benzodiazepine and pharmaceutical opioid diversion and crime links reduces the capacity for developing informed interventions.

A comprehensive literature review was conducted in order to examine key issues of relevance to the study aim of exploring the relationship between benzodiazepine and pharmaceutical opioid use and crime. The salient issues that emerged from this review of national and international literature (including current knowledge and gaps) were used to inform the study focus around the main themes of interest, including: characteristics of illicit benzodiazepine and pharmaceutical opioid markets; diversion and links to crime; implications for law enforcement and other front line workers; and appropriate interventions.

Given that one of the primary goals of the research was to consider appropriate interventions in response to burgeoning illicit markets for prescription pharmaceuticals (in this case benzodiazepines and pharmaceutical opioids), in attempting to examine the hypothesised relationship between these substances and crime, what we focus upon is the antecedents, mechanisms and potential impact of diversion of these substances. It is a practical focus which optimises the contribution this study makes to the law enforcement sector's understanding of illicit benzodiazepine and pharmaceutical opioid use. It also highlights the implications for police and other front line workers (e.g. accident and emergency staff, ambulance officers and health/youth workers), and for appropriate interventions to address these concerns in the three select Australian jurisdictions (Victoria, Tasmania, Northern Territory).

### **Study purpose and aims**

The purpose of this study was to contribute to the law enforcement sector's understanding of the relationship between benzodiazepine and pharmaceutical opioid use and crime, and the impact of this in three select Australian jurisdictions (Melbourne, Hobart, Darwin) where there is evidence of illicit prescription pharmaceutical markets. In keeping with the current Australian National Drug Strategy, which incorporates a policy of harm minimisation through supply, demand and harm reduction strategies (Australian Government Department of Health and Ageing, 2004), the approach adopted by the study team in the current research was to examine law enforcement and public health aspects of illicit markets for benzodiazepine and pharmaceutical opioid issues. While the primary focus of the study remains on law enforcement interests in relation to licit and illicit benzodiazepine and pharmaceutical opioid markets, where warranted these are discussed in relation to the broader public health implications of the range of interventions potentially available as a response to the markets being examined, and their impact.

The primary aims of the study therefore were to:

- 1) Gain a greater understanding of illicit benzodiazepine and pharmaceutical opioid market-place dimensions and characteristics.
- 2) Investigate the hypothesised relationship between benzodiazepine / pharmaceutical opioid misuse and crime.
- 3) Explore the implications for police and other front line workers (e.g. accident and emergency staff, ambulance officers and health/youth workers) of emergent illicit markets for benzodiazepine and pharmaceutical opioids.
- 4) Consider appropriate interventions to address both the law enforcement and health impacts of benzodiazepine and pharmaceutical opioid misuse.

A secondary and broader aim of the research was to examine the nexus between prescribed pharmaceutical misuse, illicit prescription pharmaceutical markets, crime and health harms.

An extensive set of research questions was developed by NDLERF and specified in the RFT 04/02 tender specifications under the five key themes of: market characteristics; diversion; links to crime; implications for police and other front line workers; and interventions (these appear in Appendix A). A core aim of the early stages of the proposed study was to further refine and prioritise this list.

## Study methodology

The study comprised multiple methods that were replicated in the three target jurisdictions of Victoria (Melbourne), Tasmania (Hobart) and the Northern Territory (Darwin and Alice Springs). The research was conducted in four stages over a 14 month period commencing April 2003 and concluding in June 2004.

### Stage one

The purpose of Stage one of the study was to serve a formative function for the main body of the research through the methods of literature review and key informant interview. A total of 33 key informant interviews were conducted with law enforcement personnel in each study site (n=13 Melbourne, n=11 Hobart, n=9 Darwin and Alice Springs). Stage One key informant interviews focused on participant experiences and perceptions of illicit benzodiazepine and prescribed opioid markets as well as the nature of operations, policing practices and nature of contacts. Law enforcement key informants were also asked to rate the importance of each NDLERF research question for law enforcement interests.

### Stage two

In recognition of the importance of people who inject drugs (PWID) as a source of sentinel data on the operation of drug markets and associated drug-related behaviours, a face-to-face survey of PWID was conducted in Melbourne (n=102), Hobart (n=100) and Darwin (n=101). The survey included core questions concerning: demographic details, drug use history and current benzodiazepine and pharmaceutical opioid patterns; source of pharmaceuticals; market characteristics; recent involvement in criminal activity; health and other impacts of pharmaceutical opioid and benzodiazepine use; and perceptions of the potential impact of substantially changed availability of such products on the illicit market.

### Stage three

A diverse range of national level, secondary indicator data was sourced from law enforcement and health sectors to provide an additional perspective on the issues under focus, and to assist the study team in interpreting the relationships between crime and prescription pharmaceutical use and misuse. Available national data was collected under the broad categories of indicators of use (e.g. population and sentinel group surveys, prescribing trends), crime and police activity (e.g. doctor-shopping, seizures/detections, pharmacy thefts), and mortality and morbidity (e.g. overdose, treatment presentations).

### Stage four

The purpose of Stage Four of the study was to facilitate interpretation of the data collected in the preceding study stages, and perform an added monitoring function through replication of core components of the Stage Two survey. A further series of face-to-face interviews were conducted with a total of 147 regular pharmaceutical opioid or benzodiazepine injectors (Melbourne, n=50;

Hobart, n=47; Darwin, n=50). In-depth qualitative key informant interviews were also conducted with 69 health and law enforcement sector professionals in order to examine issues arising from the earlier research stages in greater depth (Melbourne, n=28; Hobart, n=12; Darwin and Alice Springs, n=29).

## Key findings and implications

The key findings presented in this report are drawn from the Jurisdictional Reports from Victoria (Smith et al. 2004), Tasmania (Bruno, 2004) and the Northern Territory (O'Reilly et al. 2004). The following summary of key findings is structured according to the main study themes of market characteristics, diversion and links to crime, implications for police and other front line workers, and interventions.

### Market characteristics

- Considered together, the study findings present a picture of active illicit markets in Melbourne, Hobart and Darwin for benzodiazepines and pharmaceutical opioids. The current study provides important insights into the mechanisms by which these markets operate, and has also highlighted some of the consequences of this.
- Melbourne has an active illicit market for benzodiazepines, buprenorphine, and increasingly morphine, and that this may partly be understood with reference to the reduction in supply of this city's dominant illicit drug – heroin.
- Hobart and Darwin (including Alice Springs) do not have a dominant heroin market and the study findings suggest that active illicit pharmaceutical markets exist primarily for methadone and morphine (Hobart) and morphine (Darwin). The patterns and trends in prescription drug misuse do not seem to be influenced by heroin in these jurisdictions.
- The pre-existing large licit supply for schedule 4 (prescription only medicines) and schedule 8 (controlled drugs) drugs is a key environmental factor in explaining how illicit markets may develop to support demand for use. Another factor is the predominance of poly-drug use patterns and the fact that many benzodiazepines and pharmaceutical opioids are routinely prescribed to people who inject drugs (PWID), particularly those who are heroin/opioid dependent, to alleviate a wide range of symptomology that may be associated with that use (e.g. anxiety, depression, insomnia, drug withdrawal, pain management). Other factors that may contribute to growth of illicit prescription drug markets include: increasing demand for prescription drugs for non-medical use; licit drug market instability; availability, affordability and stability of prescription drugs; potential profits from illicit prescription drug selling; reduced risk in supplying and possessing prescription drugs relative to illicit drugs; and the impact of new technology in facilitating prescription fraud and availability of illicit pharmaceutical supply.
- Injection of benzodiazepines and pharmaceutical opioids is entrenched among some groups of PWID. For many in Melbourne this appears to be a response to the altered heroin supply, whereby certain benzodiazepines (e.g. temazepam) and pharmaceutical opioids (e.g. buprenorphine, morphine) are used as supplements to the heroin being used, and/or as a substitute for heroin in the current market environment (where heroin may be less available, of poorer quality, and more expensive relative to the various prescription pharmaceuticals available).

- In contrast, the groups of PWID who participated in the Hobart and Darwin arms of the current study described local illicit markets where, although heroin was still the preferred drug, it was not readily available in comparison to benzodiazepines and pharmaceutical opioids. For Melbourne participants, the drug most used was heroin (Smith et al. 2004), for Hobart respondents it was methadone (Bruno, 2004), and for participants in Darwin it was morphine (O'Reilly et al. 2004).
- The illicit opioid market of Darwin was characterised as being dominated by morphine (MS Contin), where users control distribution and use, rather than organised criminal syndicates. The NT study team contend that this has resulted in gains for the health of users, and benefits for emergency services and the criminal justice system that may continue if the local market remains dominated by pharmaceutical opioids rather than heroin. Prescription morphine in the NT is viewed by some as being protective against the re-emergence of a heroin trade and its associated harmful impacts.
- In the Hobart study, benzodiazepine use was typical among PWID cohorts surveyed (particularly diazepam, alprazolam, oxazepam, nitrazepam and temazepam), as was pharmaceutical opioid use and injection (mostly morphine sulphate – MS Contin, Kapanol), methadone (syrup, Physeptone), and oxycodone (OxyContin). The illicit pharmaceutical market in Hobart was characterised as fluid with a high degree of resilience amongst consumers reported in relation to changes in availability of any one drug in particular. The Tasmanian illicit drug market is highly distinct from those in other jurisdictions, and may thus follow an idiosyncratic response to a substantial market change in illicit availability of particular pharmaceutical products.
- The identification in the current study of poly-drug use as a feature of illicit prescription pharmaceutical markets (i.e. benzodiazepines and pharmaceutical opioids) is an important finding, as it has implications for how we understand illicit drug markets, perhaps suggesting a need for the development of more sophisticated drug market typologies – allowing for description of the implications of different drugs interacting in the market.
- Poly-drug use patterns within illicit drug markets raise a number of issues of relevance for law enforcement, including: on-selling of prescribed pharmaceutical drugs to fund/subsidise purchase of illegal drugs; creation of complex dynamics in already multi-determined illicit markets. The finding perhaps suggests possible behavioural / public order issues associated with prescription pharmaceutical intoxication (e.g. acquisitive crimes, crimes committed under the influence of pharmaceutical drugs, driver safety).

### **Diversion and links to crime**

- One of the primary aims of the research was to consider appropriate interventions in response to burgeoning illicit markets for prescription pharmaceuticals (in this case benzodiazepines and pharmaceutical opioids). Hence, in attempting to examine the hypothesised relationship between their use and crime, what we ultimately focus upon is the diversion of these substances (including the ways in which licit products are diverted into illicit markets, used illicitly, and the related impact).
- A consistent finding across all study sites was the low level of reported organised criminal activity related to the procurement of prescription pharmaceuticals. The findings show that certain benzodiazepines and pharmaceutical opioids are diverted to the black market and may be sold for considerable profit relative to their pharmacy dispensed prescription cost. However, reports from the current drug user participants of the study (corroborated by Key

<sup>3</sup> 'While the acquisition of pharmaceutical drugs by users is highly organised in the sense of being a regular, planned behaviour involving networks of friends and other contacts, there was little evidence of the involvement by organised criminal networks in the distribution of these drugs.' (O'Reilly et al. 2004).

Informant reports) indicated that supply to the illicit benzodiazepine and pharmaceutical opioid markets in Melbourne, Hobart and Darwin appeared to be driven mainly by the small-scale diversion (from a number of sources, including legitimate prescriptions, doctor-shopping, forged prescriptions) rather than through organised<sup>3</sup> burglary/thefts from pharmacies or point of wholesale/manufacture, or via other sources (e.g. Internet pharmacy, importation, inter-jurisdictional trafficking).

- Prescription drugs are reportedly relatively easy to obtain on the street, and the findings suggest they are available from a diffuse network of users, friends of users, dealers and suppliers, some of who also sell other illicit drugs (e.g. heroin, methamphetamine, cannabis).
- The likelihood of future tightening of regulation of these products, increasing prevalence of use (and perhaps dependence) – which may serve to create inflated unit cost prices (per tablet, per script) at the retail illicit market level – may in turn pose a supply challenge that may be solved either through (a) diversion of domestic supply (via prescription shopping, pharmacy thefts, on-selling from holders of legal prescriptions, formation of cooperative groups or ‘syndicates’); or (b) diversion of international supply (e.g. unregulated internet pharmacy sources, importation). Ongoing monitoring of illicit supply activity in these areas is warranted.
- The findings of the current study showed a marked discrepancy between indicator data on NT morphine consumption trends (demonstrating reduced licit availability) and surveys of drug users (indicating easy, stable availability). Possible explanations include: diversion of international supply to the Australian illicit market; some people in the NT may access markets in other jurisdictions for morphine; organized accumulation of large stockpiles; or reserves of morphine.
- The findings suggest there may be some relationship between the use of prescription drugs, dependence and some criminal activity. For instance, shoplifting, property crime, drug dealing, violence, intoxicated driving, disinhibited and aggressive behaviour, and feelings of invincibility were attributed to the drugs, in particular benzodiazepines. On the other hand, current Methadone Maintenance Treatment (MMT) may mitigate against the commission of crime. Besides criminal behaviour, other negative consequences of prescription drug use were considered to be injecting harms, dependence and overdose, as well as social impacts such as relationship breakdown, effects on mood, anxiety and irritability.
- That most users who participated in the survey components of the study in each jurisdiction were currently sourcing and using a variety of substances (in addition to the prescription pharmaceuticals that were the focus of the study), made the task of deriving clear associations between specific ‘drugs and crime’ difficult.
- In the NT, ‘the availability of prescription morphine was seen as a harm reduction measure whereby opioid users could access the drug from licit sources on a regular basis, have other health issues identified and addressed, and not engage in criminal activity to obtain the funds to purchase drugs in the illicit market’ (O’Reilly et al. 2004). O’Reilly and colleagues (2004) contended that on the basis of previous restrictions in the NT on morphine prescribing, any future such restrictions ‘would shift more people into the illicit trade, leading to reduced health outcomes, increased crime and corruption...[and]...also result in drug substitution, including illicit drugs such as methamphetamine, not eradication of drug use.’

### **Implications for police and other front-line workers**

- The data collected on law enforcement perspectives and experiences around the issue of prescription pharmaceutical misuse and related harms provide some important insights into the limitations of attempts to police illicit drug markets for licitly prescribed pharmaceuticals such as benzodiazepines and opioids.
- A consistent finding across all study sites was the perspective of law enforcement personnel that the policing of illicit pharmaceutical opioids and benzodiazepine markets posed

particular challenges. Key issues identified for front line policing in this regard included: (1) the difficulties in distinguishing between illicitly and licitly held prescription pharmaceuticals (pharmaceutical identification); (2) becoming aware of relevant scheduling and legislative considerations; (3) developing an understanding of psychopharmacology of benzodiazepines and prescribed opioids, interactions with illicit drugs, and implications for behaviour; (4) the apparent weaker relationship between prescription pharmaceutical use and crime than for illicit drugs; and (5) similar policing responses were required regardless of whether intoxication is due to use of licit or illicit drugs.

- Of special note was the development by Victoria Police of the field manual / investigation guide to pharmaceutical drug trafficking and use, together with education and training for recruits: *'An Investigation Guide to Pharmaceutical Drug Trafficking and Use'* (Victoria Police 2004). The wider distribution of such resources may be a useful mechanism for addressing these challenges. The outcomes of the evaluation of this initiative will be received with great interest.
- In the context of plentiful supply through licit prescription sources, and patterns of polydrug use of both licit and illicit drugs, the potential for law enforcement to respond in an informed manner will depend critically upon education and training opportunities in this sector.
- Injection-related harms, including scarring/bruising, infections, thrombosis, and overdoses, were reported as common across all study sites (no differences in the numbers of overdoses or thrombosis reported), though Melbourne and Hobart PWID were more likely to report injection-related harms (prominent scarring and bruising, difficulty injecting) than were PWID in Darwin.
- The level of dependence differed between sites for benzodiazepines, methadone and buprenorphine, according to recorded scores on the Severity of Dependence Scale (SDS), with no significant difference for morphine dependence. Melbourne and Hobart PWID scored on average higher SDS scores for benzodiazepines than Darwin PWID (consistent with higher observed prevalence of reported use, and higher frequency of use, in Melbourne and Hobart). Methadone dependence scores were higher on average for Melbourne and Hobart PWID also than for Darwin PWID. Melbourne PWID recorded a higher buprenorphine SDS score on average than participants in Darwin.
- Law enforcement responses to illicit markets for prescription pharmaceuticals need not be limited to supply reduction initiatives alone. Drug law enforcement may have a positive impact on demand and harm reduction, and play a complementary role with other strategies that aim to limit harms associated with drug misuse.

## Interventions

- Health and law enforcement sector Key Informants across all study sites were of the view that a health system response to prescription pharmaceutical misuse was a preferable option to that of a law enforcement or criminal justice system response.
- Suggestions for appropriate responses included: (1) creation of alternatives to arrest and criminal charges, possibly through liaison with diversion programs and service providers; (2) decreasing the costs of drug treatments; (3) a more holistic approach to prescribing of drugs; (4) close monitoring of PWID who are prescribed benzodiazepines; (5) development of alternative forms of buprenorphine that cannot be diverted; (5) keeping police and doctors up to date with prescribed drugs that are likely to be diverted; (6) education of doctors and pharmacists about diversion of the drugs; (7) encouraging sharing of information between different bodies that produce data; (8) peer education programs built around demonstrating the harms associated with intravenous administration of tablets; (9) distribution of pill and biological filters through the Needle Availability Program to reduce the health harms;

and (10) establishment and maintenance of close relationships between health and law enforcement sectors.

- The available evidence shows supply reduction efforts to limit diversion of prescription pharmaceuticals can be effective (where the main outcome of interest may be either reduced prescription rates or even removal from the market altogether). However, there is some evidence that certain of these strategies may result in negative outcomes such as the unintended consequences of drug substitution or supplementation.
- Other process outcomes around enhanced knowledge and awareness across law enforcement, health and industry sectors of the issues associated with pharmaceutical diversion are equally important and should be examined in the future.
- PWID participants and Key Informants (health and law enforcement) cautioned that attempts to reduce benzodiazepine and morphine supply may lead to a range of unintended impacts, including: (1) increased crime to finance the higher illicit costs of less available pharmaceuticals; (2) substitution with other drugs (e.g. alcohol, methamphetamine, other analgesics) leading to other potentially more severe health issues; (3) creation of conditions in the NT favorable for the return of heroin trade and/or leading to interstate pharmaceutical opioid supply. Such issues should be kept in mind in developing future initiatives in this regard.
- A variety of suggestions were offered by Key Informants concerning technical and other issues of relevance for diversion surveillance and prevention, including: (1) data collected by pharmacists on 'doctor-shopping' to be fed back to doctors and Accident and Emergency (A&E) departments at hospitals; (2) improved access to available prescription pharmaceutical monitoring data sets, providing privacy issues were addressed (for example, law enforcement and HIC data); (3) enhanced vigilance with prescription pads; (4) pharmacists calling police where forged prescriptions are presented; (5) crushing of buprenorphine doses in the pharmacy before administration (or provision of alternative dose preparations, e.g. injectable buprenorphine delivered in the pharmacy); and (6) improved sharing of information between doctors and police about drugs preferred for diversion.

### Methodological considerations

- A significant methodological challenge encountered in the study was the task of trying to estimate future user behaviour and illicit market trends in light of hypothesised changes in supply of the pharmaceutical products being studied. Whether individuals faced with reduced supply continue their drug use, seek other substitute or supplement drugs, increase or begin involvement in criminal activity, or seek treatment for substance use is multi-determined and difficult to make general inferences about.
- Predictions about the impact of supply-driven illicit market changes for PWID, health and law enforcement sectors are possible based on retrospective studies of market shifts (such as the heroin drought) and studies like the current one. However, clearer data would derive from longitudinal studies using mixed methodological approaches.
- Another limitation of the study related to the general lack of clear indicator data sources and systems to shed light on the illicit prescription pharmaceutical market place in Australia. Improved indicator data collection and availability (addressing issues such as coding specificity, public access clearances, comparability over time, access delay) is likely to improve the research and surveillance capacity in this area.
- Additional research is necessary to complement existing secondary indicator sources. On the basis of the samples recruited for this study and the findings outlined in this report, the use of multiple methods to access sub-populations of users appears to have been effective. This has

implications for future surveillance and response, particularly given the limitations of some existing routinely collected data sources, which provide only limited clarity for understanding mechanisms of diversion and supply to illicit markets.

## Directions for future research

Several directions for future research are suggested by the study findings and relate also to some of the identified study limitations and methodological challenges.

### Monitoring diversion and supply to illicit markets

- Ongoing monitoring of trends in both licit and illicit use of benzodiazepines and pharmaceutical opioids is warranted. Particular areas to focus on in such surveillance are key illicit market indicators such as price, supply source and availability. As various supply reduction interventions are brought to bear on emerging illicit prescription pharmaceutical markets (tightened prescribing regulations, discontinued production, rescheduling), a key feature of the routine monitoring research in this area will be the active collection of information concerning novel supply sources (e.g. internet pharmacies, importation), indications of the market shifting to substitute pharmaceuticals, and evidence of future restrictions to illicit opioid markets yielding greater net harms for market participants.
- Another opportunity to achieve greater clarity on the question of how licit prescription pharmaceuticals are diverted to illicit markets would be to examine more closely different segments of the market. There would be value in replicating a study such as this one by examining supply sources and diversion of prescription drugs with a comparison sentinel group of non-PWID participants, to determine whether this is a significant contributor to the diversion of prescription drugs onto the black market.
- The nature of the interrelationship between different illicit drug markets should be examined in future research. It is important for law enforcement to better understand these market intersections and the factors affecting them, as policies which focus only on the supply of certain illicit drugs that do not consider substitute and supplement drugs are likely to suffer several limitations: (1) they may be less effective than planned; (2) there is the potential for their effectiveness to be inappropriately evaluated; and (3) they can have the unintended consequence of increasing harms.

### Exploring the ‘prescription drugs and crime’ nexus

- Future studies seeking to examine this issue could recruit larger samples of current users to ensure sufficient study power to conduct the appropriate statistical analyses on key research questions.
- Alternatively, longitudinal studies using mixed methodological approaches would assist in determining the ‘natural history’ of benzodiazepine and pharmaceutical opioid misuse in diverse jurisdictions (and could incorporate a shift in focus from the recreational/dependency dichotomy to examining associations between drugs, crime and social environments).
- Additional work is also required in considering the potential interpretive power of the variety of theories on the drugs and crime link. The development of ecologically valid models that may assist in description and understanding of these markets may in turn contribute to interpretation of emerging trends and market fluctuations for the purpose of better informing law enforcement and public health responses.
- Research that identifies mechanisms for targeting drug market initiates for prevention purposes (the goal of which would be to increase the age of first drug use or injection, and age of first crime) (O’Reilly et al. 2004).

- Research focusing on aspects of the relationship between benzodiazepine intoxication, opportunistic crime and mental health issues (O'Reilly et al. 2004).

### Technical considerations for enhanced prescription drug trend monitoring

- The general lack of clear indicator data sources and systems, to shed light on the extent of the illicit prescription pharmaceutical market place in Australia, represents as an opportunity for improving the research and surveillance capacity in this area through improved indicator data availability, attention to coding specificity at the data recording and entry stage (e.g. information regarding the generic forms or brand names of benzodiazepine and pharmaceutical drug seizures by law enforcement and coding of pharmacy related crimes), and improved data sharing.
- Renewed consideration of the feasibility of a National Prescription Drug Misuse Prevention Monitoring System (see National Drug Strategy Committee Working Party on Prescription Drug Abuse (NDSCWPPDA) 1997; Australasian Centre for Policing Research 2002) focusing on achieving outcomes, including: information provision to prescribers and pharmacists to identify drug-seeking individuals; enhanced safety of drug treatment programs through notification of holders of permits to prescribe drugs of addiction and other prescribers when patients have obtained drugs elsewhere; improved prescribing practices through alerts to doctors concerning previous drug dependence notifications; identification of those involved in prescription drug trafficking and professionals engaged in inappropriate prescribing and dispensing; and reductions in forged prescriptions.
- A key future challenge in addressing surveillance shortfalls such as these will be to achieve a balance between preventing and reducing diversion of prescription drugs to illicit drug markets, and the need to provide appropriate medical treatment (avoiding under-prescribing).

## Conclusions

This study, comprising a multiple methods design replicated in the three Australian capital cities of Melbourne, Hobart and Darwin, has met its primary aims of: (1) enhancing understanding of illicit benzodiazepine and pharmaceutical opioid market-place dimensions and characteristics; (2) exploring the relationship between benzodiazepine and pharmaceutical opioid misuse and crime (focusing on the mechanisms and impact of diversion); (3) examining the implications for police and other front line workers of emergent illicit benzodiazepine and pharmaceutical opioid markets; and (4) considering appropriate interventions to address both the law enforcement and health impacts of benzodiazepine and pharmaceutical opioid misuse.

The study findings present a picture of active illicit markets in Melbourne, Hobart and Darwin for the prescribed pharmaceuticals examined – benzodiazepines and pharmaceutical opioids. The current study provides important insights into the mechanisms by which these markets operate, and has also highlighted some of the consequences of this. It appears that Melbourne has an active illicit market for benzodiazepines, buprenorphine and increasingly morphine, and that this may partly be understood with reference to the reduction in supply of heroin. In contrast, the other study sites, Hobart and Darwin, do not have a dominant heroin market and the study findings suggest that active illicit pharmaceutical markets exist primarily for methadone and morphine (Hobart) (Bruno 2004) and morphine (Darwin) (O'Reilly et al. 2004).

There remains a need in Australia for the type of comprehensive national prescription drug misuse prevention monitoring system that has been discussed previously (see NDSCWPPDA 1997). Such a system may provide a mechanism through which the current lack of clarity in existing secondary indicator sources for prescription drug use, diversion and harms may be remedied. It will be

important that law enforcement, health sector and consumer perspectives are considered in future development of such initiatives. Through enhanced monitoring of prescription drug diversion and misuse, the information in turn could be utilised to improve the more precise detection of diversion activity, over-prescribing and supply points for new markets (e.g. internet pharmacies, diversion across State/Territory borders, importation). Such information could also be employed to inform education and training programs for police, prescribers and pharmacists, and policy and program responses for the future.

The development of an enhanced national monitoring system to detect prescription drug diversion and misuse would be consistent with the principles set out in Australia's National Medicines Policy (Australian Government Department of Health and Ageing, 2000), the Quality Use of Medicines framework for response (Commonwealth of Australia, 2002), and the National Drug Strategy (Australian Government Department of Health and Ageing, 2004).



## Chapter one: Introduction

### Background to the current study

The National Drug Law Enforcement Research Fund (NDLERF) sought tenders in 2002 for research to enhance law enforcement sector understanding of the structure and functioning of illicit drug markets in Australia. The request for tender, for which the current study was developed (RFT 04/02), called for a focus on the impact of benzodiazepine and pharmaceutical opioid misuse on crime in Victoria, Tasmania and the Northern Territory. Available evidence at that time from sources such as the Illicit Drug Reporting System (IDRS) suggested that existing illicit prescription drug markets were consolidating in some major cities (e.g. Hobart and Darwin), and emerging in other cities (e.g. Melbourne), facilitated, at least in part, by the reduction in heroin supply which peaked between late 2000 – early 2001 (Topp et al. 2002). In fulfilment of its aim of performing a monitoring and early warning function, the IDRS identified key issues with respect to benzodiazepine and pharmaceutical opioid diversion and misuse that require further investigation.

One important area of investigation indicated relates to the law enforcement implications of benzodiazepine and pharmaceutical opioid diversion and misuse<sup>4</sup>. Previous research, for example, has suggested that: people who misuse illicit<sup>5</sup> drugs are more likely to have an arrest record or to report participation in property crime than those who do not (Blumstein et al. 1986); frequency of property offending is positively correlated with extent of illicit drug use (Blumstein et al. 1986; Salmelainen 1995; Stevenson & Forsythe 1998); and violence and violent crime may be employed by illicit drug manufacturers and distributors as a tool to support attempts to manipulate the market (Kleiman, 1992).

The 'drugs and crime' literature is of questionable generalisability beyond the illicit drugs (e.g. heroin, cocaine, amphetamine) upon which it has largely been developed. To our knowledge there have been no published Australian studies that have sought to investigate the nexus between prescribed pharmaceutical misuse and crime. The precise nature of this relationship remains to be clarified. At this point the extent to which the broader drugs and crime literature may assist in understanding hypothesised prescription drugs and crime links is undetermined.

Anecdotal reports from expert key informants in health and law enforcement sectors of crimes committed – either to obtain benzodiazepines (e.g. theft from pharmacies and other suppliers or indeed the legitimate holders of prescriptions) and/or while under the influence of benzodiazepines – provide further indication as to the potential law enforcement impact of prescription pharmaceutical related crime (Dobbin 1997; 1998). Benzodiazepine intoxication in particular may also be associated with a degree of disinhibition, which can potentiate the commission of crime while under their influence. This is particularly problematic where dependent use creates a need for access to larger quantities of the drug that may be available through prescriptions alone, and/or the existence of a illicit/black market for such substances which creates opportunity to gain financially from their sale. A number of important research questions concerning the relationship between prescribed pharmaceutical misuse and crime remain unanswered.

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<sup>4</sup> For the purpose of this study 'misuse' is defined as the use of a drug in harmful quantities or in quantities other than the prescribed dosage. 'Illicit use' (or 'non-medical use') of prescribed drugs is defined as use of a drug in a way not prescribed and/or not medically condoned; e.g., injecting of oral preparations, combining a prescribed drug with an illicit drug, use of multiple drugs/doses of a drug without medical supervision (see Zacny, Bigelow, Compton et al., 2003).

<sup>5</sup> Illicit drugs are defined as drugs for which possession and use is unlawful.

Firstly, it would be informative to examine in more depth the extent of the misuse of these drugs by PWID. Secondly, examination of the extent of the black market in these drugs, and their routes of diversion from medical prescription may be revealing. Thirdly, the widespread use of these drugs may have implications for medical, emergency, and health providers, who may be confronted with the health harms and injuries that may result from the misuse of these particular drugs, especially their injection (e.g. are there particular challenges for emergency services staff when responding to individuals intoxicated with pharmaceutical substances which are distinct from those posed by the effects of other illicit drugs?). Fourthly, given the complex relationships that are known to exist between illicit drug use and crime in general, more specific examination of such activity in relation to these specific drugs may yield important information of interest to law enforcement providers, and policy makers (e.g. are there distinct patterns of criminal activity associated with misuse of such products, or does an easy availability of diverted pharmaceuticals actually produce some protective effects on criminal behaviour in comparison to markets dominated by heroin or other powder drugs?).

A second important area of investigation indicated relates to the health implications of benzodiazepine and pharmaceutical opioids diversion and misuse through injection. A large international literature exists on the public health implications of prescription pharmaceutical diversion and injecting, with reports from a number of countries concerning associations between misuse, significant health harms and dependence (Darke & Ross, 2000). To date the literature has focused largely on health issues associated with benzodiazepine and pharmaceutical opioid diversion and misuse in illicit drug market settings. Evidence shows that illicit drug markets and patterns of illicit drug use may vary markedly between and within jurisdictions (Darke, Hall & Topp 2001; Fitzgerald, Hope & Dare 1999). Available evidence has also shown that patterns of prescription pharmaceutical diversion and injection differ across Australian States and Territories (Breen et al. 2002, 2003, 2004a). However, there is less available data concerning the detailed dimensions and characteristics of such illicit markets or how law enforcement and public health concerns may intersect in these settings when contemplating responses to prescription drug diversion and misuse. These issues warrant further investigation.

A necessary step in devising appropriate responses around issues such as benzodiazepine and pharmaceutical opioid diversion and injection is to gather reliable local evidence regarding the nature and extent of the problem. Stakeholder perspectives are also of core importance when the responses may necessitate incorporation of regulatory interventions. In this regard the current lack of understanding of a number of key issues of relevance to benzodiazepine and pharmaceutical opioid diversion and crime links reduces the capacity for developing informed interventions. A comprehensive literature review was conducted in order to examine key issues of relevance to the study aim of exploring the relationship between benzodiazepine and pharmaceutical opioid use and crime. The salient issues that emerged from this review of national and international literature (including current knowledge and gaps) were used to inform the study focus around the main themes of interest, including: characteristics of illicit benzodiazepine and pharmaceutical opioid markets; diversion and links to crime; implications for law enforcement and other front line workers; and appropriate interventions.

Given that one of the primary goals of the research was to consider appropriate interventions in response to burgeoning illicit markets for prescription pharmaceuticals (in this case benzodiazepines and pharmaceutical opioids), in attempting to examine the hypothesised relationship between them and crime, what we focus upon is the antecedents, mechanisms and potential impact of diversion of these substances. It is a practical focus which optimises the contribution this study makes to the law enforcement sector understanding of illicit benzodiazepine and pharmaceutical opioid use and the implications for police and other front

line workers (e.g. accident and emergency staff, ambulance officers and health/youth workers), and appropriate interventions to address these concerns in three select Australian jurisdictions (Victoria, Tasmania, Northern Territory).

## Review of national and international literature

### Introduction

Whilst the majority of research in Australia to date has found that heroin use is closely associated with criminal behaviour (Makkai 2002). However, other research findings by Makkai (2002) also suggest that the diversion of pharmaceutical drugs onto the black market may have a direct effect on the criminal behaviour of individuals who use them illicitly. This is both in terms of a need to maintain supply where dependence on such a drug exists (Makkai 2002) and in psychopharmacological effects of intoxication and/or withdrawal from these drugs (Goldstein 1985; Marshall & Longnecker 1992; Rall 1992). The available evidence indicates that the diversion of prescription drugs, in particular benzodiazepines and pharmaceutical opioids, onto the black market and their subsequent misuse by PWID, has increased in some Australian jurisdictions (Breen et al. 2003; Dietze & Fitzgerald 2002; Dobbin 1998, 2001; Fry & Bruno 2002; Fry & Miller 2002; Shand et al. 2003).

### Drugs and crime nexus

Research has identified that there is a close relationship between illicit drugs and crime (Australian Institute of Criminology (AIC) 2004). Makkai and Payne (2003) reported that criminological research on the links between drugs and crime have consistently found that people who use illicit drugs have a significantly higher than average crime rate (Goode 1997), are more likely to have been arrested (Blumstein 1986), and are more likely to report higher rates of offending (Australian Institute of Criminology 2004). Conversely, most apprehended offenders have used illegal drugs (Australian Institute of Criminology 2004). In Australia there is very high rates of illicit drug use among adult males detained for property crime, with 77% of those detained for any offences at four police stations in 2001 testing positive for illicit drugs, and incarcerated offenders frequently reporting that they were under the influence of drugs, or withdrawing from them, at the time of committing the offence (Makkai & Payne 2003). Of these, 57% tested positive for cannabis, 33% for amphetamines, 26% for benzodiazepines, and 23% for opioids (Kouri et al. 1997).

Killias and Ribeaud (1999) found that overall the view that drug use has an important impact on property crime and drug trafficking was supported when they undertook an analysis of data from 12 countries. Frequency of property offending has been found to be positively correlated with extent of illicit drug use (Blumstein et al. 1986; Salmelainen 1995; Stevenson & Forsythe 1998), and a positive linear correlation was found to exist between frequency of drug use and commission of predatory and property crime, with chronic users seen to commit crimes with the most frequency (Hammersley et al. 1989; French et al. 2000; South Australian Coalition Against Crime Working Group (SACACWG) 2003). In addition, violence and violent crime are typically employed by illicit drug manufacturers and distributors in order to support attempts to manipulate the market (Kleiman 1992).

However, whilst these associations are informative, they are qualified by a poor overall predictive power. Further, drug use does not necessarily precede crime (Killias & Ribeaud 1999; Makkai 2003; AIC 2004). Thus, while there is clearly a close relationship between drugs and crime (AIC 2004), and it is generally believed that the use of illicit drugs is responsible for much of the crime recorded by police (Weatherburn et al. 2000), there is no accurate estimate of the proportion of crime 'caused' by, or associated with, various kinds of illicit drugs (Weatherburn et al. 2000). Weatherburn et al. (2000) argue that it is therefore impossible to determine priorities among drug use control programs or assess the weight assigned to preventing crime as opposed to other adverse effects of illicit drug consumption.

The assumption of simple causal links between using drugs and commission of crime is problematic (SACACWG 2003; AIC 2004; Hough, McSweeney & Turnbull 2003), and Makkai (2002) argues that while reducing the number of offenders may reduce offending rates, reducing offending rates by targeting drug use as a 'cause' of criminal behaviour (e.g. encouraging drug-using offenders into treatment programs) may not necessarily reduce the number of offenders. This is because if the offender is '...criminogenically inclined, either through socialisation, attraction to risk behaviour, or unemployment...' (Makkai 2002, p. 112), they will still be likely to offend at some level – thus the pool of actual offenders will not decline. On the other hand, the AIC (2004) notes that whilst the relationships between drugs and crime are complex, at the very least drug use worsens criminal involvement, and that any action that results in reducing drug involvement will be likely to have the effect of reducing offending behaviour. This is a contention supported by consistent findings that heroin users in current drug treatment display decreased offending behaviour than those not in treatment (e.g. Bell, undated; Hall, Bell & Carless 1993; Weatherburn, Lind & Forsythe 1999).

In relation to the use of drugs and different types of crime a number of theories were identified in the literature. Goode (1997) identifies three theories of how drugs are associated with property crime and Goldstein (1985) outlines three theories about how drugs relate to violent crime. These theories are relevant to assessing whether different forms of intervention would have an impact on offending rates that are connected to drug use and are presented here. These models suggest that law enforcement intervention targeting dependent drug users, while reducing the rates of crime committed by such offenders, is unlikely to eradicate it.

The first theory about drugs and property crime is the 'enslavement' model, also known as the 'medical' model, in which it is held that illicit drug users become 'enslaved', unable to control their use of the drug (Goode 1997). As a result, substantially more money than can be obtained legitimately is needed to acquire the drug, therefore they 'must' engage in crime. Thus, in this model, drug-related offenders initially begin using drugs, and after becoming dependent are eventually drawn into crime; they turn to crime because of their dependence. According to this model, individuals who are currently dependent on a drug would not commit moneymaking crimes, or would at least reduce their criminal behaviour, if they could maintain their needs, and avoid withdrawal syndrome.

The second theory is the 'criminality' model, which proposes that it is not drug users who are drawn to crime, but in fact criminals who turn to drugs (Goode 1997). In this model, drug-related offenders are involved in crime and other disorderly behaviour before using drugs, and as time passes they are increasingly enmeshed in a 'deviant' lifestyle, including drug use. In this model, criminal activity and drug use are associated through an individual's pattern of 'deviant' behaviour. The model also suggests that the behaviours are related to personal attributes of an individual, in that the 'type' of person who engages in criminal behaviour is also the same type of person who uses and becomes dependent on drugs. Thus, rather than being enslaved to a drug, these offenders are more participants of a criminal lifestyle that includes misuse of drugs, and removing drugs or

making them less expensive will not eliminate the offending behaviour. In support of this model, Kinnunen (1997) and Hough et al. (2003) demonstrated that involvement in criminal activity often preceded the development of drug dependence (see also, Killias & Ribeaud 1999). In addition, Hammersely et al. (1989), in a study of 151 Scottish prisoners and non-prisoners, found that crime was a better explanation of drug use variance than drug use was of criminal activity, and concluded that the need for opioids does not simply cause crime, rather crime and opioid drug use tend to influence each other, and that this relationship applies to any drug.

The 'escalation', or 'intensification', model comprises key features of the enslavement and criminality models. It proposes that the offender becomes involved in drugs as a part of an overall criminal lifestyle, having firstly been involved in criminal behaviour, eventually becoming dependent on drugs, and thus needing more money to finance ongoing supply. In the process, it is argued, their criminality becomes higher than it normally would have been (Goode, 1997). Thus, removal of the drugs of dependence may reduce the criminal behaviour, but would not eliminate it, as the offender is deeply entrenched in a criminal lifestyle regardless of dependency. Within this conceptualisation, drugs and crime are not causally connected, rather manifestations of the same 'behavioural' tendencies; however, heavy use of drugs of dependence will intensify the likelihood such a user will commit crimes, especially moneymaking offences. ADCA (2002) reported that drug use is related to the maintenance and frequency of offending, and that heroin addiction can increase the rate of offending amongst people already involved in crime.

In relation to violent crime, three models have also been put forward that may suggest implications for evaluating potential interventions aimed at reducing drug-related crime. First, the 'psychopharmacological model' argues that certain drugs may produce irrational, excitable, or violent behaviour in an individual. The drugs most reported to be associated with violent crime are alcohol, barbiturates and stimulants (Goldstein 1985; Makkai 2002). Opioid intoxication has not been directly associated with violence (Makkai 2002), and attempts to attribute violent behaviour to the use of opioids and cannabis to this model have been discredited (Goldstein 1985). On the other hand, mood swings and irritability associated with the withdrawal syndrome from opioids may lead to violence. For instance, Goldstein (1985) found that prostitutes who used heroin often linked robbing and/or assaulting clients with withdrawal. Many benzodiazepines are also likely to produce dependency in a regular user (Marshall & Longnecker 1992; Rall, 1992), and withdrawal from benzodiazepines has been associated with severe mood swings, irritability and personality changes (Marshall & Longnecker, 1992; Rall, 1992). In addition, use of benzodiazepines has been implicated in disinhibited behaviour (Bonn & Bonn 1998; Dobbin 2001; Rall 1992). Further, Makkai (2002) and Goldstein (1985) reported that some offenders use certain drugs purposely to reduce their fear of committing a crime, while Dobbin (2001) reported that benzodiazepine intoxication can produce feelings of over-confidence and invincibility in users, causing them to commit offences they would not normally undertake. Goldstein (1985) suggests that the incidence of psychopharmacological violence is impossible to assess, because such incidents may occur anywhere (including in the home, workplace, on the street and so on) and often go unreported, and also because when cases are reported the psychopharmacological state of the offender is often not officially recorded.

The second model of the link between drugs and violence, the 'economic compulsive' model, argues that some drug users commit violent crimes, such as armed robberies, to support an expensive drug habit (Goldstein 1985), consistent with the enslavement model of property crime (Goode 1997). Theoretically, as illicit drugs are expensive and may be typified by compulsive patterns of use, the primary motivation of the user is to obtain money to purchase them. Thus, the violence is not usually intended, but occurs as a result of the situation where a property crime is being committed, such as the offender's nervousness, the victim's reaction, use of weapons by perpetrator or victim, or intercession by bystanders (Goldstein 1985). Studies have found that most

heroin users will avoid violent acquisitive crime if viable non-violent alternatives exist, because violence is more dangerous and also potentially increases the penalty if caught, and/or because perpetrators may lack a tendency towards violent behaviour (Goldstein 1985).

The third model, the 'systemic violence' model, describes the violence that occurs as a result of an individual playing their part within a system of drug use and distribution (Goldstein 1985; Makkai 2002). Systemic violence refers to typically aggressive patterns of interaction between players within the system of drug distribution and use, including for example: disputes over territory between rival dealers; assaults and homicides committed within dealing hierarchies; robberies from dealers precipitating violent responses; and disputes over drugs (Goldstein 1985). Goldstein (1985) suggested that drug users may become increasingly likely to become involved in drug dealing as their drug career progresses, therefore increasing their likelihood of becoming a perpetrator or victim of systemic violence.

On the other hand, any correlation between drug use and crime rates does not 'prove' the two variables are causally related, and any association between them may be explained by other common variable/s, for example, poverty, poor education, and/or unemployment (AIC 2004; Hartnagel 1997; AIC 2003; Makkai 2002). For many, including the SACACWG (2003), this theoretical construct is the best explanation of the complex relationships. In any case, theories of drug use and criminal behaviour have been based on the use of illicit drugs, and not on the illicit acquisition<sup>6</sup> and/or use<sup>7</sup> of prescribed drugs. Therefore their application to the discussion around the prescription drugs/crime nexus remains to be tested. Also, Makkai (2002) argues that the discussion of illicit drugs and crime lacks precision, with no clear definition of the 'problem' under examination, and is compounded by ideology and political views about crime being linked to increasing drug use.

### *Drugs and crime in Australia*

The SACAWG (2003) contend that whilst there appears to be a strong relationship between drug use and criminal activity, there are concerns about using official offence statistics, as they are often '...better indicators of police priorities and activity at a particular time in a particular jurisdiction than they are descriptors of trends in and extent of illicit drug crime'. Makkai (2002) argues that, in the Australian context, official crime and justice statistical collections '...are unable to answer the basic question of how much crime is drug-related', arguing that arrest data, while providing information on the circumstances of the arrest, fail to include comprehensive and clinical assessment of any drug problems the offender may have. In addition, different jurisdictions have different coding and reporting practices, and may also have different legislation, and the publication of official data may be the responsibility of a variety of institutions in different jurisdictions, and be of variable quality. In an attempt to address these shortcomings, the links between drugs and crime in Australia have been examined via two ongoing projects, although they still do not address the issue of criminal activity undertaken by non-incarcerated or apprehended offenders. Both projects will be discussed here.

<sup>6</sup> Illicit acquisition of prescribed drugs is defined as their non-medical acquisition; e.g., given them by others, buying them on the street, stealing them.

<sup>7</sup> Illicit use of prescribed drugs is defined as use of a drug in a way not prescribed and/or not medically condoned; e.g., injecting of oral preparations, combining a prescribed drug with an illicit drug, use of multiple drugs/doses of a drug without medical supervision.

## Drug Use Monitoring Australia

The first study is the Drug Use Monitoring Australia project (DUMA) (Wei, Makkai & McGregor, 2002; Shand et al. 2003), which seeks to measure drug use among those people who have been recently apprehended by police in four sites: Southport Watchhouse (Qld), East Perth Lockup (WA), Bankstown Police Station (NSW), and Parramatta Police Station (NSW). Data from interviews and urinalyses of 5,440 DUMA participants over three years (1999 – 2001) were used to examine issues such as the relationships between drug dependency and crime, and factors such as sex, age, and schooling (Weierter & Lynch, 2002). Seventy-three percent of detainees agreed to urinalysis, and there was a reasonable correspondence between self-reported drug use and the urinalysis results (Weierter & Lynch 2002). A breakdown of the characteristics of the participants in the DUMA found the samples at the four sites were similar; with an age range of 12 to 82 years (median age of 26), 80% male, about 40% had completed year 11 or 12 at school, and around two-thirds received a government benefit (Weierter & Lynch, 2002).

Significantly more female detainees than males in the study tested positive for opioids (36% compared with 22%) (Weierter & Lynch 2002), and 60% of detainees who had used opioids reported being heroin-dependent. A higher proportion of females than males also tested positive for amphetamines (29% compared with 22%), with one quarter of all users reporting dependency. A slightly greater proportion of males than females, however, tested positive for cannabis (54% compared with 47%). There was a significant difference between age groups for cannabis use, with younger participants more likely than older detainees to test positive (Weierter & Lynch 2002).

Over 30% of all detainees reported that they used benzodiazepines, with over one quarter of users reporting they were dependent on them, and more than 90% reported that they used alcohol. Around 16% of detainees reported using methadone, with around 20% of users reporting they were dependent on the drug. High proportions of poly-drug use were found, with two groups of significant relationships: heroin-dependent detainees were more likely to be dependent on benzodiazepines, and detainees reporting amphetamine dependency or cannabis dependency were more likely to be dependent on alcohol. There were strong relationships between drug dependence and crime, with heroin dependent detainees significantly more likely than others to commit property crime: 45% of property crimes; 10% of violent crimes; and over 30% of other crimes were committed by heroin dependent detainees. About 30% of property crimes, 12% of violent crimes, and 45% of other crimes were committed by amphetamine dependent detainees (all statistics cited in Weierter & Lynch 2002).

## Drug use careers of offenders

The AIC Drug Use Careers of Offenders (DUCO) project (Makkai & Payne 2003), was the second study that examined the intersection of drug use and criminal behaviour. DUCO aimed to provide a systematic monitoring program of drug use rates among prisoners either prior to incarceration or afterwards (Makkai & Payne 2003). The project randomly surveyed 2,135 adult male offenders incarcerated in Queensland, Western Australia, Tasmania and the NT in 2001. One hundred and thirty-four adult female inmates incarcerated in Victorian Correctional Services were also surveyed in 2003; however, these data were not available at the time of writing, but may provide important information in the future. The typical male offender tended to be aged in his twenties and thirties, with a mean age of 33 years. Participants reported low levels of education, a quarter of them were indigenous, and they had high levels of prior contact with the criminal justice system, with 30% reporting a history of juvenile detention (Makkai & Payne 2003). Initial offending was most likely to have been a property offence such as stealing without break-in or vandalism (Makkai & Payne 2003). While these findings suggest that there may be other variables that may relate to both drug use and crime (e.g. Makkai & Payne 2002), they also may provide some support for Goode's (1997) 'escalation' or 'criminality' models.

The study found that the offenders reported committing a variety of property and violent offences, and were significantly more likely than the general population to have used illegal drugs (Makkai & Payne 2003). Overall, the most common types of crimes reported by inmates were buying illegal drugs, physical assault, and break and enter, while the least common were sex offences and homicide (Makkai & Payne 2003). Active involvement in drug market activity was suggested by the finding that regular property offenders and regular multiple offenders were more likely than regular violent offenders to have bought or sold illegal drugs. The property and drug offenders were also more likely than regular violent offenders to engage in more frequent crime, and to have had a higher frequency of offending during the six months prior to arrest (Makkai & Payne 2003).

Makkai and Payne (2003) suggest that these findings are indicative of regular property and multiple offenders leading a more chronic offending lifestyle than regular violent offenders, even though violent crimes themselves are more serious (supportive of Goode's (1997) 'escalation' model of drugs and crime). The majority (over 80%) of participants in the study reported using illegal drugs, with poly-drug use also common (Makkai & Payne 2003). In terms of regular drug use, the findings were similar to the DUMA findings, 53% reported cannabis use, 31% reported using amphetamines, 21% reported heroin use, seven percent reported cocaine use, and 35% reported regular use of two or more of these substances (Makkai & Payne 2003). Makkai and Payne (2003) found significant differences in the type and frequency of drug use among the participants, with regular property, multiple and fraud offenders consistently reporting a greater lifetime prevalence of illegal drug use than homicide, violent, and non-regular offenders. Makkai and Payne (2003) further found that offenders who had a more entrenched and chronic offending profile were more likely to report higher levels of persistent illegal drug use, and that 17% of participants reported using illegal drugs prior to committing any offence, while 29% reported that offending and drug use occurred concurrently. Fifty-four percent reported they had committed any criminal offence prior to ever using any illegal drugs, while 46% reported experimentation with illegal drugs, including cannabis, before or concurrently with the onset of offending, consistent with Goode's (1997) escalation or criminality model of drug use and crime.

Makkai and Payne (2003) found that 51% of offenders who reported drug use attributed their criminal offending to alcohol and/or illegal drugs. Offenders attributed the impacts of drugs to three main explanations: drug-related economic or compulsive effects; the psychopharmacology of the drugs; and drugs and/or alcohol leading to crime (i.e. the effects of the substances directly influencing behaviour). In addition, 39% causally attributed their current most serious offence directly to intoxication or dependence, 18% to illegal drugs, nine percent to alcohol, and 12% to both. Their offence was most likely to be attributed to illegal drugs by fraud offenders, multiple offenders, and property offenders, in that order, with property and fraud offenders also most likely to report the economic/compulsive effects of their drug use (i.e., committing acquisitive crime because of the need for money to support drug use). Homicide offenders and non-regular offenders were least likely to attribute their crimes to drugs. However, where they did they were more likely to attribute their most serious crime to alcohol. Violent offenders were more likely to attribute their crime to the psychopharmacological effects of the substance, claiming that the drugs (either alcohol or other drugs) caused a change in their personality/behaviour such that they became more aggressive and/or violent (Makkai & Payne 2003).

However, those offenders who were more active in the criminal market, had greater contact with the criminal justice system, and those who reported more frequent use of illegal drugs, were more likely to have commenced offending before using illegal drugs (Makkai & Payne 2003). The researchers argue that the findings show that '...in general, the lifetime drug using and offending career began with the onset of offending, followed by the onset of illegal drug use, persisting into regular offending, and finally regular illegal drug use.' Further, they contend the findings do not support the argument that drug using causes crime, but rather suggest that '...lifetime progression data indicate that drug use and crime are related primarily to the extent that both behaviours form part of a general deviant lifestyle' (Makkai & Payne 2003).

### DUCO Study – Tasmanian specific findings

In Tasmania, 174 male prison inmates from both medium and maximum security were surveyed in the DUCO project between February and May 2001 regarding their drug use and criminal histories, and the associations between these (Williams & Morris 2002). The Tasmanian inmates had an average of 101 lifetime offences, of which approximately half had resulted in charges. The most common offence among the Tasmanian sample pool was breaking and entering, with a mean of 56 lifetime offences among those that had committed at least one such offence.

Within the Tasmanian inmate sample, 32% reported ever using morphine, with 18% using the drug in the six months prior to their arrest. Illicitly accessed methadone had been used by 24% of the sample, and 8% in the six months prior to incarceration, with 43% ever using benzodiazepines, and 21% using them in the months prior to arrest (Table 3). Regular (at least once weekly) use of pharmaceutical products within the sample was quite low, with only 9% reporting such use of morphine, 4% of methadone, and 13% using benzodiazepines regularly. However, among these individuals, the cost of their weekly expenditure on these drugs was a substantial burden, particularly in the case of morphine, where the average weekly expenditure on the drug was \$920 per week (corrected for inflation). Findings from the sample as a whole suggested that where expenditure on substance use exceeded finances available from legitimate means (social security, work), illegal activities were undertaken to maintain such use. See Table 1.

**Table 1. Pharmaceutical-related statistics from the 2001 Tasmanian DUCO sample.**

	Lifetime use	Recent use <sup>a</sup>	At least weekly use	Mean weekly expenditure <sup>b</sup>
Morphine	32%	18%	9%	\$920
Illicit methadone	24%	8%	4%	\$108
Benzodiazepines	43%	21%	13%	\$53

<sup>a</sup> In the six months prior to arrest.

<sup>b</sup> Among those reporting using these drugs at least once weekly or more often, corrected for inflation (See Williams & Morris, (2002) for method).

Thirty-nine percent of the inmates sampled as a whole reported that the main reason for committing the offence for which they were currently incarcerated was drug-related, with equal numbers reporting being under the influence of drugs at the time of the offence (15.5%), and committing offences in order to obtain money for drugs (16.8%). Only a minority of the inmates sampled reported that drugs (of any sort) had played a major part (13.5%) or as totally responsible (15.6%) for their lifetime offending histories.

### DUCO Study - Northern Territory specific findings

The DUCO project surveyed 134 male prisoners in NT Correctional Services in 2001 and found that one quarter of the sample reported lifetime use of amphetamine, 11.2% had reportedly used heroin, 4.5% street methadone, 8.2% morphine and 14.9% had used tranquillizers (Lasoncz 2001). The mean age at which heroin use became a regular activity was 16.7 years (range 13-19 years) and 17.2 years (range 15-20) for tranquillizers. The mean age of regular use was higher for both street methadone (23 years; range 21-25) and morphine (20.5 years; range 17-25).

Northern Territory DUCO data indicated only 2.3% of most serious offences (MSO) were drug offences (Lasoncz 2001). Among those prisoners who had regularly used heroin, 5.9% had committed a property MSO and 4.4% a violent one. A property MSO was more likely to be committed than a violent MSO by regular users of street methadone (5.9% compared with 1.5%) or morphine (5.9% compared with 2.9%), but the reverse held for regular use of tranquilizers (5.9% compared with 7.4%). When asked the reason for committing property MSO, 29.4% of the prisoner sample said they were under the influence of drugs or alcohol, 17.6% said the offence was drug- or alcohol-related (excluding expense and influence), while 5.9% indicated the offence was committed to obtain money to buy drugs. A much greater proportion stated being under the influence of drugs and alcohol when they committed a violent MSO (50%), while fewer thought the violent MSO was drug- and alcohol-related (9.1%) or committed to obtain money for drugs (1.5%).

In terms of the quantitative effect of drugs and alcohol on offending, twice as many prisoners stated a 100% effect (alcohol and/or drug use regarded as totally responsible for the respondent's involvement in crime) than a 0% effect (46.6% compared with 21.2%). A 100% effect was reported more commonly for property crime than violent crime (52.9% compared with 36.9%). Of the self-reported qualitative effects, 50.8% said it was the pharmacological effects (60% for property crime and 58.8% for violent crime) and another 36.9% reported drugs and/or alcohol led to crime/prison (40% for property crime and 29.4% for violent crime).

In the six months prior to arrest, employment was the largest contributor to the weekly income. However, 23% of the weekly income came from the sale of drugs and this was almost as high as that from social security (26.7%). Heroin accounted for a quarter (25.5%) of the weekly expenditure on drugs in the six months prior to arrest, and this is on a par with alcohol. Tranquillizers took 4.1% of the expenditure, morphine 2.7% and street methadone only accounted for 1.4%.

#### Illicit Drug Reporting System (IDRS)

Information about criminal activity from drug users who have not been apprehended is also worth considering. Indeed, Makkai (2002) suggests that people who use drugs may in fact commit many more criminal offences than they are charged with. Non-captive populations of injecting drug users are surveyed annually via the Illicit Drug Reporting System (IDRS) (Fry & Bruno 2002; Dietze & Fitzgerald 2002; Breen et al. 2003; Shand et al., 2003). This is an annual survey of illicit drug-related market trends in each jurisdiction in Australia that seeks to serve as a 'strategic early warning system, identifying emerging trends of local and national concern in illicit drug markets' (Breen et al. 2003). The IDRS methodology comprises interviews with at least 100 regular PWID in each jurisdiction, as well as an examination of existing indicators of drug use (such as needle exchange or pharmaceutical maintenance programs). The system has tracked trends over time in the usage patterns of different illicit substances, as well as price purity and other market characteristics, and criminal behaviours (charged for and not charged for) of PWID.

The 2003 IDRS (Breen et al. 2004a) found that 49% of the national PWID sample had committed some kind of criminal behaviour in the month prior to the survey, with 39% reporting they had been arrested in the previous 12 months. PWID in the NT were the least likely to report they had been involved in any crime (28%), or that they had been arrested (18%). Victorian PWID (48%) were the second most likely after NSW participants (49%) to report they had been arrested. The most frequently reported offences overall were drug dealing (34%) and property crime (22%). PWID in Victoria reported committing property crimes with the highest frequency (35%), followed

closely by PWID in Tasmania (32%), with those in the NT least likely to report this (9%). See Table 2. Breen et al. (2004a) reported that there was a significant correlation between involvement in criminal activity and expenditure on illicit drugs on the day preceding the interview, with the amount participants spent ranging from \$2 to \$1,500

**Table 2. Self-reported criminal activity among PWID in the month preceding the interview, by jurisdiction (2003 IDRS Study).**

	Total sample N = 970	NSW n = 154	ACT n = 100	VIC n = 152	TAS n = 100	SA n = 120	WA n = 100	NT n = 109	QLD n = 135
Property crime %	22	31	22	35	32	11	18	9	14
Drug dealing %	34	36	35	39	32	28	42	20	37
Fraud %	6	7	5	5	6	7	8	3	8
Violent crime %	7	8	6	9	5	3	6	4	10
Any crime %	49	55	50	59	52	38	50	28	53
Arrested last 12 months %	39	49	36	48	46	21	36	18	47

Source: Breen et al. (2004a).

#### IDRS – Victoria specific findings

Jenkinson, Miller & Fry (2004) found that 59% of Victorian PWID respondents in the 2003 IDRS reported engaging in some kind of criminal behaviour in the previous month, mostly property crime and dealing/trafficking of drugs, with fraud and violent crime less frequent. The overall findings were similar to the previous two years, which had seen a substantial increase from the figures in 2000 (Fry & Miller, 2002), mainly due to reported continuous increases in the frequency of committing property crimes, as well as a tripling in the rate of violent crime between 2000 and 2001, which, although reducing in 2002, has since failed to return to the 2000 rate. See Table 3.

**Table 3. Reported criminal activity among injecting drug users in the month prior to the IDRS Survey, Victoria 2000, 2001, 2002 and 2003.**

Percentage of Respondents				
Type of crime	2000 <sup>a</sup>	2001 <sup>b</sup>	2002 <sup>b</sup>	2003 <sup>b</sup>
Property crime	20	29	39	35
Dealing	34	37	41	40
Fraud	12	15	14	7
Violent crime	5	15	9	10
Any Crime	47	60	63	59

<sup>a</sup> Source: Fry & Miller (2002).

<sup>b</sup> Source: Jenkinson, Miller & Fry (2004).

Forty-seven percent of the 2003 respondents reported they had been arrested in the previous 12 months, with 51% reporting their arrest was a for a property crime, 22% reporting it was in relation to drug use or possession, 18% for violent crime, and 14% for dealing/trafficking. Twenty-seven percent of respondents who had been arrested reported multiple (two – five) types of charges (most were combinations of property crimes and use/possession) (Jenkinson, Miller & Fry 2004).

Fifty-nine percent of the 2002 sample reported being arrested in the previous 12 months, with 32% of arrests related to property crime, 15% to possession, 8% to violent crime and 6% to dealing/trafficking. Thirty-three percent of participants who had been arrested reported multiple types of charges (mainly, as in 2003, property-related combined with possession offences) (Jenkinson, Fry & Miller 2003). In 2001, 60% reported having been arrested in the previous year, with 39% in relation to property crime, 9% in relation to use or possession, 11% for trafficking, and 8% for violent crime, with 26% reporting multiple charges (as before, property/trafficking combinations) (Fry & Miller 2002).

In the 2003 IDRS, key informants reported that crime levels had remained stable since the previous year, and that in most areas (but not all) the level of police activity had continued to decrease from previous IDRS studies (Jenkinson, Miller & Fry 2004). The reports of the participating PWID did not completely accord with the Key Informants (KI) reports, or with each other, as they provided a variable picture of police activity prior to the interview. More than half the participants (59%) considered activity had increased, whilst almost one-third (32%) thought it had not changed, and three percent reported there had been less police activity. Most participants, however, (76%) agreed that police activity had not had any impact on their ability to acquire drugs, while 20% reported it had (Jenkinson, Miller & Fry 2004).

#### IDRS – Tasmania specific findings

Half of the Tasmanian PWID sample in 2002 self-reported engaging in some form of crime in the month prior to the interview. The most commonly reported crimes were dealing or property crime, with relatively few respondents reporting involvement in violent crime or fraud (Bruno & McLean, 2003). Most injecting drug users (IDU) reporting involvement in criminal activity indicated that they had engaged in such activities less than once per week. See Table 4.

**Table 4. Reported criminal activity among injecting drug users in the month prior to the IDRS Survey, Tasmania 2002.**

Percentage of Respondents			
Type of crime	2000	2001	2002
Property crime	18	23	28
Dealing	49	41	34
Fraud	5	4	2
Violent crime	10	4	6
Any Crime	64	56	50

Source: Bruno & McLean (2003)

Forty-one percent of the 2002 Tasmanian PWID sample reported being arrested in the 12 months prior to interview, with the most common grounds for arrest being property crime (25%), violent crimes (14%) and use/possession (9%). There was little change in the reported crime rates from 2000 – 2002 (Bruno & McLean 2003). The only exceptions were increases in reported rates of arrest for violent crime (6% in 2000 and 14% in 2002), and steadily escalating proportions reporting both engaging in, and being arrested for, property crimes (both increasing by around 10% between the 2000 and 2002 samples). Reported rates of involvement in dealing had also decreased between 2000 (49%) and 2002 (34%).

#### IDRS – Northern Territory specific findings

From 2000 to 2001, there was consistently a higher rate of participation in at least some criminal activity by Australian PWID than by Darwin PWID. Involvement in any crime remained fairly stable among Australian PWID, but it increased in Darwin participants from 2001 to 2002 (from 33% to 42%). Notably, the proportion of Darwin PWID arrested in the previous year declined in the same period (from 32% to 22%). Darwin PWID participants were approximately half as likely to be arrested as the average of the total Australian PWID cohort between 2000 and 2002. In 2000 and 2001, Australian PWID were close to three times as likely to report involvement in violent crime than the Darwin PWID samples; however, an apparent increase in reported violent crime was observed amongst the Darwin PWID sample (from 3% in 2001 to 12% in 2002). A larger proportion of the PWID in the national IDRS cohort engaged in drug dealing than did Darwin PWID in all three IDRS surveys. Similarly, in 2002 the national PWID sample was almost twice as likely to have been arrested in the previous year (43% compared with 22%). There were no differences in the likelihood of a past imprisonment history. See Table 5.

Table 5. Self-reported criminal activity in the previous month, Darwin, 2000 – 02.

Any crime 12 months	2000 <sup>a</sup>	2001 <sup>a</sup>	2002 <sup>b</sup>
Property crime	8%	12%	14%
Dealing	30%	24%	31%
Fraud	12%	3%	13%
Violent crime	2%	3%	12%
Arrested last 12 months	28%	32%	22%

<sup>a</sup> Source: O'Reilly (2002).

<sup>b</sup> Source: Duquemin & Gray (2003).

In 2001, of the Darwin PWID who had committed property crime in the previous month, 31% had committed such crimes on a weekly basis and another 31% more than once a week (O'Reilly 2002). Among those who had engaged in dealing, one in three did so on a weekly basis and 23% dealt drugs on a daily basis. Younger PWID (under 25 years) were more likely to have committed property crime in the previous month (23% compared with 7%), and more of the younger PWID engaged in property crime more than once a week (50% compared with 12%). While a higher proportion of the younger PWID dealt drugs in the previous month (37% compared with 22%), slightly more of the older group dealt drugs more than once a week (54% compared with 50%).

There were some changes in the pattern of arrests for Darwin PWID over the three-year period. In 2000, property crime accounted for two in every five arrests, then one in every three in 2001. However, property crime only accounted for 21% of arrests in 2002, compared to 40% across the national IDRS sample. The proportion of Darwin arrests for dealing/trafficking declined from 2000 to 2001 (from 14% to 5%) and remained steady in 2002. From 2001 to 2002, the proportion of PWID arrested for use/possession tripled in Darwin (from 7% to 21%), but increased to a lesser degree in the Australian sample (from 16% to 26%). Similarly, arrests for violent crime almost doubled in Darwin from 2001 to 2002 (from 12% to 21%), but only increased slightly in Australia (from 14% to 18%).

### Summary

These Australian studies provide valuable information that informs the discussion of links between drugs and crime. However, they are not without limitations. Firstly, as has already been mentioned, the DUCO and DUMA studies utilise samples of apprehended offenders in order to ascertain drug use patterns (Makkai 2002). It has been argued that arrests are not necessarily a reflection of offences committed (e.g. Makkai 2002), a contention supported by the IDRS findings that self-reported criminal behaviour was more frequent than arrests in the PWID samples (Breen et al. 2004a). A further issue with both DUMA and IDRS studies is the use of cross-sectional, non-random samples, which limits the generalisability of the findings to broader offender and drug-using populations. In addition, while self-reported criminal behaviour of drug-using samples (IDRS) and drug using behaviour of apprehended offenders (DUCO, DUMA) provides some information about prescriptions drugs and offending behaviour, clearly the primary aim of these studies has been to capture information relating to illicit drugs and crime. The utility of the findings to questions about criminal behaviour and prescription drug use, including the illicit use of pharmaceuticals, has yet to be systematically examined.

## Drug trends in Australia

### *Properties of benzodiazepines and pharmaceutical opioids*

#### Benzodiazepines

The Benzodiazepine family of sedative/hypnotic drugs was developed in 1960, and according to Bonn and Bonn (1998) by the 1970s they had become the world's most prescribed drugs. They are also among the most prescribed drugs in Australia, although the last few years has seen a slight decline in prescriptions filled under the Pharmaceutical Benefits Scheme/Repatriation Benefits Scheme (PBS/RPBS). In 2001, 3,951,554 prescriptions were filled, while in 2002 the figure had dropped by about 10% to 3,621,685, and in 2003 had dropped again to 3,351,952 (Australian Government Department of Health & Ageing 2004). Benzodiazepines (commonly known as tranquilisers, sedatives or sleeping tablets) are central nervous system depressants, and are widely used as pre-anaesthetic medication and to supplement anaesthesia (Marshall & Longnecker 1992).

Benzodiazepines slow down physical, mental and emotional processes, producing sedation, decreased anxiety, muscle relaxation, anticonvulsant activity, and sometimes resulting in anterograde amnesia and also behavioural disinhibition (Rall 1992). The benzodiazepines that are available in Australia under various brand names are: alprazolam, bromazepam, clonazepam, diazepam, flunitrazepam, lorazepam, nitrazepam, oxazepam, and temazepam. Most of the drugs are available in tablet form, although some of the drugs, such as temazepam and flunitrazepam, were previously also available as both tablets and capsules, and some, such as diazepam, may be administered intravenously (Marshall & Longnecker 1992). Depending on the form, the sedative effect of benzodiazepines may last from six hours to three days (Marshall & Longnecker 1992). Benzodiazepines are useful in the short-term management of certain medical and psychological conditions. However, their availability for these purposes have helped facilitate their misuse (International Narcotics Board (INCB) 2001) (Peterssun & Lader 1981; Dobbin 2002).

Driving may be impaired with intoxication by benzodiazepines, as they cause drowsiness, reduce concentration, and impair psychomotor skills and coordination (Rall 1992). Rall (1992) found that the residual effects of two nightly doses of flurazepam (not available in Australia) on driving performance were at least as great as those produced by alcohol at a concentration of 0.10%. Rall (1992) further reported that the effects of the drugs were dose-related and could be insidious, with most subjects underestimating the degree of their impairment. The long-term effects of benzodiazepine use can also include dependence, nausea, headaches, dizziness, irritability, lethargy, memory impairment, personality changes, aggression, and depression (Jaffe 1992; Marshall & Longnecker 1992; Bonn & Bonn 1998). High doses may cause confusion, lack of coordination, depression, and slurred speech, and may lead to mood swings and hypermanic behaviour and increased aggressive outbursts, and even hallucinations (Marshall & Longnecker 1992; Rall 1992). Some benzodiazepines, in particular full agonists such as diazepam, have many adverse effects that include sedation, amnesia, ataxia, rebound anxiety on withdrawal, motor incoordination, impairment of mental and psychomotor functions, and bizarre uninhibited behaviour and/or hostility and rage in some users (Rall 1992; Bonn & Bonn 1998; Marshall & Longnecker 1992).

Although the onset of symptoms normally takes several minutes following administration, because the sedative effects generally last at least six hours some individuals purposely use benzodiazepines to become intoxicated (Jenkinson, Miller & Fry 2004; Marshall & Longnecker 1992). According to the 2001 Australian Drug Household Survey (Australian Institute of Health & Welfare 2002) – an ongoing project that examines the general population's use of drugs – around six per cent of respondents reported recently using benzodiazepines illicitly (doubling since 1995). In addition, 46.2% of respondents reported they had had the opportunity to use painkillers and/or tranquilisers for non-medical purposes.

Misuse of benzodiazepines usually occurs as part of a pattern of use of multiple drugs, thus individuals with a history of alcohol or drug use are the most prone to use them inappropriately (Rall 1992). Injecting drug users may use them as a substitute when heroin or other opioids are not available, or to increase the effect of heroin or other opioids (Australian Bureau of Criminal Intelligence (ABCI) 2002; Jaffe 1992). Benzodiazepines are often prescribed medically to people who are dependent on illicit narcotics such as heroin as well, in order to help them manage their rehabilitation. Some users of stimulant drugs such as amphetamines may also use benzodiazepines to facilitate 'coming down' (ABCI 2002). Other drug users may be prescribed, or self-medicate with, benzodiazepines in order to manage emotional or psychological problems (ABCI 2002). In addition, benzodiazepines are opioid agonists, binding to opioid receptor sites in the brain, and thus potentiate the central nervous system depressant effects of opioids (International Narcotics Control Board 2002; Ross, Darke & Hall 1996a). Therefore people who use heroin or other opioids may use benzodiazepines when they can't access their preferred opioid drug, when they are trying to stop using them, or to increase their effects (Rall, 1992). Because of the differences for uptake and absorption into the brain, as well as the half-life of the different benzodiazepines (Rall 1992), some forms such as alprazolam and temazepam, in particular in gel capsule form, are more likely to be preferred by injecting drug users.

Whilst the rapid injection of diazepam may result in apnoea and respiratory failure, benzodiazepines usually only cause moderate depression of circulation and respiration, thus death rarely occurs due to benzodiazepines intoxication alone (Marshall & Longnecker 1992). However, death may result when benzodiazepines are combined with alcohol or other drugs<sup>9</sup>. When alcohol and/or opioids are taken concurrently the combination may cause severe cardiovascular depression, as well as severe and prolonged depression of respiratory responses (Marshall & Longnecker 1992; Rall 1992). In Victoria benzodiazepines were detected in 71%, and morphine in 16% of heroin-related deaths in 2001 (Wallington et al. 2002). In addition, polydrug use among heroin-related fatalities is common, with Darke, Topp and Ross (2002) finding that the injection of benzodiazepines is associated with higher levels of polydrug use.

#### Pharmaceutical opioids

Opioid analgesics are a family of drugs that include opioids, which are derived from the opium poppy (such as heroin, morphine and codeine) and opioids, which are synthesised drugs with the properties of opioids (such as pethidine, oxycodone, hydrocodone, methadone and buprenorphine) (Jaffe & Martin 1992). The opioids include agonists, which bind to opioid receptor sites in the brain, and antagonists, that block the receptors (Jaffe 1992). While derivatives of opium were unrestricted, and utilised for their pleasure-inducing properties globally for centuries, concerns about misuse resulted in the regulation of opioids for medical use in the middle of the twentieth century (Jaffe 1992).

Morphine and codeine were isolated from the opium poppy in 1806, and while they were powerful painkillers, being readily absorbed transdermally, through the gastrointestinal tract, and via nasal and rectal mucosa, they were found to be highly addictive (Jaffe & Martin 1992). Intravenous, subcutaneous and intramuscular injection, in bypassing metabolism in the liver, facilitates swift uptake and absorption into the brain, with greater effect (Jaffe & Martin 1992). Hence use of morphine and other opioids, including codeine and methadone, increased markedly with the advent of the hypodermic needle (Jaffe & Martin 1992). The search for potent analgesics that were not potentially as addictive as opioids led to the development of synthetic compounds

<sup>9</sup> Martyres et al. (2004) have noted that most heroin-related fatalities in Australia are due to combined drug toxicity involving prescription drugs.

such as methadone, for medical use around the time of the second world war, that nonetheless proved to have morphine-like actions (Jaffe & Martin 1992). Buprenorphine, a compound with partial agonist effects, was developed in the 1960s (Jaffe & Martin 1992).

Like benzodiazepines, opioids are central nervous system depressants, and are used as supplements during anaesthesia and as painkillers. They reduce pain, aggression and sexual drive (Jaffe & Martin 1992), and may provide rapid analgesia for between 15 minutes and six hours, depending on the type and form used (Marshall & Longnecker 1992). Morphine is the most potent painkiller, and is considered the standard against which analgesics are measured (Jaffe & Martin 1992). Morphine produces analgesia without loss of consciousness, drowsiness, changes in mood, and mental cloudiness, tranquillity, and sometimes euphoria (Jaffe & Martin 1992). Large or repeated doses can induce prolonged sedation, nausea, vomiting, apathy, lessened physical activity, dysphoria, constipation, hypotension, and respiratory depression which can lead to death (Jaffe & Martin 1992; Marshall & Longnecker 1992). Development of tolerance and physical dependence with repeated use, where withdrawal causes distress and drug-seeking behaviour, is a characteristic feature of all the opioid drugs, and is a major limitation of their clinical use (Jaffe & Martin 1992).

In Australia, opioids that are regulated for medical use for pain relief are fentanyl, morphine, codeine, oxycodone, hydrocodone, tramadol, dextromoramide, and (decreasingly) pethidine. The most common opioids prescribed for pain relief under the PBS/RPBS have been fentanyl patches and morphine tablets and capsules (Therapeutic Goods Administration (TGA) 2003). Prescriptions issued under the PBS/RPBS for combined morphine tablets and capsules (as brands Anamorph, MS Contin and Kapanol) in Australia increased between 1999 (24,159,512 prescriptions) and 2000 (24,925,738 prescriptions) but then decreased between 2000 and 2002 (to 23,439,667 prescriptions) (TGA 2003). However, prescriptions for morphine tablets alone increased 14%, from 14,294,785 prescriptions filled in 1998, to 16,321,275 in 2002. Combined prescriptions for all sizes of fentanyl transdermal patches (2.5mg, 5mg, 7.5mg and 10mg) increased more than ten-fold from 1998 to 2002 (from 46,778 to 553,911 prescriptions) (TGA 2003). For further information about Australian prescribing trends in pharmaceutical opioids refer to Chapter three, under National Indicator Data, of this report.

The INCB (2002) reported that the global consumption of morphine has increased ten-fold during the last two decades. The use of narcotic pain-relief is considerably higher, and growing faster, in developed countries than in developing countries because of the importance placed on palliative care. The INCB (2002) reported that Australia was amongst the 20 countries recording the highest level of consumption of narcotic drugs for the treatment of moderate to severe pain in 2000, as a result of efforts to improve pain management. The INCB (2002) has noted that increasing the availability of narcotic drugs for legitimate medical purposes facilitates the diversion and misuse of the same drugs.

## Pharmacological opioids utilised for treatment of opiate dependence

### Buprenorphine

Buprenorphine is an opioid that has been used clinically as an analgesic for many years, and was recently introduced in the detoxification and substitution treatment of heroin addiction in many countries including Australia in 2000. Buprenorphine was initially considered to have lower misuse potential than other opioids such as morphine (Jaffe 1992). However, several studies have found that it does in fact have such potential (Bigelow & Preston 1992; Strain & Walsh 1997). For instance, a double-blind study by Bedi and Ray (1998) of six detoxified opioid dependent males, found that buprenorphine injection caused significant euphoria, and on all measured parameters of effects resembled morphine; the drug was identified as heroin by the subjects. The researchers

concluded that the data suggested that the liability for misuse of buprenorphine was similar to morphine (Bedi & Ray 1998). Strain and Walsh (1997) also found in double-blind, controlled, laboratory studies that the supplemental injection of buprenorphine by volunteers, who were on daily sub-lingual buprenorphine, produced opioid agonist-like effects. This demonstrated the potential for misuse of the drug, although there was also evidence that the magnitude of effects may be limited by the drug's combination of partial agonist effects plus high affinity for opioid receptors.

Concurrent with trends in the decreasing use of methadone syrup for drug treatment in Australia, buprenorphine prescriptions increased rapidly (more than twenty-fold) between 1998 and 2002. The trend reflected the drug's uptake as an accepted treatment protocol in 2000, and was approved for PBS prescribing in 2001 (TGA 2003). Uptake of the drug was particularly dramatic in Victoria, which accounted for 48% of all PBS buprenorphine prescriptions in 2002 (at 1,557,734). The NT also saw an exponential increase in prescribed doses, from 1,550 in 2000 to 15,109 in 2002, as did Tasmania, which increased from 2,700 in 2000 to 26,943 in 2002 (TGA 2003).

### Methadone

Methadone is an opioid utilised for the treatment of opioid dependence, and is available as syrup, tablets and in injectable ampoules (the latter two are branded as Physeptone) (GlaxoSmithKline 2003). Methadone syrup is the most commonly prescribed form of the drug utilised for maintenance treatment in Australia, although there are large differences between jurisdictions, as Physeptone tablets are used for treatment in some jurisdictions, and Physeptone injections also sometimes administered for pain relief (GlaxoSmithKline 2003). Methadone has traditionally been the most utilised of all pharmacological treatments for opioid dependence in Australia, especially in NSW; however, prescribed methadone syrup doses under the PBS/RPBS decreased nationwide between 1998 and 2002 (from 107,438,436 to 100,068,600) (TGA 2003). Decreases were reflected in most jurisdictions, in particular in Victoria where they more than halved, reflecting the dramatic uptake of buprenorphine treatment (TGA 2003). Prescriptions for methadone, however, actually increased in Tasmania by more than 30% in that time (from 1,517,800 to 2,055,200, and increased in the NT, from 19,600 to 31,600 doses (TGA 2003).

Generally, there are two types of methadone programs: a maintenance or long-term program, which may last for months or years, that aims to reduce the harms associated with drug use and improve quality of life; and a withdrawal (short-term) detoxification program, which lasts approximately 5-14 days, that aims to ease the discomfort of coming off opiates such as heroin. The evidence suggests, however, that even several years of constant methadone use does not produce complete tolerance to some effects of the drug, with persisting side effects including constipation, insomnia and decreased sexual function in 10 to 20% of users, and excessive sweating in about 50% (Jaffe 1992). Methadone has also been found to induce dependence in its users (Jaffe 1992), and the abrupt withdrawal of the drug produces a syndrome that is less intense but similar to morphine withdrawal, developing more slowly and lasting longer (Jaffe 1992). Even a very slow reduction in dosage has been found to cause withdrawal symptoms in users who have maintained high dosages (Jaffe 1992).

Many heroin users who are maintained on methadone have also been found to be physically dependent on both opioids and benzodiazepines (Jaffe 1992). Methadone is thus prone to diversion from medical treatment programs to the black-market, and injection of both the syrup and tablet forms of the drug have been found to be widespread among injecting drug users in many jurisdictions of Australia (Darke, Topp & Ross 2002). Studies have shown that while methadone maintenance contributes to significant reductions in the mortality rates of heroin dependent participants, that fatal methadone toxicity can also occur in presence of concomitant benzodiazepine misuse, particularly in new maintenance program entrants and those using

methadone tablets for pain relief (Caplehorn & Drummer 1999; Caplehorn & Drummer 2002a; Caplehorn & Drummer 2002b). Many overdose deaths, where methadone has been implicated, have been found to be due to a cocktail of benzodiazepines and opioids. However, Caplehorn and Drummer (2002) found that benzodiazepines were significantly more likely to have contributed to deaths from methadone toxicity among maintenance patients and people taking the tablets for pain relief than deaths related to diverted methadone syrup. Other studies have found that the tablet and injectable forms of methadone were more likely than syrup to be related to both fatal and non-fatal methadone-related overdose (GlaxoSmithKline, 2003).

#### Increase in PWID prescription drugs use

The reported 19% reduction of global opium production, and the fall in the value of the Australian dollar, together with police and customs activity related to the Sydney Olympics, contributed to a well-documented marked decrease in the availability of heroin in some areas of Australia, including Victoria, at the end of 2000 (Topp et al. 2002; Degenhardt, Day & Hall 2004; Donnelly, Weatherburn & Chilvers 2004). This 'heroin drought' led to increased prices and consequently a reduction in heroin use. The magnitude of this decrease was demonstrated by the 90% reduction in the number of heroin-related deaths identified by the Australian Bureau of Statistics (ABS) (2003) in 2001, with 386 deaths identified, compared with 1,116 in 1999, and 938 in 2000. The numbers of deaths continued to decline in 2002 to 364 (ABS 2003). The shortage of heroin, however, has been blamed for an increase in 'major unprecedented changes in drug misuse by dependent heroin users' (Dobbin 2002), including misuse of prescribed opioids, and benzodiazepines

The injecting and misuse of benzodiazepines and pharmaceutical opioids by PWID in Australia has been reportedly increasing for many years (Ruben & Morrison 1992; Darke 1994; Ross, Darke & Hall 1996a; Australian Bureau of Criminal Intelligence 2002; Victorian Department of Human Services 2002a). However, reportedly because of their availability including the ease with which they can be obtained from doctors or trafficked on the street, as well as their affordability and consistency (Strategic Crime Analysis Unit (SCAU) 2002), there has been a recorded increase in injection of these drugs in most Australian jurisdictions in recent years, and it is predicted the market may continue to expand (Australian Bureau of Criminal Intelligence 2002; Victorian Department of Human Services 2002a; SCAU 2002; Topp et al. 2002). Over the past few years the IDRS has detected an increase in reporting by PWID of illicit use of prescription drugs, with reported lifetime injection of benzodiazepines in particular increasing from 34% of the national sample in 2000 to 44% in 2003 (Topp et al. 2001; Topp et al. 2002; Breen et al. 2003; Breen et al. 2004a).

Benzodiazepine use is widespread among heroin-users who are both in and out of treatment, and around 25% of heroin users are believed to be benzodiazepine dependent (Ross & Darke 2000). Darke et al. (1992) documented the injection of benzodiazepines and pharmaceutical opioids by Australian injecting drug users as far back as 1992. The heroin drought, however, was directly linked with a major increase in the use of amphetamines and 'pills' (pharmaceutical drugs), including temazepam and other benzodiazepines use and injection (potentiating and extending the sedative effects of heroin and methadone, as well as acting as heroin substitutes), and injection of morphine tablets or other prescribed opioids as a supplement or substitute for illicit opioids (Waltzman 1999; Rouen et al. 2001; Dobbin 2002; Degenhardt, Day & Hall 2004). Before the drought, Darke and Ross (2000) found that a third of respondent PWID (primarily opioid users) in Sydney had injected benzodiazepine tablets, while following the drought, Miller, Fry & Dietze (2001) reported PWID in Melbourne used pharmaceutical drugs more often than previously, and many reported commencing injection of pharmaceuticals during the drought. Pharmaceuticals were reportedly easy to obtain via trafficking with friends and street suppliers.

### Use of benzodiazepines by Australian PWID

Following the heroin drought, there was a recorded increase in benzodiazepines injection by regular PWID participating in the IDRS in most jurisdictions in Australia, with the practice reportedly increasing from 19% of PWID participants in 2000, to 24% in 2001 of the national IDRS PWID sample. Temazepam gel capsules were the most commonly injected (Topp et al. 2002), although injection of other benzodiazepines such as Valium tablets was also recorded (Topp et al. 2002). Injecting of benzodiazepines varied widely between participants in jurisdictions in that year, from nine percent of SA respondents to 40% in Victoria, 37% in Tasmania, and 27% in both the NT and Queensland (Topp et al. 2002). PWID participants in Sydney reported a 20% increase in injecting benzodiazepines as a result of the drought (Rouen et al. 2001); similarly in Victoria the practice reportedly increased from 19% of the sample of PWID in 1999, to 36% in 2000 and 40% in 2001 (Jenkinson, Fry & Miller 2003). Use of benzodiazepines in the NT amongst the sample of PWID also increased in 2001 to 47%, from 17% in 2000, with injecting increasing threefold, from 9% to 27% (Duquemin & Gray 2003). Furthermore, the rate of benzodiazepine injection by Tasmanian PWID increased slightly from 2000 to 2002 (from 36% to 38%) (Bruno & McLean 2003).

Health harms associated with injection of drugs intended for oral use, such as vascular damage, blood clots and increased risk of overdose, and crimes associated with diverting the drugs to the black market, have become increasingly reported in recent years (Breen et al. 2002; Dobbin 2002; Dobbin et al. 2003). Darke, Topp and Ross (2002) reported that benzodiazepines injectors also had higher levels of polydrug use, needle-risk behaviours, psychological distress and an increased risk of heroin overdose, as well as more vascular morbidity, amputations and mortality, and that having injected benzodiazepines in the previous six months was in itself a significant predictor of injection-related health problems.

The Australian Crime Commission (ACC) (2003) suggested that as heroin re-emerged in quantity in the Australian market, those who supplement their heroin use with pharmaceutical drugs would be likely to return to using heroin alone, thus resulting in a reduction in the use of pharmaceutical drugs. The 2002 IDRS subsequently reported a return of heroin supply, as well as a decrease in price (Breen et al. 2003). An increased number of people reported using heroin daily, although not to pre-2001 levels, a situation that stabilised in 2003 (Breen et al. 2004a; Jenkinson et al. 2004). Even so, PWID continued to use benzodiazepines, and many also continued to inject them (Breen et al. 2002; Kinner & Fischer 2002), with 65% of Australian PWID in 2002 reporting benzodiazepines use in the previous six months, and 21% reportedly injecting the drugs (Jenkinson et al. 2003). Again, reports varied widely across jurisdictions, with six percent of ACT respondents reporting the practice, compared with 38% of Tasmanian PWID.

In 2003, benzodiazepine supply and price remained stable when compared with 2002 findings (Breen et al. 2004a). Sixty-one percent of national respondents in the 2003 IDRS reported taking benzodiazepines orally, and 17% injecting them. Proportions injecting the drugs remained high in the NT (30%) and Tasmania (31%) (Breen et al. 2004a). See Table 6. Both licitly and illicitly acquired benzodiazepines were used by participants, with more than one-third (38%) of the national sample reporting they had used illicitly acquired benzodiazepines in the previous six months, ranging from 26% in Queensland to 66% in Tasmania, while 44% reported they had obtained prescriptions for the drugs. Illicit benzodiazepines were the predominant kind used by 53% of Tasmanian respondents and 44% of NT respondents (Breen et al. 2004a).

**Table 6. Proportion of PWID participants in the 2000, 2001, 2002 and 2003 IDRS who reported injecting benzodiazepines in the previous six months, by jurisdiction.**

Jurisdiction	2000 <sup>a</sup>	2001 <sup>b</sup>	2002 <sup>c</sup>	2003 <sup>d</sup>
NSW	13	18	19	20
ACT	15	14	6	9
VIC	36	40	21	15
TAS	36	37	38	31
SA	5	9	13	8
WA	21	14	30	12
NT	12	27	17	30
QLD	16	27	25	11

<sup>a</sup> Source: Topp et al. (2001).

<sup>b</sup> Source: Topp et al. (2002).

<sup>c</sup> Source: Breen et al. (2003).

<sup>d</sup> Source: Breen et al. (2004a).

PWID who had used benzodiazepines in 2003 were asked to name the main brand they had used. Most (71%) had taken diazepam orally, with oxazepam the next most commonly swallowed (13%), followed by temazepam (9%). Participants reported that temazepam continued to be a preferred drug for injecting (32% of recent injectors), even following its regulation, although diazepam was injected by an even higher proportion of the respondents (29%), albeit at a lesser frequency (Breen et al. 2004a). See Table 7.

A large international literature exists on the public health implications of benzodiazepine diversion and injecting, with reports from a number of countries including the United Kingdom (Ruben & Morrison 1992), United States (DuPont 1998), Canada (Sajan, Corneil & Grzybowski 1998), Israel (Gelkopf et al. 1999) and Australia (Darke et al. 1992; Darke et al. 1993; Darke, Ross & Cohen 1994; Darke 1994; Darke, Ross & Hall 1995; Ross, Darke & Hall 1996b; Ross, Darke & Hall 1997; Ross & Darke 2000). This work has examined associations between misuse, significant health harms and dependence, and provided important data regarding the prevalence of lifetime and recent benzodiazepine misuse amongst IDU (Darke & Ross 2000).

**Table 7. The number of PWID participants in the 2003 IDRS who reported using and injecting different brands of benzodiazepines.**

	Recent oral use (not injected) n = 405	Recent injectors n = 146
Diazepam	71	42
Oxazepam	13	6
Temazepam	9	32
Alprazolam	3	8
Nitrazepam	2	3
Clonazepam	1	2
Flunitrazepam	1	5

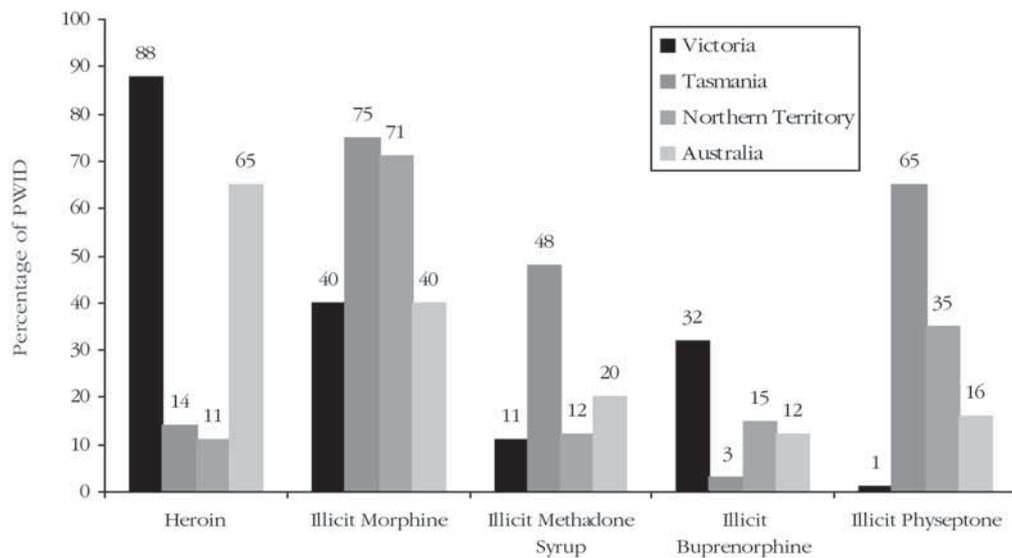
Source: Breen et al. (2004a).

However, there is a paucity of comparable data on patterns of benzodiazepine diversion and injection in other Australian jurisdictions (Fry & Bruno 2002). The majority of Australian data on benzodiazepine misuse by injection has originated from Darke and colleagues in Sydney, New South Wales (Darke et al. 1992; Darke et al. 1993; Darke, Ross & Cohen 1994; Darke 1994; Darke, Ross & Hall 1995; Ross, Darke & Hall 1996b; Ross, Darke & Hall 1997; Ross & Darke 2000). A lack of similar research exists for the market characteristics and patterns of misuse for other types of prescribed pharmaceuticals, despite evidence of emergent illicit markets from studies such as the IDRS.

#### Use of pharmaceutical opioids by Australian PWID

The market characteristics of heroin supply influences the demand for pharmaceutical opioids by some PWID in some locations, since prescription drugs are able to be obtained more easily and/or cheaply in many jurisdictions than heroin, and are of a purer quality, not containing as many adulterating additions (ACC 2003). Furthermore, prescription drugs may be obtained legally, often costing less than four dollars per prescription, and may thus be sold on the street for a considerable profit (SCAU, 2002). In the NT and Tasmania for example, unlike jurisdictions such as NSW and Victoria, pharmaceutical opioids have traditionally been more commonly misused than heroin by injecting drug users (Bruno & McLean 2001; ABCI 2002; Bruno & McLean 2002; O'Reilly 2002; ACC 2003; Bruno & McLean 2003). PWID in the NT have been more likely to use morphine than heroin or any other opioid, whereas those in Tasmania have been more likely to use methadone. See Figure 1 for differences in selected opioid use in the six months prior to the 2003 IDRS survey, between Victoria, Tasmania and the NT, in comparison with Australian PWID.

Figure 1: Proportion of PWID in Victoria, Tasmania and the NT who had used a selection of illicit drugs in the six months prior to the 2003 IDRS survey.



Source: Breen et al. (2004a).

Similar to trends for benzodiazepines, increased pharmaceutical opioid use and injection was reported following the heroin drought across the national IDRS sample, with many participating PWID reporting that they obtained opioids illicitly (ABCI 2002; Jenkinson, Fry & Miller 2003). In 2001 national PWID usage of illicitly acquired opioids other than morphine, methadone or heroin varied from three percent of PWID respondents in the NT IDRS to 10% of Victorian PWID, and 18% of those in the Tasmanian sample (Breen et al. 2004a). Notwithstanding an increase in heroin availability, levels of illicit use and injection of pharmaceutical opioids has not returned to pre-drought levels (Breen et al. 2004a). For instance, in 2000, 49% of the Victorian PWID sample in the IDRS reported using any opioid other than heroin. Use remained stable at 49% of the sample in 2001, but increased substantially to 63% in 2002, remaining at 61% in 2003 (Fry & Miller 2002; Breen et al. 2003; Jenkinson, Miller & Fry 2004). The proportion of Victorian participants reportedly injecting any opioid in 2000 was 24%, increasing substantially to 36% in 2001 and increased again to 41% in 2003 (Fry & Miller 2002; Breen et al. 2003; Jenkinson, Miller & Fry 2004).

### Morphine

Whilst morphine injection by PWID tended to increase in most jurisdictions in the period since the drought (ABCI 2002; Kinner & Fisher 2002; Jenkinson, Fry & Miller 2003), it has historically been the most commonly injected drug in the NT; with for instance 73% of 2003 PWID reporting they used it within the previous six months, as well as by high numbers of PWID in Tasmania (e.g., 71% in 2003). Like the NT, Tasmania has traditionally experienced low availability of heroin (Breen et al. 2004a). However, the frequency of use of morphine in the NT is unique, with the Australian Bureau of Criminal Intelligence (2002) contending that the market for morphine preparations in the NT is 'addiction-based' rather than occasional.

The IDRS only commenced collecting specific information about morphine use in 2001, therefore a direct comparison of IDRS findings for morphine prior to that year is not possible; however, IDRS findings over the past few years suggest that morphine use by PWID within the six months prior to the survey was high in most jurisdictions, and increasing in many, hovering consistently at around half of the national sample. See Table 8. The majority of morphine was reportedly acquired illicitly and injected rather than taken orally (Topp et al. 2002; Breen et al. 2003, 2004a). Licitly sourced morphine was more common in the NT than in any other jurisdiction at 42% in 2001, 42% in 2002 and 35% in 2003.

**Table 8. Proportion of PWID participants in the 2001, 2002 and 2003 IDRS who reported using illicitly acquired morphine in the six months prior to the survey, by jurisdiction.**

Jurisdiction	2001 <sup>a</sup>	2002 <sup>b</sup>	2003 <sup>c</sup>
NSW	9	17	15
ACT	33	35	38
VIC	34	42	40
TAS	72	75	71
SA	40	39	34
WA	25	52	40
NT	73	76	73
QLD	30	52	36
Australia (licit and illicit morphine)	43	50	47

<sup>a</sup> Source: Topp et al. (2002).

<sup>b</sup> Source: Breen et al. (2003).

<sup>c</sup> Source: Breen et al. (2004a).

In 2000, 40% of the national sample had injected morphine in the six months prior to the survey, and 43% had used it, on average, for 13 days (Topp et al. 2001). The majority, at 88%, of NT respondents had reportedly used the drug. In the NT, morphine was the most commonly injected opioid in the previous month (65%) and the drug most often last injected (57% last injected in 2001 and 56% in 2000), although heroin was reportedly the most preferred drug of 39% of all PWID in 2001 and 44% in 2002 (O'Reilly 2002). These findings contrast with those for Tasmanian PWID, 20% of whom reported injecting morphine most often in the previous month (compared with 39% in 2000), and just one percent of Victorian PWID who reported the same (compared with none in 2000) (Topp et al. 2002).

The 2002 IDRS reported an increase in the proportion of PWID reporting recent use of morphine in comparison to the previous study in most jurisdictions, with usage patterns only decreasing slightly in 2003 (Breen et al. 2003, 2004a). In the 2002 and 2003 IDRS (Breen et al. 2003, 2004a), the same proportion of the national sample, at over 40% (consistent in all jurisdictions except NSW where it was around 20%), injected morphine. Nationally in 2002 and 2003, the morphine using PWID accessed morphine predominantly via illicit means (i.e. any method of access other than direct prescription to the respondent). This was particularly the case in Tasmania where during

2002 and 2003 97% of respondents were illicitly accessing morphine (Breen et al. 2003, 2004a). Key Informants in several jurisdictions in 2002 and 2003 suggested that legislative changes in availability of temazepam had caused more PWID to inject morphine instead (Breen et al. 2003, 2004a).

Key informants in Victoria and Tasmania were concerned at the increase in morphine injection from tablet form. In particular, they reported that PWID did not know how to filter properly tablets that had been turned into a liquid form for injection. As a result this reportedly caused vein damage (although reportedly less damage than with some benzodiazepines) (Breen et al. 2003). Injection of morphine increased 19% in the Victorian cohorts between 2001 and 2002 (from 32% to 51%). Again, Tasmania and the NT saw the highest proportion of recent users in both years, although it appeared to decrease slightly in the NT in 2003, (75% from 85% in 2002) and remained stable in Tasmania (75% in 2003 and 76% in 2002), and 47% of Victorian PWID also injected it in 2003. While 43% of NT PWID reported morphine as their drug of choice in 2003 (46% in 2002 and 39% in 2001), only 1% in the 2003 sample said it was the drug they injected most during the month before interview (2% in 2002 and 5% in 2001) (Moon 2004). Morphine was the most commonly injected opioid overall in the NT (64% in 2003, 74% in 2002, 65% in 2001) and the second most common, after methadone, in Tasmania in both years, although morphine use decreased somewhat in frequency in Tasmania in 2002 as methadone tablets (Physeptone) use increased (Breen et al. 2003).

#### Pharmacotherapies

Illicit use and injection of opioids prescribed for drug treatment, such as methadone syrup and tablets (Physeptone), and buprenorphine (Subutex), also became more widespread following the heroin drought, although use of the different drugs varied significantly between Australian jurisdictions (Kinner & Fischer 2002; Jenkinson, Miller & Fry 2004). Historically experiencing low heroin use, Tasmanian PWID have been more likely to inject methadone syrup and tablets than are PWID in any other state, although the practice reportedly increased in other jurisdictions following the heroin drought (Kinner & Fischer 2002; ACC 2003; Bruno & McLean 2001; Bruno & McLean 2002; Bruno & McLean 2003; O'Reilly 2002), and showed a dramatic increase in the NT (Breen et al. 2004a). See Table 9. Injection of methadone is considered especially problematic as it has unique pharmacological characteristics; building slowly to peak blood levels and has a long half-life, leading to accumulation in the body that can result in toxicity. Injection of both the syrup and tablets is also associated with vascular damage and increased risk of overdose, with injection of syrup independently associated with higher levels of injection-related health problems (Lintzeris, Lenné & Ritter 1999; Breen et al. 2004a; Darke, Topp & Ross 2002).

Almost half of all PWID (48%) in the 2001 IDRS national cohort reportedly used methadone in the previous six months, and 23% injected it, compared with 22% in 2000, 48% in 2002, and 28% in 2003. By comparison 76% of Tasmanian PWID reported injecting it in 2001 (slightly higher than 2000, but the same in 2002, increasing slightly to 81% in 2003), compared with three percent in Victoria in 2001, which did not change substantially (Topp et al. 2002; Breen et al. 2004a). More than one-third of Tasmanian PWID (39%) reported that methadone was the drug they injected most in the previous month (compared with 29% in 2000), and 31% reported it was the last drug they had injected in 2001 (compared with 24% in 2000) (Bruno & McLean 2003). This compared with no Victorian PWID reporting methadone as the last drug they injected in both years, and three percent of PWID in the NT (four percent in 2000). Forty-six percent of Tasmanian PWID in 2003 reported that they had injected illicitly obtained methadone; that is, doses that were not prescribed to them. There were also reports of increased combined injection of methadone and alprazolam in Tasmania in 2003, a practice which increases the risk of overdose (Breen et al. 2004a).

**Table 9. Proportion of PWID participants in the 2000, 2001, 2002 and 2003 IDRS who reported injecting (all forms of) methadone in the previous six months, by jurisdiction.**

Jurisdiction	2000 <sup>a</sup>	2001 <sup>b</sup>	2002 <sup>c</sup>	2003 <sup>d</sup>
NSW	13	22	16	16
ACT	19	27	29	34
VIC	3	6	3	2
TAS	74	76	76	81
SA	22	16	19	25
WA	8	15	13	19
NT	19	22	30	43
QLD	32	14	19	26

<sup>a</sup> Source: Topp et al. (2001).

<sup>b</sup> Source: Topp et al. (2002).

<sup>c</sup> Source: Breen et al. (2003).

<sup>d</sup> Source: Breen et al. (2004a).

Usage patterns of Physeptone tablets also varied widely across jurisdictions, with injection increasing overall in 2003. Few respondents, however, reported it was the drug they used most, with 56% of Tasmanian respondents reportedly using Physeptone in 2003 (up from 42% in 2002, and 30% in 2000), compared with over 35% of those in the NT (from 17% in 2001). The use of Physeptone by Victorian IDRS PWID participants has not been widely reported to date, with only one participant each in 2003 (similar to previous years) reporting their licit and illicit use (Jenkinson, Miller & Fry 2004). Physeptone was generally acquired illicitly amongst PWID within the national IDRS sample; in 2003, 56% of Tasmanian PWID reported injecting illicitly acquired tablets, while only two percent injected licit tablets, and in the NT 35% injected illicit tablets, with 12% injecting prescribed tablets.

Sustained illicit use and injecting of buprenorphine in Victoria has occurred since the acceptance of the drug as a treatment protocol since its introduction in 2000 (Jenkinson, Miller & Fry 2004). Licit buprenorphine was reportedly used in the previous six months by 38% of the 2003 Victorian IDRS sample, while 32% of the participants reported they used it illicitly (Jenkinson, Miller & Fry 2004). Buprenorphine treatment was introduced to the NT in July 2001, and two-thirds of the 14% of NT respondents that year reported they had used illicit buprenorphine, increasing to 19% in 2003, with five percent injecting it (Breen et al. 2003, 2004a).

Buprenorphine does not appear to have been widely taken up by the illicit market in Tasmania, with seven percent of the IDRS PWID cohort using it in 2002. However, injection of buprenorphine was much more prevalent in Victoria than injection of methadone, with 39% of the 2003 IDRS sample reporting having used this route of administration in the previous six months. This was a slight increase on the 2002 rates of 33% and the same as in 2001 (Jenkinson et al. in press). Jenkinson, Miller & Fry (2004) reported the high prevalence of buprenorphine injection to be of concern. A number of health harms, similar to those associated with temazepam injection, such as vein damage, arteriosclerosis, thrombosis and infections, are associated with buprenorphine injection (Decocq et al. 1997; Gouny, Gaitz, & Vayssairat 1999; Varescon et al. 2002). In addition, if PWID divert buprenorphine that has been in their mouth there is an increased risk of infection from bacteria in the saliva (Breen et al. 2004a).

Other opioids

The increasing use of opioids other than morphine, methadone or buprenorphine – for instance Panadeine Forte, codeine, and oxycodone – has also been of concern, with over one quarter (27%) of participants in the 2003 IDRS reporting they had used them in the previous six months, and 7% reporting they had injected them (Breen et al. 2004a). Thirteen percent of the national sample reported they had used such other opioids they had obtained illicitly, and their injection increased, but rates varied widely across jurisdictions, with 21% of Victorian respondents reporting they had done so in the previous six months (compared with 15% in 2002, 12% in 2001), 30% of Tasmanian PWID reporting the same practice (16% in 2002, 18% in 2001), and 12% of NT PWID reporting it (8% in 2002, 3% in 2001) (Breen et al. 2003, 2004a ; Topp et al. 2002). The main types reportedly used by the PWID were Panadeine Forte (54% of those reporting use of other opioids), codeine (9%), Oxycontin (8%), and opium (7%).

The increase in misuse of prescription drugs reflects a similar trend in Europe and the United States (Medical and Toxicological Information Review (MTIR) 2003). The MTIR (2003) reports that escalating misuse of these drugs, along with a con-comitant increase in related criminal activity, has been identified by many states in the USA as their greatest emerging problem. They contend that the trend is fuelled by aggressive advertising by manufacturers, the increasing prescription of the drugs in the community generally, and ease of internet access. These findings suggest that the trends in misuse of prescription drugs may not be totally dependent on trends in the illicit drug market such as heroin availability, and therefore whatever changes may occur in the heroin market, trends in increasing use of pharmaceutical drugs may continue in Australia.

*Pharmaceutical opioids and benzodiazepines most likely to be diverted for illicit use*

The pharmaceutical opioid and benzodiazepine families of drugs comprise many different generic forms, but the main medications that become diverted for direct misuse are described in Table 10.

**Table 10. Pharmaceutical drugs that are subject to diversion for direct misuse.**

Drug Family	Chemical (generic) Name	Trade/Brand Name	Street Name
Opioids (narcotic analgesics, painkillers)	morphine	Kapanol, MSContin, Anamorph, Ordine, Dilaudid, Kadian, Morphalgin	M, Monkey, Morph, Miss Emma, Dreamer, Hard Stuff, Grey Nurse
	oxycodone	MSMono, Endone, Prolodone, Oxycontin	
	codeine	Codeine, Panadeine forte	
	pethidine	Pethidine	Peth,
	methadone	Methadone, Physeptone	Meth, Done, Metho
	tramadol	Tramal, Zydol	
	buprenorphine	Temgesic, Subutex	Bupe

Table 10 continued.

Drug Family	Chemical (generic) Name	Trade/Brand Name	Street Name
Benzodiazepines (tranquilisers)	alprazolam	Xanax, Kalma, Alprax	Downers, Sleepers, Benzos, Tranx
	clonazepam	Rivotril	Pins, Super valium
	diazepam	Antenax, Diazemuls, Ducene, Valium, Valpam, Diazepam	V, Vals, Vallies
	nitrazepam	Aledorm, Mogadon	Moggies
	oxazepam	Alepam, Murelax, Serepax	Sarahs
	temazepam(capsules/ tablets)	Euhypnos, Normison, Temaze, Temtabs, Nocturne	Temazies, Jellies, Eggs, Footballs, Normies
	triazolam	Halcion	

Source: Dobbin (1998).

### Benzodiazepine and pharmaceutical opioids misuse and crime

Many PWID who use heroin or other opioids also use benzodiazepines or other opioids to supplement their main drug, with a high proportion of illicit drug users also being polydrug users; indeed benzodiazepine use is linked to polydrug use among PWID in the IDRS (Darke, Topp & Ross 2002; Breen et al. 2003, 2004a; Ross & Darke 2000). See Table 11.

Table 11. Polydrug history of PWID by jurisdiction, 2003.

	NSW n = 154	ACT n = 100	VIC n = 152	TAS n = 100	SA n = 120	WA n = 100	NT n = 109	QLD n = 135
Mean no. drugs ever used	10.2	11.4	12.4	12.4	11.5	13.1	11	10.5
Mean no. drugs used last 6 months	6.7	7.1	7.5	8	6.4	7.7	6.4	6.4
Mean no. drugs ever injected	4.6	6	5.9	6.5	5.2	6.7	5.6	5.1
Mean no. drugs injected last 6 months	2.7	3.1	2.9	3.7	2.4	3.3	2.9	2.8

Source: Breen et al. (2004a).

### *Use of illicitly acquired prescription drugs by PWID*

It is clear that IDRS PWID users of pharmaceuticals may acquire them illicitly (e.g. Breen et al. 2004a). The distinction between licitly and illicitly acquired pharmaceutical drugs (as defined in the IDRS studies) does not take account of 'doctor-shopping', but includes: buying the drugs from friends or dealers; being given them by someone else; or swapping other drugs for them. The definition also does not take into account licitly obtained drugs (obtained via one's own prescription) being used inappropriately (e.g. where drugs intended for oral use are injected). As Caulkins and Reuter (1998) note, illicit drugs are consumer goods, and are provided through markets. There has been little information gathered to date in Australia about the illicit markets in many prescription drugs, or the intersection between illicit drug markets and the street market in illicit pharmaceuticals; indeed there has been difficulty in simply establishing the numbers of illicit drug users of any type, and the extent of illicit drug use (Larson & Bammer 1996; Calkins & Aktan 2000; Davis et al. 2003). Conclusions about illicit prescription markets in Australia can only at this stage be inferred from the IDRS data relating to use of illicit prescription drugs, their availability on the street, and the prices paid for them when they are obtained illicitly, as well as what is known about how markets in illicit drugs operate (Caulkins & Reuter 1998).

Over one-third of the national IDRS sample (38%) reported they had used illicitly acquired benzodiazepines in the previous six months in 2003 (Breen et al. 2004a). Use of illicit benzodiazepines varied between jurisdictions, from 26% in Queensland to 66% in Tasmania, with other jurisdictions at 40% (NSW), 35% (ACT), 45% (VIC), 30% (SA), 34% (WA), and 33% (NT). However, many PWID who obtain these drugs illicitly are also prescribed them, with PWID in all jurisdictions except Tasmania (53% of whom reported illicit benzodiazepines as the form they most used) reporting prescribed drugs were the main forms used (Breen et al. 2004a). Of those using illicit benzodiazepines, most reported they mainly used diazepam (58%) and temazepam (16%) (Breen et al. 2004a). Since the restrictions on temazepam gel capsules, the trade in the drug was reported to have dropped dramatically. However, there were still reports of it being sold in inner Melbourne, for between \$150 and \$300 for multiples of 20, or swapped for heroin. Key informants in 2003 considered that temazepam was accessed mainly via doctor-shopping and through black-market street level selling, although some suggested acquisition was primarily opportunistic (Jenkinson, Miller & Fry 2004).

In regard to morphine, in the 2003 IDRS (Breen et al. 2004a), PWID in all jurisdictions were more likely to report using illicitly acquired morphine than having it prescribed, ranging from 15% in NSW to 71% in TAS and 73% in the NT, with ACT reporting 38%, Victoria 40%, SA 34%, WA 40%, and QLD 36%. The majority of PWID reporting recent use of illicit morphine also reported this was the form of the drug they had used the most (Breen et al. 2004a). MS Contin tablets were reportedly the most common form of morphine available in most jurisdictions.

The price of morphine was reportedly stable in 2003, with 100mg tablets selling in the NT for \$50, 60mg at \$30 and 30mg at \$15, although the Australian Bureau of Criminal Intelligence (2002) reported that 100mg MS Contin and Kapanol could sell on the street in Darwin for up to \$100. The most commonly used brands of morphine in 2002 and 2003 in the NT were reported still to be MS Contin tablets with prices reportedly remaining around \$50 for a 100mg tablet. (Breen et al. 2002, 2003). Key informants in the NT in 2003 considered that morphine availability tended to fluctuate, depending on prescribing patterns of individual doctors. Thus if there was a reduction in prescribed morphine, this resulted in less morphine being diverted onto the street market. PWID in the NT reported that illicit morphine was available and easy to obtain. However, diversion of morphine prescriptions was also common (Breen et al. 2004a).

In Tasmania the use and availability of morphine reportedly remained stable between 2000 and 2001, although there were anecdotal reports of more PWID using morphine. There were also reports that the price of the drug decreased, from about \$50 in 2000 to between \$40 and \$50 in 2001 for a 60mg tablet (Bruno & McLean 2003). In Tasmania in 2003, MS Contin was again the most commonly available morphine, and sold at about \$70 for a 100mg tablet. Also, Ordine liquid use reportedly increased in 2002 (Bruno & McLean 2003). Victorian PWID reported illicit morphine was easy (43%) or very easy to obtain (22%) on the street, and they tended to mostly use MS Contin and Kapanol, although there were also reports of Anamorph, Endone, and Prodonone. They reported paying between \$20 and \$50 for 100mg tablets and capsules. Victorian KI reported there had been an increase in availability in morphine in 2002, with PWID obtaining it opportunistically. PWID reported that they mainly purchased 100mg MS Contin tablets and Kapanol capsules for around \$50, and also reported that 30mg MS Contin cost \$10, and 60mg cost \$20, with 50mg Kapanol and Anamorph fetching \$25 each, with prices reportedly stable in 2003, and the drug easy to obtain (Breen et al. 2003, 2004a; Jenkinson, Miller & Fry 2004).

Diversion of methadone syrup has been consistently reported in the IDRS, although in all jurisdictions licit use of the drug is reported more frequently among those sampled. The proportion of PWID reporting use of illicitly obtained methadone syrup ranged from 11% (VIC) to 48% (TAS), with 12% (NT), 19% (NSW), 31% (ACT), 18% (SA), 14% (WA), and 22% (QLD). In Tasmania (the jurisdiction with the highest reported illicit use) methadone had a street price of approximately \$1 for one ml. It was reported that the drug was mainly acquired via street dealers and friends (Breen et al. 2004a). In the 2003 IDRS study, one Victorian PWID reported buying syrup from a dealer for \$100 for 150ml, while one other reported swapping cannabis for it (Jenkinson, Miller & Fry 2004).

Physeptone tablets had also been used by more Tasmanian respondents than those from other jurisdictions in 2003 (65%). The trend was increasingly towards illicit use of the tablets and away from methadone syrup, with tablets reportedly easy to obtain (Bruno & McLean 2004). However, Physeptone use seemed to be increasing in the NT as well (35%), although it was reported to be easy or difficult to obtain by equal numbers of NT respondents. Proportions of respondents reporting use of the tablets from the other jurisdictions were below 10%, except in SA (23%). The tablets reportedly sold in Tasmania and the NT for \$10 for a 10mg tablet, prices that were regarded by consumers as being stable (Breen et al. 2004a).

The use of illicit buprenorphine in the previous six months ranged from none (ACT) to 32% (VIC), with NT reporting 15% using it, and WA reporting 17%, with QLD and SA at 10% and TAS at 3%. The use of licit buprenorphine was, however, more common in most jurisdictions (with the exception of WA and the NT) than the use of illicit buprenorphine (Breen et al. 2004a). Victorian key informants in 2003 reported there were problems with the diversion of buprenorphine, and that users often swapped it between themselves, or sold it for around \$5 a dose. Two key informants reported there were users of illicit buprenorphine who were obtaining it daily (Jenkinson, Miller & Fry 2004).

The use of opioids such as Oxycontin and Panadeine Forte obtained illicitly were highest in Tasmania (30%), and lowest in Queensland (2%). Most of the PWID who reported using other opioids from illicit sources also reported these were the main forms that they used, which suggests that there may be small numbers of PWID who use these drugs obtained illicitly as their main form of opioid (Breen et al. 2004a).

Clearly, there is a demonstrable market in pharmaceutical drugs in all jurisdictions, in particular methadone and morphine in Tasmania, morphine in the NT, buprenorphine in Victoria, and benzodiazepines nationally. The evidence to date suggests that the market in illicit benzodiazepines in Australia may be relatively unsophisticated, supplied via medical patients

diverting their own or others' prescriptions, and much of the trading may be opportunistic, either via dealers or friends of users and users dealing to fund their own drug use. On the other hand, the prices of morphine and of temazepam gel capsules also suggest there may also be some more organised syndicates or individuals willing to trade on what appears to be an increasing (or at least steady) demand. A major issue is what mechanisms are employed to divert drugs that are normally dispensed via prescription to the black market and illicit users of the drugs.

### *Diversion of prescription drugs onto the illicit market*

Dobbin (2002) stated that, 'The extent and intensity around drug diversion from licit sources to illicit use, in particular the forgery of prescriptions and thefts from pharmacies, indicates a very strong demand for the drugs' (p. 14). It is also clear from the IDRS findings that benzodiazepines and pharmaceutical opioids are diverted in various ways from licit use to the black or illicit market for misuse, including injection (Dobbin 2002). Diversion to the black or illicit market and trafficking of such drugs is of concern to health and law enforcement authorities, not only in Australia (ABCI 2002; SCAU 2002; ACC 2003). Diversion may occur via international trade and overseas-based internet pharmacies, as well as via domestic channels, such as: prescription fraud; robbery of pharmacies, doctor's surgeries, drug factories and wholesalers; doctor-shopping to obtain numerous scripts from different doctors, and presenting to multiple pharmacists; individuals obtaining over-prescription or falsely representing disease to persuade doctors to prescribe drugs; theft of prescriptions; using a false identity or stolen Medicare card (ABCI 2002; Dobbin 2002; SCAU 2002). In addition, diversion of pharmaceutical drugs by pharmacists or doctors operating illegally has been reported.

#### Prescription fraud

The most common methods of prescription fraud that have been employed successfully by prescription drug users as well as by organised syndicates across Australian jurisdictions are using a stolen script, and handwriting fraudulent details, including a forged doctor's signature (SCAU 2002). Other methods include: phoning a fake prescription to pharmacists; altering a prescription by adding a medication to the order, or increasing the dosage or form of a medication; and producing a counterfeit computer prescription (SCAU 2002). Lloyd, et al. (2000) contend that prescription fraud is a major contributor to the diversion of prescription drugs onto the illicit market, and its extent is vastly underestimated. They report that forged prescriptions are frequently not detected and/or acted on, and even if reported to the Department of Human Services (in Victoria), they may not be followed up. There is also no national strategy for dealing with the problem, with different jurisdictions having significant variation in their reporting requirements. Just three states and one territory require all controlled drug prescriptions to be forwarded to the relevant state department for monitoring analysis. Therefore, the actual incidence of forgeries is unknown. However, the data that are available suggest that forging prescriptions to obtain benzodiazepines and opioids may be widespread and increasing in Victoria (Lloyd et al. 2000).

In 1995, 223 items were included on forged or altered prescriptions reported to the Drugs and Poisons Unit, Victoria (cited in Dobbin 2001). Benzodiazepines accounted for 49% of the forged items, with temazepam accounting for 29% of all benzodiazepines prescriptions forged (Dobbin 2001). In the six months to the end of May 2001, 185 forged items were reported, with benzodiazepines accounting for 74%, and temazepam accounting for 85% of all benzodiazepines prescriptions forgeries. All forgeries or alterations nominated capsules as the dose form. There were no alterations or forgeries for tablets (Dobbin 2001). Forgeries were written on stolen prescription stationery, some of which were taken during burglaries. A number of computer-generated forgeries were also detected for 50 packs of Normison 20mg capsules (Dobbin 2001). Forgery-related offences that were investigated by Victoria Police increased by 80% in 1999 compared to 1998 (from 371 cases to 669 cases). Between January 1997 and March 1999 there were 38 different

drugs sought via forged prescriptions, with the most common being for benzodiazepines and opioids: temazepam (n = 79); flunitrazepam (n = 73); pethidine (n = 39); diazepam (n = 31); codeine (n = 28); oxazepam (n = 21); oxycodone (n = 16); morphine tablets (n = 15) morphine ampoules (n = 10); and nitrazepam (n = 5) (Lloyd et al. 2000). In all cases, the prescriptions were written on illegally obtained genuine PBS stationery, and only one case was known of where counterfeit forgery had been used (Lloyd et al. 2000).

The Strategic Crime Analysis Unit from the Bureau of Criminal Intelligence in Queensland (SCAU 2002) reported that the predominant trend for accessing prescription drugs was via prescription fraud, particularly among people dependent on prescription drugs and by organised syndicates. There were 408 prescription frauds reported to Queensland police between April 2001 and March 2002. The most commonly sought prescription drugs in prescription fraud offences in 2000/01 in Queensland were morphine-based preparations (62%), comprising MS Contin and Kapanol, and benzodiazepines (16%). They also reported that there was an emerging trend in Queensland for fraud involving oxycodone-based opioid preparations (such as Oxycontin, Prolodone and Endone) (SCAU 2002). Both Lloyd et al. (2000) and SCAU (2002) reported that much of attempted fraud is unsophisticated, frequently exhibiting incorrect spelling of medications, omission of PBS numbers, or mis-spelt doctor's name. The SCAU (2002) reported that most of those forging prescriptions were individual offenders, although some were associated with an organised syndicate, and that many offenders had criminal histories relating to drug use and/or supply. The SCAU (2002) reported that the true extent and cost of prescription drug fraud in Australia is unavailable. However, it cost the UK National Health Service 69 million pounds in 2001. It is unknown whether data for Victoria and Queensland reflects a national situation as such information is unavailable.

#### Doctor-shopping

The ACC (2002) reported that doctor-shopping for illicit pharmaceutical drugs was widespread within Australia, having been identified in most jurisdictions. In Victoria the symptoms most commonly faked to obtain benzodiazepines and /or opioids were insomnia (reportedly 57%) and anxiety (reportedly 42%), as well as opiate dependence (reportedly 31%) (Victorian Department of Human Services 2002a). Prior to 2004, a 'doctor-shopper' was defined by the Health Insurance Commission (HIC) as a person who had 30 or more Medicare consultations in a year, or who sees more than 15 different medical practitioners to obtain more PBS prescriptions than appear to be clinically necessary (HIC 2003; Kamien 2004). Using these criteria, in 1995-96, there were 13,240 Australians who met the definition of doctor-shopper, which fell to 8,780 in 1999 – 2000 (Kamien 2004). Of the total PBS medicines obtained by doctor-shoppers, 35.5% were benzodiazepines, 14.6% were codeine compounds and 8.4% were opioid analgesics (HIC 2003). The number of PBS prescriptions for benzodiazepines and narcotic analgesics increased by 4.8% and 5.3% respectively in 1999-00, although the number of total prescriptions overall decreased by 0.45% (HIC 2003).

Doctor-shopping has been reportedly undertaken by illicit drug users to obtain benzodiazepines and opioids (Dobbin 2001). According to Dobbin (2001), in 2000 one in 18 (5.6%) of Australian PBS scripts for temazepam capsules, and one in 12 (8.6%) scripts for diazepam 5mg tablets were obtained by this subset of doctor-shoppers. According to the HIC (2003) for example, a single heroin-user had consulted 613 doctors in twelve months. In jurisdictional comparisons of doctor-shoppers from 1995/06 to 2000/01, NSW was the only jurisdiction to experience a notable decrease in numbers (Breen et al. 2003). Doctor-shoppers in the NT accounted for 5.4% of PBS scripts for 10mg temazepam capsules in 2001, similar to the national figure of 5.6% (Dobbin, 2001), and had the highest rates of any jurisdiction for doctor-shopping of oxazepam 30mg and diazepam 5mg tablets (11.0 % and 10.9% respectively compared to 6.2% and 8.6% nationally) (Duquemin & Gray 2003). In 2002 the ACC reported evidence that doctor-shopping for MS

Contin had increased nationwide, and was particularly widespread in the NT, although the ABCI (2002) reports that Health Department efforts to control doctor-shopping in that jurisdiction have led to greater identification of doctors suspected of over-prescribing drugs as well as individuals requesting scripts in excess of their needs. Because 'doctor-shoppers' exclude people who attend fewer than 15 doctors, those who use a false identity or Medicare card, or obtain private prescriptions (non-PBS or RPBS subsidised), these figures may under-estimate the true prevalence of acquisition of these drugs for non-medical purposes.

#### Targeting of pharmacies and patients to obtain prescription drugs

According to the ABCI (2002) the reduced availability of heroin has resulted in PWID targeting pharmacies with thefts and ram-raids to obtain pharmaceuticals, as well as falsifying prescriptions and doctor-shopping. Traffickers or users of the drugs may also assault or threaten medical patients in order to acquire the drugs or a prescription, sell their own legitimately obtained prescriptions and drugs, and swap their prescribed drugs for illicit drugs, with packs of Temazepam capsules for instance trafficked on the street in Melbourne for between \$20 and \$100, or traded directly for a deal of heroin (ABCI 2002; Victorian Department of Human Services 2002a; Dobbin 2002). Aggressive and threatening behaviour has been widely reported by pharmacists and doctors and their staff in Australia, with temazepam capsules the main target of burglaries, ram-raids, stand-over attempts, and thefts of drugs and/or prescriptions and prescription pads (Guild Insurance Limited 2003).

For instance, the Victorian Department of Human Services (2002b) reported that 537 of Victoria's 1200 pharmacies (45%) were burgled between January 1 and August 30, 2001, and there were 275 such burglaries in 2002/03. Available data do not elaborate on goods or property stolen or damaged at chemists or pharmacies in the state, and unfortunately stolen drugs are not systematically recorded. Whilst Tasmania has also experienced these kinds of robberies, in the southern region of the state there has been a steady decline in such occurrences over the past few years, with 17 such incidents in 1998/99, 10 in 1999/00, two in 2000/01 and four in 2001/02. Benzodiazepines were the most commonly stolen drug, featuring in at least 12 of the 17 incidents in 1998/99, 8 of the 10 1999/00 burglaries and 1 of the 4 incidents in 2001/02, although temazepam capsules were rarely taken (Bruno & McLean 2001; Bruno & McLean 2002; Bruno & McLean 2003). Opioid based products have rarely been the targets of pharmacy burglaries or ram-raids due to enhanced security measures (such as floor safes) utilised for the storage of such drugs (ABCI 2002). Individuals with legal opioid prescriptions, however, may be assaulted or threatened for drugs such as morphine, methadone or buprenorphine. The drugs may then be used by the assailant, or else diverted to the black market and trafficked or swapped for other illicit drugs (ABCI 2002).

Each year Guild Insurance Limited collects data about pharmacy related crimes in all jurisdictions except the NT. There is not specific data available for drugs stolen. The most recent data available are to the end of June 2002, and show that while claims varied between jurisdictions between 1998/99 and 2000/01, they decreased nationwide (from 2,044 to 1,882). However, nationwide total pharmacy-related crime claims more than doubled between 2000/01 and 2001/02 (from 1,882 to 4,172). See Table 12. This increase corresponds to the period following HIC regulation of temazepam 10mg gel capsules, although no direct association may be determined as data relating to thefts of drugs are not available. Two increases of note in Victoria between 1999/00 and 2001/02 were total claims (from 805 to 2,410), and burglaries (from 339 to 1,524). Burglaries in all other jurisdictions also increased noticeably in the same period (Guild Insurance Limited, 2003). The breakdown of these data is presented in Table 27 in Chapter three – National Indicator Data p.69-71.

**Table 12. Total pharmacy crime-related claims for the four years ending June 30, 2002, in all jurisdictions except the Northern Territory.**

State	Description of Incident	1998/99	1999/00	2000/01	2001/02
New South Wales	Total	1,318	1,335	1,310	2,246
Victoria	Total	1,318	805	1,038	2,410
Queensland	Total	423	405	506	1,399
South Australia	Total	205	221	179	638
ACT	Total	20	23	0	87
Western Australia	Total	350	307	336	1,055
Tasmania	Total	151	124	57	146
Australia	Malicious Damage	868	832	560	1,411
	Burglary	671	729	922	2,124
	Armed hold up/Threat	335	238	232	220
	Theft	106	87	62	350
	Larceny	64	124	106	67
	Total	2,044	2,010	1,882	4,172

Source: Guild Insurance Limited (2003).

Diversion of prescription drugs to the black market from treatment programs also reportedly occurs, with some users purchasing prescription medications from associates or street dealers (SCAU 2002). Thirty percent of Victorian PWID in 2003 reported they had injected illicitly acquired buprenorphine, with 8mg buprenorphine tablets (Subutex) selling for around \$5 on the street. PWID also reported buprenorphine was swapped between friends (Jenkinson, Miller & Fry 2004). In addition, hospitals, doctors, pharmacists and wholesalers reportedly may also illegally prescribe or sell drugs (Victorian Department of Human Services 2002a; Dobbin 2002; INCB 2002). For instance, for five years a Melbourne chemist reportedly sold prescription drugs that he had bought at reduced prices from a pharmaceutical warehouse supervisor who had stolen them (Herald Sun, 15 July 2004). As well, the Victorian Medical Practitioner's Board censured a Melbourne GP in 2003 for inappropriate prescribing of benzodiazepines and Schedule 8 drugs (morphine) to known drug dependent patients.

#### *Crimes associated with the use of prescription drugs*

As has been previously discussed, some prescription drugs may have psychopharmacological effects that influence behaviour (Jaffe 1992; Marshall & Longecker 1992; Rall 1992). Opioid intoxication in itself has not been directly associated with violence (Makkai 2002), and attempts to attribute violent behaviour associated with the use of opioids (and cannabis) to possible psychopharmacological effects of the drugs have been discredited (Goldstein 1985). On the other hand, there is evidence that mood swings and irritability associated with the withdrawal syndrome from opioids may lead to violence, with Goldstein (1985) finding that prostitutes who used heroin

often blamed withdrawal for criminal behaviour such as assault. Many benzodiazepines are also likely to produce dependency in a regular user (Marshall & Longnecker 1992; Rall 1992), and withdrawal from benzodiazepines has been associated with severe mood swings and aggression (Marshall & Longnecker 1992; Rall 1992).

In addition, the use of benzodiazepines has been implicated in disinhibited and uncharacteristic behaviour, and loss of memory for events occurring whilst intoxicated (Bonn & Bonn 1998; Dobbin 2001; Rall 1992). There have been reports of crimes committed whilst under the influence of the benzodiazepines. Descriptions of paradoxical effects, and personality changes such as that termed the 'Rambo effect' (e.g., French 1989; Daderman & Lidberg 1999; Daderman et al. 2002; Simmer 1999) – where an individual consumes benzodiazepines and experiences heightened feelings of invincibility and disinhibition that can result in crimes of violence, or commission of behaviours outside the realm of the person's normal experience – have emerged.

Dobbin (2001) for instance reported that benzodiazepine intoxication can produce feelings of over-confidence and invincibility in users, causing them to commit offences they would not normally undertake. Daderman and Lidberg (1999), who studied five forensic patients, reported all of those studied demonstrated paradoxical reactions to flunitrazepam, when it was used in combination with alcohol and other drugs. The reactions included hostility and anterograde amnesia. Daderman and Lidberg (1999) reported that, in comparison to their behaviour based on their ordinary psychological characteristics, the patients' crimes were extremely violent, and were characterised by an inability to think clearly or to have empathy with their victims. Similar paradoxical responses have been reported to other benzodiazepines, such as alprazolam (French 1989; Osman, Rudorfer, & Potter 1989), diazepam, and others (Simmer 1999).

Thus, behaviour during benzodiazepine intoxication may be aggressive towards others, a 'disinhibition of usually controlled behaviour', aggressive outbursts, increase in hostility, increased violence, antisocial behaviour, and effects on episodic memory. Crimes committed under the influence of these drugs may include shoplifting, sexual offences, and aggressive outbursts of rage or violence resulting in assault (French 1989; Osman, Rudorfer & Potter 1989; Simmer 1999). Further, Makkai (2002) and Goldstein (1985) reported that some offenders use certain drugs such as benzodiazepines purposely to reduce their fear of committing a crime. Prescription drugs, alone or in combination with illicit drugs or other legal drugs such as alcohol, have also been associated with criminal offences such as property crimes in order to finance illicit use. Other offences associated with pharmaceutical drugs have been driving under the influence of benzodiazepines and opioids, drink-spiking with benzodiazepines in order to facilitate sexual assault, and murder (MTIR 2003).

It is clear from the IDRS findings that misuse of pharmaceutical products is common among samples of PWID in many Australian jurisdictions. Findings to date also suggest that benzodiazepines and pharmaceutical opioids represent a small but significant proportion of drug-related offences (possession, dealing) in comparison to drugs such as heroin, cannabis and methamphetamine. In addition, regular use of prescription drugs may carry with it a substantial financial burden, which renders it more probable that criminal activity will be engaged in to sustain such drug uses. Additionally, the direct effects that some drugs may have on behaviour may also have an impact on criminal activity. To date, there have been no direct studies of the links between pharmaceutical misuse and crime carried out in Australia. However, from two related studies of illicit drug use and criminal behaviour, DUCO and the IDRS, several conclusions can be drawn. There is a complex relationship between drug use and crime, with more serious and rewarding crimes (in financial terms), tending to be committed by the heaviest users (SACACWG 2003). In addition, amongst incarcerated individuals, offenders who have committed property crime are more likely to use illicit drugs. There is also some evidence that widespread use of

prescription drugs may be occurring among the more serious youth offenders (SACACWG 2003). Some prescription drugs, either alone or in combination with others, may also precipitate aggressive behaviour and other criminal behaviour. The past findings relating to illicit drugs and crime, the evidence of diversion of prescription drugs to the illicit drugs market and misused by PWID, and the evidence that crimes have been committed as a direct result of the ingestion of prescription drugs, suggests that prescription drug use by PWID may represent a significant, and under-recognised, problem for law enforcement and health professionals in Australia.

## Implications for law enforcement and health-related services

### *Supply reduction and law enforcement and health impacts*

Beyer, Crofts and Reid (2002) noted that the public expectation is that police will uphold the law and proceed against drug offenders; however, they found that 35 professionals working in the criminal justice sector of Melbourne, Canberra and Sydney were in unanimous agreement about the difficulty of working within an environment where the media, community, politicians, and some aspects of the criminal justice system tend to demonise street level drug selling and using. Various strategies have been applied by law enforcement in order to reduce drug use and crime, and they hold implications for policing of the diversion and illicit use of prescription drugs. Law enforcement strategies around illicit drug markets have tended to focus on supply reduction and police 'crackdowns' on drug users and dealers. The aim of supply reduction is to reduce the availability of drugs, which may also drive up the price of a targeted drug at street level, both of which may be expected to reduce the amount of the drug purchased and hence consumed.

According to Maher and Dixon (2001), supply reduction of illicit drugs is often the reaction to the drug-crime problem, as well as to the drug problem as a whole (see also Maher & Dixon 1999). Weatherburn and Lind (1997) argued, however, that supply reduction is ineffective, as evidenced by reductions in the prices of drugs over time, the rapid spread of new and designer drugs, and the overall increased amount of drugs within the context of a policy of focus on supply reduction. Weatherburn and Lind (1997) and Maher and Dixon (2001) argued that there has been little evidence that supply reduction in the form of heroin seizures has had a significant effect on heroin price, purity or perceived availability in Australia. Weatherburn & Lind (1997) also found that admissions to methadone programs were not effected by the perceived price or availability of heroin or by arrests for use/possession. They argued therefore that supply reduction would only work if heroin could be shown to be price-elastic. This is because it has also been contended that the practice of supply control policy may lead to greater harms, rather than a reduction in use (e.g. Taylor, Caulkins & Reuter 2000; Reuter 2001; Weatherburn et al. 2001). This contention is based on the argument that demand for addictive drugs is not related to price, so that the total demand for the drug will not change regardless of its cost, thus motivating users to resort to activities such as crime to fund their drug use.

For example, Benson, Leburn, and Rasmussen (1994) found, after examining law enforcement data in Florida for 1984 – 1989, that large increases in drug enforcement resulted in an increase in property crime. In accord with this, health professionals and PWID, participating in the 2001 IDRS in Darwin, predicted that reducing the supply of morphine may lead to an increase in the prices on the streets, which would result in increases in the levels of crime (O'Reilly 2002). In addition, even if the 'restricted' drug was price-elastic as Kaplan contended (1983, cited in Weatherburn & Lind 1997), it has been argued that there is the potential for users to switch to alternative drugs if their favoured drug is more expensive or less available. For instance Kleiman (1989, cited in Caulkins & MacCoun 2003) found that tougher marijuana enforcement encouraged smugglers, dealers and users to 'creatively' substitute into cocaine because it was easier to conceal. Similarly, PWID and key informants in Darwin expressed concern that continued efforts to curb the supply of Schedule 8 opioids, without a concomitant reduction in demand, could create the potential

to develop a heroin market (O'Reilly 2002). These findings, coupled with evidence following the heroin drought, suggest that supply reduction in heroin or the dominant illicit substance could be predicted to result in changes in the drug supply and demand chain, with diversion of prescription drugs such as opioids and benzodiazepines an obvious option in a traditional heroin or other opioids-based market, for several reasons: opioids' pharmacological compatibility with heroin; their availability; their consistent quality; and the potential for large profits based on their retail price.

Caulkins and MacCoun (2003) also argued that supply control may have other perverse and unexpected effects on the drug markets, such as producing new users and sellers, and locations for dealing. They found that changing drug usage, resulting from law enforcement, produced a group of generally poor, 'professional' sellers who were often young with limited work opportunities, and the researchers speculated that increasing enforcement may have discouraged dealers for whom sanctions were especially costly. Caulkins and MacCoun (2003) note that many drug dealers are also habitual users themselves; thus if the environment changes in a way that impacts on their access to drugs, they will be driven to behave in a way that achieves the goal of attaining the drug one way or another. In other words, it may increase the proportion of dealers to consumers in the market (see also Maher & Dixon 2001). Maher and Dixon (2001) further argued that supply reduction techniques often result in displacement of the drug users and/or dealers away from central areas and into more suburban locations. They contend that supply reduction rarely results in eliminating the supply of drugs, does not target the 'Mr Bigs', does not actually change the number of drug users, and may in fact promote illicit drug use.

#### Police crackdowns and law enforcement and health impacts

There is further evidence that 'tough' policing of drug use/dealing may lead to displacement and dispersion in the drug market, making it more difficult to supervise (Beyer, Crofts & Reid 2002; Maher & Dixon 2001). Further, this may in turn result in more sophisticated dealing and strengthen the relationship between users and dealers (e.g. Beyer et al. 2002). Beyer et al. (2002) suggests such policing may actually lead to increased harm for both drug users and society, for instance in increased rates of crime and more risky user practices such as reluctance to carry clean injecting equipment and injecting 'on the run', which may result in increased infections, blood-borne viruses, and other injecting-related harms, all of which will in turn impact on other emergency services.

In accordance with this contention, Aitken et al. (2002) found that while 'Operation clean heart' – a police crackdown in 2000 on a heroin street market in Footscray, Melbourne – achieved its objective of reducing the visible aspects of the street drug scene, the market rapidly adapted and the operation was only temporarily and superficially successful. The operation represented a significant increase in resources targeted at Footscray's documented drug problems, with strategies aimed at people buying, selling or in possession of illicit drugs, and passive deterrence through maintaining high visibility on the streets. People who police determined were intending to buy or sell drugs were stopped and questioned, and were sent out of the suburb if their answers were not satisfactory. Aitken et al. (2002) found, however, there were numerous negative consequences of the action, including public health harms, partial displacement of the drug scene to nearby suburbs, reduction in safe needle and syringe disposal and an increase in unsafe injecting behaviour (Aitken et al. 2002).

Injecting drug users in the area reported during the operation that they felt compelled to inject rapidly, with resultant vein damage, or they found a more isolated location or injected in a moving car, thereby putting themselves at risk. PWID also reported sharing fits with others, and not disposing of needles properly (Aitken et al. 2002). Other reported harms were increases in 'stand-overs' (threats or violence used to obtain drugs from dealers), and sales of fake drugs on the streets,

which also led to further violence (Aitken et al. 2002). Maher and Dixon (1999, 2001) found similarly that risk-taking, violence and other behaviours prejudicial to public health, resulted from intensive police anti-drug operations, and this was supported by further findings following an equivalent operation ('Operation Puccini') in Cabramatta, Sydney (Maher & Dixon 2001). Aitken et al. (2002) concluded that the Footscray crackdown was an inappropriate response to illicit drug problems, resulting in more harms for both users and the community than positive outcomes, a conclusion echoed by Maher & Dixon (2001).

On the other hand, Williams et al. (2001) demonstrated how targeted 'problem-oriented' police interventions against drug transactions and drug markets in a small city in Massachusetts had the effect of reducing related criminal behaviour, such as robbery, burglary and violence in the city. They reported that in the first year of the intervention, reported robberies dropped by 18.5%, reported burglaries by 37.5%, and reported crimes against the person by 66%, and that these reductions were sustained with robberies decreasing even further over time. Residents reported a perceived increased quality of life and less disorder. Williams et al. (2001) suggest that success with problem-oriented policing depends on targeting specific problems and places, such as identifying a place as a drugs and/or crime 'hot spot', which they argue requires a recognition of an underlying cause of many incidents and calls to police, and that the most effective police interventions are based on systematic strategies tailored to particular places and problems (Williams et al. 2001).

Following similar reasoning, 'Operation mantle' was undertaken in Adelaide from October 1998 to March 1999 in order to '...reduce the impact of illicit drug-related crime, increase the diversion and retention of illicit drug users/dealers into rehabilitation, and disrupt the activities of the illicit drug markets at all levels' in areas that had been seeing increases in offences associated with illicit drug use, such as break and enter, armed robberies and total property offences (Williams et al. 2001). Special investigation teams comprising six members were formed in each of six local service areas and integration was achieved through the attachment to a Drug and Organised Crime Investigation Branch specialist. The tactics employed included coordinated law enforcement activities targeted at mid and low level illicit drug dealers, 'taking into account the principles of harm minimisation'<sup>10</sup> in an effort to reduce mid and low level drug trafficking, as well as undertaking media and marketing activities to promote the integrated drug reduction strategy and provide community reassurance (Williams et al. 2001). Unlike the Massachusetts findings, during the operation Williams et al. (2001) reported that all offences stabilised or increased slightly, drug-specific offences fell, while in one area there was a significant increase in total property offences. Declining offence statistics during the operation 'rebounded' following it, although the authors argue that the operation managed to arrest a previously escalating crime rate.

It has been argued that reduction of drug problems and associated crime by law enforcement efforts is doomed to failure, firstly because supply can expand to cover losses due to seizures (Maher & Dixon 2001). This is because the elimination of one dealer from the distribution network allows the entry of another, motivated by the huge profits in illicit drugs (Maher & Dixon 2001). Secondly, drug dealing is a consensual crime, with the purchaser wanting a successful transaction at least as much as the seller (Maher & Dixon 2001). Maher and Dixon (2001) thus argue that, with a clear link between the level of crime and the number of dependent users who feel the need to commit offences to support their dependency, the effectiveness of law enforcement in reducing

<sup>10</sup> In this context 'harm minimisation' is defined as including: recognising that for injecting drug users there was a priority health issue; assisting where possible in the referral to treatment/rehabilitation services; provision of information on treatment/rehabilitation services; involvement of police in broader integrated community solutions; the preservation of needle exchange services as non-targeted locations; and attendances at overdoses on an exception principle only.

crime will depend on the application of harm reduction/minimisation strategies. They contend that harm minimisation strategies, such as encouragement to enter treatment, will result in the number of dependent users decreasing and will serve to curtail the number of recruits to dependent users.

### *Strategies for reducing diversion and illicit use of prescription drugs*

#### Law enforcement

Caulkins (2002) argued that law enforcement can play a valuable role in micro and macro harm reduction, and also contended that harm reduction and use reduction are not mutually exclusive. He outlined five roles for law enforcement in this area: partnerships with treatment and other interventions; constraining supply; time-focused intervention early in an epidemic; reducing control costs; and exploiting drug markets' inherent adaptability. The first, partnerships, may be attained in various ways, but Caulkins (2002) suggests that the most promising are information exchange (where police may know of areas not well serviced by treatment programs), drug courts, treatment in prison, or making compliance with treatment a condition of probation or parole. In this way law enforcement can encourage people into treatment who would not enter voluntarily, and to keep them there and avoid relapse (Caulkins, 2002).

The effectiveness of drug treatment in reducing crime has been well documented, for instance Lind et al. (2004) and Bell (undated) found that when people were undertaking methadone maintenance treatment their property offending rates were significantly lower than when they were not in the program (see also Hall, Bell & Carless 1993 and Weatherburn, Lind & Forsythe 1999). Lind et al. (2004) found that when reductions in officially recorded offending were scaled up to allow for offences that did not result in the prosecution of the offender, it was found that for every 100 persons in methadone maintenance for one year, NSW had 12 fewer robberies, 57 fewer break and enters and 56 fewer motor vehicle thefts. Bell (undated) suggests methadone treatment is effective in reducing crime through reduction in illicit drug use. Maher and Dixon (1999, 2001) agree, contending that the more that dependent users can be brought into treatment the less they will be involved in crime to support their drug use, thus the benefit is also to the community as well as to the user.

However, many of the law enforcement participants in the Beyer et al. (2002) study noted the shortage of appropriate drug services, with waiting lists for accessing treatment, and the fact that treatment services targeted adults rather than adolescents, as well as treatment services being insensitive to cultural issues. The participants also contended that treatment tended to focus simplistically on addiction, rather than the multiple factors that underpinned drug dependence, and often did not provide follow-up support after detoxification to enable the former user to establish an alternative lifestyle that would maximise their chances of successfully remaining drug-free (Beyer et al. 2002).

The second strategy forwarded by Caulkins (2002) hinges on the understanding of drug markets as an economy – operating as a result of the laws of supply and demand in the marketplace, so that reducing use would theoretically reduce related harms. This strategy is countered, however, by arguments outlined previously about alternative activities of users when supply is reduced. Caulkins (2002) argues, however, that increases in price can reduce the initiation of new users, and thus have a positive impact, and suggests that the heroin drought has had a beneficial effect on harm-related indicators, for instance the (previously mentioned) substantial reduction in heroin-related overdoses (countered by the use of benzodiazepines and other drugs in some jurisdictions, and a rise in other harms). In terms of the third strategy, Caulkins (2002) suggests that it may be possible to intervene in initiation into drug use at the beginning of an 'epidemic' (use of a new drug for instance), and in that way avert increasing and expanding use.

The fourth strategy outlined by Caulkins (2002) was reducing control costs and associated harms. This approval focuses on the 'induced' costs and harms, such as harms resulting from efforts to control or reduce drug use. These induced costs and harms include crime committed from a need to finance a drug habit, or unsafe injection caused by attempting to avoid detection by the police. These induced costs and harms contrast with the direct harms related to using the drugs, such as direct physical harm caused to the user or to others due to the user's behaviour whilst intoxicated (see also Weatherburn & Lind, 1999). Caulkins (2002) argues that measures designed to reduce the induced harms without effecting direct harms would have a valuable contribution, by, for instance, targeting resources effectively for the biggest net gain rather than sweeping for low level consumers. He argues, for instance, for redesigning performance reviews away from reward for volume of arrests, to focusing more on 'quality' of arrests (such as targeting a most wanted list of big-time known dealers who the community name as causing the biggest harm) (Caulkins, 2002).

The final strategy Caulkins (2002) recommended was taking advantage of the desire of drug sellers to make profits, and the way they operate to maximise them, whatever the environment. Caulkins (2002) suggests this can be achieved by accepting that drugs per se will not be eliminated, and shifting the market from its current form into a form that generates less harm overall. In this way, he argues that law enforcement can reduce harms without precipitating the market to 'push back'. However, Caulkins (2002) asserts this strategy is difficult in an environment that prosecutes all drug-involved offenders aggressively. In this vein, law enforcement key informants interviewed by Beyer et al. (2002) considered that drug dealing by users could be considered as a form of 'harm minimisation', being preferable to committing violence or property crime as some did to support their drug use. There was also general agreement among these KI that people dealing drugs to fund their own use and not committing any other crime should be subject to lesser sentences than a person selling for commercial purposes. Key informants also suggested that there needed to be degrees of sentencing for seriousness of drug offences, with the mode of drug use taken into account: 'We are never going to eliminate the illegal drug market...(we can) shape the drug market in such a way that it does the least amount of damage...' (key informant from criminal intelligence agency) (Beyer et al. 2002).

## Health

Several strategies have been utilised to date by health-related institutions to reduce the diversion and illicit use/misuse of prescription drugs. Due to increasing concern over adverse health effects associated with the injection of temazepam capsules in particular, the Victorian Department of Human Services introduced the Temazepam Injection Prevention Initiative (TIPI) in November 2001, in order to reduce injecting of the gel capsules by educating prescribing doctors about the drug's diversion and injection (Dobbin 2002). Subsequently in May 2002 changes were made to the PBS prescribing authority for 10mg temazepam capsules (Breen, et al. 2003). The 20mg gel capsules were still available without authority as non-PBS items (i.e. non-subsidised prescriptions).

Interviews were conducted with a sample of PWID who had used the gel capsules between January and April 2002, prior to the restriction on the capsules, and with a second sample in December 2002, following the restriction (Breen et al. 2002). Despite a suggested decrease in the reported injecting of temazepam in the June survey in the month after the policy change, the findings from the December survey suggest that injecting of the drug still remained a problem, with continued injection of temazepam gel capsules. PWID also reported being able to continue to obtain capsules on the street following the restriction (Breen et al. 2003). These findings are not representative of PWID generally who use benzodiazepines, as they were targeted injectors, and key informants in the study contended it was too early to determine the real effect of the restrictions (Breen et al. 2003).

As previously described, IDRS findings since this policy change (Breen et al. 2004a) suggest that injecting of benzodiazepines, in particular temazepam gel capsules, has decreased in most jurisdictions. The announcement by Sigma, the pharmaceutical company that manufactures temazepam gel capsules, that they ceased production of the capsules as of March this year and were destroying all remaining stocks (Dobbin, personal communication, 2004) may be expected to further impact on the acquisition and illicit use of the drug.

Reductions in the use of temazepam following the restrictions on the capsules reflect the experience with flunitrazepam (Rohypnol), which was rescheduled from Schedule 4 to Schedule 8<sup>11</sup> in 1998 following reports of adverse reactions, such as memory loss and aggression, and the implication of the drug in drink-spiking and 'date-rapes' (Dobbin 1997). However, a side-effect of the increased restrictions may have been an increase in the misuse of other drugs, in particular opioids. Many of the law enforcement participants in the 2002 and 2003 IDRS suggested that changes in availability of temazepam had caused more PWID to inject morphine instead, and in Tasmania it was found that there was an increase in injecting of alprazolam and methadone combined (Breen et al. 2003, 2004a; Bruno & McLean 2002, 2003).

A program called the 'Prescription Shopping Project' is currently being established as a replacement for the now defunct 'Doctor-shopper' project. A 'prescription shopper' is now defined as a person who has been supplied prescription drugs by six or more prescribers within a three month period, or 30 or more in a year, or has been prescribed a total of 25 target pharmaceutical benefits, or a total of 50 or more pharmaceutical benefits (Australian Medical Association (AMA) 2004; Kamien 2004). The goal of the new program is to provide feedback and educational intervention to excessive prescribers with the aim of changing their prescribing practices, as well as – with a patient's consent – to authorise the HIC to contact patients or give drug information to their doctor (Kamien 2004). A total of 22,000 doctor-shoppers have been identified by the HIC in Australia using these new criteria (HIC 2003; AMA 2004; Kamien 2004). It is recommended that the new program be closely monitored in the future for future trends in prescription shopping. Findings from a similar scheme in the NT suggest that the new database may be effective. In January 1999, the NT introduced a voluntary contract system for people receiving Schedule 8 and some Schedule 4 medications; Duquemin & Gray (2003) reported a subsequent decrease between 1998/99 and 2000/01 in the number of NT doctor-shoppers for benzodiazepines, codeine and narcotic analgesics.

On the other hand, strategies for reducing prescription forgeries have been less successfully pursued, with no national coordination, although it has been recommended in the past (e.g. Lloyd et al. 2000). Findings by McBride et al. (2003) and Lloyd et al. (2000) suggest that, along with a national policy with central coordination for reporting, doctors and pharmacists are the key to monitoring the appropriate dispensing of prescription drugs, and in detecting and reporting forged prescriptions. Lloyd et al. (2000) asserted that considerable action needs to be taken to minimise the extent of prescription forgery, and consequent diversion of prescribed drugs onto the illicit market, arguing for a number of implementations. They argue for gathering information about the extent of prescription forgeries, coordinated action to minimise forgeries, monitoring of how new technologies might impact on forgeries, and educating and informing pharmacists and doctors about how to minimise forgeries and diversion of drugs.

<sup>11</sup> All States/Territories have adopted the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP); however, jurisdiction variation may occur in local poisons schedules stipulations (see Therapeutic Goods Administration, 2000).

Lloyd et al. (2000) suggest these aims be achieved by: firstly, establishing a common database (which would be secure and address the needs of personal privacy) dedicated to the diversion of pharmaceutical drugs generally, and for forged prescriptions specifically; secondly, by monitoring current systems that produce computer-generated prescriptions, with regard to the incidence of stationery theft and counterfeiting and forgery of prescriptions; thirdly, by prioritising the security of electronic transmission of information of prescription messages between doctors and pharmacists, to prevent fraud that results in diversion of prescribed drugs onto the illicit market; fourthly, by informing pharmacists and doctors of the extent of forgeries and its contribution to drug abuse, and alerting them to how to detect forgeries, and provide them with resources for use in pharmacies (e.g. public notices, procedures); and for doctors, alerting them to ways that are used to steal prescription stationery and provide them with guidance on procedures for keeping stationery secure, as well as combining information on doctor-shopping and drug seeking behaviour.

## Study rationale

The preceding literature review shows that there is a substantial gap in the Australian literature regarding research into the association between pharmaceutical misuse and crime. However, studies to date suggest that PWID in Australia are likely to report involvement in criminal activity, and substantial proportions of these past research participants use benzodiazepines and pharmaceutical opioids (both licitly and illicitly). The potentially lucrative market in prescription drugs (particularly S8 classes) suggests their diversion to the black market could present an attractive source of income. In addition, the effects on behaviour of benzodiazepines (e.g. disinhibition, aggression, memory loss), as well as the financial imperative to maintain their supply once dependence is established, might help to highlight one antecedent of a link between the use of pharmaceutical drugs and crime. The material reviewed in the previous section provides evidence of the existence of active illicit benzodiazepine and pharmaceutical opioid markets fed by diversion from legitimate supply sources – national prescribing data shows that the licit supply of these pharmaceuticals is plentiful (Martyres, Clode & Burns 2004). Evidence of non-medical use (particularly injection), and associated health and other harms associated with illicit markets, poses a significant challenge for health and law enforcement. The examples considered of interventions (both supply and harm reduction), that have been implemented in response to diversion and misuse, show that these may have mixed and sometimes unintended effects.

Several issues are of interest in order to enhance understanding of the misuse of pharmaceutical drugs by illicit drug users. Firstly, it would be informative to examine in more depth the extent of the misuse of these drugs by PWID. Secondly, examination of the extent of the black market in these drugs, and their routes of diversion from medical prescription, may be revealing. Thirdly, the widespread use of these drugs may have implications for medical, emergency, and health providers, who may be confronted with the health harms and injuries that may result from the misuse of these particular drugs, especially their injection. Fourthly, given the complex relationships that are known to exist between illicit drug use and crime in general, more specific examination of such activity in relation to these specific drugs may yield important information of interest to law enforcement providers and policy makers to guide specific responses to these issues.

The examination of these issues may thus lead to information that can be utilised to inform development of appropriate interventions by both law enforcement and health providers, to minimise health harms and the impacts of crime on the community that may result from the misuse of pharmaceutical drugs. NDLERF funded the current study in order to enable examination of these pertinent issues.

## Aims and objectives

The purpose of this study was to contribute to law enforcement sector understanding of the relationship between benzodiazepine and pharmaceutical opioids and crime, and the impact of this in three select Australian jurisdictions (Melbourne, Hobart, Darwin) where there is evidence of illicit prescription pharmaceutical markets. In keeping with the current Australian National Drug Strategy, which incorporates a policy of harm minimisation through supply, demand and harm reduction strategies, the approach adopted by the study team in the current research was to examine law enforcement and public health aspects of illicit markets for benzodiazepine and pharmaceutical opioid issues. While the primary focus of the study remains on law enforcement interests in relation to licit and illicit benzodiazepine and pharmaceutical opioid markets, where warranted these are discussed in relation to the broader public health implications of the range of interventions potentially available as a response to the markets being examined and their impact.

The primary aims of the study therefore were to:

1. Gain a greater understanding of illicit benzodiazepine and pharmaceutical opioid market-place dimensions and characteristics.
2. Investigate the hypothesised relationship between benzodiazepine/pharmaceutical opioid misuse and crime.
3. Explore the implications for police and other front line workers (e.g. accident and emergency staff, ambulance officers and health/youth workers) of emergent illicit markets for benzodiazepine and pharmaceutical opioids.
4. Consider appropriate interventions to address both the law enforcement and health impacts of benzodiazepine and pharmaceutical opioid misuse.

A secondary and broader aim of the research was to examine the nexus between prescribed pharmaceutical misuse, illicit prescription pharmaceutical markets, crime, and health harms.

## Research questions

An extensive set of research questions was developed by NDLERF and specified in the RFT 04/02 tender specifications under the five key themes of: market characteristics; diversion; links to crime; implications for police and other front line workers; and interventions (these appear in Appendix A). A core purpose of the early stages of the proposed study was to further refine and prioritise this list in accordance with law enforcement interests.

## Report structure

This National Overview Report presents an overview of study methodology, key findings and jurisdiction-specific discussion points. It should be read in conjunction with each of the companion Jurisdiction Reports for Melbourne (Smith et al. 2004), Hobart (Bruno 2004) and Darwin (O'Reilly et al. 2004), which contain detailed data content, and discussion of the findings and issues of local relevance to those study sites.

This report avoids duplication of the data content of each Jurisdiction Report, in preference for summary and discussion of the main important findings and themes that have emerged from this comprehensive study. Specifically, the report focuses upon:

- salient issues that have emerged from the review of relevant national and international literature (current knowledge and gaps in the literature);
- comparison of key findings across study sites (descriptive and explanatory/statistical comparisons concerning market characteristics, diversion and links to crime); and

- discussion of the implications of these findings for law enforcement and health services (including implications for front line workers, options for intervention within the market, the costs and benefits of such actions, and future directions).

The remaining five sections of this report are presented as follows:

Chapter two: Study Methodology

Chapter three: Study Findings: Overview and Discussion

Chapter four: Study Implications and Conclusions

References

Appendices

## Chapter two: Study methodology

This report section provides a description of the multiple methods employed in this study. Further details may be found in each of the Jurisdiction Reports (Smith et al. 2004; Bruno 2004; O'Reilly et al. 2004), together with a discussion of methodological limitations.

A flexible and reflective study methodology was employed to study the crime and law enforcement implications of diverse and fluid drug market places such as those that appear to exist for benzodiazepines and prescribed opioids. The study design incorporated a mix of epidemiological, social and market research methodologies in order to gather data from multiple data sources, including: available published and 'grey literature' (such as monographs, technical reports and other publications); primary data from current benzodiazepine and pharmaceutical opioid users; expert key informants from health and law enforcement sectors; and select secondary indicator data sets.

The study comprised core methods that were replicated in the three target jurisdictions of Victoria, (Melbourne), Tasmania (Hobart) and the Northern Territory (Darwin). The research was conducted in four stages over a 14-month period commencing April 2003 and concluding in June 2004. See Table 13.

**Table 13. Summary of core methods for each study stage.**

Research Stage	Core Methods
Stage one	Literature review and key informant interviews – law enforcement (N=33)
Stage two	Survey of benzodiazepine and pharmaceutical opioid users (N=303)
Stage three	Analysis of secondary indicator data (law enforcement and health)
Stage four	Survey of benzodiazepine and pharmaceutical opioid users (N=147) In-depth key informant interviews – health and law enforcement (N=69)

The data collected from multiple sources were triangulated for cross-validation and interpretation purposes. Triangulation is a research strategy that aims to minimise the inherent biases and weaknesses in primary and secondary data sources, thereby increasing the ability to interpret findings (Thurman 2001; Sarantakos 1998). It involves the combination of at least two methodological approaches; data sources (i.e. different participants, data sets or research tools) or data analysis methods (Thurman, 2001). In the context of the findings presented in this report, the information from the PWID surveys, interviews with key informants, and secondary indicator data, are interpreted in conjunction with one another. This exercise was conducted with a focus upon the prioritised set of NDLERF research questions. Where appropriate, descriptive and explanatory analyses were undertaken on the collected data. For the data on experiences, attitudes and practices, simple frequency counts were tabulated. Group differences were examined using both bi-variate (e.g. chi-square) and multivariate statistical methods (e.g. logistic regression). Raw data from open-ended questions from PWID surveys (Stage two and four) and in-depth interviews following transcription (Stage four) were analysed descriptively via open coding followed by content and theme analysis (Strauss & Corbin 1990; Manning & Cullum-Swan 1994).

The data collection components of the study proceeded with appropriate ethics approval and other approvals required from the following committees: Victorian Department of Human Services Human Research Ethics Committee; Victoria Police Research Coordination Committee; Tasmanian Southern Health and Medical Research Ethics Committee; and the Human Ethics Committee, Charles Darwin University. All secondary indicator data was obtained with permission of data keepers in accordance with the above clearances.

## **Stage one: Literature review and key informant interviews**

The purpose of Stage one of the study was to serve a formative function for the main body of the research through the combined methods of literature review and key informant interview. Specifically, it was intended to: (1) inform the further prioritisation of the comprehensive set of research questions suggested in the NDLERF RFT 04/02 tender specifications (refer to Appendix A); and (2) facilitate the development of the user survey to be implemented in Stage two.

### **Literature review**

A review of available national and international literature on benzodiazepine and pharmaceutical opioid misuse and law enforcement impacts was conducted. Key words derived from the set of NDLERF research questions were used to perform searches for published literature on a variety of electronic databases (i.e. PUBMED, PSYCHLIT, MEDLINE, Citation Indexes etc). Through direct contact and additional internet searches the study team also consulted key crime research institutes in Australia (e.g. ABCI, AIC, Bureau of Crime Statistics and Research (BOCSAR)), and university-based criminologists in order to identify other relevant research in progress and 'grey literature'. The literature review helped in identifying knowledge gaps that the current study could begin to address. A total of 533 relevant sources were identified. On the basis of team consensus, 130 of these were collected and compiled for the purpose of the literature review.

### **Key informant interviews**

Key informant interviews with select law enforcement personnel in each jurisdiction were conducted for the purpose of prioritising the study research questions, and to inform the development of both the drug user survey (Stage two) and in-depth key informant interview schedule (Stage four). A total of 33 key informant interviews were conducted with law enforcement personnel during July and August 2003 (n=13 Melbourne, n=11 Hobart, n=9 Darwin). Stage one key informant interviews focused on participant experiences and perceptions of illicit benzodiazepine and prescribed opioid markets as well as the nature of operations, policing practices and nature of contacts.

Key issues and themes were identified through reference to the NDLERF specified research questions, the literature review and analysis of extant data. The topic areas covered were: drugs commonly associated with crime; diversion of prescription drugs to illicit markets; the impact of prescription drugs on policing; the impact of licit and illicit markets in prescription drugs on crime; how law enforcement could impact on illicit use of prescription drugs; and harm minimization approaches to illicit use of prescription drugs. For the prioritisation exercise, the original 25 research questions of interest were further unpacked by the research team, resulting in a final total of 33 questions pertaining to the key themes of market dimensions and characteristics, diversion, links to crime, implications for front line workers and interventions. The comparative results from the prioritisation exercises undertaken in each study site are presented in Appendix B. Further detail is provided in each jurisdiction report (Smith et al. 2004; Bruno, 2004; O'Reilly et al. 2004).

Eligibility criteria were determined for each jurisdiction. Key informants from the law enforcement sector were drawn from regions corresponding to the main illicit drug markets in each jurisdiction, including representatives from: Divisional Information Management Units; Regional Response Units; Drug Squad (eg. clandestine labs); and Criminal Investigation Units (or their jurisdictional equivalents). Most key informants were sent a copy of the interview schedule, project information, and a consent form to enable them to consider their suitability for participation. The KI were interviewed by phone or in person at their place of work, and asked a series of open-ended questions about local markets for benzodiazepines and pharmaceutical opioids, and methods of diversion of the drugs. They also discussed how the misuse of these drugs impacts on criminal activities and policing practices. Interviews took an average of an hour to complete, and the information was subjected to thematic analysis using a word processor.

## **Stage two: Survey of people who inject drugs (PWID)**

In recognition of the importance of people who inject drugs (PWID) as a source of sentinel data on the operation of drug markets and associated drug-related behaviours, a face-to-face survey of 303 PWID was conducted in Melbourne (n=102), Hobart (n=100) and Darwin (n=101) during September through November 2003. Strict eligibility criteria were utilised to ensure standardisation of sample recruitment across jurisdictions: injecting at least monthly in the preceding six months; using pharmaceutical opioids and/or benzodiazepines in the same time frame; and residing in the particular study site city for the past year, with no substantial periods of time away from the local drug market (such as incarceration, holidays etc.) within the preceding six months.

Using targeted sampling and snowballing methods, each jurisdiction sampled a minimum of 50 benzodiazepine users and 50 pharmaceutical opioid users (where at least 30 were benzodiazepine injectors). Multiple methods were employed to recruit the sample, including advertisements at alcohol and drug services and the Needle Syringe Programs (NSP), active recruitment by NSP staff and word of mouth. Potential interviewees were informed of set times the interviewers would be at interview sites, and those interested in participating were provided with a study information sheet and consent form and screened against the entry criteria.

The standardised structured interview included core questions concerning: demographic details (age, gender, ethnicity, employment, residential postcode, education, criminal and prison history); drug use history and current patterns (benzodiazepines and other prescribed pharmaceuticals such as prescribed opioids and other drugs, age at first use, age at regular use, reasons for prescription drug uptake, consequences of use, frequency of use, route of administration, health, social and legal harms, drug treatment history, attributions and experiences while under the influence of prescribed pharmaceuticals, source of pharmaceuticals, market characteristics, recent involvement in criminal activity, health and other impacts of pharmaceutical opioid and benzodiazepine use, and perceptions of the potential impact of substantially changed availability of such products on the illicit market).

Each interview took approximately 50-60 minutes to complete (ranging from 30 to 120 minutes), and the participants were reimbursed \$20-30 for out-of-pocket expenses and time (according to jurisdiction standards and ethics protocols). Quantitative data were analysed using Statistical Package for the Social Sciences (SPSS) for Windows Version 11 and qualitative information was subjected to thematic and content analysis with a word processor.

## Stage three: Secondary indicator data (national)

A diverse range of secondary indicator data was sourced from law enforcement and health sectors to provide an additional perspective on the issues under focus, and assist the study team in interpreting the relationships between crime and prescription pharmaceutical misuse. Where possible, unit record data was requested and analysed on a quarterly basis for the study duration at a postcode level as well as at larger aggregations such as local government area or state<sup>12</sup>. The analyses focused upon prescription pharmaceutical use, crime correlates and related harms.

### Indicators of use

#### *Population and Sentinel Group Survey*

Every three years the National Drug Strategy Household Survey (NDSHS) (Australian Institute of Health and Welfare 1995; 2001) collects an array of information on drug use by Australians aged 14 years or more. The surveys are widely used to report on the prevalence of the use of all drugs. However, their reliability is limited to widely used drugs, such as alcohol, tobacco and cannabis, and information about other drugs is limited because use of other drugs is less common, and it is often difficult to obtain reliable information about socially undesirable behaviours. As well, household sampling is limited in capturing the populations most likely to be using these drugs (e.g., young people, the homeless) (Victorian Department of Human Services, 2002b). Data on lifetime and recent use (past 12 months) of selected drugs from the last three surveys (1995, 1998, and 2001) are displayed in this report.

The Illicit Drug Reporting System (IDRS) is a national project designed to monitor key and emerging trends related to the use of opioids, methamphetamines, cocaine, cannabis, and other drugs (Breen et al. 2004a). Each state undertakes surveys with a sentinel group of at least 100 PWID, key informant interviews with representatives of health and law enforcement organisations, and analysis of relevant secondary data. IDRS data for Melbourne, Hobart and Darwin, and Australia for 2001, 2002, and 2003, in particular pertaining to opioids and benzodiazepines use, are presented here (Breen et al. 2003, 2004a; Topp et al. 2002).

The Australian Needle and Syringe Program (ANSP) collates survey data on the prevalence of the last drug injected by Needle Syringe Program (NSP) clients in each jurisdiction. The findings for the previous two surveys, 2001 and 2002, are reported here (Buddle, Zhou & MacDonald 2003).

The Australian Institute of Health and Welfare (AIHW) funds the national Clients of Treatment Services Agencies (COTSA) census, to identify the characteristics of clients attending alcohol and drug treatment services, and to compare the drug and alcohol problems they treated since the first census in 1990. Nationally, all services that provided specialist face-to-face treatment were surveyed on Wednesday May 2, 2001. Services were asked to report the characteristics of the clients treated in a 24-hour period. The findings for the 2001 census are presented here (Shand & Mattick 2001).

#### *Prescribing Trends*

The Drug Utilisation Sub-committee (DUSC) of the Pharmaceutical Benefits Branch collates data for prescriptions issued under the Pharmaceutical Benefits Scheme (PBS/RPBS) for all benzodiazepines in Victoria and Australia annually. Relevant data for benzodiazepines prescribing in Victoria and Australia for the period 2000 – 2002 are presented here (Australian Government Department of Health and Ageing, 2004).

<sup>12</sup>Technical details and limitations of some of the indicator data sources utilized in the current study have also been described elsewhere (see Victorian Department of Human Services, 2004).

The Drug Use Monitoring System (DRUMS), part of the Treaties and Monitoring Team, Office of Chemical Safety, Therapeutic Goods Administration, records the total number of prescriptions for all pharmaceutical opioids, including morphine tablets and capsules, methadone, and buprenorphine issued under the PBS/RPBS. The data presented here refer to the period to 2002, extending back up to five years, depending on the drug and when it became available in Australia (Source: DRUMS, The Treaties & Monitoring Team, Office of Chemical Safety, Therapeutic Goods Administration).

Annual National Pharmacotherapy statistics to June 30, 2002 (Australian Government Department of Health and Ageing 2003), provided information about prescribing of methadone and buprenorphine by public and private prescribers in that year, which is presented here.

Prior to 2003, a 'doctor-shopper' hotline was operated by the Health Insurance Commission (HIC) in order to collate information on people who had 30 or more Medicare consultations in a year, or who saw more than 15 different medical practitioners to obtain more Pharmaceutical Benefits Scheme (PBS) prescriptions than appear to be clinically necessary (HIC 2003) (Kamien 2004). Using these criteria, doctor-shopper data was collected by the HIC until 2002. The findings are presented here for the period 1995/1996, to 1999/2000. The Doctor-Shoppers project was discontinued in August 2002 because of budget and privacy concerns (AMA 2004). At the time of writing a replacement program called the 'Prescription Shopping Project' was being established. The goal of the new program is to provide feedback and educational intervention to excessive prescribers with the aim of changing their prescribing practices – as well as, with a patient's consent – to authorise the HIC to contact patients or give drug information to their doctor. Preliminary findings are presented here.

## Indicators of crime

### *Seizures*

The Australian Customs Service records information about drug seizures at Australian ports annually. For the majority of benzodiazepine and pharmaceutical drug seizures, specific information regarding the generic forms or brand names are not currently recorded in the Customs drug statistics database, with many recorded under 'other benzodiazepines' or 'prescribed drugs'. Drug detection figures for the relevant drug categories that are available from the Customs database between 1999 and 2003 are presented here (available from the Australian Customs Service database).

Heroin purity data for national heroin seizures between 2000 and 2002 are also presented (Breen et al. 2003).

### *Pharmacy-related crime*

Each year Guild Insurance Limited collects data about pharmacy-related crimes, including break-in, theft, burglary and malicious damage, in all jurisdictions except the Northern Territory. The most recent data are to the end of June 2002 and are presented here (available from the Guild Insurance Limited database).

### *Crime statistics*

The Australian Bureau of Statistics (ABS) collates crime and justice data on drug offences annually, which are presented here for the years 1999/2000 and 2000/01 (ABS 2002).

The national IDRS collects data on self-reported criminal activity by PWID participants. Data from 2000 to 2003 are presented here (Breen et al. 2003; Breen et al. 2004; Topp et al. 2001; Topp et al. 2002).

## Indicators of morbidity and mortality

### *Fatalities*

The ABS collects data annually from Medical Certificate Cause of Death submitted to each State and Territory's Registrar of Births, Deaths and Marriages and from the National Coroner's Information System. Deaths attributed to accidental opioid overdose (accidental deaths by opioids, including heroin, morphine, pethidine, methadone and codeine) are presented in this report for the period 1999 – 2002 (ABS 2002, 2003).

### *Treatment entry*

The Alcohol and Other Drugs Treatment Services National Minimum Data Set records the number of treatment episodes nationally for alcohol and other drugs. Treatment episodes statistics for drugs of concern nationally in 2001 – 2002 are presented here (AIHW 2003).

## Stage four: Survey of PWID and key informant interviews

The purposes of Stage four of the study were to (1) facilitate interpretation of the data collected in the preceding study stages, and (2) perform an added monitoring function through replication of core components of the Stage two user survey. The inclusion of an in-depth law enforcement key informant component to the study is justified on the grounds that, to date, law enforcement perspectives and experiences on the issue of prescription pharmaceutical misuse and related harms have not been studied. Data from this component will be particularly valuable to law enforcement interests around policing practices in a fluid drug market place.

### Survey of benzodiazepine and pharmaceutical opioid users / injecting drug users

A further series of face-to-face interviews were conducted with a total of 147 regular pharmaceutical opioids or benzodiazepines injectors (Melbourne, n=50; Hobart, n=47; Darwin, n=50). Inclusion criteria remained that the individual must have injected pharmaceutical opioids or benzodiazepines at least once monthly in the six months prior to interview, and that they had resided in the capital city in question for the past twelve months with no substantial periods of time away from the local drug market (such as incarceration, holidays etc.) within the preceding six months. Interview sites, ethics processes and participant reimbursement remained consistent with those used in the Stage two survey (above).

All processes and procedures around sampling, recruitment and interview for the repeat survey were identical to that employed in Stage two, except for numbers recruited. Each jurisdictional sample consisted of a minimum of 25 benzodiazepine users and 25 pharmaceutical opioid users. The survey instrument for this stage of the study consisted of a core set of questions employed in Stage two, plus additional questions developed for the purpose of clarification of the data gathered in Stage two and three. It included sections on: demographics; drug use history; recent benzodiazepine and pharmaceutical opioid use; modes of access and street prices of such drugs; the impact of market changes to the availability of such drugs on a wide variety of aspects of the individual's life; recent behaviour while under the influence of such drugs; and a quantitative and qualitative examination of recent criminal activity and the motivations for such behaviour.

Each interview took approximately 30 minutes to complete (ranging from 15 to 45 minutes), and the participants were reimbursed \$20-30 for out-of-pocket expenses and time (according to jurisdiction standards and ethics protocols). Quantitative data were analysed using SPSS for Windows Version 11 and qualitative information was subjected to thematic and content analysis with a word processor.

### **In-depth interviews (health and law enforcement key informants)**

During April and May 2004, in-depth qualitative interviews were conducted with health and law enforcement sector KI with specific knowledge on benzodiazepine and pharmaceutical opioid misuse and related issues of concern. The aim of these interviews was to gain rich insight rather than achieve a number that suggests generalisability. However, there also needs to be an adequate number of KI from each geographical region and professional background to provide an accurate picture. Targets of approximately 20-30 KI (15 from health, 15 from law enforcement) were set for each jurisdiction. Eligibility criteria and appropriate sampling frames were devised for each jurisdiction. Generally, these professionals were actively working in the illicit drug field, having regular contact with and/or specialised knowledge of illicit drug users, dealers or manufacture.

In-depth qualitative interviews were conducted with 69 experts and professionals across the health and law enforcement sectors in order to examine the issues arising from the earlier research stages in greater depth (Melbourne n=28; Hobart n=12; Darwin n=29). Interviews were conducted face-to-face in a private setting approved by the interviewee, or via telephone depending on distance and interviewee preferences. Key informant interviews were tape recorded with the permission of each participant. All interview tapes were transcribed, and if requested transcripts were returned to interviewees for review and final approval as an accurate record of the discussion.

In following an in-depth qualitative methodology, KI were asked questions based on a series of prompts, rather than a structured set of questions. This is designed to allow the researcher and the participant to follow any topics or issues that may arise from the KI own experience and to modify questions accordingly. The interview itself was qualitative in nature, but discussions centred around several key themes, dependant on the expertise of the individual being interviewed. These included: the impact of pharmaceutical opioid and benzodiazepine misuse on their client group and work; examples and perceptions of the impacts of substantial changes to the availability of such pharmaceuticals on the illicit drug market; approaches used by individuals to illicitly source such products (such as doctor-shopping, drug trading etc.), possible approaches to restricting such diversion and the potential impacts of same; criminal activity in association with the diversion and misuse of such products; and, finally, policing issues in relation to illicit pharmaceutical opioids or benzodiazepines in terms of role, the impacts on policing, opportunities for supply reduction and the potential consequences of changes in the approaches to such issues.

## Chapter three: Study findings: Overview and discussion

### National indicator data

This section reports on the diverse range of available secondary indicator data sourced during Stage three of the study from law enforcement and health sectors to provide an additional perspective on national patterns and trends in: prescription pharmaceutical use (population and sentinel group surveys); prescribing rates (PBS/RPBS, DRUMS, pharmacotherapy statistics, HIC); crime (drug seizures, pharmacy-related crime, crime statistics); and morbidity and mortality (fatalities, treatment entry). The Stage three secondary indicator data results are presented first in order to provide a context (local and national) for presentation and discussion of the primary data collected in Stage one (KI interviews), two (User survey #1) and four (User survey #2).

Additional detail from local level indicator data (not available nationally) reported for the Melbourne, Hobart and Darwin arms of the study may be seen in each jurisdiction report (Smith et al. 2004; Bruno 2004; O'Reilly et al. 2004).

### National trends and jurisdictional comparisons

#### *Use trends*

#### National Drug Strategy Household Survey

According to the 2001 National Drug Strategy Household Survey (Australian Institute of Health and Welfare 2002), 3.2 percent of Australians aged 14 years and over reported ever using tranquillisers/sleeping pills for non-medical purposes, while one percent reported their recent use. This was a substantial decrease on the previous survey of 1998; however, it was comparable to the 1995 findings. See Table 14.

**Table 14. Lifetime and recent use of selected drugs in 1995, 1998 and 2001, Australia, from the NDSHS (%).**

Drug	Lifetime Use			Recent Use		
	1995	1998	2001	1995	1998	2001
Heroin	1.4	2.2	1.6	0.4	0.7	0.2
Other opioids	na	na	1.2	na	na	0.3
Methadone	na	0.5	0.3	na	0.2	0.1
Benzodiazepines	3.2	6.2	3.2	0.6	3.0	1.1
Injected illegal drugs	1.3	2.1	1.9	0.6	0.7	0.6

Source: AIHW (1995, 1998, 2002).

Note: Specific information about morphine was not collected, and data collection on methadone and other opioid use only commenced in 2001.

Painkillers/analgesics were nominated as the third most commonly abused drugs in 2001, with 46.2% of respondents reporting the opportunity to use painkillers and/or tranquilisers for non-medical purposes. In addition, 4.2% reported misusing these drugs in the previous 12 months (8.0% reported they had ever misused them), and 25.5% of those respondents reported misusing one drug or more daily or weekly.

### *Illicit Drug Reporting System*

The 2003 IDRS showed decreases since 2002 in the numbers of participants in most jurisdictions reporting they injected benzodiazepines; however, proportions increased in the NT (43% compared with 30%) and remained high in Tasmania (31% compared with 38%) (Breen et al. 2004). See Table 15.

**Table 15. Proportion of PWID participants in the 2000, 2001, 2002 and 2003 IDRS who reported injecting benzodiazepines in the previous six months, by jurisdiction.**

Jurisdiction	2000	2001	2002	2003
NSW	13	18	19	20
ACT	15	14	6	9
VIC	36	40	21	15
TAS	36	37	38	31
SA	22	16	19	25
WA	8	15	13	19
NT	19	22	30	43
QLD	32	14	19	26

Source: Breen, et al. (2004a).

PWID who had used benzodiazepines were asked to name the main brand that they most often used, and then the group was divided according to whether they had injected benzodiazepines in the past six months or not. Proportions of PWID using benzodiazepines orally and injecting them in the six months preceding interview are presented in Table 16. Of those reporting oral use, most (71%) nominated diazepam as the main type used, whereas only 9% selected temazepam. On the other hand, injectors of benzodiazepines reported using temazepam in almost one-third of cases (32%).

**Table 16. Proportion of PWID participants in the 2003 IDRS who reported using and injecting different brands of benzodiazepines.**

	Recent oral use (not injected) n = 405	Recent injectors* n = 146
Diazepam	71	42
Oxazepam	13	6
Temazepam	9	32
Alprazolam	3	8
Nitrazepam	2	3
Clonazepam	1	2
Flunitrazepam	1	5

Source: Breen et al. (2004a).

\*83% of injectors also reported oral use, therefore the assumption cannot be made that the main brand reportedly used was also injected.

#### *IDRS: Methadone injection 2000 – 2003*

Reported methadone injection (both syrup and Physeptone) remained high in Tasmania (from 76% in 2002 to 81%), and increased substantially in the Northern Territory (from 17% in 2002 to 30%) in 2003, but decreased in Western Australia (from 30% to 12%) and Queensland (from 25% to 11%), remaining steady in Victoria (3% compared with 2%) (Breen et al. 2004a). See Table 17.

Injecting of both licitly and illicitly acquired Physeptone was quite low in most jurisdictions in 2003, with the exception of Tasmania (56% for illicit Physeptone) and the Northern Territory (12% for licit and 35% for illicit tablets) (Breen et al. 2004a). See Table 18.

**Table 17. Proportion of PWID participants in the 2000, 2001, 2002 and 2003 IDRS who reported recent injection of methadone, by jurisdiction.**

Jurisdiction	2000	2001	2002	2003
NSW	13	22	16	16
ACT	19	27	29	34
VIC	3	6	3	2
TAS	74	76	76	81
SA	5	9	13	8
WA	21	14	30	12
NT	12	27	17	30
QLD	16	27	25	11

Source: Breen et al. (2004a).

**Table 18. Proportion of PWID participants in the 2003 IDRS who reported recent injection of licitly and illicitly acquired Physeptone, by jurisdiction.**

Jurisdiction	Licit	Illicit
NSW	1	1
ACT	0	1
VIC	1	3
TAS	2	56
SA	1	16
WA	1	8
NT	12	35
QLD	1	3

Source: Breen et al. (2004a).

Note: TAS samples have a much higher proportion of PWID participants that are legitimately receiving methadone syrup than people in other jurisdictions.

#### Australian Needle and Syringe Program

The Australian Needle and Syringe Program (ANSP) collates survey data on the prevalence of the last drug injected by Needle Syringe Program (NSP) clients in each jurisdiction. In 2002, 36% of the sample of 2,445 participants reported the last drug they had injected was heroin, 33% reported it was amphetamines, 7% each reported it as methadone and morphine, and 1% each reported it to be benzodiazepines and buprenorphine. These data highlight a unique pattern of morphine injection in the NT (79%), and, to a lesser extent, Tasmania (16%), compared with Victoria (2%) and the rest of Australia. Thirty-two percent of Tasmanian clients also reported that methadone was the last drug they had injected, much more than Victoria, at less than one percent, and NT, at none. On the other hand, 57% of Victorian clients reported last injecting heroin, which was significantly higher than Tasmania with 3% and NT respondents at 4% (Buddle, Zhou & MacDonald 2003). See Table 19.

#### Clients of Treatment Services Agencies Census

The results of the Clients of Treatment Services Agencies Census in 1995 and 2001 (Shand & Mattick 2001) indicated a decrease in alcohol clients across all jurisdictions, with the NT recording the highest proportion of alcohol clients (65.5%) in 2001 – much higher than the national average of 35.1%. From 1995 to 2001 the proportion of clients presenting nationally with an opioid as the principal drug of concern increased from 33.6% to 39.1%, although there were significant variations between jurisdictions – with Victoria recording amongst the highest proportion of clients (43.4%) and Tasmania (30%) and the Northern Territory (13%) the lowest. The proportion of polydrug clients including opioids also demonstrated wide variation between jurisdictions, increasing in 2001 to 6.7% in the NT (from 0% in 1995), but reaching 7.8% in Victoria (from 10% in 1995). See Table 20.

Table 19. Prevalence of last drug injected by jurisdiction, 2002.

Drug	NSW N = 760	VIC N = 265	QLD N = 715	WA N = 127	SA N = 318	TAS N = 151	ACT N = 62	NT N = 47
Cocaine	26 3%	0 0%	2 <1%	0 0%	1 <1%	0 0%	0 0%	0 0%
Heroin	367 48%	150 57%	369 43%	25 19%	78 25%	4 3%	41 67%	2 4%
Methadone	66 9%	1 <1%	10 1%	4 2%	6 5%	49 32%	5 8%	0 0%
Morphine	14 2%	6 2%	15 3%	19 12%	10 8%	25 16%	0 0%	37 79%
Buprenorphine	0 0%	12 5%	2 <1%	5 4%	3 1%	1 1%	-	-
Benzodiazepines	3 <0.1%	0 0%	4 <1%	1 1%	1 1%	3 2%	0 0%	1 2%
Amphetamine	173 23%	60 23%	361 43%	92 56%	50 39%	45 30%	10 16%	7 13%
> One drug	61 8%	24 9%	51 6%	14 9%	14 11%	19 12%	4 6%	0 0%
Not reported	2 <1%	2 <1%	2 1%	4 %	4 3%	0 0%	0 0%	0 0%

Source: Buddle, Zhou & MacDonald (2003).

Table 20. Percentage of clients of alcohol and drug treatment services by jurisdiction, 1995 and 2001.

	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	Nat
Alcohol									
2001	30.9	33.2	36.1	43.9	38.2	35.1	38.6	65.5	35.1
1995	42.9	45.4	54.6	56.1	55.6	63.3	63.3	80.1	49.3
Opioids <sup>a</sup>									
2001	45.8	43.4	34.3	21.4	37.5	29.9	39.4	12.6	39.1
1995	40.4	36.3	31.8	23.4	21.1	10.1	30.2	3.6	33.6
Cannabis									
2001	9.3	12.3	7.2	8.3	4.6	15.7	7.1	9.2	9.3
1995	6.4	7.1	6.0	5.1	8.0	13.9	10.1	6.1	6.7
Amphetamines									
2001	6.6	3.8	10.0	19.4	10.0	9.0	8.6	4.2	8.3
1995	4.9	9.8	6.4	10.1	3.8	3.8	12.1	2.0	6.5

Source: Shand & Mattick (2001).

<sup>a</sup> Includes polydrug including opioids.

Table 20. Continued

	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	Nat
Polydrug inc. opioid									
2001	7.2	7.8	9.8	3.5	6.2	2.2	4.7	6.7	7.1
1995	8.3	10.1	6.5	3.7	8.0	2.5	2.0	0	7.4
Polydrug exc. opioids									
2001	4.7	3.4	9.4	4.8	6.6	11.2	4.7	6.7	5.1
1995	4.1	3.4	1.8	1.1	12.6	0	0	0	3.5

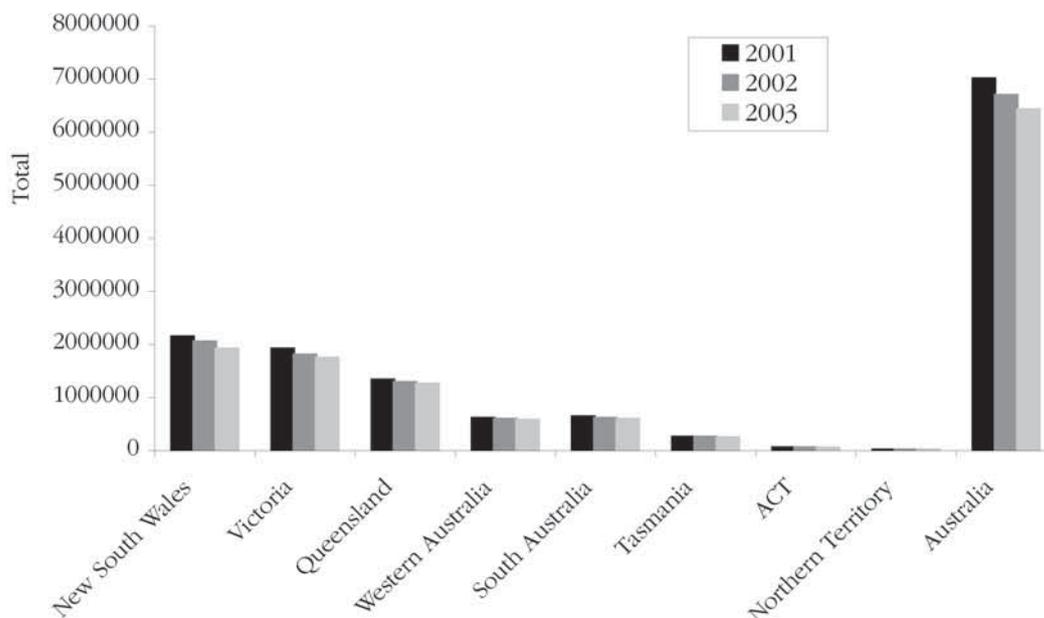
Source: Shand & Mattick (2001).  
<sup>a</sup> Includes polydrug including opioids.

*Prescribing trends*

Benzodiazepines

All combined benzodiazepine prescriptions issued under the PBS/RPBS have been decreasing steadily in most jurisdictions since 2001, and were around 10% less in Australia as a whole in 2003 than in 2001 (Australian Government Department of Health and Ageing 2004). Figure 2 displays the differences between all the jurisdictions and Australia as a whole for trends in benzodiazepine prescribing.

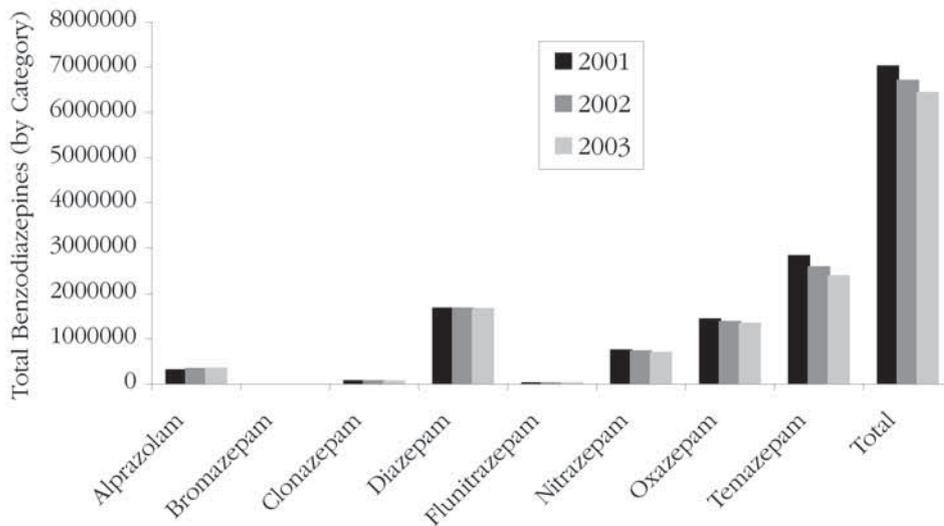
Figure 2: All benzodiazepines prescriptions under the PBS/RPBS, all jurisdictions, 2001 – 2003.



Source: Drug Utilisation Sub-committee (DUSC) Pharmaceutical Benefits Branch, Health Access and Financing Division, Australian Government Department of Health and Ageing, 2004.

When the prescriptions for benzodiazepines issued under the PBS/RPBS were broken down into the different forms of the drug, wide variations could be seen. Temazepam was the most frequently prescribed form across all years (37% in 2003, down slightly from 38% in 2002, a slight decrease again on 2001 at 40%). Diazepam was the second most frequently prescribed benzodiazepine in all three years (25.7% in 2003), followed by oxazepam (21% in 2003), and nitrazepam (10.5% in 2003). Flunitrazepam, bromazepam and clonazepam were the least frequently prescribed benzodiazepines in all years. See Figure 3.

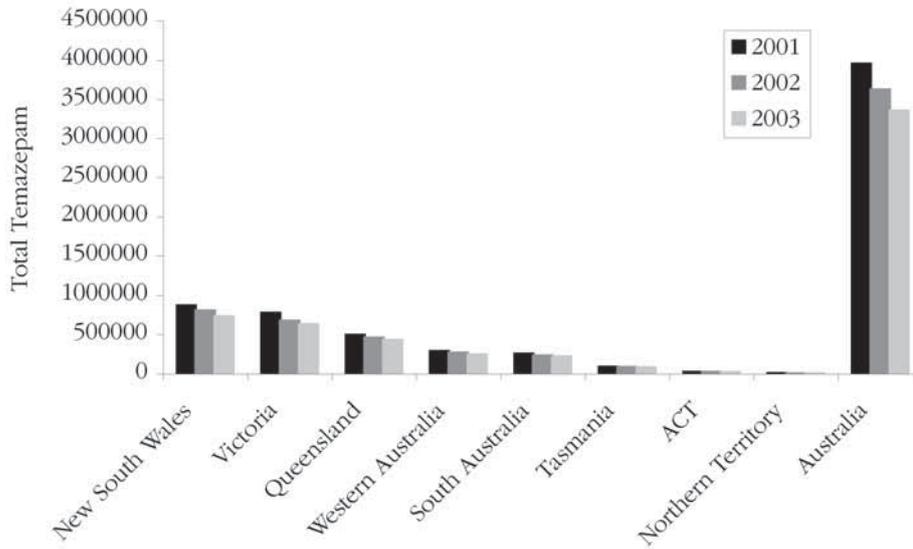
**Figure 3: Different categories of benzodiazepines prescriptions under the PBS/RPBS, all Australia for 2001– 2002.**



Source: Drug Utilisation Sub-committee (DUSC) Pharmaceutical Benefits Branch, Health Access and Financing Division, Australian Government Department of Health and Ageing, 2004.

Temazepam (capsules and tablets) prescriptions issued under the PBS/RPBS have steadily decreased across all jurisdictions since the capsules were regulated in 2002, and there were around 15% fewer prescriptions issued in 2003 (3,351,952) compared with 2001 (3,951,554) (Australian Government Department of Health and Ageing, 2004). See Figure 4.

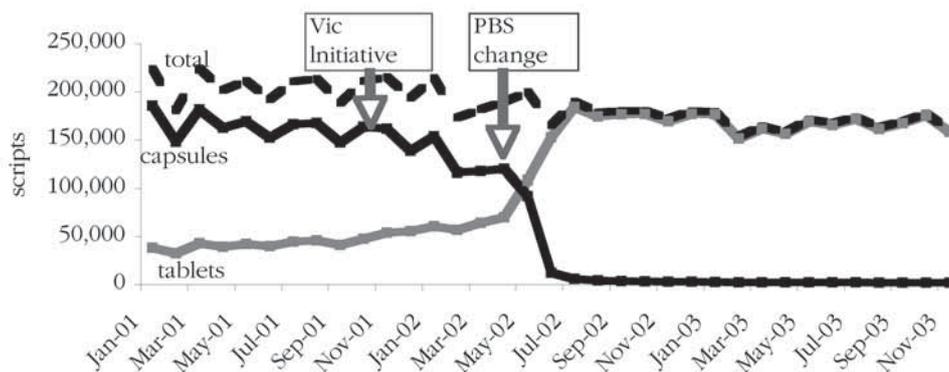
Figure 4: Temazepam prescriptions issued under the PBS/RPBS, all jurisdictions, 2001 – 2003.



Source: Drug Utilisation Source: Sub-committee (DUSC) Pharmaceutical Benefits Branch, Health Access and Financing Division, Australian Government Department of Health and Ageing, 2004.

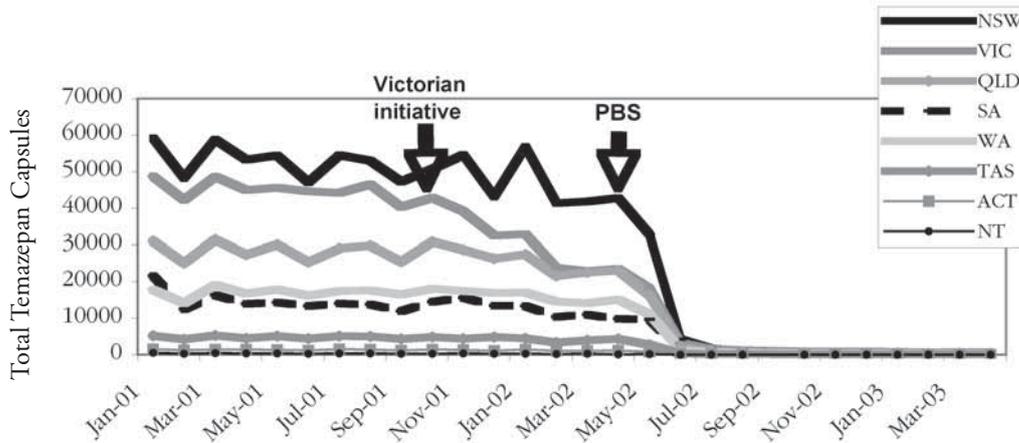
When temazepam prescriptions are separated into capsules and tablets, a decrease in temazepam gel capsule prescriptions from May 2001 to November 2002 in Australia was accompanied by a corresponding increase in temazepam tablet prescriptions. See Figure 5 and Figure 6.

Figure 5: Prescribing trends for temazepam tablets and capsules in Australia under the PBS/RPBS between January 2001 and November 2003.



Source: Drug Utilisation Sub-committee (DUSC) Pharmaceutical Benefits Branch, Health Access and Financing Division, Australian Government Department of Health and Ageing, 2004.

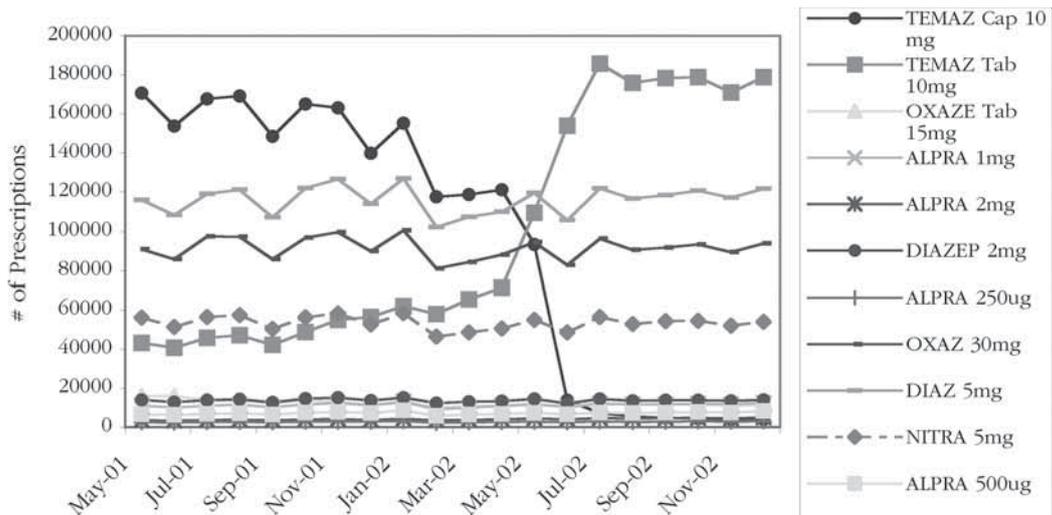
Figure 6: Number of prescriptions issued under the PBS/RPBS for temazepam capsules between January 2001 and March 2003, all Australian jurisdictions.



Source: Drug Utilisation Sub-committee (DUSC) Pharmaceutical Benefits Branch, Health Access and Financing Division, Australian Government Department of Health and Ageing, 2004.

The decrease in the number of prescriptions issued under the PBS/RPBS for temazepam capsules corresponded with an increase in the number of prescriptions (in some jurisdictions) for temazepam tablets between May 2001 and November 2002. Temazepam tablets became the most prescribed temazepam following the PBS regulation of the 10mg capsules and, compared with other benzodiazepines, between May 2001 and November 2002, alprazolam and then oxazepam were the next most frequently prescribed (Australian Government Department of Health and Ageing, 2004). See Figure 7.

Figure 7: Benzodiazepine prescriptions issued under the PBS/RPBS between May 2001 and Nov 2002

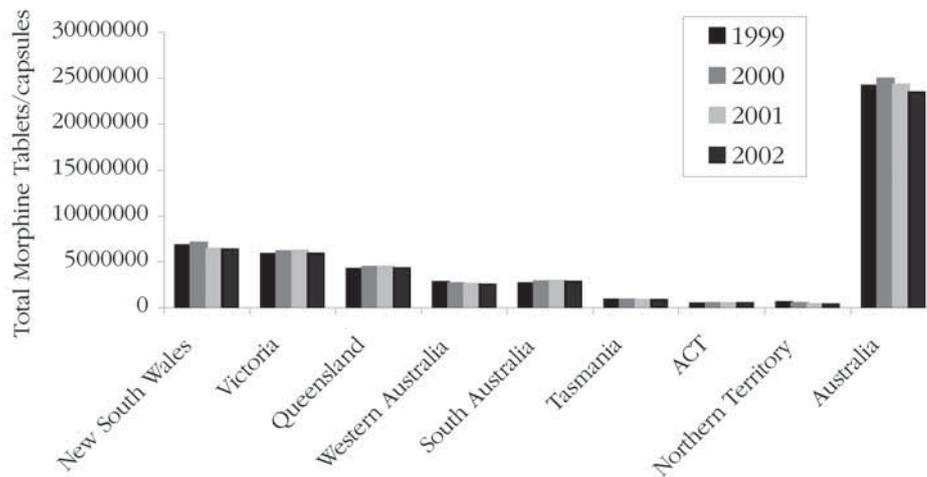


Source: Drug Utilisation Sub-committee (DUSC) Pharmaceutical Benefits Branch, Health Access and Financing Division, Australian Government Department of Health and Ageing, 2004.

Pharmaceutical Opioids

Prescriptions issued under the PBS/RPBS for morphine tablets and capsules (as brands Anamorph, MS Contin and Kapanol) in Australia increased slightly between 1999 (24,159,512 prescriptions) and 2000 (24,925,738 prescriptions) but then decreased slightly (by around 5%) between 2000 and 2002 (to 23,439,667 prescriptions). The changes were fairly consistent across most jurisdictions, except in the NT, where prescriptions decreased dramatically between 1999 and 2003; at around 20% between 1999 and 2000, by almost 45% altogether between 1999 and 2002 (Therapeutic Goods Administration, 2003). See Figure 8.

**Figure 8: Morphine capsules and tablets (as Kapanol, MS Contin & Anamorph) Prescriptions under the PBS/RPBS.**



Source: DRUMS, The Treaties & Monitoring Team, Office of Chemical Safety, Therapeutic Goods Administration (2003).

Methadone syrup prescriptions under the PBS/RPBS decreased in most jurisdictions since 2000, especially in Victoria, where they decreased by about 30% (from 17,418,400 to 12,018,800), reflecting the increase in uptake of buprenorphine treatment in 2000 in that state, followed by that drug's approval under the PBS/RPBS in 2001. Prescriptions for methadone decreased by around 10% across Australia overall. However, prescriptions actually increased in Tasmania by around 25%, from 1,517,800 to 2,055,200 and have decreased in the NT since 2001 (possibly due to the introduction in September 2002 of a methadone maintenance program). See Table 21.

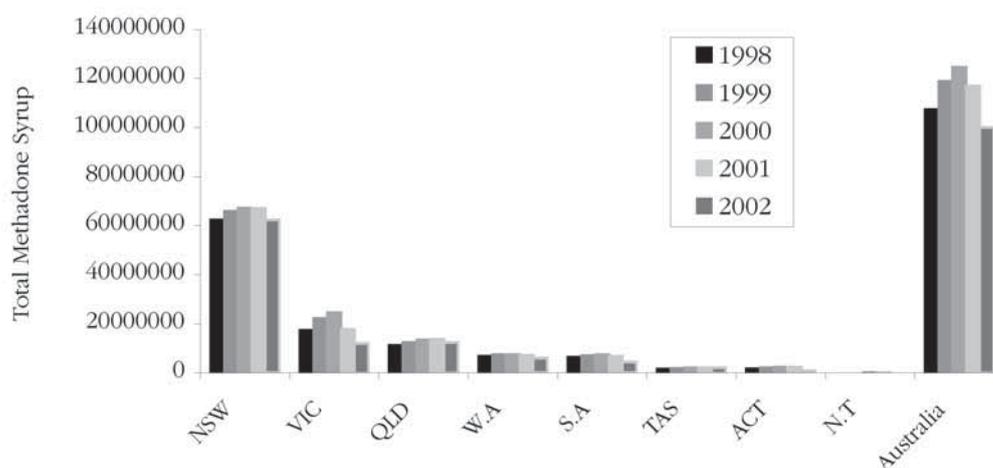
**Table 21. Methadone Syrup Prescriptions issued under the PBS/RPBS in all jurisdictions, 1998 – 2002.**

	Methadone Syrup Prescriptions				
	1998	1999	2000	2001	2002
New South Wales	62,323,636	65,845,753	67,175,600	67,023,098	62,361,800
Victoria	17,418,400	22,182,800	24,475,600	17,726,600	12,018,800
Queensland	11,169,200	12,366,200	13,460,000	13,693,350	12,436,400
Western Australia	6,829,600	7,466,000	7,501,400	7,236,000	5,966,400
South Australia	6,429,600	7,042,000	7,381,400	6,804,600	4,373,400
Tasmania	1,517,800	1,788,400	2,028,400	2,101,200	2,055,200
ACT	1,730,600	2,121,400	2,406,000	2,285,200	825,000
Northern Territory	19,600	17,200	162,800	66,200	31,600
Australia	107,438,436	118,829,753	124,591,200	116,936,248	100,068,600

Source: DRUMS, The Treaties & Monitoring Team, Office of Chemical Safety, Therapeutic Goods Administration, 2003.

Figure 9 reflects the trend in prescribing of methadone from 1998 to 2002.

**Figure 9: Methadone Syrup Prescriptions under the PBS/RPBS, 1998 – 2002.**



Source: DRUMS, The Treaties & Monitoring Team, Office of Chemical Safety, Therapeutic Goods Administration, 2003.

Physeptone may be prescribed for drug treatment, and in some cases is used as an analgesic. Physeptone prescriptions under the PBS/RPBS varied widely between jurisdictions between 1998 and 2002. They increased more than five-fold Australia-wide between 1998 and 1999 (from 1,152,089 to 6,043,908), continued to increase until 2001 (to 6,220,534), then decreased to 2002 (to 5,903,200). The decrease in prescribing between 2001 and 2002 was reflected in most jurisdictions, especially in the Northern Territory (from 113,820 to 68,960, which was also a large

decrease since 1998, at 157,560) and SA. Prescriptions also decreased slightly in Tasmania in that time (from 404,680 to 398,940), although they remained higher than they had been in 1998 (363,380). However, prescriptions in Victoria increased between 1998 (600,300) and 2001 (to 821,420) and continued to increase to 2002 (to 869,680). See Table 22.

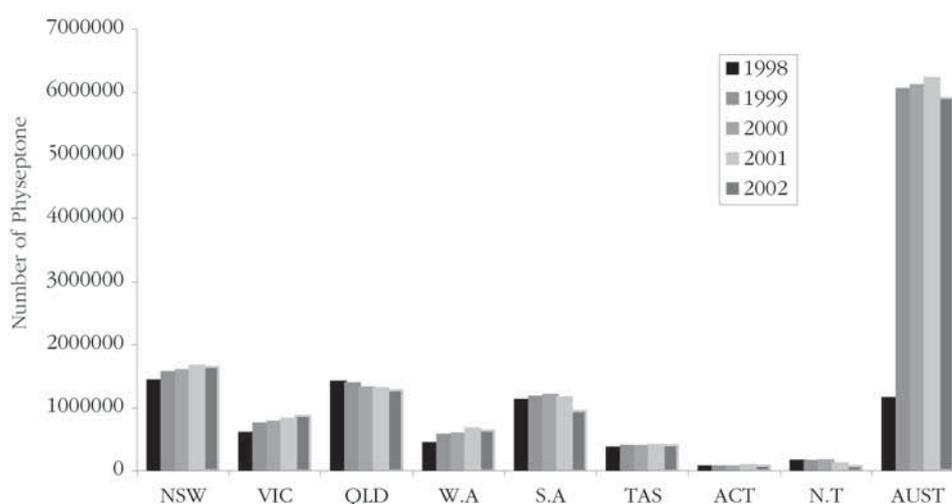
**Table 22. Physeptone (combined 5mg and 10mg tablets) prescriptions issued under the PBS/RPBS in all jurisdictions, 1998 – 2002.**

All Physeptone Prescriptions					
	1998	1999	2000	2001	2002
New South Wales	1,432,329	1,561,488	1,594,410	1,661,953	1,641,440
Victoria	600,300	746,920	777,860	821,420	869,680
Queensland	1,410,160	1,384,320	1,319,900	1,306,342	1,272,060
Western Australia	436,160	570,360	589,840	668,699	635,440
South Australia	1,121,520	1,170,640	1,200,280	1,159,820	942,480
Tasmania	363,680	390,020	392,260	404,680	398,940
ACT	63,500	65,720	66,195	83,800	74,200
Northern Territory	157,560	154,440	164,580	113,820	68,960
Australia	1,152,089	6,043,908	6,105,325	6,220,534	5,903,200

Source: DRUMS, The Treaties & Monitoring Team, Office of Chemical Safety, Therapeutic Goods Administration, 2003.

Figure 10 displays the prescribing trends in Physeptone since 1998.

**Figure 10: Physeptone prescriptions under the PBS/RPBS, 1998 – 2002.**



Source: DRUMS, The Treaties & Monitoring Team, Office of Chemical Safety, Therapeutic Goods Administration, 2003.

### Annual national pharmacotherapy statistics on methadone prescribing

Annual National Pharmacotherapy statistics to June 30, 2002 (Therapeutic Goods Administration, Australian Government Department of Health and Ageing, 2003), provided information about prescribing of methadone by public and private prescribers in that year. There were a total of 26,489 registered prescribers nationwide in that year, and the majority of prescriptions (17,375) were issued through private prescribers. There were also large variations in the numbers of clients registered in different jurisdictions and clients registered with public and private prescribers in different jurisdictions. New South Wales had the highest number of clients registered at all prescribers in that year ( $n = 14,533$ ), with around three times as many as Victoria ( $n = 4,888$ ); the small numbers registered in the Northern Territory ( $n = 3$ ) and Tasmania ( $n = 466$ ) reflect the smaller populations for those jurisdictions, as well as the fact that NT did not have an accessible MMT program at that time. See Table 23.

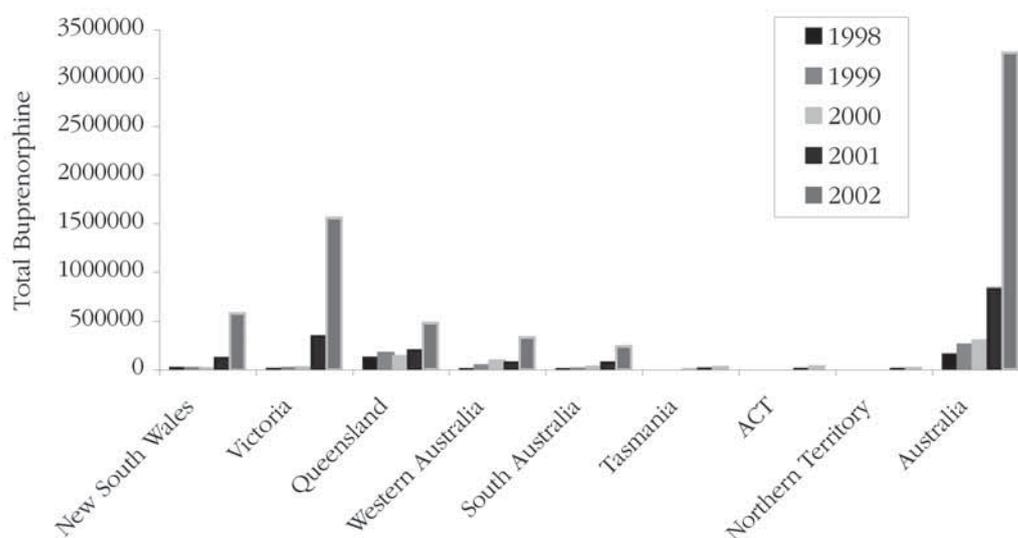
**Table 23. Number of methadone treatment clients registered with different types of prescribers in all jurisdictions and Australia as a whole, financial year to June 2002.**

Number of clients registered with a prescriber	SA	VIC	QLD	NSW	TAS	WA	ACT	NT	Total
Public prescriber	NA	185	2,800	2,598	77	831	397	0	6,888
Private prescriber	NA	4,561	486	10,129	295	1,754	147	3	17,375
Public/private prescriber	NA	NA	NA	201	89	NA	NA	NA	290
Correctional facilities	NA	142	34	1,528	5	140	10	NA	1,859
Other	NA	NA	NA	77	N	NA	NA	NA	77
Total number clients	NA	4,888	3,320	14,533	466	2,725	554	3	26,489

Source: Australian Government Department of Health and Ageing, 2003.  
NA: not available

Concurrent with trends in the decreasing use of methadone syrup, buprenorphine prescriptions filled under the PBS/RPBS have increased rapidly as it was taken up as accepted treatment protocol in 2000, particularly in Victoria, and approved for PBS prescribing in 2001, increasing by around 10 times across Australia. In 2002, Victorian prescriptions represented 48% of all prescriptions for buprenorphine issued under the PBS/RPBS. See Figure 11, which demonstrates the trends in prescribing for buprenorphine.

Figure 11: Buprenorphine prescriptions under the PBS/RPBS, 1998 – 2002.



Source: DRUMS, The Treaties & Monitoring Team, Office of Chemical Safety, Therapeutic Goods Administration (Australian Government Department of Health and Ageing 2003).

Annual National Pharmacotherapy statistics on buprenorphine prescribing

Annual National Pharmacotherapy statistics to June 30, 2002 (Therapeutic Goods Administration, Australian Government Department of Health and Ageing, 2003), provided information about prescribing of buprenorphine by public and private prescribers in that year. There were a total of 5,309 registered prescribers nationwide in that year, and the vast majority of prescriptions (4,318, 81%) were issued through private prescribers. There were also large variations in the numbers of clients registered in different jurisdictions, and clients registered with public and public prescribers in different jurisdictions. Victoria had the highest number of clients registered at all prescribers in that year (2,812), accounting for 53% of all registered clients across Australia (5,304). There were few registered clients in the NT (n = 18) or Tasmania (n = 47). See Table 24.

Table 24. Number of buprenorphine treatment clients registered with different types of prescribers in all jurisdictions and Australia as a whole, financial year to June 2002.

Number of clients registered with a prescriber	SA	VIC	QLD	NSW	TAS	WA	ACT	NT	Total
Public prescriber	NA	52	320	187	4	185	36	2	786
Private prescriber	NA	2,706	228	652	41	675	NA	16	4,318
Public/private prescriber	NA	NA	NA	15	2	NA	NA	NA	17
Correctional facilities	NA	54	28	84	NA	17	NA	NA	183
Total number clients	0	2,812	576	938	47	877	36	18	5,304

Source: Australian Government Department of Health and Ageing, 2003.  
 NA: Not available.

## Annual National Pharmacotherapy statistics

Annual National Pharmacotherapy statistics to June 30, 2002 (Therapeutic Goods Administration, Australian Government Department of Health and Ageing, 2003) provided information about combined prescribing of methadone and buprenorphine by public and private prescribers in that year. There were large variations in the numbers of clients registered with public and private prescribers in different jurisdictions, although private prescribers represented the majority in all jurisdictions except the ACT. Victoria had about 22% of all registered clients, whilst Tasmania and the NT accounted for a small proportion. See Table 25.

**Table 25. Number of pharmacological treatment clients registered with different types of prescribers in all jurisdictions and Australia as a whole, financial year to June 2002.**

Number of clients registered with a prescriber	SA	VIC	QLD	NSW	TAS	WA	ACT	NT	Total
Public prescriber	783	237	3,120	2,785	81	1,016	433	2	8,457
Private prescriber	1,457	7,267	714	10,781	336	2,429	147	19	23,150
Public/private prescriber	0	0	0	216	91	0	0	0	307
Correctional facilities	177	196	62	1,612	5	10	0	0	2,219
Other	-	-	-	77	-	-	-	-	77
Total number clients	2,417	7,700	3,896	15,471	513	590	21	21	34,210

Source: Australian Government Department of Health and Ageing, 2003.

### *National doctor-shopping data*

Prior to 2004, a 'doctor-shopper' was defined by the HIC as a person who had 30 or more Medicare consultations in a year, or who saw more than 15 different medical practitioners to obtain more PBS prescriptions than appear to be clinically necessary (HIC 2003; Kamien 2004). Using these criteria, in 1995-96 there were 13,240 Australians who met the definition of doctor-shopper, which fell to 8,780 in 1999-2000 (Kamien 2004).

Recently the HIC (now Medicare Australia) introduced a new definition of 'prescription shopper' as a person who has been supplied prescription drugs by six or more different prescribers within a three month period, or has been supplied a total of 25 or more target pharmaceutical benefits or a total of 50 or more pharmaceutical benefits (Medicare Australia 2007; AMA 2004; Kamien 2004). In 2005-06, a total of 54,474 unique doctor-shoppers were identified by Medicare Australia using these new criteria (Medicare Australia 2007; AMA 2004; Kamien 2004). According to the former HIC, one 'heroin-user' had consulted 613 doctors in one year (HIC 2004).

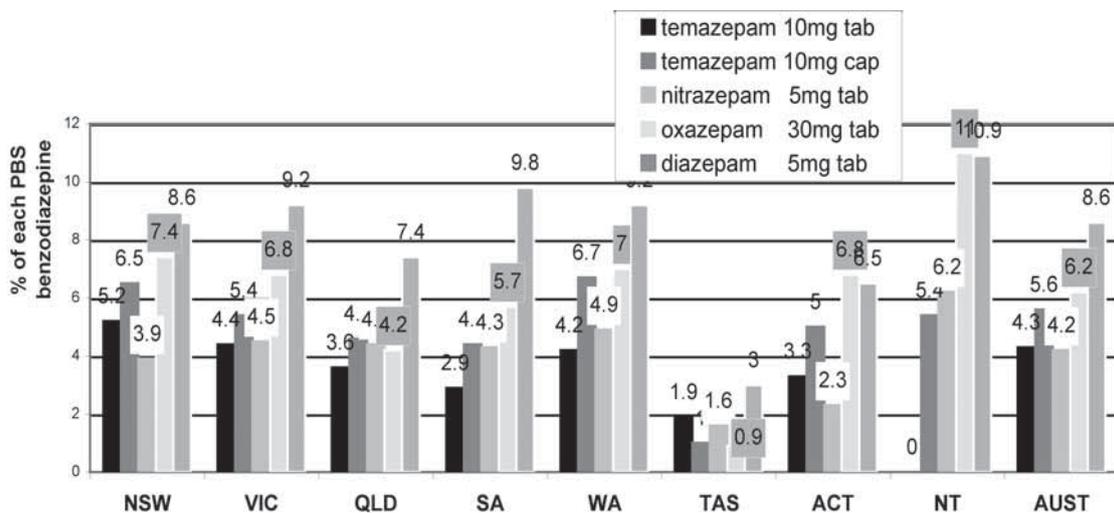
The Doctor-shoppers Project, which was co-ordinated by the former HIC to detect large-scale doctor-shopping and over-prescribing of prescription medications in Australia, was discontinued in August 2002 because of budget and privacy concerns (AMA 2004). A replacement program called the 'Prescription Shopping Program' was established in 2002-03. The goal of the new program is to identify and reduce the number of patients getting PBS medicines in excess of medical need.

The Prescription Shopping Program has two key elements:

- An Analysis and Support Function: allows Medicare Australia Pharmacists to proactively alert doctors about patients that Medicare Australia has assessed as being at high risk of getting more medicine than they need. Information is provided to doctors through letters and face-to-face meetings. Letters are also sent to the patients themselves notifying them of Medicare Australia's concerns and advising that their doctors have been contacted; and
- The Prescription Shopping Information Service (PSIS): a 24 hour 7 days a week Inquiry line established in 2005 to help doctors make more informed clinical decisions about patients who they suspect may be getting more medicine than they need.

The proportion of PBS benzodiazepine prescriptions obtained by the subset of drug-seekers identified as HIC 'doctor-shopper' in 2000 is represented in Figure 12. Only the most commonly obtained dose forms for the three leading benzodiazepines (temazepam, oxazepam and diazepam) are described (Dobbin 2001).

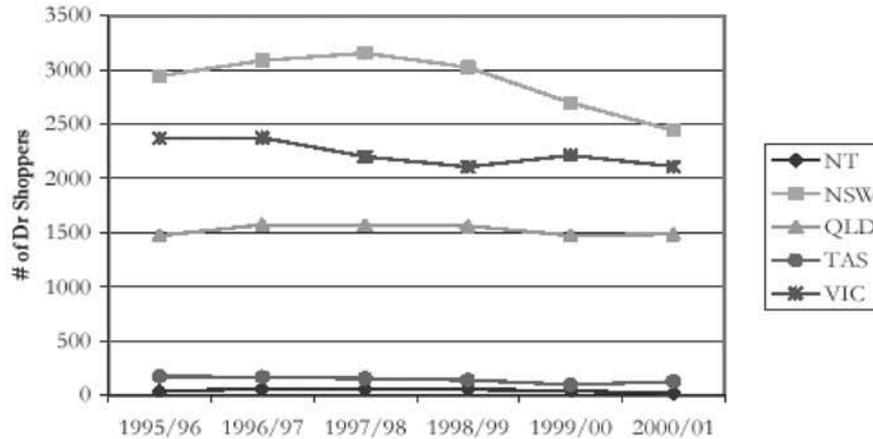
Figure 12: PBS benzodiazepine prescriptions for 'doctor-shoppers' (15+GPs pa) 2000.



Source: Dobbin (2001).

In 2000, one in 18 (5.6%) of Australian PBS scripts for temazepam capsules were obtained by this subset of people. This compares to the figure of 1 in 12 (8.6%) scripts for diazepam 5mg tablets (Dobbin 2001). In jurisdictional comparisons of doctor-shoppers from 1995/6 to 2000/1, NSW was the only jurisdiction to experience a notable decrease in numbers (Breen et al. 2003). See Figure 13.

Figure 13: Number of benzodiazepine doctor-shoppers June, 1995/96 – 2000/01, only selected jurisdictions.



Source: Breen et al. (2003).

### *Crime/police activity*

For the majority of benzodiazepine and pharmaceutical drug seizures, specific information regarding the generic forms or brand names are not currently recorded in the Australian Customs Service drug statistics database.

Table 26 provides drug detection figures for the relevant drug categories that are available from the Australian Customs Service database between 1999 and 2003. Detections of the remaining drug categories are recorded in the generic categories of 'Other benzodiazepines' and 'Prescribed drugs'. The detections of drugs within these categories, especially 'Other benzodiazepines' (from 1 in 2000 to 362 in 2003) and 'Prescribed drugs' (from 310 in 1999 to 1,180 in 2003), increased dramatically throughout that time, and an increase in seizures for diazepam was also of note (from 29 in 1999 to 186 in 2002, decreasing slightly to 169 in 2003). Seizures for codeine had increased between 1999 and 2002, from 4 to 88, but decreased somewhat again in 2003, to 32 (Australian Customs Service 2004).

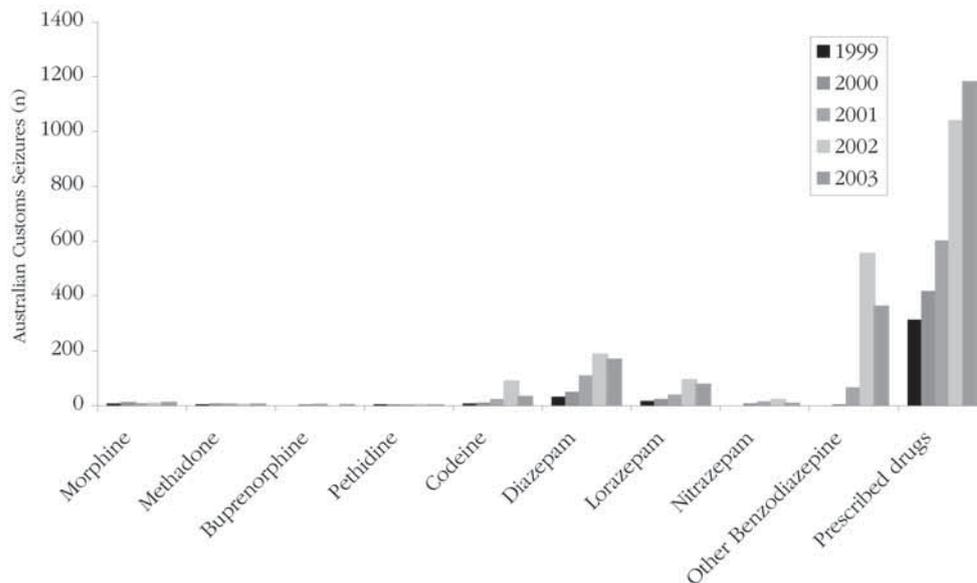
**Table 26. Number of drug detections by Australian Customs Service of selected opioids, benzodiazepines and prescribed drugs for years 1999 – 2003.**

Drug category	1999	2000	2001	2002	2003
Morphine	4	9	5	7	10
Methadone	1	4	4	3	4
Buprenorphine	0	1	3	0	2
Pethidine	1	1	1	2	1
Codeine	4	7	21	88	32
Diazepam	29	47	106	186	169
Lorazepam	13	21	36	93	76
Nitrazepam	0	4	11	21	7
Other Benzodiazepine	NA	1	63	552	362
Prescribed drugs	310	413	598	1,037	1,180

Source: Australian Customs Service (2004)  
NA: Not available

Figure 14 shows the seizures of drugs within the different categories.

**Figure 14: Seizures by Australian Customs of prescribed drugs between 1999 and 2003.**



Source: Australian Customs Service (2004).

### Pharmacy Guild Insurance

Each year Guild Insurance Limited collects data about pharmacy-related crimes in all jurisdictions except the Northern Territory. The most recent data are to the end of June 2002, and show that while claims fluctuated between 1998/99 and 2000/01, total pharmacy-related crime claims in Australia overall doubled between 2001 and 2002 (from 2,044 to 4,172), which was reflected in most jurisdictions (except in Tasmania, where they dropped slightly from 151 to 146). The increase is mainly related to increases in malicious damage, burglaries, and thefts in most jurisdictions, and corresponds to the period around the Victorian Temazepam Initiative and the HIC regulation of temazepam. However, it is not possible to ascertain how these data relate to that event, as temazepam or other drugs thefts data cannot be isolated. See Table 27.

**Table 27. Number of pharmacy crime related claims for the four years ending June 30, 2002.**

State	Description of Incident	1998/99	1999/00	2000/01	2001/02
NSW	Malicious Damage	601	530	331	743
	Burglary	360	438	636	1,082
	Armed hold up/Threat	218	188	189	160
	Theft	83	79	53	200
	Larceny	56	100	101	61
	Total	1,318	1,335	1,310	2,246

Source: Guild Insurance Limited (2003).

Table 27. Continued

State	Description of Incident	1998/99	1999/00	2000/01	2001/02
VIC	Malicious Damage	207	337	258	657
	Burglary	171	339	669	1,524
	Armed hold up/Threat	53	25	20	54
	Theft	71	48	47	132
	Larceny	44	56	44	52
	Total	546	805	1,038	2,419
QLD	Malicious Damage	132	156	132	349
	Burglary	219	200	311	876
	Armed hold up/Threat	14	8	16	8
	Theft	20	21	21	128
	Larceny	38	20	26	38
	Total	423	405	506	1,399
SA	Malicious Damage	66	92	65	220
	Burglary	120	110	95	354
	Armed hold up/Threat	13	8	11	7
	Theft	4	3	4	56
	Larceny	2	8	4	1
	Total	205	221	179	638
ACT	Malicious Damage	7	12	0	33
	Burglary	4	8	0	38
	Armed hold up/Threat	1	2	0	1
	Theft	3	0	0	13
	Larceny	5	1	0	2
	Total	20	23	0	87
WA	Malicious Damage	105	123	126	360
	Burglary	134	134	174	572
	Armed hold up/Threat	98	36	31	49
	Theft	13	3	4	73
	Larceny	0	11	1	1
	Total	350	307	336	1,055

Source: Guild Insurance Limited (2003).

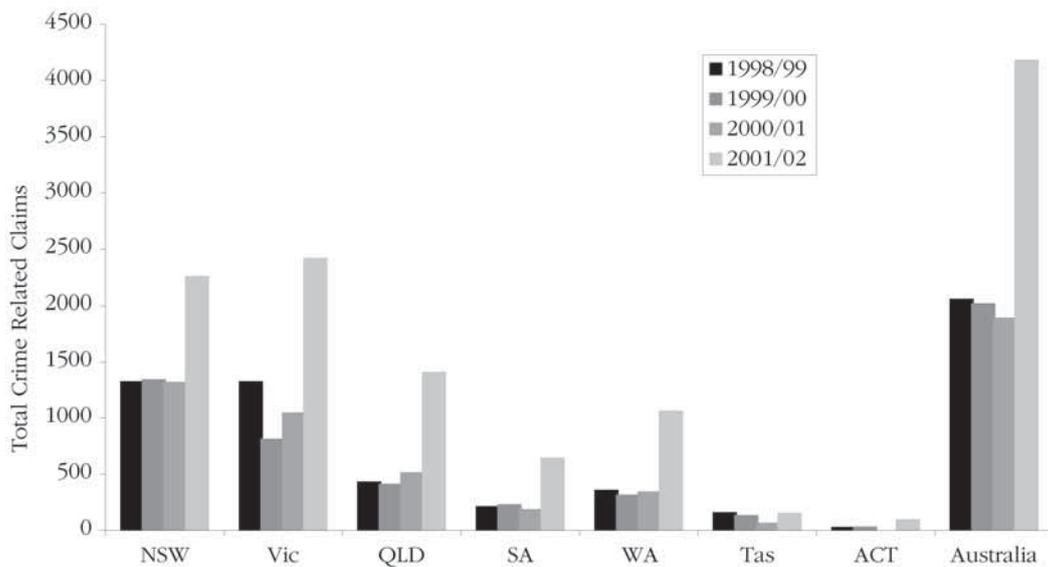
Table 27. Continued

State	Description of Incident	1998/99	1999/00	2000/01	2001/02
TAS	Malicious Damage	89	75	38	55
	Burglary	53	39	17	78
	Armed hold up/Threat	5	4	1	3
	Theft	3	2	1	8
	Larceny	1	4		2
	Total	151	124	57	146
Australia	Malicious Damage	868	832	560	1,411
	Burglary	671	729	922	2124
	Armed hold up/Threat	335	238	232	220
	Theft	106	87	62	350
	Larceny	64	124	106	67
	Total	2,044	2,010	1,882	4,172

Source: Guild Insurance Limited (2003).

Figure 15 displays the increasing trends for total incidents claimed for in this period.

**Figure 15: Total crime-related claims lodged with Guild Insurance Limited between 1998/99 and 2001/02. All claims for Malicious Damage, Burglary, Armed hold up/Threat, Theft, and Larceny have been combined.**



Source: Guild Insurance Limited (2003).

The financial loss (which includes both the costs of stolen products and the damages to property) to Guild Insurance more than doubled in the years 1998/99 to 2001/02 for Australia-wide claims, and more than quadrupled in Victoria, from an Australia-wide total of \$2,178, 665 in 1998/99 (\$500,769 in Victoria) to \$5,258,757 (\$2,410,770 in Victoria). Victoria's proportion of the total Australian figures increased substantially throughout the period so that by 2001/02 it represents more than half of all claims received. The Victorian percentage of total claims was 26.7% in 1998/99, 40% in 1999/00, 55% in 2000/01, and 57.7% in 2001/02.

#### Australian Bureau of Statistics

The Australian Bureau of Statistics (ABS) crime and justice data on drug offences for the year 1999/2000 indicate 67% of drug offences nationally involved cannabis. Heroin was associated with 14% of drug offences. In 2000/01 heroin and other opioids accounted for 9% of drug offences nationally. The national arrest rate for heroin and other opioids was 38.2 per 100,000 persons (ABS, 2002).

#### The Illicit Drug Reporting System

The national IDRS collects data on self-reported criminal activity by PWID participants. The national sample reported a slight fluctuation between 2000 and 2003 for reported criminal involvement in the month preceding interview. For those reporting they had been involved in any crime, the most commonly reported crimes were drug dealing and property crime in all four years, and the latter increased between 2000 and 2002 (from 19% to 26%). Respondents were most likely to have been arrested for property crime in 2001 and 2002 (rates were stable at 39% and 40%), followed by use/possession (which increased from 16% to 26%). See Table 28.

**Table 28. Reported criminal history of PWID in the national samples of 2000 - 2003 IDRS (%).**

Criminal history	2000 <sup>a</sup>	2001 <sup>b</sup>	2002 <sup>c</sup>	2003 <sup>d</sup>
Any crime %	54	52	55	49
Any property crime %	19	20	26	22
Any violent crime %	7	9	8	7
Any drug dealing %	41	39	38	34
Any fraud %	12	9	10	6
Arrested last 12 mths %	47	44	43	39
Prison history %	43	44	45	43

<sup>a</sup> Source: Topp et al. (2001).

<sup>b</sup> Source: Topp et al. (2002).

<sup>c</sup> Source: Breen et al. (2003).

<sup>d</sup> Source: Breen et al. (2004).

In 2003, 39% of the total sample reported they had been arrested within the 12 months prior to the survey, a slight decrease on the three previous years, while 49% reported having been involved in any crime in the month prior, also a decrease on the three previous years. As in previous years, the majority of reports for criminal activity in the month prior related to involvement in drug dealing (34%) and property crimes (22%). Fraud (6%) and violent crimes (7%) were reportedly committed by small proportions of respondents. Respondents in the NT were the least likely to report criminal involvement (28%) or arrest (18%), followed by those in SA. Respondents in Victoria were most likely to have committed property crimes (35%), followed by those in Tasmania (32%) (Breen et al. 2004a). See Table 29.

**Table 29. Self-reported criminal activity among PWID in the month preceding the interview, by jurisdiction, 2003 (IDRS Study).**

	Total sample N = 970	NSW n = 154	ACT n = 100	VIC n = 100	TAS n = 100	SA n = 120	WA n = 100	NT n = 109	QLD n = 135
Property crime %	22	31	22	35	32	11	18	9	14
Drug dealing %	34	36	35	39	32	28	42	20	37
Fraud %	6	7	5	5	6	7	8	3	8
Violent crime %	7	8	6	9	5	3	6	4	10
Any crime %	49	55	50	59	52	38	50	28	53
Arrested last 12 months %	39	49	36	48	46	21	36	18	47

Source: Breen et al. (2004a).

### Health

#### Opioid overdose

There were 364 deaths attributed to opioids (where opioids were the primary factor causing death) in 2002 among people aged 15 – 24 years in Australia, and just less than half of the deaths (43%) occurred in New South Wales (n = 158). Deaths in the 15 – 24 age group made up 98% of total accidental opioid deaths, and the additional deaths occurred almost exclusively among people aged over 24. The rate of accidental deaths due to opioids in Australia was 32.3 per million persons aged 15 – 24 years, a 69% decrease compared with the rate in 1999 (103 per million), and relatively stable compared with 2001 (34.6 per million). Ten year breakdowns of deaths attributable to opioids in 2002 show that the largest proportion of deaths was amongst the 25 – 34 year age group (41%), followed by the 35 – 44 age group (30%), 15 – 24 (16%), and 45 – 54 (13%). The number and rate of accidental deaths due to opioids for the 25 – 54 age group remained relatively stable between 2001 and 2002. There was a decrease among the youngest age group (15 – 24 years), with the rates decreasing from 29.4 – 20.9 deaths per million persons between 2001 and 2002. See Table 30 for the number of accidental opioids deaths in Australian jurisdictions from 1997 – 2002 for those aged 15 – 24 years (ABS, 2003).

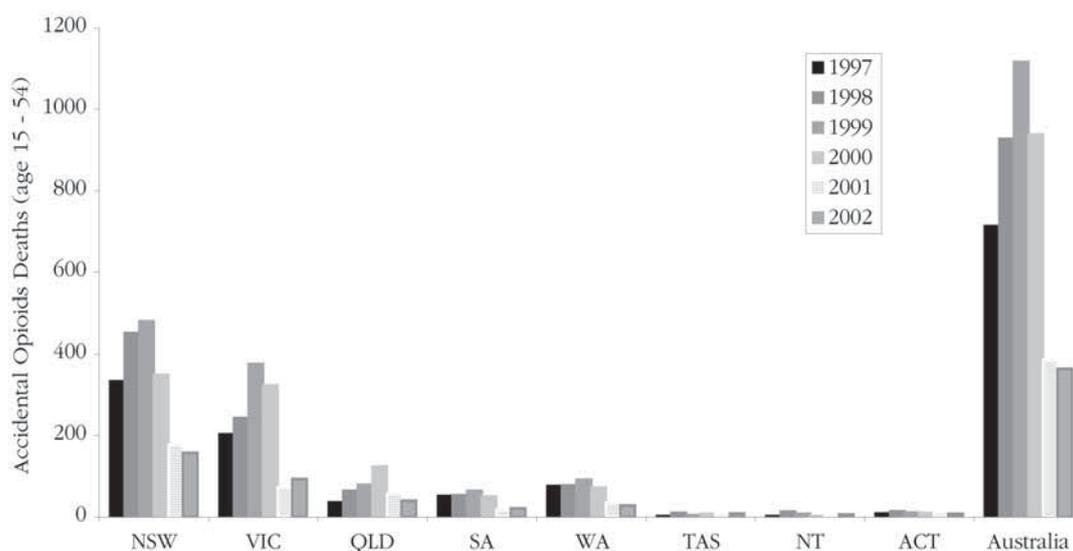
**Table 30. Number of accidental deaths due to opioids among those aged 15 – 54 years, by jurisdiction, 1997 – 2002.**

Year	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Australia
1997	333	203	36	52	76	2	2	9	713
1998	452	243	64	53	78	10	13	14	927
1999	481	376	79	64	92	5	8	11	1,116
2000	349	323	124	50	72	8	2	10	938
2001	177	73	58	18	35	8	5	12	386
2002	158	93	40	21	28	9	6	8	364

Source: Australian Bureau of Statistics (2003).

Figure 16 shows the proportion each jurisdiction contributed to the overall death rate in that time.

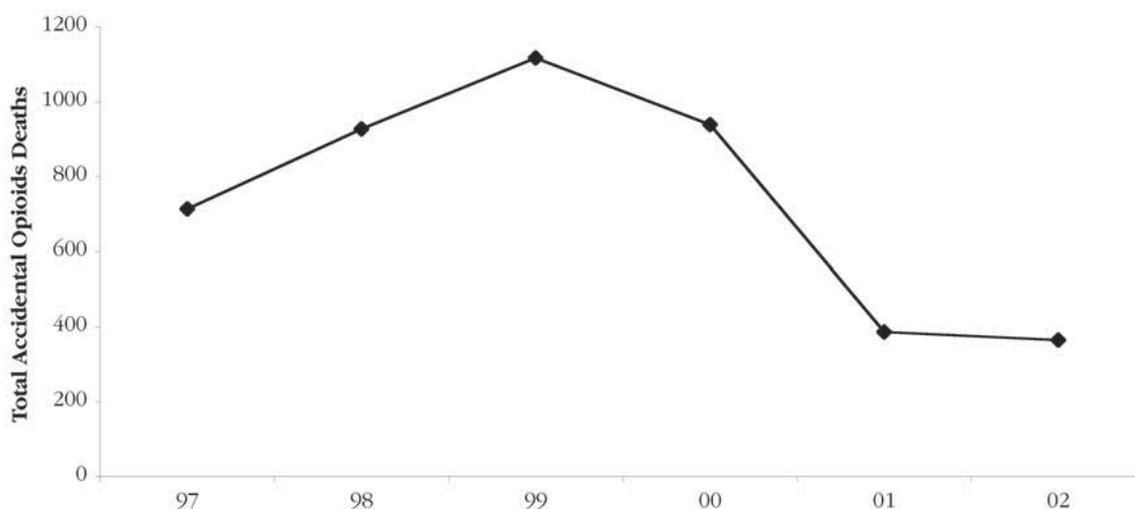
**Figure 16: The number of accidental opioids deaths by jurisdiction, 1997 – 2002 for those aged 15-24 years.**



Source: ABS (2003).

Figure 17 displays the trend in accidental opioid deaths Australia-wide across the six years to 2002, following the heroin drought in 2001.

Figure 17: Total accidental opioid deaths Australia-wide for the years 1997 – 2002, for those aged 15 – 24 years.



Source: ABS (2003).

Alcohol and other drugs treatment services

A total of 113,231 ‘treatment’ episodes (consultations relating to a particular drug) were recorded in the Alcohol and Other Drugs Treatment Services National Minimum Data Set in 2001 – 02 (AIHW 2003). Table 31 shows that the primary drug of concern presented at treatment was alcohol (37% of all episodes), followed by cannabis (21%), then heroin (20,027 episodes, 17.7%). There were 2,883 episodes of benzodiazepine and other sedatives and hypnotics treatment (2.5% of the total), and 6,088 episodes relating to methadone and other analgesics (5.37%). See Table 31.

Table 31. Number of clients of Alcohol and other Drugs Treatment Services episodes, 2001 – 02.

Treatment episodes	Male	Female	Not stated	Total
Other analgesics	2,119	1,395	4	3,518
Methadone	1,360	1,207	3	2,570
Heroin	12,768	7,220	39	20,027
Alcohol	29,458	12,398	30	41,886
Benzodiazepines	1,355	1,389	1	2,745
Balance of sedatives and hypnotics	66	72	0	138
Amphetamines	7,920	4,281	10	12,211
Cannabinoids	17,149	6,662	15	23,826
Ecstasy	169	84	0	253
Other stimulants and hallucinogens	216	112	0	328

Source: Australian Institute of Health and Welfare (2003).

Table 31. Continued.

Treatment episodes	Male	Female	Not stated	Total
Cocaine	563	239	2	804
Nicotine	775	827	0	1,602
Other drugs of concern	1,427	1,062	9	2,498
Not stated	492	330	3	825
Total	75,837	37,278	116	113,231

Source: Australian Institute of Health and Welfare (2003).

## Drug market characteristics and pharmaceutical use

### *Illicit Drug Reporting System*

#### Characteristics of the heroin market

There has been an increase in heroin seized at the Australian border since the late 1990s, partly attributed to the allocation of resources and increased surveillance around the Sydney Olympics in 2000 (Breen et al. 2003). There were 106 seizures in 2002/03, increasing from 47 seizures in 2000/01, although the amount (319kg) was less than the previous year. The data suggest that heroin has been increasingly shipped in smaller quantities or imported by mail or by passengers, rather than in large cargo quantities (Breen et al. 2004a).

PWID surveyed in the 2003 IDRS reported heroin purity to be low (39%) to medium (37%), whilst 12% thought the purity level was high. Heroin seizures are analysed by the Australian Federal Police and State police in each jurisdiction (Australian Crime Commission, cited in Breen et al. 2004). The median purity of heroin seized in 2002/03 varied widely across jurisdictions, at 70% in Tasmania (eight seizures), to 26% in New South Wales, and 19% in Western Australia. Breen et al. (2003) report that there has been a decline in the median purity of heroin seizures analysed by state police from mid 1999 in all jurisdictions, with a stabilization of purity of seizures analysed in 2002/03. IDRS data suggests there was an increase in the availability of heroin in most jurisdictions in 2002, which was sustained in 2003, but it did not return to pre-2000 levels (Breen et al. 2004a). Forty-two percent of PWID respondents in 2003 reported that heroin was easy to obtain, while 44% reported it was very easy. The price of heroin also decreased in 2002 and 2003, but did not return to 2000 levels (Breen et al. 2004a). The price of a cap was around \$50 in all jurisdictions, with a gram selling from between \$300 in NSW to \$550 in Western Australia (although it should be noted that PWID were not in agreement as to how much heroin constituted a measurement) (ACC, cited in Breen et al. 2004a).

#### Characteristics of the pharmaceutical drug market

Twenty-one percent of the 2003 national IDRS sample reported using illicit methadone syrup in the previous six months, whilst 16% reported using illicit Physeptone. There were substantial jurisdictional differences ranging from no reports in the ACT and Queensland, to almost half (48%) in the Northern Territory. Forty percent reported it was easy to obtain methadone, and 19% reported it was very easy. About a third reported it was difficult. Most people who bought methadone reported their source was a take-away dose. The most common price quoted for methadone syrup was one dollar per ml. Physeptone 10mg tablets ranged between one dollar and \$15 each (Breen et al. 2004a).

Twelve percent of the sample reported the use of illicit buprenorphine, with wide variation between jurisdictions for such reports, with PWID in Victoria most likely to report both licit and illicit use of the drug. Six percent of the sample reported injecting licit buprenorphine, and nine percent reported injecting illicit buprenorphine, with again jurisdictional variations. The highest reported injection was 22% of Victorian PWID who reported injecting buprenorphine that was prescribed for them, and 30% who reported injecting it when it was prescribed for someone else (Breen et al. 2004a).

Over 40% of PWID in 2003 in all jurisdictions, except New South Wales (20%), reported they recently injected morphine. Consistent with previous years, the use of morphine was highest in Tasmania (75%) and the Northern Territory (75%), where heroin has not traditionally been available and methadone and morphine respectively have dominated the markets. This compared with 37% of all PWID. There was an increase in the ACT of reported use of morphine, and reported decreases in Victoria and Western Australia. Key informants in the Northern Territory reported that the supply of morphine available for diversion onto the illicit market had been affected by the reduction in the numbers of doses being prescribed, resulting in an increase in other opioids – buprenorphine, codeine and pethidine – onto the market. However, the opinion of the key informants was that morphine was easy to obtain, and that reductions had not had a substantial impact on price or availability. Because most PWID who reported using morphine also reported it was obtained illicitly (ranging from 67% in the Northern Territory to 97% in Tasmania), it seems apparent that most morphine being used by this population is diverted (Breen et al. 2004a).

Twenty-seven percent of the national 2003 IDRS sample reported they had recently used other opioids, including Panadeine Forte (54%), oxycodone (8%), and opium (7%), with seven percent reporting they had injected the drugs. Recent illicit use of other opioids was highest in Tasmania (30%), and lowest in Queensland (2%) (Breen et al. 2004a).

Most (64%) of the national IDRS 2003 sample had used benzodiazepines, and 17% reported injecting them in the previous six months, although most jurisdictions reported decreases in injecting in 2003 compared with 2001. Tasmania and Victoria had the highest proportions of PWID reporting use of the drugs. Again, wide variation in benzodiazepines use was seen between jurisdictions, at 48% in Queensland to 88% in Tasmania. Rates of injection also varied, being lowest in South Australia (8%) and highest in the Northern Territory (30%) and Tasmania (31%). Injecting in Victoria decreased from 40% in 2002 to 15% in 2003. Thirty-eight percent of the sample reported they had obtained their benzodiazepines illicitly, ranging from 26% in Queensland to 66% in Tasmania, although most obtain them via prescription also (Breen et al. 2004a).

## **Key findings: Melbourne, Hobart and Darwin studies**

The material for this section has been extracted from the jurisdictional reports on the findings from the Victorian (Smith et al. 2004), Tasmanian (Bruno 2004) and Northern Territory (O'Reilly et al. 2004) arms of the study. To facilitate comparison across jurisdictions, the following overview of key findings is structured according to the main study themes of market characteristics, diversion and links to crime, implications for police and other front line workers, and interventions. The jurisdictional reports present detailed study findings for each of the four stages of the project.

## Drug market characteristics and pharmaceutical use

### *Melbourne*

The current study has shown that an illicit market for diverted benzodiazepines and pharmaceutical opioids exists in Melbourne, and is characterised by frequent intravenous use of select pharmaceuticals such as temazepam, morphine and buprenorphine. Available evidence indicates that the injection of benzodiazepines probably increased following the heroin drought at the end of 2000, with such use of benzodiazepines appearing to decline again in 2003, and morphine and buprenorphine injecting remaining stable (Jenkinson, Miller & Fry 2004). Patterns and characteristics of prescription pharmaceutical diversion and misuse in Melbourne appear to be tied to the heroin market place.

This current study specifically sampled PWID who used illicit benzodiazepines and/or pharmaceutical opioids. The findings in the main are consistent with IDRS study findings, with similar self-reported prevalence of recent injecting of morphine and buprenorphine, and a higher prevalence of recent benzodiazepines injection found among the current sample (Jenkinson, Miller & Fry 2004). It must be kept in mind that sampling of the PWID participants targeted those who misuse any/all of these types of drugs, and therefore the findings cannot be generalised to broader PWID populations. Nevertheless, clearly there exists an illicit market demand for a variety of diverted prescription drugs. These findings accord with past research by others such as Miller, Fry and Dietze (2001), Fry and Miller (2002), and Dobbin (2002). The current findings show that, whilst temazepam is preferred by PWID for injecting, because of its fast and long-lasting effect and the way it increases the effects of heroin, other benzodiazepines such as diazepam and alprazolam were also injected. The findings also show that morphine and buprenorphine injecting are also an established practice. There were substantial overlaps in drug usage, with most PWID being polydrug users.

Changes to the PBS prescribing practices for 10mg temazepam gel capsules in 2001, and emergence of increased heroin supply in 2002 were expected to result in decreases in the misuse of prescription drugs (ACC 2003; Breen et al. 2002). The Victorian IDRS (Jenkinson, Miller & Fry 2004) found that injecting of benzodiazepines did subsequently decline; however, it also found that injection of buprenorphine and morphine remained high, findings also reflected here. And whilst temazepam has reportedly become more difficult to acquire, with most PWID considering it too difficult to obtain from a doctor, acquisition and use of the drug still continues, at least amongst some groups of PWID in some geographical locations around Melbourne. These findings strongly suggest that temazepam, morphine, and to a lesser extent buprenorphine, appear to have become firmly established on the black market in Melbourne, reportedly not difficult to obtain, especially in the inner-city suburb of Footscray in the case of temazepam, and most areas for morphine and buprenorphine.

It has generally been considered that prescription drugs are used by PWID to increase the pharmacological effects of heroin, or as substitutes for heroin (e.g. Marshall & Longnecker 1992; Rall 1992), as they are considered to be of a consistent quality, reasonably priced and easy to acquire (see Breen et al. 2002; Dobbin 2002). Most key informants from the health sector, and all KI from law enforcement agreed with past reports, asserting that benzodiazepines are used to supplement a primary drug of choice, rather than being a drug of choice, contending that benzodiazepines are used to increase the effects of heroin use, to ease symptoms of withdrawal, or to deal with sleeplessness or anxiety. However, these findings suggest that may not necessarily always be the case, and that prescription drugs may in fact be the primary drug for some PWID. There are reports that benzodiazepines are used as a primary drug of choice by some PWID, with suggestions that temazepam in particular was used in preference to other drugs as a consequence of its relative affordability, and the perception that it may offer a longer lasting effect than heroin.

In addition, the use of benzodiazepines was reported to be quite fluid, with PWID alternating between substances according to availability, health and financial situation. With regard to pharmaceutical opioids, key informants suggested there is a blend of primary and supplemental use.

The findings suggest that the prescription drugs market in Melbourne – with the possible exception of morphine, which is more expensive and less easy to acquire than benzodiazepines and buprenorphine – does not at this stage appear to be large-scale or organised. The market seems to be dominated by small-time dealers, users selling to fund their own use, and a diffuse network of users sharing their own prescription drugs, and swapping drugs amongst themselves. There were reports of prescription drug thefts and attempts at doctor-shopping for all drugs, and benzodiazepines were reportedly acquired by these PWID, mainly via friends and medical prescriptions, and through small-time dealers. PWID also tended to inject buprenorphine that they were prescribed, or shared others' doses. Tablets reportedly sell for as little as one dollar, and gel capsules for between \$5 and \$30 each, although morphine tended to be acquired through friends or dealers for around \$50 for 100mg. Respondents generally reported that dealers of all prescription drugs were other users with a prescription for sale, or were 'small-time', although there were frequent reports that many dealers sold other illicit drugs as well. These reported patterns of dealing and use suggest an opportunistic way that polydrug using PWID might adapt to and manipulate available drugs for maximum effect, according to the availability, price, and consistency of illicit drugs on the market at any given time. This was balanced against the widespread availability and relatively low price, as well as the predictable quality, of prescription drugs.

Where PWID were clear that use of prescription drugs have become established among PWID, and offer another selection of choices in the dealers' menu of drugs – apparently reasonably easily available and widely used – comments by law enforcement KI seem to reflect a feeling that such use is not entrenched or problematic. These KI generally considered that heroin and amphetamines were the main drugs of choice, and represent the main drugs market, with the use of benzodiazepines only supplemental, or in place of heroin if it was not available, and that there is not a notable market in benzodiazepines and other prescription drugs. PWID and KI, however, did seem to agree about the make-up of dealing networks. KI argued that the majority of pharmaceutical drugs originated from medical prescriptions, with the possible exception of temazepam, which reportedly had become increasingly difficult to obtain, and was considered to be more likely to be purchased on the street. This tends to agree with PWID reports for most drugs, except morphine, which seems particularly difficult to obtain medically (as well as temazepam gel capsules). KI and PWID agreed that any networks are low-level and disorganised with no organised crime involved. However, part of the KI reasoning for this conclusion seemed to be based on the opinion that selling pharmaceutical drugs is not financially rewarding. That perception is not necessarily borne out by these findings, given that the drugs may potentially be obtained for around \$4 for an entire prescription and then sold for anywhere from \$1 and \$100 per tablet, and some participants reported spending up to \$1,000 in two weeks on prescription drugs.

The main question about the prescription drugs market in Melbourne that is raised by these current findings, as well as past assertions by others such as the ACC (2003) that most opioids acquisition was illicit, seems to be around the original sources for morphine and temazepam. Both are restricted drugs, heavily regulated (morphine is S8 and temazepam gel capsules are either issued under authority under the PBS or else only prescribed privately), and reportedly difficult to obtain medically, yet PWID report that though generally expensive they are available on the street if 'you know the right people'. Data from the PBS/RPBS (Australian Government Department of Health and Ageing 2003, 2004) show that temazepam, as well as MS Contin and Kapanol prescriptions declined across Australia in the past five years. However, morphine was used regularly by most of

these participants, and many had used temazepam gel capsules, yet contended they were difficult, but not impossible to obtain on the street. Both PWID and KI reported that users of these drugs would not access them on the internet; however, Australian Customs Service data demonstrate an increase in seizures of morphine and of benzodiazepines over the past five years.

### *Hobart*

Benzodiazepine use was almost ubiquitous among both PWID cohorts surveyed. The most commonly used benzodiazepines were diazepam (Valium, Antenex, Ducene), alprazolam (Xanax, Kalma), oxazepam (Serepax), nitrazepam (Mogadon) and temazepam (Temaze). Pharmaceutical opioids most commonly accessed by PWID included morphine sulphate (MS Contin, Kapanol), methadone (syrup, Physeptone), and oxycodone (OxyContin). Data from the state's Needle Availability Program suggests that injection of pharmaceutical opioids comprises almost half of all transactions from non-pharmacy outlets, with methadone (syrup or tablets) becoming increasingly predominant over morphine in these figures.

PWID participants interviewed were clearly very flexible in the types of drugs that they used, with individuals that used one pharmaceutical opioid type typically also using other types as well (for example, those recently accessing diverted methadone syrup also commonly using Physeptone, morphine and benzodiazepines as well).

There were stronger relationships between use of diverted methadone and benzodiazepines than there were between the use of other drugs. However, while those surveyed were generally predominantly consumers of licit or illicit pharmaceutical opioids, there was a very high use of methamphetamine in both cohorts

### *Darwin*

Sample characteristics were similar in both PWID surveys, and 43 of the 50 participants in the second survey had participated in the first survey. The only differences between the Stage two and Stage four surveys were a higher mean age (37.6 : 34.5 years), a slightly lower proportion of males (74% : 77%), a higher proportion unemployed (84% : 79%) or with a prison history (58% : 51%). In the Stage two survey 59% injected at least once a day compared to 70% in the Stage four survey and this was due to a marked reduction in the proportion reporting they injected more than weekly but not daily (36.5% : 18%). Recent drug use indicated more PWID in the Stage four survey had injected heroin (30% : 20%) for a slightly higher mean number of days (36 : 33) in the last six months than in the first survey. In contrast, more PWID had injected methamphetamine (66% : 61%) in Stage two than in Stage four, but the mean number of days was the same. In the Stage two survey more PWID had used cannabis (78% : 59%) for a higher mean number of days (114 : 101). Use of alcohol was similar in both surveys.

#### Pharmaceutical opioid use

Oral use of licit morphine in the last six months was higher in the Stage two survey than the Stage four survey (13% : 2%), but more PWID had injected licit morphine in stage 4 (30% : 27%) for a higher mean number of days (157 : 140). More PWID in Stage two had used illicit morphine orally (11% : 4%) or injected it (91% : 86%), but in Stage four the mean number of days was higher (101 : 86). It is not possible to compare this pattern of morphine use to that of the NT IDRS samples because the IDRS does not disaggregate licit and illicit morphine in terms of routes of administration and days used. Additionally, analysis of the number of days used in the last six months in the IDRS samples since 2002 only includes the median number of days, and without the mean number of days it is difficult to determine any shift in the frequency of use.

The preferred drug of most PWID in both surveys was heroin, followed by morphine, but the drug injected most in the last month was morphine followed by methamphetamine in the first survey and methadone in the second. These results in combination with the indicator data confirm morphine as the most used opioid in the NT even though heroin is the most preferred drug. The proportion of PWID with morphine as the preferred drug was higher in the Stage four survey than the Stage two survey (24% : 20%) and slightly fewer reporting a preference for heroin (44% : 50%). When asked in the Stage two survey what drug they would substitute if the drug they used most the previous month was unavailable, almost a half nominated morphine and one in ten each nominated methadone, benzodiazepines or cannabis. In Stage four they were asked what drug they substituted the last time they could not get the drug they used most, and one quarter said they always obtained their drug, mainly because they were on prescription morphine. Almost a third reported no drug substitution. However, among those that did substitute, the most common drug was morphine, followed in descending order by benzodiazepines, methamphetamine, alcohol, cannabis, and methadone.

In terms of other pharmaceutical opioids, 7% of the Stage two sample had orally used these drugs from licit sources in the last six months and the same proportion had injected them, compared to 12% oral and 6% injecting in the Stage four survey. Similar proportions had illicitly used the drugs intravenously (17% : 16%) but in Stage four fewer had used them orally (11% : 4%). There is no clear evidence of a shift in pattern over the two surveys. In the six months before the Stage two survey, 9% of the sample had swallowed illicit methadone syrup and 14% injected it. Illicit Physeptone was swallowed by 15% of the stage 2 sample and 34% used it intravenously. Close to one in ten had taken buprenorphine orally or intravenously. The proportions for the use for each of these pharmacotherapies is very similar to that reported in the 2003 NT IDRS sample (Moon 2004). In the Stage four survey, 36% of the sample had used a licit pharmacotherapy and 12% injected it. Illicit pharmacotherapies had been taken orally by 16% of the PWID and 28% had injected them. The pharmacotherapies involved were methadone syrup, Physeptone and buprenorphine and they were usually bought from friends or provided as gifts.

When the Stage two survey PWID were asked if they had experienced any problems from opioid use in the last month, almost half had not experienced any problems as a direct consequence of morphine, methadone or buprenorphine use. The proportion reporting no problems associated with morphine use was much lower than in the NT 2003 IDRS sample. The most common problems experienced in the current research from morphine use were dependence, low motivation and feeling anxious, while for methadone it was dependence, relationship problems and feeling anxious. For those who had used buprenorphine, the problems were low motivation, dependence, problems concentrating and feeling anxious. None of those using morphine had contact with police directly as a consequence of using morphine in the previous month and only one in twenty had been in criminal trouble or engaged in undetected criminal activity as a consequence of using morphine.

The majority of morphine users sourced their drug from known individuals, such as GPs or friends, at a relatively standard price. In most cases each instance of acquiring the drug was a regular, pre-planned behaviour that involved very little or no searching or of setting out speculatively to meet an unknown dealer. Similarly, in most instances a particular drug type and form was sought, and if it was unavailable the majority of users would seek a similar form or go without rather than substitute another drug type. The large majority would administer the drug in a private home. This meant that patterns of sourcing and use were relatively stable and most users generally did not have contact with unknown people or situations. There was also a well developed barter system operating within some groups and tablets were a form of currency whereby goods could be swapped for morphine tablets, other drugs swapped for tablets, or tablets borrowed and re-paid with tablets.

However, there were a proportion of PWID who accessed methamphetamine, and the crossover between opioids and methamphetamine cannot be clearly delineated. The data from this research indicates it was one of the possible substitute drugs if morphine was unavailable. A reduction in prescribing of morphine and a resultant drop in diversion to the illicit trade may result in a proportion of morphine users accessing methamphetamine and, therefore, shift the pattern of sourcing from primarily among a friendship group to exploring access through unknown dealers and more organized networks that are thought to exist in the trade for illicit drugs. The quality and price of illicit drugs such as methamphetamine are far more unpredictable than for pharmaceuticals, and varying purity levels pose health risks for novice and less experienced users. Other associated risks are entering into credit arrangements with unknown people and the resulting potential for coercion and opportunistic crimes to obtain the money to purchase illicit drugs without the barter system that operated with their usual supply of morphine.

#### Benzodiazepine use

In the Stage two survey, only 6.9% of the PWID stated benzodiazepines were the preferred drug, 7% had injected them most in the last month and 5% had used these drugs most often in the preceding month. However, in the second survey none of the PWID nominated benzodiazepines as the preferred drug and only 2% had injected them most in the last month. A greater proportion of PWID in the Stage two survey compared to the Stage four survey had used licit benzodiazepines orally (43% : 30%) or injected them (37% : 4%) in the last six months. The mean number of days of injecting licit benzodiazepines was much lower in the Stage four survey (35 : 66 days). Similarly, a higher proportion of the Stage two participants had orally used illicit benzodiazepines (48% : 38%) or injected them (40% : 28%), and the average number of days of injecting use was very similar. The results indicate a decline in oral and intravenous use of both licit and illicit benzodiazepines in the four month period. The results cannot be directly compared to the NT IDRS samples to determine trends in benzodiazepine use as the IDRS does not disaggregate licit and illicit benzodiazepines in terms of routes of administration and days used.

Many morphine users were occasional or supplemental users of benzodiazepines, but there were comparatively few users who were solely or primarily users of benzodiazepines. This was also the opinion of the KI involved in this research. In the Stage four survey PWID stated what drug they had used the last time they could not obtain the drug used most, and benzodiazepines were nominated most after morphine. Benzodiazepines tended to be used to self-manage opioid withdrawal, to potentiate the effects of morphine and to assist in the come down from methamphetamine. Another important type of use was as either a prescribed or self-administered treatment for the conditions for which benzodiazepines are medically indicated, such as insomnia or anxiety. The illicit acquisition of benzodiazepines was usually from friends or acquaintances and the drugs were provided as gifts, swapped for other drugs or purchased at relatively low prices. Acquisition appeared to be less regular and pre-planned than for morphine, and people obtained the drugs opportunistically from their usual drug source.

Almost half of the PWID who had used benzodiazepines in the last month reported they had not experienced any problems directly related to its use. The most often reported problems were blackouts and memory loss, followed by problems concentrating, low motivation and aggression. The proportion reporting no problems associated with benzodiazepine was similar to that in the NT 2003 IDRS sample. One in ten had also experienced contact with the police directly resulting from benzodiazepine use and some had incurred criminal trouble. One in ten had also engaged in criminal activity that was not detected by law enforcement.

One purpose morphine users made of benzodiazepines was to manage morphine withdrawal if they were having difficulty sourcing morphine, or wished to reduce their morphine dose. For this reason it is possible that if the morphine supply was further reduced or became less predictable for morphine users, this type of drug substitution or remedial use of benzodiazepines by people who were primarily seeking morphine might increase.

## **Diversion and links to crime**

### *Melbourne*

These findings accord with Dobbin's (2002) assertion that a strong demand for the drugs is driving intense and extensive diversion of licit drugs to illicit markets, and that policing of the issue is complicated by the difficulty in identifying where use and/or possession is licit or illicit. The current findings suggest that each type of surveyed prescribed drugs were frequently diverted to the black market, either through diverting of legitimate prescriptions through PWID giving them away, swapping them for other drugs or selling them, or via thefts of the drugs or forgeries of prescriptions; however, there were no reports of pharmacy break-ins or hold-ups by PWID, which have been reported in the past (e.g. Dobbin 2001; Guild Insurance Limited 2003). However, KI contended that the break-ins or hold-ups were occurring, although to a lesser extent currently compared with a year or two ago. This seems to be supported by Law Enforcement Assistance Program (LEAP) data (Victoria Police 2004).

Most participants in this study had received both prescribed and illicit benzodiazepines, most had also received illicit morphine, and the use of both prescribed and diverted buprenorphine was widespread as well. Law enforcement KI considered prescribed drugs mostly originated from medical prescriptions, but also may come from pharmacy burglaries, and thefts from drug distributors, although they reported these incidents had declined in the past 12 months. These findings suggest that swapping and sharing of PWID's own prescriptions is widespread, and comments from both PWID and KI suggest that such sharing activity may be a part of drug culture, and related to an understanding of reciprocity (i.e. one who shares their own drug this week will be owed for the future, calling in the debt when it is needed).

The findings accord with Dobbin's (2001) assertion that doctor-shopping may be the origin of many of the drugs on the illicit market, being a common source of benzodiazepines (although most participants considered it was too difficult to obtain temazepam gel capsules that way), and a less successful source for morphine. The initiation of the new prescription shopper database (Kamien 2004) may help clarify the relationship between doctor-shopping and diversion of these drugs to the illicit market. The findings also concur with Dobbin et al. (2003) that prescription forgery has been used to source prescribed drugs, in particular benzodiazepines (74% of all forgeries). Dobbin et al. (2003) found that the majority of benzodiazepine forgeries (85%) were for temazepam gel capsules, which PWID reported to a lesser extent here. The difference would presumably be because the increased regulation of these forms of the drug since 2002 has made it increasingly difficult to present such forgeries to pharmacists. These PWID did report a level of prescription/drug theft, especially of benzodiazepines. They reported stealing them, or else having them stolen from them. In the case of the former, the activity tended to be opportunistic, although PWID expressed preferences for the drugs that they stole. The current findings further suggest, therefore, that for this group of PWID at this stage at least, prescription drug acquisition, diversion, and illicit use seems primarily to be operated by a diffuse network of low-level user/dealers.

The majority of research in Australia to date has found that heroin use is most closely related to criminal behaviour (e.g. Makkai 2002), and the current finding was that frequency of heroin use was most closely associated with self-reported commission of crimes, with the current sample predominantly heroin users. However, these findings do suggest that prescription drugs may be

related to crime in several ways. Eleven percent of the first sample reported they had experienced contact with police because of their benzodiazepines use and a high proportion of both samples of participants reported involvement in criminal activity, especially shoplifting, other property crimes, drug dealing, intoxicated driving, and to a lesser extent violence, and most blamed drugs for their offences. However, they were also in the main reportedly polydrug users, and previous research – while linking drugs and crime (e.g. Makkai 2002) – has been unable to pinpoint how specific drugs relate to specific crimes (e.g. Makkai 2002; Weatherburn et al. 2000). Other findings suggest that sometimes drugs may be used for the specific purpose of reducing the fear of committing a crime (Makkai 2002).

When considering theories of drugs and crime, these findings are thus ambiguous. They could suggest that PWID who are dependent, may need to increase their income through crime in order to pay for the drugs. This would accord with the 'enslavement' model forwarded by Makkai, 2002. Alternatively, this could be part of a 'deviant' lifestyle, involving both drug use and crime. This would be consistent with the 'criminality' model. Another possibility is that the psychopharmacological effects of the drugs may increase criminal behaviour, in keeping with a 'psychopharmacological' model (Makkai 2002).

These findings accord with previous research, such as Bonn and Bonn (1998), Rall (1992) and the ACC (2003), that has found that prescription drugs, especially benzodiazepines, may exert a psychopharmacological effect on users that increases uncharacteristic, aggressive, disinhibited and/or criminal behaviour. PWID reported they were more likely to commit criminal offences when they were intoxicated by, and withdrawing from, prescription drugs, especially benzodiazepines and to a lesser extent morphine. Research has suggested that benzodiazepines may cause personality changes, disinhibition, and bizarre behaviour, as well as precipitating feelings of over-confidence and invincibility (e.g. Bonn & Bonn 1998; Dobbin 2001; Rall 1992). These participants frequently reported feeling 'invisible', 'invincible' and more confident than usual, believing they could get away with behaviours they would not normally undertake. A high proportion of these participants directly attributed such behaviour as aggression, shoplifting, and thefts to benzodiazepines – either alone or in combination with other drugs. Some PWID also reported they had experienced hallucinations and black-outs while intoxicated by benzodiazepines, with reports of participants committing offences whilst intoxicated, but having no memory of the events the following day.

It was found that the frequency of use of illicit benzodiazepines was related to the number of different kinds of criminal behaviours that respondents reported being involved in, and the degree of dependence on benzodiazepines was also related to whether a crime had been committed whilst intoxicated by, or withdrawing from, benzodiazepines. A relationship was also found for dependence on morphine and committing crime whilst intoxicated on the drug, which is problematic for the psychopharmacological model, but more supportive of the enslavement model (morphine is generally acquired illicitly and is expensive) or criminality model. The finding that dependence on methadone for these PWID tends to reduce involvement in criminal behaviour also supports a psychopharmacological relationship for methadone and crime (Makkai 2002); however, MMT is far less expensive than illicit drugs, thus may not precipitate the need to commit crime to increase income in the same way (Makkai 2002). In the current research KI considered that when a PWID is undertaking a maintenance program, such as buprenorphine, the regular expenditure can be such that it becomes prohibitive, and may be a catalyst for crime. This may also support the enslavement model (Makkai 2002). A high proportion of these respondents also reported dealing drugs, with a substantial proportion of their average income attributed to the activity, which means that many may be involved in a cycle of drug use and criminal activity that is related to an entrenched lifestyle. If that was indeed the case, possibly they are more likely to offend, or to offend more frequently, than if they were not using drugs. This might accord with the 'criminality' model of drugs and crime discussed by Makkai (2002).

Law enforcement KI were of the opinion generally that prescription drugs were not a major cause of crime in Melbourne. The first sample of KI reported the main policing problem associated with the drugs was in the care and management of intoxicated people in custody, and intoxicated driving. The second sample indicated that while they were of the belief that problems associated with prescription drug use were not 'huge', benzodiazepines were related to bag snatches, burglaries, robberies, armed robberies, property crimes and thefts. KI did consider that prescription drugs might disinhibit behaviour, and thus make it more likely that a crime already planned may take place, which is in agreement with PWID accounts about the effects of benzodiazepines on their behaviour. It seems possible, however, that KI assessments of the impacts of these drugs on behaviour may be underestimated when compared with PWID reports. When considered in their entirety, these findings do suggest a link between the use of prescription drugs and criminal behaviour, through changes in behaviour, self-reported offences attributed to the drugs by these PWID, and the consideration that where dependency on a drug exists, there is a need to maintain supply (Makkai 2002). Further, many of the drugs, particular morphine and temazepam, are difficult to obtain and may be expensive and not affordable on a legitimate income (especially as the vast majority of the PWID gain most of their income from government benefits, begging and charity). Past research suggests that more serious and financially rewarding crimes tend to be committed by the heaviest drug users (SACACWG 2002), and these participants tend to use a wide range of drugs frequently. These findings accord with contentions by Makkai (2003) and Makkai, McGregor & Wei (2003), that the relationship between drugs and crime is complex, with the phenomena varying according to types of offenders and drug users, and a number of environmental, situational and psychological factors.

### *Hobart*

PWID respondents most commonly reported purchasing morphine, Physeptone and oxycodone from individuals engaged in small- to medium-level 'dealing' in these drugs, along with methamphetamine and/or cannabis.

Reports from key informants and PWID suggest that these drugs are accessed 'not' through 'doctor-shopping', pharmacy burglary, internet sources, or fraud by the PWID, but are instead diverted by individuals who are receiving prescriptions for these drugs for legitimate medical reasons, who are on-selling some or all of these prescriptions to intermediaries. These intermediary sources may then sell the drugs on to PWID.

Methadone syrup was reported by those surveyed as typically purchased directly from 'friends' or others who were receiving methadone maintenance treatment. These individuals typically reported diverting such doses for financial reasons (such as covering the costs of daily methadone dispensing or other bills), to purchase or trade for other illicit drugs, or as a consequence of threats and intimidation by individuals seeking to access methadone. Both PWID and key informants noted recent increases in hassling of methadone maintenance patients in and around dispensing points by individuals seeking the drug.

Benzodiazepines, however, were predominantly accessed through legitimate prescriptions from a medical practitioner by PWID, and it was rare for these individuals to have accessed these drugs from any more than one or two prescribers in the previous six month period. Access to these drugs from non-legitimate sources was clearly a secondary and substantially less prevalent pathway to access of benzodiazepines, and it was more common for people to receive them as gifts or through trades for other drugs than it was for these to be purchased from a 'dealer'. PWID reported typically seeking diverted benzodiazepines if their legitimate prescription had been used up early, to help manage withdrawal symptoms, or to self-medicate during stressful periods.

Reports from key informants specialising in the issue of 'doctor-shopping' suggested that the demographic characteristics and types of prescriptions accessed by those engaging in such activity were clearly distinct from those seen in PWID groups. PWID themselves very rarely reported trying to access benzodiazepines or pharmaceutical opioids through feigned symptoms from one or more prescribers, with most suggesting that they did not even bother trying because they expected to be refused.

Theft of pharmaceuticals from pharmacies or forging prescriptions was virtually non-existent among PWID, although a substantial proportion of PWID receiving legitimate prescriptions had recently experienced having these drugs stolen from them, with methadone syrup and alprazolam being the drugs most commonly targeted for such access. Data from Tasmania Police suggest that pharmacy burglaries are not common and high-value pharmaceutical opioids are not frequently accessed in these events due to the legal requirements for security of these products. In contrast, a substantial proportion of PWID surveyed reported having their legitimately obtained prescription drugs (most commonly methadone syrup and alprazolam) stolen from them in the preceding six months.

A minority of PWID subjects suggested that their recent pharmaceutical drug use had contributed to them being involved in some form of criminal behaviour; however, these reports did not appear to differ according to the pharmaceutical drug class that participants were referring to (benzodiazepine or pharmaceutical opioids), nor was there any substantial difference between criminal behaviour reported as associated with general 'use' or 'withdrawal' from these drugs.

Involvement in property crime was weakly associated with the degree of dependence on morphine, with use of prescribed methadone syrup emerging as a factor protective against such involvement. Law enforcement key informants suggested that use of morphine was associated with the lower end of the spectrum of property crime, such as opportunistic, 'soft target' theft or shoplifting, which was consistent with the data emerging from the PWID interviews. Police suggested that this may be due to the fact that the majority of PWID maintained daily use levels requiring \$50-100 per day, which meant that higher profile criminal acts were less likely to be considered.

Prescribed methadone syrup, while a protective factor against involvement in property crime, was associated with the experience of theft, threats, or assault 'against' those receiving this drug legitimately, according to responses from both key informants and consumers. Both PWID and key informants noted recent increases in hassling of methadone maintenance patients in and around dispensing points by individuals seeking the drug.

While benzodiazepine use was not associated with any crime in particular, PWID consumers reported experiencing extremely disinhibited behaviour when intoxicated by these drugs, particularly when potent benzodiazepines such as alprazolam were combined with methadone and/or alcohol. Individuals thus intoxicated reported uncharacteristic and bizarre behaviour. Key informants were aware that use of alprazolam and methadone in combination had been increasing in recent months and were concerned with this in terms of the increased overdose risk of such an activity, but there were no reports by front-line workers of particular recent problems with the associated disinhibited behaviour.

### *Darwin*

Comparisons of self-reported criminal activity in the previous month indicate more of those in the Stage two survey had engaged in any property crime than in Stage four and slightly more had been dealing drugs. The proportions reporting involvement in any of these crimes were generally similar to the NT IDRS sample in 2003, which in turn were lower than the national IDRS sample.

In Stage four the information on illegal behaviour was expanded to include a variety of drug-related behaviour. The inclusion of shoplifting as a separate category resulted in one in three PWID reporting they had done this in the previous month yet only 6% reported they had committed property crime. Two in every five said they had sold drugs but almost 40% had engaged in swapping drugs and two in five had provided services for drugs or exchanged goods for drugs. Some of these goods appeared to be stolen, according to some comments made by individual PWID. The Stage two survey explored the impact of drug use and problems associated with its use, and those who had used benzodiazepines were more likely to be aggressive than those using morphine, methadone or buprenorphine. Benzodiazepine use was also associated with more contact with police, criminal trouble and uncharged criminal behaviour.

In Stage two none of the demographic variables, drug used most in the last month, or recent drug use, were correlated with total self-reported criminal involvement in the previous month, except for the number of days methamphetamines or licit morphine had been used in the last six months. The greater the number of days of methamphetamine use, the greater the self-reported criminal involvement. However, an inverse relationship was evident with licit morphine use: the greater the number of days used, the less the criminal involvement. The numbers of days of methamphetamine, cannabis or illicit benzodiazepine use were also positively correlated to drug dealing in the previous month. In the Stage four survey, total self-reported criminal involvement was only significantly correlated with the total number of days of methamphetamine, cannabis and ecstasy use in the last six months. This lends support to the proposition that illicit drug use may be more associated with crime than licit pharmaceutical drug use. Additionally, in Stage four, days of methamphetamine or cannabis use were significantly associated with selling drugs, providing services for drugs, exchanging goods for drugs and selling goods for drugs. Days of illicit and licit benzodiazepine use were correlated with shoplifting and providing services for drugs, and days of illicit morphine was correlated with property crime and swapping drugs. Licit morphine use was not significantly associated with any of the self-reported illegal activity, providing further support for less criminal involvement with licit opioid use.

Most users of pharmaceutical drugs did not see drug-related illegal activity examined in this research as a desirable option or one that was a regular planned behaviour, with three exceptions. The first exception was driving while intoxicated. Most of the users felt that their driving was unimpaired by their use of pharmaceutical drugs. On the other hand, the ambulance service suggested there was trauma caused by prescription drug misuse that went unreported. In the case of road trauma, this may be because of the legal status of these drugs and the lack of established legal limits for driving such as there is for alcohol. Law enforcement personnel thought that most users injected at a home, which is consistent with the findings of the Stage two and four surveys, and they would not be driving while intoxicated. However, Stage four survey findings indicate the majority of users had reported driving while under the influence of drugs. It may be that they do in fact use at home but not necessarily remain there. This indicates the need for research into driving impairment associated with various prescribed drugs, development of legal limits and an education campaign aimed at any people using these drugs. The second exception was the selling, swapping and other exchange of drugs, which many PWID saw as a means of trading without money, obtaining more than they would if a monetary system was involved, or avoiding illegal behaviour. The third exception was shoplifting. Most users reported some shoplifting in the past month and indicated they did so out of necessity to obtain food or other essential items not directly linked to their drug use. Users who shoplifted for food or other essential items generally did so because of lack of money to purchase them. This suggests that lowering the percentage of their income that users spent on pharmaceutical drugs (either by decreasing the cost of the drugs to users on stable doses, reducing the demand, reducing the supply without increasing the cost or increasing the income of users on stable doses) may reduce this sort of crime. Another possibility might be to include training in budgeting skills as part of interventions for users charged with property crime.

There was a significant correlation between the number of days of licit benzodiazepine use and shoplifting and providing services for drugs. There was also a significant correlation between days of illicit use with shoplifting, drug dealing, selling goods for drugs and providing services for drugs. None of the other drugs used in the last six months was correlated with shoplifting, suggesting this is a specific area requiring more exploration. Some users and KI also reported benzodiazepines were associated with opportunistic crime such as shoplifting and other property crime while in a blackout state from intoxication. Aggression and violence were also thought to result from benzodiazepine intoxication. The survey findings and KI reports are consistent with the literature reporting an association between benzodiazepine use and shoplifting (Ashton, 2000). Other research reports a third of temazepam users took the drugs to provide the confidence to engage in criminal activity (Ruben & Morrison 1992). Although users in the two samples in the current research did not specifically report this as a benefit of benzodiazepine use, it is an area worthy of further investigation. Reports of memory loss, blackouts, aggression and violence are also consistent with the literature indicating benzodiazepines are associated with mental disturbances such as memory loss, amnesia for recent events, antisocial behaviour, aggression, violence, chaotic behaviour linked to paranoia, and road traffic accidents (Ashton, 2002). An increase in the availability of benzodiazepines or an increase in their use, perhaps prompted by a reduction in the availability of morphine, may result in more property crime, particularly shoplifting, assault and misconduct resulting from intoxication.

### **Implications for police and other front-line workers**

#### *Melbourne*

The main harms attributed to prescription drugs by both previous research – such as the IDRS (Jenkinson, Fry & Miller 2003), and Dobbin (2001) – and these current findings have been injecting harms such as vein damage, thrombosis, ‘dirty hits’, scarring and infections. Almost two-thirds of these PWID participants reported experiencing injection-related harms, and benzodiazepines and morphine were frequently blamed. Injecting harms apply to all the prescription drugs commonly used by these PWID, especially temazepam, morphine and buprenorphine, as they are manufactured for oral use, and injection is only possible by heating and liquefying the tablets/capsules. The resultant liquid hardens once it is injected and reaches body temperature, potentially causing severe health effects, including amputation. High proportions of these participants agreed there were negative consequences of using prescription drugs, such as: physical/health effects, volatile behaviour, overdose, and addiction (benzodiazepines); overdose/death, physical/health effects, and addiction (morphine); addiction and physical/health effects (methadone); and injecting/health effects and addiction (buprenorphine). Prescription drugs intoxication and withdrawal were also blamed for social and relationship problems, anxiety, lack of motivation, and irritability by the PWID. Health KI reported that the habit-forming nature of benzodiazepines, as well as injection-related damage, was a potential negative consequence of their prescription. They also contended prescription drugs overdose was a problem, especially with benzodiazepines when used with other drugs, and with methadone. Key informants reported a relatively high incidence of sharing between partners, and there were reports that female drug users were sometimes coerced into undertaking sex work in order to make money to procure drugs for themselves and their partners.

Dependence and overdose (especially when the drugs were combined with other drugs and/or alcohol) were cited by PWID as two of the biggest disadvantages to using prescription drugs. Two-thirds of these PWID recorded scores on the Severity of Dependence Scale (SDS) that suggests they may be dependent on benzodiazepines, morphine, buprenorphine, and/or methadone. In addition, data from the Melbourne Ambulance Service (analysed by Turning Point (2003)) confirm that most heroin-related deaths in the past ten years have involved benzodiazepines and/or other opioids. In addition, law enforcement KI considered the desirability of benzodiazepines on the black market

and the abuse of benzodiazepines, especially when used in conjunction with other drugs, to be problematic, driving diversion of the drugs. The use of pharmaceutical opioids and other drugs (such as heroin) in combination were considered to be one of the main drawbacks of prescribing the drugs to PWID, and some law enforcement KI considered the provision of pharmaceutical opioids as a bandaid solution that does not address drug use. Law enforcement KI argued that the diversion of buprenorphine was a negative aspect of prescribing, and health KI suggested that inconsistencies in the dispensing of buprenorphine, such as not crushing the tablet on the spot, were a problem, allowing the drug to be diverted or injected.

On the other hand, there were suggestions that lack of supply of prescription drugs could force both dependent and non-dependent benzodiazepines users to seek a more harmful replacement, thus causing health and law enforcement problems. There was general agreement that prescribing of pharmacological drug treatments were essential for the health and quality of life of drug users, and for the reduction of crime; although several KI argued that the sometimes prohibitive cost of ongoing treatment may result in less access to treatment, reduced improvement in the health and wellbeing of drug users, and an increase in crime for some people as they are compelled to commit crime to pay for their dose. This contention was supported by the finding that some PWID who are on the buprenorphine program had spent up to \$50 in the previous fortnight on the drug.

### *Hobart*

Key informants reported, and data from consumers demonstrated, that intravenous administration of pharmaceutical opioids not designed for such use carries a degree of health harms. Two main themes of opportunities for health intervention were proposed.

Primary prevention suggestions included developing peer education programs built around demonstrating the harms associated with intravenous administration of tablets, using graphic demonstrations of images such as lungs riddled with particulate matter from years of injection, similar to the approaches used in anti-smoking campaigns.

Key informants more commonly suggested secondary health interventions, such as distribution of pill and biological filters through the Needle Availability Program to reduce the health harms, and the future burden on the public health system, from continued introduction of particulate matter in the circulatory system from regular injection of these pharmaceuticals. Additionally, acknowledgement that some individuals receiving methadone maintenance therapy will continue to administer 'take-away' doses of this drug intravenously, and taking steps to reduce the harm of this (such as not diluting these doses, or changing the formulation of these doses to Biodone or injectable methadone) was suggested by many key informants.

### *Darwin*

In the Stage two survey more PWID had accessed treatment in the last six months than in the Stage four survey (44% : 32%) and there were also higher proportions in the first survey that had accessed the methadone program (40% : 20%), counselling (15% : 4%) and buprenorphine (24% : 20%). In contrast, more PWID in the Stage four survey reported they were on prescription morphine (20% : 9%). The proportion of people stating they were currently in treatment was higher in the second survey than the first (46% : 33%) and of those in treatment there was a noticeable reduction in those reporting they were currently in the methadone (50% : 33%) or buprenorphine programs (25% : 13%) or counselling (15% : 0%). There was a concomitant increase in the proportion stating they were currently on prescribed morphine (41% : 16%). This change may reflect a variation in the response options for this question in Stage four. In Stage two there was not a response option called 'prescribed morphine' but a number of PWID spontaneously provided this response. When queried, they believed this to be a valid form of drug treatment and, therefore, it was listed as an option in the second survey. It is difficult to determine the degree to which this altered the response pattern.

Longer term trends from secondary data sources indicate the proportion of the NT IDRS samples reporting they were currently in treatment dropped from 34% in 2000 to just 14% in 2002 (O'Reilly 2002; Duquemin & Gray 2003). In 2003 the proportion rose to 24% but all respondents were in a pharmacotherapy program (Moon 2004). There were higher proportions currently in treatment in both surveys of the current research than in the 2003 IDRS sample, but there is a similar pattern in regard to PWID accessing pharmacotherapies and morphine as opposed to other forms of treatment. The NT IDRS samples reveal a shifting pattern of service utilization over time. In February 2000 the Opioid Withdrawal Management Program was implemented and 29% of the IDRS sample that year reported they were on methadone, and the other treatment forms most commonly reported were drug counselling (15%) and residential treatment (12%) (O'Reilly & Rysavy 2001). In 2001 the proportion on methadone rose to 54%, but there was a slight decrease in those in counselling (12%) and none were in a residential drug treatment. However, 21% spontaneously reported they were on prescription morphine as a treatment (O'Reilly 2002). This was the only year in which the NT IDRS elicited responses on prescription morphine as a form of treatment. In the 2002 sample 50% were on methadone and 36% on a morphine reduction program (Duquemin & Gray 2003) and, as stated above, in 2003 all those in treatment were in a pharmacotherapy program. In September 2002 the NT introduced pharmacotherapy maintenance programs and this may partly explain the shift toward this type of treatment. However, the Alcohol and Other Drugs Program Treatment Services (AODPTS) data indicate a decline in episodes of treatment with morphine as the principal drug of concern since 1998, and episodes among injecting users also display a decline for both heroin and morphine since 2001. The number of episodes for opioid (principally morphine) detoxication/withdrawal shows a marked decline since 1999, from 186 episodes to just 34 in 2003. The service underwent a major restructure in 2002 but the declines were clearly evident prior to this service modification.

Overall, the results of this and other research in the NT suggests the need to examine service utilization from a number of perspectives and the role of non-pharmacotherapy forms of treatment either as full treatment in themselves or as adjuncts to pharmacotherapy. This is particularly important given 93% of people in the Stage four survey stated they would not use methadone because they were on prescribed opioids and did not want to shift to methadone, or they would not access methadone because of stories they had heard or beliefs they held such as it being the equivalent of 'chemical handcuffs'. Almost one in three had been on methadone at some point in time and would not use it again and a quarter were not interested because they were unconcerned with their drug use. Both those surveyed and the KI expressed additional concerns about pharmacotherapy programs not being suitable, or not meeting the needs of many PWID, and these concerns centred on long waiting lists, not providing proper medical care, inflexibility with limited dosing regimes and a restrictive medical model focus rather than an holistic approach where drug substitution would be coupled to a range of support services, both short and long term. Additionally, the cost of the pharmacotherapy programs was reported by both users and the KI as an issue, particularly for those on prescribed morphine. The pharmacotherapy programs currently cost about \$170 per month when dispensed from a chemist, whereas a monthly visit for a prescription to a GP who does not even bulk bill will cost considerably less.

The NT is currently considering legislation to introduce specific controls on the prescribing of pharmaceutical opioids and one KI stated the pharmacotherapy programs would be expanded to absorb opioid dependent people. The aim would be to transfer those on prescription morphine to the pharmacotherapy programs. However, as one GP in this study opined, patients were very reticent about transferring to the methadone program. A marked reduction in the supply of prescription morphine would impact differentially among morphine users. Those with occasional use, or mild to moderate dependence, would have more options in responding to reduced availability. Some might not use while others may find it easier to reduce consumption, move into a treatment program, use differently or use other drugs. A reduced supply can refine the market in

that it can remove the less dependent, but it can also produce a more dedicated drug use lifestyle among those who feel unable to cut down. It is evident that few of the opioid users surveyed in this research would enter treatment programs, especially pharmacotherapies, because the majority thought drugs such as methadone to be far less desirable than continued use of morphine. Most morphine users prefer heroin to morphine, but appear to find morphine a reasonable substitute in a market with poor heroin availability. It is possible that if morphine became much less available, some opioid users might access pharmacotherapy drugs as an alternative, but it would appear from the current research that many would seek the next preferred substitutes, which were benzodiazepines, other opioids, cannabis, alcohol and methamphetamine. In the Stage two survey, only 1% said they would access a pharmacotherapy if there was a marked reduction in availability of pharmaceutical opioids, while a third indicated they would substitute other drugs, such as benzodiazepines, other opioids, alcohol, cannabis and methamphetamine. The benefits of morphine use as reported by participants in the Stage two survey resemble self-medication. A third indicated morphine provided pain relief and, therefore, a better quality of life and one quarter reported it reduced stress and anxiety and facilitated improved sleep. Decreased access to morphine and increased use of licit drugs such as alcohol for self-medication may result in an increase in alcohol-related harm to the community, particularly that associated with intoxication: such as public nuisance, drink driving, assault.

There are additional concerns in regard to measures to restrict the prescription of pharmaceutical opioids such as morphine. There is a delicate balance that must be maintained to ensure those with legitimate need are not adversely affected by such measures. Although a reduction in prescribing could possibly reduce use, it could also impede access to medically necessary treatment. There is evidence that regulatory controls, particularly monitoring systems, have the potential to make providers more conservative or cautious and to alter their prescribing behaviours, through such measures as reducing the number of prescriptions for monitored drugs or substituting non-monitored drugs. This can indirectly result in a negative impact on patient care (Wastila & Bishop 1996; Simoni-Wastila & Tomkins 2001). It can also produce pressure on GPs to detect and respond to suspected misuse or diversion and this has the potential to negatively impact on service rapport, trust and full disclosure of difficulties. This can result in people not returning to the GP for on-going care. Additionally, those people with a history (past or present) of opioid dependency are also at risk of not obtaining the treatment for valid conditions (Cook, Sefcik & Stetina 2004). One KI cited research on European trials of government prescribed drugs and decriminalization of drugs for personal use. The resultant lowered marginalisation and stigmatisation of prescribers was claimed to result in improved health outcomes through greater access to services. Most KI and some users identified health benefits from the use of legal rather than illegal drugs. These benefits included a reduction in marginalisation through access to health professionals without the social and legal complications of being identified as a drug user, and this contact allowed for other drug use, health and well-being issues to be assessed and managed. Another benefit stemmed from the regulated purity and dose of pharmaceutical drugs and the reduced risk of overdose and contamination through cutting agents.

Both Australian and overseas research demonstrates a strong association between crime, particularly property crime, and illicit heroin use (Stevenson & Forsythe 1998; Kaye & Darke 2000). Conversely, it also highlights concomitant reductions in opioid-related crime when appropriately resourced and targeted methadone maintenance treatment programs are provided (Hall 1996; Parker & Kirby 1996; Bell 1997; Mattick et al. 1997; van Beusekom & Iguchi 2001; Lind et al. 2004). The NT is uniquely positioned with its opioid market dominated by the use of morphine rather than illicit heroin. Government could harness opportunity from this situation by shifting from a policy approach dominated by supply control to one focussed on harm reduction, and implement a pharmacotherapy program involving the use of prescription morphine which may act as a suitable substitute for methadone, overcoming some of the issues associated with the

structure and requirements of the current pharmacotherapy programs. There is some evidence that users are able to stabilise their use over a long time frame if they have a regular and affordable supply, such as when a user is prescribed morphine. Importantly, there is evidence for less involvement in crime among those people accessing prescription morphine as indicated by the significant inverse relationship between the number of days of prescription morphine use in the previous six months and total criminal involvement in the Stage two user survey. In the Stage four survey, only the number of days of 'illicit' morphine use was associated with property crime and swapping drugs, and there were no significant correlations between days of 'licit' morphine use and any of the variables assessing self-reported illegal activity. There is already exploration of the use of morphine in treatment programs with the trials of a new high dose methadone detoxification protocol with transfer to morphine for several weeks. This is followed by a reduction program of sublingual buprenorphine before a Naltrexone implant for maintenance of an opioid free lifestyle (Reece 2004). For those wishing a maintenance program rather than abstinence, a safe injectable form of morphine could be developed and trialed as a similar but alternative pharmacotherapy to injectable diamorphine (heroin), which has been used successfully in Swiss trials and in the UK. A study of clients' perceptions of this form of maintenance treatment (diamorphine) indicated users accessing the program most often reported doing so to obtain a pure form of an opioid with a known dose, to improve relationships with family and to avoid contact with the police and the criminal justice system (Sell & Zador 2004). Many of the clients cited advantages of being on injectable diamorphine as opposed to injectable methadone.

Most of the injecting users and KI (including law enforcement personnel) surveyed in the current study thought some form of treatment was preferable to progression through the criminal justice system. The possession of prescription drugs, even without a prescription, is not illegal and those using them are less likely than illicit drug users to come into contact with the criminal justice system through use or supply. Users can also seek or be diverted to various interventions without being labelled as an illicit drug user. Many KI thought this was a desirable goal, which could be achieved in part through an appropriate diversion system. There are benefits inherent in co-operative arrangements between courts, police, health and treatment providers to divert people into the health sector, and these obviously include better health and social outcomes. There would be less strain on the justice system resources, especially in relation to the difficulties associated with policing prescription drugs and prescription drug-related crime.

The rate of benzodiazepine injection remains an area of concern and was highlighted by both PWID in both surveys and KI in this research. There appeared to be a drop in the prevalence of injecting in the four months between the two surveys and further monitoring would be required to determine if this is an emergent trend. The NT IDRS samples indicate a noticeable rise in benzodiazepine injecting from 2000 to 2003, with only one in ten PWID having injected benzodiazepines in the six months prior to the survey in 2000 compared to 30% in 2003. There was also a rise in the median number of days of use, but the IDRS does not disaggregate days of Intra-venous (IV) use and days of oral use. There have been concerted efforts by a wide variety of health services, treatment agencies and drug user groups to educate injecting users about the risks associated with injection of benzodiazepines. There has also been the removal of the temazepam gel capsules from the market. Despite all these efforts, the proportion in the NT IDRS samples injecting benzodiazepines has increased and this clearly demonstrates the need for a re-thinking of measures to reduce benzodiazepine injecting. Such a re-think would also need to consider users' motivations and drug market forces, particularly availability of other opioids, in addition to traditional approaches such as health promotion initiatives.

The first survey of injecting users in this research indicated a noteworthy level of self-medication with benzodiazepines, particularly for anxiety and sleep disorders. There are potentially serious health and well-being implications from non-medically supervised use of these drugs. Benzodiazepines can impair memory functions, specifically the ability to learn and retain new information and can produce amnesia for recent events (Ashton 2000, 2002) and it is not yet established whether long-term use results in permanent cognitive or neurological damage. Non-medical use of benzodiazepines can also result in anxiety, insomnia and depression and thus paradoxically produce the conditions for which some people claim to be self-treating with these drugs (Ashton 2002). The drugs may provide initial relief from anxiety symptoms but in the longer term they can impair psychological adjustment to trauma and inhibit alternative coping strategies. The drugs can also aggravate pre-existing depression and precipitate self-harm. Finally, benzodiazepines can impair the ability to feel pleasure or pain or to empathize with others, termed emotional anaesthesia (Ashton 2000), and this has implications for an increased disregard for the negative legal, criminal or interpersonal consequences that may follow from an individual's behaviour (e.g. uncharacteristic shop-lifting, higher or more unrestrained levels of interpersonal violence). There is clearly a need to educate people who use benzodiazepines about the risks associated with use, but also health practitioners and the general community could be educated on the short- and long-term effects of these drugs.

In the Stage two survey only 3% of PWID reported experiencing an overdose in the previous month and this was similar to the proportion in the 2003 NT IDRS. Overall, the NT IDRS demonstrated a decrease over time from two in five in 2000 to one in a hundred in 2003. There was a very low rate of morphine or benzodiazepine overdose in the previous six months and none of the sample had been administered Narcan™ in the year before the survey. The low rates of overdose are supported by information on NT hospital separations that indicate only two separations for opioids acute intoxication in the 2002/03 financial year. Emergency Department attendances also display a very low rate for opioid poisoning and ambulance callouts indicate a decrease in morphine-related callouts from 2002 to 2003. St John Ambulance KI also reported a reduction in ambulance callouts for overdoses in the previous year, partly due to introducing a combination of short- and long-acting Narcan administration to reduce double callout rates. There was only one issue for the ambulance service in relation to prescription drug use that had implications for law enforcement: the service expressed an interest in the police being able to assist at callouts where there was disinhibition and problem behaviour but people did not meet current psychiatric admission criteria. There appeared to be a need for safe custody such as a residential or overnight space for people withdrawing. The police could assist ambulance officers through their skills in dealing with unpredictable and aggressive behaviour. Refresher courses would need to be provided regularly to police officers and include information on emergent drugs and associated behaviour.

## Interventions

### *Melbourne*

This study found that police activity generally was not considered by PWID to have impacted on the availability of prescription drugs on the illicit markets, and this may be supported by the finding that many law enforcement KI found it difficult to police the illicit use of prescription drugs. In accord with this, most KI did not consider that police activity had any effect on the use of prescription drugs by PWID, impacting more on illicit drugs. However, a few law enforcement KI did not agree, arguing that police cautioning and diversion programs were having an impact on all drug use, and that police activity in shopping malls was making access to drugs (including pharmaceuticals) more difficult, and reducing crime in those areas. Law enforcement KI reported that policing efforts had reduced the use of pharmaceuticals and hence the incidence of crime, and this was reflected in crime statistics. They also considered this kind of visible police activity may

reduce the incidence of forged prescriptions being presented. A further suggestion of these findings was that another benefit of policing in regards to pharmaceutical misuse may be a changing approach of police towards drug users. With the diversion of drug users into cautioning programs, police contend they are more able to focus their efforts on the trafficking of pharmaceuticals. The production of the Victoria Police manual *An Investigation Guide to Pharmaceutical Drug Trafficking and Use* (Victoria Police 2004) for all stations was also seen to benefit policing efforts, in that it allows officers to correctly identify pharmaceuticals and to lay charges where applicable, suggesting that wider distribution of this, or a similar publication, may be useful. Provision of information to police about emerging problems and regular updating of the manual are therefore suggested by these findings.

The current findings suggest that potential consequences of police 'crackdowns' – resulting in more 'underground' activity and use of pharmaceutical drugs – should be considered when planning such programs. It was considered by other KI that police crackdowns on illicit drugs leads to displacement of illicit drug trafficking to other areas (moving the problem but not solving it), or may result in drug trafficking becoming more covert in response, and/or an increase in the use of benzodiazepines as illicit drugs become more difficult to obtain. Another side effect of police activity cited that may result from crackdowns is PWID sharing injecting equipment, injecting 'on the run', and in unsanitary conditions, thus increasing injecting harms considerably, as well as the risk of overdose. Injecting harms were considered to be the major problem by health KI, and they prioritized the development of harm reduction practices around injecting pharmaceutical drugs. It was also mentioned that where people in possession of benzodiazepines without a prescription had been charged, it often resulted in prescription drug use becoming more covert.

Overwhelmingly, this study found that pharmacological drug treatments were considered to be of utmost importance in reducing both health and law enforcement problems associated with prescription drugs use, and health KI considered that targeted and monitored benzodiazepines could be useful in a withdrawal treatment regime. Treatments were attributed with significantly improving the health and well being of drug users, with flow on effects to employment and housing, thereby leading to continuing stability for individuals. It was considered that provision of these treatments reduced crime as they reduced the need for substantial amounts of money for financing drug use. On the other hand, some consideration may need to be given to the costs of these programs, as KI contended that the cost of regular treatment (up to \$5 per day) for those on low incomes could become prohibitive, and may in fact precipitate criminal behaviour (law enforcement KI agreed that pharmacotherapy treatments were worthwhile, and considered that their availability could disengage PWID from street supplies of heroin). Some KI thus suggested that the cost should be reduced or waived because of this. The findings suggest that diversion and maintenance of PWID into such (affordable) treatment programs may have a positive effect on both health and law enforcement outcomes. Further to this, police considered that strategies that would assist them in policing pharmaceutical drug misuse include: dispensing pharmacotherapies from 24-hour clinics; and establishing pharmacies in a wider area than currently to reduce the numbers of people flocking to 'hot-spots'.

The findings suggest that interventions from health authorities, rather than law enforcement, may have a greater impact on the use of prescription drugs. For instance, temazepam injecting appears to have declined since the HIC regulated prescribing of the 10mg gel capsules under the PBS/RPBS in 2001. The cessation of production of all gel capsules that has now occurred in Australia may be expected to have a further impact. Several other interventions in prescribing practices were suggested by these findings. KI tended to agree that medical interventions may be useful in reducing prescription drug misuse. For instance, KI considered that limiting prescribing of some drugs, such as benzodiazepines (for example by prescribing daily pick-up of enough of the drug to maintain a person for only the next 24 hours), may reduce diversion. In support of this, PWID

often reported that when they received a prescription, they kept a proportion for their own use and sold or gave away the rest, suggesting that if they had less of the drug they may be less inclined to share it. Furthermore, PWID reported that GP and HIC crackdowns on prescribing and doctor-shopping were the activities most likely to have made the drugs more difficult to obtain both medically and on the street. Findings from the current study – that temazepam and morphine were very difficult to acquire medically, and there is no point in trying to get them this way – further suggest that prescribing practices have reduced access to the drugs, and have most likely discouraged doctor-shopping for them.

Somehow restricting the sources of benzodiazepines and pharmaceutical opioids, tracking the prescriptions an individual has, as well as the development of a system that tracks batches of benzodiazepines as they are produced, cross-matched with data on dispensing, may help reduce diversion of prescription drugs. Many doctors (e.g. Kamien 2004) are also looking forward to availability of the HIC prescription shopper's data base, replacing the doctor-shopper hot-line as a way of enabling better control of over-prescribing and doctor-shopping. There were some suggestions that that it would be helpful for data collected by pharmacists on doctor-shopping to be fed back to doctors and A&E departments at hospitals, and that access to different sorts of data sets, for example law enforcement data, may be of use. Law enforcement KI agreed that access to cross-matched data could be of use. Privacy is obviously an issue with these suggestions. PWID reports suggest these strategies may have some effects, as PWID reported that when they believed they were on a doctor-shoppers database they did not bother to attempt to obtain prescriptions for drugs. Other strategies suggested for reducing diversion included better vigilance with prescription pads, pharmacists calling police where forged prescriptions are presented (which often does not currently happen), crushing of buprenorphine in the pharmacy before administration (or administering a 'fizzy' form similar to Berocca), injectable buprenorphine delivered in the pharmacy, and more sharing of information between doctors and police about drugs preferred for diversion.

### *Hobart*

The patterns of sourcing of diverted pharmaceuticals by providers and the modes of access to these drugs from PWID consumers create particular challenges for policing and limited points for intervention in these systems. Experience in policing in this area suggested that the establishment of close relationships between health and law enforcement sectors helped support good outcomes for both sectors. For example, where problems with prescription or diversion were identified by police, historically prescribers had been more responsive to interventions made by agencies overseeing prescription (Pharmaceutical Services) than those approaches made by police directly.

KI further suggested that an appropriate point for supply reduction may be in further supporting medical practitioners in regard to patient assessment and identifying multiple options for treatment so that the best match could be made between patient need and the treatment provided. Increasing access to specialist pain management and drug withdrawal or maintenance programs may assist in such processes.

Reports from key informants and PWID surveys suggested that a substantial reduction in the availability of diverted pharmaceutical products may have a range of possible unanticipated consequences that need to be considered.

Given that surveys of local PWID consumers consistently suggest that many are using pharmaceutical opioids in the place of heroin (due to its poor availability on the local market), it is possible that such a reduction in availability of diverted pharmaceutical opioids may produce an environment conducive to the establishment of a local heroin market. However, as it was shown that PWID consumers were particularly flexible in their patterns of use of pharmaceutical

opioids, it may be that reducing the supply of one opioid form may simply lead to an increase in use of an alternative pharmaceutical product. This appears to have been the case in response to the removal of gel capsules of temazepam from the market, with use of alprazolam among local PWID groups increasing in response. Alternatively, there were suggestions that a proportion of PWID may shift from regular pharmaceutical opioid use to regular use of stolen opium poppies or methamphetamine if these supplies reduced, both of which would carry particular health and policing issues that may be more demanding than the current scenario.

Alternatively, data from PWID consumers suggested that some consumers may increase their involvement in criminal activity if there were to be a reduction in the availability of diverted pharmaceutical opioids in order to pay the increased purchase price of these products on the illicit market. Similarly, there were suggestions that there may be increased targeting and intimidation of those receiving pharmaceutical products legitimately, as has been seen toward individuals receiving methadone maintenance in recent months.

KI also noted that increased regulation on prescription of these medications or on the dispensing of these drugs also had the potential to unnecessarily burden those who have legitimate need of treatment with these medications, and may lead to reduced health outcomes for these individuals.

Finally, KI noted (with PWID data supporting these reports) that substantial supply reduction of these drugs on the illicit market had the potential to produce a sizeable increase in demand for treatment services such as pharmacological maintenance therapy, pain management, detoxification or withdrawal management. These services within Tasmania are already significantly stretched, with notable waiting lists for treatment common. Additional demand on these services would be unlikely to be able to be met, with this scenario producing reduced health outcomes for those within, and attempting to access, such services.

Such issues merit careful consideration prior to any major intervention strategy. Either way, it would appear that the greatest scope for changing such patterns of use of diverted pharmaceuticals could be made through interventions within the health system. While medical practitioners appear to be particularly cautious with avoiding 'doctor-shopping' or prescription of pharmaceutical opioids to PWID, the sources of these products on the illicit market appears to be individuals receiving these drugs legitimately, but potentially not receiving the optimal level of pharmacological treatment for their level of need. Enhancing support to prescribers when assessing non-PWID, and increasing the availability of other specialist pain management, or addiction management options, may offer some benefits in terms of establishing the best match between treatment and patient need, and hence reduce the likelihood that any prescriptions will be diverted.

### *Darwin*

The key aspect of the policing of pharmaceutical drugs is the licit status of drugs such as morphine and benzodiazepines. They do not fall under the *Misuse of Drugs Act* and law enforcement personnel stated their distribution and use was largely outside their area of responsibility. Although the black market in pharmaceutical opioids and benzodiazepines was of concern, the police could only impact on this area by obtaining evidence at the point of sale, and they rarely received sufficient intelligence to gather such evidence. Additionally, the points of sale tended to be among groups of friends, thus limiting the ability of informants to infiltrate or access the type of intelligence required to conduct a successful investigation and prosecution. It was not in the interests of law enforcement, particularly in terms of their available resources, to act without good intelligence and the likelihood of a successful conviction. The majority of KI were of the same opinion and the users of pharmaceutical drugs themselves reported little evidence of any influence by the police on their distribution and use. While the acquisition of pharmaceutical

drugs by users, especially morphine, is highly organised in the sense of being a regular, planned behaviour involving networks of friends and other contacts and good knowledge of sources, law enforcement reported there was little evidence of involvement by organised criminal networks in the distribution of these drugs. Those involved in selling were described as being organized at cottage industry level, even in the most organized form, and were distinct from those using the drugs who engaged in some low level drug trade to supplement their income. This assessment was supported by the majority of KI and the users themselves.

Law enforcement KI stated the drugs most commonly associated with crime and drug-related policing were the illicit drugs methamphetamine and cannabis, and work in this area involved a considerable amount of time and resources. This was supported by information gathered in the various stages of this study, particularly the indicator data on drug-related offences. Many KI, including law enforcement personnel, believed that morphine use reduced crime in dependent opioid users, particularly the serious crime associated with heroin. KI and users reasoned that steady availability from a GP for a low price, as opposed to purchasing illicit morphine for high prices, meant people were not forced to engage in crime to obtain money to supplement their income. The current study provides support for this position. The Stage two survey found a significant positive correlation between total involvement in crime in the preceding month and number of days of methamphetamine use, and an inverse relationship between days of licit morphine use and criminal involvement. Days of methamphetamine, cannabis or illicit benzodiazepine use also displayed a significant positive correlation with drug dealing in the last month. Significant positive correlations between days of methamphetamine, cannabis and ecstasy use and various criminal activity in the previous month in the Stage four survey strengthen support for the proposition that illicit drugs are more associated with crime than prescription drugs. The Stage four survey also found the differential between total income in the last fortnight and expenditure on licit and illicit drugs in the same time was significantly correlated with selling drugs in the last month, as was the number of days of methamphetamine, cannabis and ecstasy use. Methamphetamine and cannabis also displayed significant associations with providing services for drugs, exchanging goods for drugs and selling goods for drugs. Benzodiazepine and pharmaceutical opioid use were not correlated with selling drugs, again providing further support to law enforcement claims that the illicit drugs are more associated with crime than prescription drugs, even when used illicitly. Other research demonstrates a significant association between income from illicit drug distribution and total crime committed, and the higher the income the more crime, particularly violent crime (Inciardi & Pottieger 1994; Kinlock, O'Grady & Hanlon 2003). A large number of individuals earning high amounts from illicit drug dealing are young males with an early onset of crime and marked violent tendencies.

At present, the supply of pharmaceutical drugs is diffuse. Users and KI report a large number of sources that each supply a small number of users. The legal status of these drugs allows for a large number of licit sources and the prevalence of selling, swapping, or other non-monetary exchanges creates an even larger number of total sources with a stable and comparatively low base price. In order for the supply of these drugs to be profitably infiltrated by an organized criminal network, such a network would have to gain control of a large proportion of the local illicit market. It seems unlikely that such a network could achieve this given the number of local licit sources, unless it was able to bring in a sufficiently cheap supply from a non-local source to compete with the groups of friends and acquaintances trading with each other. There are some indications that non-local morphine may be coming into the NT. Two KI in Alice Springs reported that backpackers and dealers provided the majority of illicit morphine in the local market. There appeared to be a new phenomenon of an underground movement of dealers coming from southern jurisdictions. Two Darwin KI thought some morphine was coming in from southern jurisdictions but they did not have any evidence to support this claim as they were unaware of any interdiction of quantities of morphine. However, there are some puzzling aspects to the relationship between patterns of

morphine use in the two user surveys in this research, the indicator data and the NT IDRS. The indicator data clearly demonstrate a reduction in consumption of all forms of morphine since the late 1990s. There has also been a reduction in doctor-shopping and in the dispensing of PBS and RPBS morphine prescriptions and KI reports of reduced availability. Despite this information, the majority of those using morphine in this research stated it was easy or very easy to obtain, and price and availability were stable. The 2003 NT IDRS (Moon 2004) notes the discrepancy between evidence demonstrating reduced licit availability and user reports of easy, stable availability. In the 2001 NT IDRS sample, 49% of those using morphine had used it daily and 68% had used it at least every second day. In 2003, the NT IDRS reported 63% used morphine daily but provided no figures on those using at least every second day. The most recent NT IDRS sample in the NT indicated 56% of those using morphine did so daily and 69% used at least every alternate day. Overall, from these figures it would appear there was an overall increase in the proportion using every day, but no change in those using at least every second day. This adds to the puzzle of why there is no consistency between indicator data on consumption and self-reports of consumption among those injecting drugs. It is unfortunate that the IDRS posed the problem but did not engage in detailed analyses of the use patterns to provide any insight into the puzzle. There are a number of possibilities that may play a role in balancing the equation. Consumption may have fallen among a section or sections of the population that do not cross into the population of people who inject drugs. Alternatively, the patterns of morphine use among those predominantly using morphine may have shifted, but the IDRS has not engaged in the level of analysis or the type of analyses required to illuminate these changes. The third possibility is the importation of morphine from sources outside of the NT.

The limited role of policing in prescription drug markets as they currently exist suggests that if law enforcement wanted to have a greater impact on the illicit use of these drugs their legal status of possession would have to change in some way. One possibility would be to make possession without a valid script illegal. However, several KI pointed out the difficulties this could create without necessarily reducing illicit use and the potential it had to disadvantage people who were on prescriptions for genuine pain management. It is possible that a parallel black market in scripts could emerge alongside the black market in the drugs themselves. Additionally, law enforcement stated the availability of prescription morphine had protected Darwin and Alice Springs from heroin and organized criminal groups involved in the heroin trade. Some KI had indicated that morphine had acted as a heroin substitution program and some law enforcement KI thought it was a creative and socially acceptable solution to satisfy the demand for opioids when the heroin trade was disrupted. It resulted in significant harm reduction because users had a cheap source of opioids that were pure and of a known dose. They were also less marginalized, able to function better and had regular contact with GPs to address health and other issues. Other KI expressed similar views in the Stage four interviews and many thought the continued pressure to reduce the prescribing of morphine could increase the price of morphine on the black market. There is research indicating that prohibition can drive up the price of drugs, and interventions such as crack downs and interdiction can create short-term scarcity that leads to substantial price increases (Caulkins & Reuter 1998). More importantly, many aspects of what is reported to be the drug problem, including drug-related crime, are driven by the value of the drug on the black market. Caulkins (1997) estimated approximately one sixth of drug-related crime and violence was due directly to drug use and the remainder primarily resulted from the drive to obtain money for drugs. About a third of this crime was described as 'economic compulsive' and a half 'systemic'. If the value of the drug could be reduced considerably, or in the case of morphine, be available on prescription as part of a treatment program, then it is quite possible the incentives would be removed for a large proportion of drug-related crime.

Some KI thought further restricted availability of morphine could provide the conditions necessary to re-establish a heroin trade in Darwin and Alice Springs, the results of which would be more deteriorating health, corruption, organized crime and more crime in general, including possibly more violent crime. In the first survey in this research, two in five users reported they had injected heroin in the last six months but the average frequency of use was about once a week. In the second survey one in three had injected heroin in the last six months but there was only a very small percentage that had used heroin most in the last month. Recent use of heroin was higher in the second survey than in the NT IDRS samples from 2000 to 2003, suggesting there may be an increase in the sporadic heroin supply in Darwin. Law enforcement personnel in Alice Springs reported heroin was generally unavailable in that location and appeared to be becoming even scarcer. However, there may be potential for a robust heroin market to develop and this is an area requiring monitoring and further investigation.

## Chapter four: Study implications and conclusions

The purpose of this study was to examine the relationship between benzodiazepine and pharmaceutical opiate and crime, and the impact of this in three select Australian capital cities of Melbourne, Hobart and Darwin where there is evidence of illicit prescription pharmaceutical markets. In keeping with the current Australian National Drug Strategy, which incorporates a policy of harm minimisation through supply, demand and harm reduction strategies, the approach adopted by the study team in the research was to consider both law enforcement and public health aspects of illicit markets for benzodiazepine and pharmaceutical opiate issues.

Considered together, the study findings present a picture of diffuse and active illicit markets in Melbourne, Hobart and Darwin for certain of the prescribed pharmaceuticals examined – benzodiazepines and pharmaceutical opioids. The current study provides important insights into the mechanisms by which these markets operate, and has also highlighted some of the consequences of this. Of particular interest are the apparent similarities and differences between the markets in Melbourne, Hobart and Darwin in relation to the key study themes of market characteristics, diversion and links to crime and implications for police and other front line workers. The following sections draw from the key findings presented in each Jurisdictional Report (Smith et al. 2004; Bruno 2004; O'Reilly et al. 2004).

### Prescription drug markets in Melbourne, Hobart and Darwin

#### Market characteristics

As evidenced from the findings, it appears that Melbourne has an active illicit market for benzodiazepines, buprenorphine, and increasingly morphine, and that this may partly be understood with reference to the reduction in supply of this city's dominant illicit drug – heroin (Smith et al. 2004). In contrast, the other study sites, Hobart and Darwin (and surrounding cities) do not have a dominant heroin market and the study findings suggest that active illicit pharmaceutical markets exist primarily for methadone and morphine (Hobart) (Bruno 2004) and morphine (Darwin) (O'Reilly et al. 2004)<sup>13</sup>. The patterns and trends in prescription drug misuse do not seem to be influenced by heroin in these jurisdictions – neither support significant heroin markets. This fact seems to have given way to predominant illicit markets for methadone and morphine varieties in Hobart and Darwin respectively.

The pre-existing large licit supply for schedule 4 (prescription only medicines) and schedule 8 (controlled drugs) drugs<sup>14</sup> should be seen as a key environmental factor in explaining how illicit markets may develop to support demand for use. Another factor is the predominance of polydrug use patterns and the fact that many benzodiazepines and pharmaceutical opioids are routinely prescribed to people who inject drugs (PWID), particularly those who are heroin/opioid dependent, to alleviate a wide range of symptomology that may be associated with that use (e.g. anxiety, depression, insomnia, drug withdrawal, pain management). Other factors predicted to facilitate expansion of the prescription drug market in QLD may also be relevant to future development in these jurisdictions, including: increasing demand for prescription drugs for non-

<sup>13</sup> The dominance of the illicit methadone market in Hobart may be protective against future buprenorphine diversion and injection in that jurisdiction – buprenorphine use can lead to precipitated withdrawal for those in methadone substitution treatment (Clark et al. 2002; Strain et al. 1992, 1995).

<sup>14</sup> All States/Territories have adopted the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP); however, jurisdiction variation may occur in local poisons schedules stipulations (see Therapeutic Goods Administration 2000).

medical purposes; instability in the illicit drug market; availability, affordability and stability of prescription drugs; profits to be made in selling prescription drugs on the street; reduced risk in supplying and possessing prescription drugs relative to illicit drugs; and emergence of prescription fraud as a specific criminal enterprise (Queensland Bureau of Criminal Intelligence 2002).

The current research has shown that injection of particular benzodiazepines and pharmaceutical opioids has become entrenched among some groups of PWID. For many in Melbourne this appears to be a response to the altered heroin supply, whereby certain benzodiazepines (e.g. temazepam) and pharmaceutical opioids (e.g. buprenorphine, morphine) are used as supplements to the heroin being used, and/or as a substitute for heroin in the current market environment (where heroin may be less available, of poorer quality, and more expensive relative to the various prescription pharmaceuticals available). In contrast, the groups of PWID who participated in the Hobart and Darwin arms of the current study described local illicit markets where, although heroin was still the preferred drug (though less so in Hobart in preference for methadone), it was not readily available in comparison to the benzodiazepine and pharmaceutical opioid drug classes studied<sup>15</sup>.

The relatively unique illicit opioid market of Darwin was characterised as dominated by morphine (MS Contin), where users control distribution and use rather than organised criminal syndicates. The NT study team contend that this has resulted in gains for the health of users, emergency services and the criminal justice system that may continue if the local market remains dominated by pharmaceutical opioids rather than heroin. Prescription morphine in the NT is viewed by some as being protective against the re-emergence of a heroin trade and its associated harmful impacts (O'Reilly et al. 2004).

In the Hobart study (Bruno 2004) benzodiazepine use was typical among PWID cohorts surveyed (particularly diazepam, alprazolam, oxazepam, nitrazepam and temazepam), as was pharmaceutical opioid use and injection (mostly morphine sulphate (MS Contin, Kapanol), methadone (syrup, Physeptone), and oxycodone (OxyContin)). The illicit pharmaceutical market in Hobart was characterised as fluid with a high degree of resilience amongst consumers reported in relation to changes in availability of any one drug in particular – ‘with individuals that used one pharmaceutical opiate type typically also using other types as well (for example, those recently accessing diverted methadone syrup also commonly using Physeptone, morphine and benzodiazepines as well)’. Bruno (2004) has suggested that this apparent resilience or ‘flexibility’ in use of pharmaceutical opiates may simply reflect the polydrug consuming nature of many market participants. Bruno (2004) has also concluded that the Tasmanian illicit drug market is highly distinct from those in other jurisdictions (e.g. Breen et al. 2004a) and may thus follow an idiosyncratic response to a substantial market change in illicit availability of particular pharmaceutical products.

The identification in the current study of polydrug use as a feature of illicit prescription pharmaceutical markets (i.e. benzodiazepines and pharmaceutical opioids) is consistent with previous research (e.g. Breen et al. 2002, 2003, 2004a). This is an important finding as it has implications for how we understand illicit drug markets, perhaps suggesting a need for the development of more sophisticated drug market typologies. Australian drug market research typically attempts to understand markets for particular drugs as separate entities (for example: heroin market research – Fitzgerald, Hope & Dare 1999; Fitzgerald, Broad & Dare 1999; Miller, Fry & Dietze 2001 – and ‘party drug’ market research – Breen, Degenhardt, White et al. 2004b; Topp & Churchill 2002).

<sup>15</sup> For Melbourne participants, the drug most used was heroin (Smith et al. 2004), for Hobart respondents it was methadone (Bruno 2004), and for participants in Darwin it was morphine (O'Reilly et al. 2004).

The antecedents, characteristics and causative factors of wider illicit drug market intersections/relationships in this country are not well understood, although available data allows us to hypothesise. Preliminary Victorian data suggest that polydrug use patterns (emergent in some market sections, consolidating in others) may help create circumstances that bring different sections of retail illicit drug markets together (Jenkinson, Fry & Miller 2003; Jenkinson, Miller, & Fry 2004; Johnston et al. 2004a; Johnston et al. 2004b). A factor that appears to have facilitated these patterns has been significant shifts in drug supply. For example: the 'heroin drought' leading to market experimentation and substitution with non-opioids (notably psychostimulants and benzodiazepines); and enhanced regulatory control of prescription pharmaceuticals (e.g. flunitrazepam, temazepam), resulting for some drug users in greater uptake of other scheduled prescriptions (Miller, Fry & Dietze 2001; Breen et al. 2002; Dietze et al. 2004; Jenkinson, Fry & Miller 2003; Jenkinson, Miller & Fry 2004; Degenhardt, Day & Hall 2004).

The nature of the interrelationship between different illicit drug markets should be examined in future research. It is important for law enforcement to better understand these market intersections and the factors affecting them, as the effect of increased supply-side drug law enforcement depends on the structure of the drug market (White & Luksetich 1983). Further, Curtis and Wendel (2000) have observed that the operation of heroin markets may be affected by other heroin markets, as well as other types of illicit drug markets. Law enforcement policies focussing on the supply of certain illicit drugs that do not consider substitute and supplement drugs are likely to suffer several limitations: (1) they may be less effective than planned; (2) there is the potential for their effectiveness to be inappropriately evaluated; and (3) they can have the unintended consequence of increasing harms (Weatherburn et al. 2001).

Focusing on the phenomenon of polydrug use patterns within some segments of illicit drug markets, and the likelihood of this extending for some people to use of various pharmaceutical drugs to supplement use of illicit drugs, a recent discussion paper by the Australasian Centre for Policing Research (2002) identified a number of issues of interest this raises for law enforcement, including: on-selling of prescribed pharmaceutical drugs to obtain illegal drugs; the creation of an additional complex dynamic in already multi-determined illicit drug markets; behavioural problems associated with prescription pharmaceutical intoxication; acquisitive crimes and crimes committed while under the influence of pharmaceutical drugs; and driving while under the influence of prescription pharmaceuticals.

In addition to its relevance to immediate policy, further investigation of drug market intersections also presents an opportunity to examine drug market data in relation to current drug market theories (e.g. criminological, economic, ecological, network) (Makkai 2002), and available illicit drug market typologies from the crime and place literature (e.g. Eck & Weisburd 1995; Mazerolle et al. 1998; Mazerolle, Kadleck & Roehl 2004; Curtis & Wendel 2000). This has the potential to increase drug trend monitoring precision and the capacity to interpret emerging trends and market fluctuations for the purpose of better informing law enforcement and public health responses in the longer term.

### **Diversions and links to crime**

A consistent finding across all study sites was the low level of reported organised criminal activity related to the procurement of prescription pharmaceuticals. The findings show that certain benzodiazepines and pharmaceutical opioids are diverted to the black market and may be sold for considerable profit relative to their pharmacy dispensed prescription cost. However, reports from the current drug user participants of the study (corroborated by KI reports) indicated that supply to the illicit benzodiazepine and pharmaceutical opioid markets in Melbourne, Hobart and Darwin appeared to be driven mainly by the small-scale diversion (from a number of sources including legitimate prescriptions, doctor-shopping, forged prescriptions) rather than through organised<sup>16</sup>

burglary/thefts from pharmacies or point of wholesale/manufacture, or via other sources (e.g. internet pharmacy, importation, inter-jurisdictional trafficking). Prescription drugs are reportedly relatively easy to obtain on the street, and the findings suggest they are available from a diffuse network of users, friends of users, dealers and suppliers, some of who also sell other illicit drugs (e.g. heroin, methamphetamine, cannabis).

Previous reports of organised groups engaging in 'pharmacy hopping' to target and procure large quantities of over-the-counter pharmaceuticals containing pseudoephedrine (for use in manufacture of methamphetamine) (ABC1, 2002), may suggest the potential for such cooperative groups or 'syndicates' to form and the practice to be repeated to obtain prescription pharmaceuticals. The ACPR (2002) has contended that while the high level of monitoring that occurs for Schedule 8 drugs (i.e. the pharmaceutical opioids of interest in the current study) at all stages of supply (manufacture, wholesale, prescription, dispensing, monitoring) makes it less likely that large scale diversion of these drugs will occur, less certainty exists around Schedule 2 and 3 medications (pharmacy only supply) or Schedule 4 (i.e. prescription benzodiazepines of interest in the current study except flunitrazepam and temazepam gel-capsule preparations).

However, some of the current study findings may indicate that it is the Schedule 8 pharmaceuticals (e.g. morphine) that are most likely to be the target of attempts to supply the illicit market through offshore supply sources. Factors such as the tight regulation of these products together with increasing prevalence of use (and perhaps dependence) may serve to create inflated unit cost prices (per tablet, per script) at the retail illicit market level, which in turn pose a supply challenge that may be solved either through: (a) diversion of domestic supply (via prescription shopping, pharmacy thefts, on-selling from holders of legal prescriptions etc.); or (b) diversion of international supply (e.g. unregulated internet pharmacy sources, importation).

That diversion of international supply to the Australian illicit market may be occurring is one possible explanation for the findings of the current study which showed a marked discrepancy between indicator data on NT morphine consumption trends demonstrating reduced licit availability, and surveys of drug users indicating easy, stable availability (O'Reilly et al. 2004). Another possibility is that some people in the NT may access markets in other jurisdictions for morphine (although the NT component of the study was unable to verify this). It is likely that because the illicit market is small in comparison to the legitimate / licit market, even large changes in the availability or supply of licit prescription pharmaceuticals may have a limited impact on the illicit market. Yet another possible explanation for such findings is that organized accumulation of large stockpiles<sup>17</sup> or reserves of morphine had occurred in the NT in response to the publicity surrounding the increased attention (O'Reilly & Rysavy 2001) of Commonwealth PBS members and HIC investigators on morphine (MS Contin) prescription in Darwin. This commenced in August 1999 and reached a peak in June 2002 when the NT Chief Health Officer through Section 31 of the *Poisons and Dangerous Drugs Act* sent a notice prohibiting a medical practitioner from prescribing, supplying or administering any scheduled drug. The GP crackdown and tightened prescribing practices were seen as the main factors contributing to reduced availability and resulting in a rise in morphine prices (O'Reilly 2002). Available NT prescribing data showed clearly that the licit supply of morphine in this jurisdiction prior to the crackdown was large enough to allow accumulation of large stockpiles or reserves, which would serve to compensate the market in the event of reduced prescriptions. If such changes in supply were unpredictable, this explanation would seem less likely (as market participants may not have time

<sup>16</sup> 'While the acquisition of pharmaceutical drugs by users is highly organised in the sense of being a regular, planned behaviour involving networks of friends and other contacts, there was little evidence of the involvement by organised criminal networks in the distribution of these drugs.' (O'Reilly et al. 2004).

<sup>17</sup> The drug stockpile hypothesis as a possible explanation for apparent market stability after large heroin seizures at Australian borders has been discussed previously by Rumbold & Fry (1999).

to react by employing stockpile strategies). However, the significant publicity leading up to the commencement of prescribing restrictions in the NT may have afforded enough time to react.

The findings suggest there may be some relationship between the use of prescription drugs and dependence and some criminal activity. For instance shoplifting, property crime, drug dealing, violence, intoxicated driving, disinhibited and aggressive behaviour, and feelings of invincibility, were attributed to the drugs, especially benzodiazepines. On the other hand, current MMT may mitigate against the commission of crime. Besides criminal behaviour, other negative consequences of prescription drug use were considered to be injecting harms, dependence and overdose, as well as social impacts such as relationship breakdown, effects on mood, anxiety and irritability.

By contrast, in the NT in particular, 'the availability of prescription morphine was seen as a harm reduction measure whereby opioid users could access the drug from licit sources on a regular basis, have other health issues identified and addressed, and not engage in criminal activity to obtain the funds to purchase drugs in the illicit market' (O'Reilly et al. 2004). O'Reilly and colleagues (2004) contended that on the basis of previous restrictions in the NT on morphine prescribing, any future such restrictions 'would shift more people into the illicit trade, leading to reduced health outcomes, increased crime and corruption...[and]...also result in drug substitution, including illicit drugs such as methamphetamine, not eradication of drug use'.

What has also emerged from the current study is the importance of polydrug use as an identified feature of the characteristic of illicit markets for prescription pharmaceuticals (i.e. benzodiazepines and pharmaceutical opioids). That most users who participated in the survey components of the study in each jurisdiction were currently sourcing and using a variety of substances (in addition to the prescription pharmaceuticals that were the focus of the study), made the task of deriving clear associations between specific 'drugs and crime' a difficult one.

This has not been a criminological study and so we have not engaged the theoretical question of how crime may be best understood, or other issues currently contested in the criminology literature (and related disciplines). Nevertheless, the study findings suggest a number of important things about the role and place of 'crime' (or illicit activity) in what appear to be distinct illicit market places for benzodiazepines and pharmaceutical opioids in jurisdictions, which are also very different. Given that one of the primary aims of the research was to consider appropriate interventions in response to burgeoning illicit markets for prescription pharmaceuticals (in this case benzodiazepines and pharmaceutical opioids), in attempting to examine the hypothesised relationship between them and crime, what we ultimately focus upon is the diversion of these substances (including the ways in which licit products are diverted into illicit markets, used illicitly, and the related impact). In this way, we have utilised the available literature pertaining to the 'drugs and crime' nexus by considering first and foremost what interpretive value this brings to our task of identifying and recommending potentially useful interventions (whether these be in relation to supply reduction, harm reduction, demand reduction, or a combination of these). The data collected in this study also has value in relation to the utility of the current literature for understanding what might be characterised as the 'prescription drugs and crime' nexus. As we have already discussed, there are a number of unanswered questions about the generalisability of the drugs and crime literature beyond the illicit drugs (e.g. heroin, cocaine, amphetamine) upon which it has largely been developed<sup>18</sup>.

<sup>18</sup> These and other related themes will be examined in greater detail in forthcoming publications from this work.

## Implications for police and other front-line workers

The data collected on law enforcement perspectives and experiences around the issue of prescription pharmaceutical misuse and related harms provide some important insights into the limitations of attempts to police illicit drug markets for licitly prescribed pharmaceuticals such as benzodiazepines and opioids. This research provides clear evidence of the complex interconnections that exist between the substances of interest and the illicit markets that have developed around them. A consistent finding across all study sites was the perspective of law enforcement personnel that the policing of illicit pharmaceutical opioids and benzodiazepine markets posed particular challenges, including: the difficulties in distinguishing between illicitly and licitly held prescription pharmaceuticals; relatively less involvement in crime than for illicit drugs<sup>19</sup>; and the same policing response required regardless of whether intoxication is due to use of licit or illicit drugs. Of special note was the development by Victoria Police of the field manual *An Investigation Guide to Pharmaceutical Drug Trafficking and Use* (Victoria Police 2004). The wider distribution of such resources may be a useful mechanism for addressing these challenges<sup>20</sup>.

Injection-related harms, including scarring/bruising, infections, thrombosis, and overdoses, were reported as common across all study sites (no differences in the numbers of overdoses or thrombosis reported), though Melbourne and Hobart PWID were more likely to report injection-related harms (prominent scarring and bruising, difficulty injecting) than were PWID in Darwin. The level of dependence differed between sites for benzodiazepines, methadone and buprenorphine, according to recorded scores on the SDS (De Las Cuevas et al. 2000), with no significant difference for morphine dependence. Melbourne and Hobart PWID scored on average higher SDS scores for benzodiazepines than Darwin PWID (consistent with higher observed prevalence of reported use, and higher frequency of use, in Melbourne and Hobart). Methadone dependence scores were higher on average for Melbourne and Hobart PWID also than for Darwin PWID. Melbourne PWID recorded a higher buprenorphine SDS score on average than participants in Darwin.

Generally, the health and law enforcement sector KI across all study sites were of the view that a health system response to prescription pharmaceutical misuse was a preferable option to that of a law enforcement or criminal justice system response (consistent with previous research on criminal justice professionals' attitudes to illicit drug offending and criminal justice responses – Beyer, Crofts & Reid 2002). Suggestions for appropriate responses included: creation of alternatives to arrest and criminal charges, possibly through liaison with diversion programs and service providers (O'Reilly et al. 2004); decreasing the costs of drug treatments; a more holistic approach to prescribing of drugs; close monitoring of PWID who are prescribed benzodiazepines; development of alternative forms of buprenorphine that cannot be diverted; keeping police and doctors up to date with prescribed drugs that are likely to be diverted; education of doctors and pharmacists about diversion of the drugs; encouraging sharing of information between different bodies that produce data (Smith et al. 2004); peer education programs built around demonstrating the harms associated with intravenous administration of tablets; distribution of pill and biological filters through the Needle Availability Program to reduce the health harms; and establishment of close relationships between health and law enforcement sectors (Bruno 2004).

<sup>19</sup> People using prescription drugs tend to come into contact with police due to activities related to sourcing money to purchase drugs or activities related to intoxication, rather than due to prescription drug possession or supply (O'Reilly et al. 2004).

<sup>20</sup> Other potentially useful resources also exist (see *Australian Government Department of Health and Ageing 2002*). *The control and monitoring of drugs and chemicals to prevent their diversion for illicit use. A pharmaceutical and chemical industries training and awareness program. Therapeutic Goods Administration Canberra: Commonwealth of Australia. <http://www.tga.health.gov.au/docs/html/export/trainprg.htm> [Accessed 14 July 2004].*

Generally, the available evidence has provided a clear picture of the efficacy of supply reduction efforts to limit diversion of prescription pharmaceuticals (Loxley et al. 2004), where the main outcome of interest may be either reduced prescription rates or even removal from the market altogether. However, there is some evidence that certain of these strategies may result in negative outcomes such as the unintended consequences of drug substitution or supplementation. Other procedural outcomes around enhanced knowledge and awareness across law enforcement, health and industry sectors – of the issues associated with pharmaceutical diversion – are equally important yet more difficult to evidence. The study has provided some interesting findings in relation to the predicted impact of future supply reduction initiatives. Both PWID participants and KI (health and law enforcement) cautioned that attempts to reduce benzodiazepine and morphine supply may lead to a range of undesirable impacts, including: increased crime to finance the higher illicit costs of less available pharmaceuticals; substitution with other drugs (e.g. alcohol, methamphetamine, other analgesics) leading to other health issues; and creation of conditions in the NT favorable for the return of the heroin trade and/or leading to interstate pharmaceutical opioid supply. These issues should be kept in mind in developing future initiatives in this regard.

The diversion of licit pharmaceuticals to illicit markets and the mechanisms of access to these drugs by consumers create particular challenges for policing and limited points for intervention in these markets. As we have seen in the current study, the original sources of diverted products appear mostly to be through licit/legitimate prescriptions from GPs (directly or indirectly). This study also suggests that those selling the products directly to PWID appear to have little reported connection with 'organised crime groups' and may themselves be consumers, or only trafficking small quantities of these drugs to support their own use, or as an alternative source of income supplementation. Bruno (2004) reports that the Tasmanian experience in policing in this area showed that the establishment of relationships between health and law enforcement sectors helped deliver good outcomes for both sectors.

Further, in the context of plentiful supply through licit prescription sources and patterns of polydrug use of both licit and illicit drugs, the potential for law enforcement to respond in an informed manner will depend critically upon education and training opportunities in this sector. Key issues for front-line policing in this regard include: pharmaceutical identification; scheduling and legislative considerations; psychopharmacology of benzodiazepines and prescribed opioids; and interactions with illicit drugs. Initiatives such as the Victoria Police production and dissemination to members of an investigation guide to pharmaceutical drug trafficking and use manual, together with education and training for recruits (Victoria Police 2004), may be a good model for response in this area. The outcomes of the evaluation of this initiative will be received with great interest.

In the meantime, examples such as this serve to highlight that the scope of law enforcement responses to illicit markets for prescription pharmaceuticals need not be limited to supply reduction initiatives alone, and this is in keeping with the diverse role in contributing to harm reduction objectives for law enforcement as recognised previously by Spooner and McPherson (2001). Indeed drug law enforcement may have a positive impact on demand and harm reduction, and play a complementary role with other strategies that aim to limit mortality and morbidity associated with drug misuse (Weatherburn, Lind & Forsythe 1999; Donnelly, Weatherburn & Chilvers 2004).

## Methodological considerations

A number of methodological challenges and limitations of the current study are worthy of discussion. The study undertook primary data collection with individuals that regularly inject

pharmaceutical products. This approach has been shown to produce reliable data on patterns of illicit drug use, particularly when interpreted in conjunction with other data sources, such as expert KI and secondary data available from law enforcement and health indicator data sets (Hando et al. 1998; Darke, Hall & Topp 2001; Thurman 2001). The focus on individuals that regularly inject these products is justified as they represent the most visible and accessible group amongst the total population who misuse pharmaceutical products. People who misuse benzodiazepines and pharmaceutical opioids by injection and whom may also be regular participants of the illicit drug market (e.g. purchasing or selling licit pharmaceuticals) were the most appropriate sentinel target group of users to access in order to examine the particular research questions which were the focus of the current study.

However, it is apparent from KI reports that there exist a substantial proportion of people that misuse benzodiazepines and/or pharmaceutical opioids that may be doing so orally and/or not coming to the attention of police or health agencies. For example, reports from the Health Insurance Commission suggest that individuals who 'doctor-shop' for benzodiazepines represent a demographic distinct from local injecting drug users. Such individuals form an important part of the overall picture of benzodiazepine and pharmaceutical misuse. However, as these are a less visible population than PWID groups, and apparently less strongly associated with crime or health disruption, they were not targeted for examination within the current study.

A significant methodological challenge encountered in the study was the task of trying to estimate future user behaviour and illicit market trends in light of hypothesised changes in supply of the pharmaceutical products being studied. A number of possible PWID behaviours and market outcomes were considered in the current study and are discussed above. Whether individuals faced with reduced supply continue their drug use, seek other substitute or supplement drugs, increase or begin involvement in criminal activity, or seek treatment for substance use is multi-determined and difficult to make general inferences about. Predictions about the impact of supply-driven illicit market changes for PWID, health and law enforcement sectors are possible based on retrospective studies of naturally occurring market shifts (such as the heroin drought) and studies like the current one. However, the clearest data would derive from longitudinal studies using mixed methodological approaches to determine the 'natural history' of, in this case, benzodiazepine and pharmaceutical opioid misuse in diverse settings (allowing 'greater elucidation of the social context and construction of drug use and crime'. O'Reilly et al. 2004).

One limitation of the study related to the general lack of clear indicator data sources and systems to shed light on the illicit prescription pharmaceutical market place in Australia. There appears to be few routine data systems that provide detailed indicators of the illicit prescription pharmaceutical market place in Australia. In some cases this appears to be due to precision or coding specificity at the data recording and entry stage (where records may only be kept for broad categories such as 'prescription drugs'), while in other cases it may be an issue of whether or not the data are available for public access. Further, data collections may from time to time be decommissioned or changed which may undermine attempts to gather comparable data for pre- and post-change periods. The study team experienced significant delays in attempting to access a number of key national data sources. Improved indicator data collection and availability is likely to improve the research and surveillance capacity in this area.

This shortfall underscores the importance of disseminating accurate information to the law enforcement sector concerning the identification and legal status of prescription pharmaceuticals that appear to constitute a growing illicit market in Australia. Initiatives such as the Victoria Police production and dissemination to members of an investigation guide to pharmaceutical drug trafficking and use manual (Victoria Police 2004), together with education and training for recruits, represents a step in the right direction in this regard, in that it allows law enforcement officers

to correctly identify pharmaceuticals and determine licit from illicitly held products. However, thorough evaluation of such measures to assess issues such as uptake and impact on day-to-day policing (i.e. time costs involved in cross checking of valid prescriptions) is critical.

As discussed, this study provides evidence of well-established illicit markets for benzodiazepines and pharmaceutical opioids in the capital cities studied – Melbourne, Hobart and Darwin. Reliance on secondary indicator data to understand different aspects of these markets (e.g. supply, diversion, related crime and health impact) will provide an incomplete picture because of coding and coverage issues identified above, and the burden of ‘harms’ associated with use may not be as great as that associated with some other illicit drugs (e.g. heroin). Such negative consequences attributed to the misuse of benzodiazepines and pharmaceutical opioids use are therefore outside the capture frame of most secondary indicator data sources (due to poor coding specificity for drug types of interest in existing secondary data systems, severity, and therefore ‘visibility’ of problems).

Additional research is necessary to complement secondary indicator sources. On the basis of the samples recruited for this study and the findings outlined in this report, the use of multiple methods to access sub-populations of users appears to have been effective. This has implications for future surveillance and response; particularly given the limitations of some existing routinely collected data sources, which provide only limited clarity for understanding mechanisms of diversion and supply to illicit markets.

## Direction for future research

Several directions for future research are suggested by the study findings and relate also to some of the identified study limitations and methodological challenges. Different research methods are indicated in order to explore the variety of research questions that exist in relation to the nature and operation of illicit markets for prescription pharmaceuticals.

### Monitoring diversion and supply to illicit markets

Ongoing monitoring of trends in both licit and illicit use of benzodiazepines and pharmaceutical opioids is warranted. Particular areas to focus on in such surveillance are key illicit market indicators such as price, supply source and availability. As various supply reduction interventions are brought to bear on emerging illicit prescription pharmaceutical markets (tightened prescribing regulations, discontinued production, rescheduling), a key feature of the routine monitoring research in this area will be the active collection of information concerning novel supply sources (e.g. internet pharmacies, importation) and indications of the market shifting to substitute pharmaceuticals.

One issue to monitor suggested by this study is the question of supply sources for morphine. The current findings raise questions about the origin of these drugs, given the reported difficulties in obtaining prescriptions for them, and the apparent reluctance of survey participants to attempt to obtain them medically. For example, O’Reilly et al. (2004) comment on the ‘discrepancy between the [NT] indicator data on morphine consumption trends demonstrating reduced licit availability and surveys of [NT] drug users indicating easy, stable availability of morphine’ (also observed prior to this study in the NT IDRS – Moon 2004). One explanation offered by O’Reilly and colleagues (2004) is that of across-border morphine supply (via road transportation or regular trips or holidays to other jurisdictions), though no evidence is presented in support of this. Another possibility is that of importation. Available Australian Customs Service data that shows a small but apparent increase in numbers of seizures of morphine shipments in recent years, together with early evidence from the Australian literature of the potential for internet supply for prescribed drugs (St George, Emmanuel & Middleton 2004; Gijsbers & Whelan 2004), may be indicative of supply maintenance

mechanisms that, according to international trends (National Center on Addiction and Substance Abuse 2004) could be expanded and replicated for different pharmaceuticals in the event of increasing pressure on supply<sup>21</sup>. Finally, as discussed earlier, it is also possible that drug stockpiling may occur in response to expected future interruptions in supply. These hypotheses could be tested in future research into illicit pharmaceutical markets<sup>22</sup>.

Another issue to be monitored into the future is the availability and illicit use of temazepam gel-capsule preparations. The May 1 2002 PBS status of 10mg temazepam gel-capsule preparations was altered such that GPs require a prescribing authority to issue prescriptions. The available data clearly shows this reduced the prescription of gel-caps (Breen et al., 2004a); however, this evidently did not eliminate misuse (Wilce, 2004). Alphapharm withdrew its temazepam capsules from the market in February 2004, though some claimed this made little difference to the availability and use of other brands (Wilce, 2004). A month later in March 2004, the pharmaceutical company Sigma sent letters to Australian doctors and pharmacies indicating it would withdraw from sale its brands of temazepam capsules and destroy remaining capsules. Research that monitors this issue could directly test the 'drug stockpiling' hypothesis discussed above.

Another opportunity to achieve greater clarity on the question of how licit prescription pharmaceuticals are diverted to illicit markets would be to examine more closely different segments of the market. As discussed in the previous section, the current study has investigated one aspect of this by focusing on people who inject drugs (PWID) as a sentinel group. However, there would be value in replicating a study such as this one by examining supply sources and diversion of prescription drugs with a comparison sentinel group of non-PWID participants. The hypothesis that emerges from the current study, that could be tested through research with non-intravenous users of benzodiazepines and pharmaceutical opioids, is whether this wider group plays a role in supplying the illicit market with their own licitly obtained prescriptions. For example, a number of participants in the current study commented that they were able to access morphine in particular from patients with pain medication or cancer treatments, and that at least some of these people sold their medication to raise money. It would be informative to examine this further to determine whether this is a significant contributor to the diversion of prescription drugs onto the black market.

### Exploring the 'prescription drugs and crime' nexus

As discussed, one of the main limitations of this study was that where participants reported using specific forms of prescription drugs (e.g. temazepam), and also reported engaging in criminal activity, the numbers were too small to enable analyses to be conducted to test for associations and predictive relationships. Future studies seeking to examine this issue could recruit larger samples of current users to ensure sufficient study power to conduct the appropriate statistical analyses on key research questions. Alternatively, through purposeful sampling of different sentinel groups (e.g. prison samples of individuals sentenced on prescription drug-related offences), it may be possible to determine with greater clarity the links that may exist between prescription drugs and crime. Finally, longitudinal studies using mixed methodological approaches would be most appropriate to determine the 'natural history' of benzodiazepine and pharmaceutical opioid misuse in diverse jurisdictions. Such methods could also examine factors external to the individual, "such as early childhood and adolescent experiences in the family and immediate social environment; education and access to labour market given the link between high school

<sup>21</sup> There was no evidence of internet supply of benzodiazepines and pharmaceutical opioids in the current study.

<sup>22</sup> The strengthening of prescribing controls in some jurisdictions (e.g. Northern Territory Government 2003) presents an opportunity to continue monitoring of the impact of such changes upon the illicit market place.

participation and criminal activity (Chapman, Weatherburn, Kapuscinski, Chilvers & Roussel, 2002); social and cultural environment; lifestyle choices and other factors that are not amenable to treatment" (O'Reilly et al., 2004).

Additional work is also required in considering the potential interpretive power of the variety of theories on the drugs and crime link (e.g. enslavement, criminality and economic compulsive theories) and illicit drug market models and theories (e.g. economic, ecological and network). The development of ecologically valid models that may assist in description and understanding of these markets may in turn contribute to interpretation of emerging trends and market fluctuations for the purpose of better informing law enforcement and public health responses. Such approaches could usefully focus on the interactions between market participants (consumers and providers) in the context of market structures and other factors. This type of research would need to combine both quantitative and qualitative data collection methods and be driven more explicitly by an exploratory theory building orientation.

O'Reilly and colleagues (2004) offer further recommendations for research focusing on aspects of the relationship between prescription pharmaceuticals and crime, including:

- A shift in research focus from the recreational/dependency dichotomy to consideration of the concept of 'persistent use' (from Simpson, 2003) in examining associations between drugs, crime and social environment<sup>23</sup>;
- Further monitoring of the potential for future restrictions to illicit opioid markets to create greater net harms for market participants (e.g. intimidation, stand over tactics and threats, victims of crimes of violence – assault and robbery);
- Research that identifies mechanisms for targeting drug market initiates for prevention purposes (the goal of which would be to increase the age of first drug use or injection, and age of first crime); and
- The relationship between benzodiazepine intoxication, opportunistic crime and mental health issues.

### **Technical considerations for enhanced prescription drug trend monitoring**

There appears to be a general lack of clear indicator data sources and systems to shed light on the illicit prescription pharmaceutical market place in Australia. Others have noted that limited intelligence exists relating to the supply or misuse of prescription drugs on specialist law enforcement databases such as the Australian Criminal Intelligence Database (ACID)<sup>24</sup> (Queensland Bureau of Criminal Intelligence 2002). From what we could determine in the current study, in some cases this is due to the lack of precision or coding specificity at the data recording and entry stage, and in other cases may be an issue of access clearances. The study team experienced significant delays in attempting to access a number of key national data sources. While there is no such thing as a perfect database or surveillance system, what these shortcomings signal is that available secondary indicators alone should not be relied upon for trend monitoring purposes. That we have identified a number of aspects of the core datasets utilised in the current study where the clarity of data on prescription pharmaceuticals is unclear, or indeed where certain

<sup>23</sup> See also Hough (1996) who argues for the application of in-depth ethnographic methods to explore the drugs and crime relationship.

<sup>24</sup> The 2002 – 03 budget announcement of \$11.0 million over the next four years for the Australian Bureau of Criminal Intelligence will facilitate an upgrade of its criminal intelligence database system, enabling analysis of new intelligence against information in the Australian Criminal Intelligence Database (ACID).

desirable data is not available, may mean that the true patterns of use and related behaviours such as crime have been obscured. This presents as an opportunity for improving the research and surveillance capacity in this area through improved indicator data availability.

Future monitoring and understanding of illicit prescription pharmaceutical markets in Australia would be significantly improved through attention to greater coding specificity of existing indicator data systems (e.g. information regarding the generic forms or brand names of benzodiazepine and pharmaceutical drug seizures by law enforcement<sup>25</sup>; and coding of pharmacy related crimes), and perhaps also through the development and implementation of a comprehensive national prescription drug misuse prevention monitoring system that has been discussed previously (see NDSCWPPDA 1997). Advocates for such a system have argued that enhancing the Australian response to prescription pharmaceutical diversion in this way would have a number of key outcomes, including: information provision to prescribers and pharmacists to identify drug-seeking individuals; enhanced safety of drug treatment programs through notification of holders of permits to prescribe drugs of addiction and other prescribers when patients have obtained drugs elsewhere; improved prescribing practices through alerts to doctors concerning previous drug dependence notifications; identification of those involved in prescription drug trafficking and professionals engaged in inappropriate prescribing and dispensing; and the reduction of the likelihood that forged prescriptions will be successfully filled (cited in Australasian Centre for Policing Research 2002).

At the time of writing, no nationally coordinated prescription drug misuse prevention monitoring system exists in Australia, due largely to the significant budgetary and ethico-legal (i.e. patient/health records privacy) legislative stipulations that exist in each State/Territory and at the Commonwealth level. The past work of the NDSCWPPDA (1997) – in recommending to the Inter-Governmental Committee on Drugs that a national monitoring system be implemented effectively – stalled due to the change in government in 1996<sup>26</sup>. The States/Territories have paper-based prescription monitoring systems (e.g. in Victoria a system of field inspectors of dispensing records; the NT introduced a voluntary contract system for people receiving Schedule 8 and some Schedule 4 medications in January 1999), while some are in the process of establishing electronic systems (e.g. Tasmania and SA). The gold standard for such a system would be real time on-line monitoring availability for pharmacists and prescribers to check history in order to avoid over-prescribing to prevent misuse<sup>27</sup>.

Further, progress made through initiatives such as the National Illicit Drug Statistics Framework (a joint project between the Australian Bureau of Criminal Intelligence and the Australian Bureau of Statistics) might usefully be harnessed to address some of the technical issues we identify here. The National Illicit Drug Statistics Framework (a component of the National Illicit Drug Reporting Format project) aims to provide standardised national illicit drug statistics to facilitate a more comprehensive analysis of illicit drug trends in Australia (Australian Crime Commission 2003). Although implemented in 2002 the National Illicit Drug Reporting Format system has a

<sup>25</sup> The Australian Customs Service drug statistics database does not currently record information on the generic forms or brand names for the majority of benzodiazepine and pharmaceutical opioid drug seizures, and detections of the remaining drug categories are recorded in the generic category of 'other benzodiazepines' and 'prescribed drugs'. Detections of drugs in these categories have increased dramatically in recent times (Australian Customs Service, 2004).

<sup>26</sup> Dr Malcolm Dobbin (Personal Communication, July 2004).

<sup>27</sup> Kamien (2004) laments the cancellation of the 'Doctor-Shopping Line' that until August 2002 would allow GPs to quickly confirm whether or not people had been identified as known doctor-shoppers. Kamien (2004) notes that budgetary constraints and privacy concerns led to the closure of the dedicated telephone line, which has been replaced by a voluntary release-of-information form which allows the GP to access prescription shopping histories (usually in 7 – 10 days). Kamien (2004) calls for the reinstatement of the service for provision of quick and accurate prescription shopping information.

number of acknowledged limitations, including: lack of uniformity in recording and storage of illicit drug arrest and seizure data across jurisdictions; quality control issues leading to absence of essential information from records; non-standard counting and extraction methods across jurisdictions; differences in definitions of consumer and provider offences across jurisdictions and time; differences in the way drugs and offences may be coded; inadequate drug identification; and inability to identify seizures from joint law enforcement operations (Australian Crime Commission 2003).

What emerges from these considerations is the existence of a number of gaps in the available monitoring systems and programs and indicator collections, which result in an incomplete picture of the nature and extent of prescription pharmaceutical diversion in Australia (particularly for benzodiazepines and prescribed opioids). A key future challenge in addressing surveillance shortfalls such as these will be to achieve a balance between preventing and reducing diversion of abusable prescription drugs and the need to provide appropriate medical treatment (avoiding under-prescribing) (Fountain et al. 1998; Simoni-Wastila & Tompkins 2001)<sup>28,29</sup>.

## Conclusions

This study comprising a multiple methods design replicated in the three Australian capital cities of Melbourne, Hobart and Darwin has met its primary aims of: (1) enhancing understanding of illicit benzodiazepine and pharmaceutical opioid market-place dimensions and characteristics; (2) exploring the relationship between benzodiazepine and pharmaceutical opioid misuse and crime (focusing on the mechanisms and impact of diversion); (3) examining the implications for police and other front line workers of emergent illicit benzodiazepine and pharmaceutical opioid markets; and (4) considering appropriate interventions to address both the law enforcement and health impacts of benzodiazepine and pharmaceutical opioid misuse.

The study findings present a picture of active illicit markets in Melbourne, Hobart and Darwin for the prescribed pharmaceuticals examined – benzodiazepines and pharmaceutical opioids. The current study provides important insights into the mechanisms by which these markets operate, and has also highlighted some of the consequences of this. It appears that Melbourne has an active illicit market for benzodiazepines, buprenorphine and increasingly morphine, and that this may partly be understood with reference to the reduction in supply of heroin (Smith et al. 2004). In contrast the other study sites, Hobart and Darwin (and surrounding cities), do not have a dominant heroin market and the study findings suggests that active illicit pharmaceutical markets exist primarily for methadone and morphine (Hobart) (Bruno 2004) and morphine (Darwin) (O'Reilly et al. 2004). The patterns and trends in prescription drug misuse do not seem to be influenced by heroin in these jurisdictions.

We have examined illicit prescription pharmaceutical markets in Melbourne, Hobart and Darwin, focussing on the characteristics of the markets, evidence of diversion and links to crime, and the implications of this for front line workers and preventive intervention. We have also explored the methodological limitations of the current study, and discussed some of what we consider

<sup>28</sup> Recent initiatives implemented in the US to enhance prescription monitoring are instructive – see Georgia Council on Substance Abuse (2004); National Association of State Controlled Substance Authorities website <http://www.nascsa.org/monitoring.htm>, particularly the Alliance of States with Prescription Monitoring Programs.

<sup>29</sup> See also the excellent recent College on Problems of Drug Dependence review of issues related to non-medical use and abuse of prescription opioids (Zacny et al. 2003).

are priority areas for future research on the diversion of benzodiazepines and pharmaceutical opioids to illicit drug markets (i.e. monitoring requirements and technical considerations, further exploration of the prescription drugs and crime nexus).

Our final conclusion is that there remains a need in Australia for the type of comprehensive national prescription drug misuse prevention monitoring system that has been discussed previously (see NDSCWPPDA 1997). Providing important ethico-legal considerations can be addressed in light of new privacy legislation concerning use of health records, such a system may provide a mechanism and the impetus from which the current lack of clarity of existing secondary indicator sources for prescription drug use, diversion and harms may be remedied.

As noted elsewhere, it will be important that law enforcement perspectives are considered in future development of such initiatives (Australasian Centre for Policing Research, 2002). Health sector and consumer perspectives are also of critical importance here. Through enhanced monitoring of prescription drug diversion and misuse, the information in turn could be utilised to improve detection precision of diversion activity, over-prescribing and supply points for new markets (e.g. internet pharmacies, diversion across State/Territory borders, importation). Such information could also be employed to inform education and training programs for police, prescribers and pharmacists, and policy and program responses for the future.

‘Effective targeting of resources requires good data describing the characteristics of the problem, the drivers that could be targeted to bring about change, and how those resources could best be deployed. An evidence-based approach to drug law enforcement and policing requires investments in data. Data collection, data quality control, and data analysis need to be seen as core activities by both criminal justice agencies and policy-makers.’ (Makkai 2002 p.125).

The development of an enhanced national system of prescription drug diversion and misuse monitoring would be consistent with the principles set out in Australia’s National Medicines Policy (Australian Government Department of Health and Ageing 2000), the Quality Use of Medicines framework for response (Commonwealth of Australia 2002), and the National Drug Strategy (Australian Government Department of Health and Ageing 2004)<sup>30</sup>.

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<sup>30</sup> See also the Alcohol and Other Drugs Council of Australia (2003) policy position concerning misuse of prescription drugs, including good practice strategies for harm reduction (e.g. prescriber and pharmacy initiatives, prescription shopping reduction, treatment, controlled access to pharmacotherapies, medicines regulation, formulation changes).

## References

- Adhikari, P. & Summerill, A. (2000). *The national drug strategy household survey, 1998*. AIHW cat. no. PHE 27. (Drug Statistics Series No. 6). Canberra: Australian Institute of Health and Welfare.
- Aitken, C., Moore, D., Higgs, P., Kelsall, J. & Kerger, M. (2002). *The impact of a police crackdown on a street drug scene: Evidence from the street*. *International Journal of Drug Policy*, 13, 193 – 202.
- Alcohol and Other Drugs Council of Australia (ADCA) (2002). *Inquiry into crime in Australia*. Submission to the House of Representatives. Canberra: House of Representatives Standing Committee on Legal and Constitutional Affairs.
- Alcohol and Other Drugs Council of Australia (ADCA) (2003). *Misuse of prescription drugs*. ADCA Policy Position 1.3. [http://www.adca.org.au/policy/policy\\_positions/index.htm](http://www.adca.org.au/policy/policy_positions/index.htm) [Accessed 14 July 2004]
- American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition (DSM-IV)*. Washington D.C: American Psychiatric Association.
- Ashton, H. (2000). *Benzodiazepines: The still unfinished story*. Paper presented at Beat the Benzos Campaign Launch Conference, London, 1<sup>st</sup> November, <http://www.benzo.org.uk/ashtonspeech.htm>.
- Ashton, H. (2002). *Benzodiazepine Abuse*. <http://www.benzo.org.uk/ashbzab.htm>.
- Australasian Centre for Policing Research (2002). *The diversion of pharmaceutical drugs onto the illicit market*. Unpublished discussion paper (prepared for the Drug Policy Subcommittee of the Conference of Police Commissioners of Australasia and the South West Pacific Region). Adelaide: Australasian Centre for Policing Research.
- Australian Bureau of Criminal Intelligence (ABCI) (2002). *Australian illicit drug report 2000 – 2001*. Canberra: Australian Bureau of Criminal Intelligence.
- Australian Bureau of Statistics (ABS) (2002). *Opioid overdose deaths in Australia*. 2002 Edition. Canberra: Australian Bureau of Statistics.
- Australian Bureau of Statistics (ABS) (2003). *Opioid overdose deaths in Australia*. 2003 Edition. Canberra: Australian Bureau of Statistics.
- Australian Crime Commission (ACC) (2003). *Australian illicit drug report 2001 – 2002*. Canberra: Commonwealth of Australia.
- Australian Government Department of Health and Ageing (2000). *National Medicines Policy*. Commonwealth of Australia: Canberra. [www.nmp.health.gov.au/pdf/nmp2000.pdf](http://www.nmp.health.gov.au/pdf/nmp2000.pdf) [Accessed 14 July 2004].
- Australian Government Department of Health and Ageing. (2003). *National pharmacotherapy statistics, annual data as at June 2002*. Canberra: Australian Government Department of Health and Ageing.

- Australian Government Department of Health and Ageing (2004). The National Drug Strategy – Australia's integrated framework 2004 – 2009. <http://www.nationaldrugstrategy.gov.au/pdf/framework0409.pdf> [Accessed 14 July 2004]
- Australian Institute of Criminology (AIC) (2004). Does drug use cause crime: Understanding the drugs-crime link. *Crime Reduction Matters* No. 22. Canberra: Australian Institute of Criminology.
- Australian Institute of Health and Welfare (AIHW) (1995). *The national drug strategy household survey, 1995*. Canberra: Australian Government Department of Health and Ageing.
- Australian Institute of Health and Welfare (AIHW) (1998). *The national drug strategy household survey, 1998*. Canberra: Australian Government Department of Health and Ageing.
- Australian Institute of Health and Welfare (AIHW) (2001). *The national drug strategy household survey, 2001*. Canberra: Australian Government Department of Health and Ageing.
- Australian Institute of Health and Welfare (AIHW) (2002). *The national drug strategy household survey, 2001*. AIHW cat. no. PHE 41. (Drug Statistics Series No. 11). Canberra: Australian Institute of Health and Welfare.
- Australian Institute of Health and Welfare (AIHW) (2002). Alcohol and other drug treatment services in Australia 2000-01: first report on the national minimum data set. AIHW cat. no. HSE 22. Canberra: Australian Institute of Health and Welfare.
- Australian Institute of Health and Welfare (AIHW) (2003). Alcohol and other drug treatment services in Australia 2001-02: report on the national minimum data set. AIHW cat. no. HSE 28. Canberra: Australian Institute of Health and Welfare.
- Australian Medical Association (AMA) (2004). Calls for introduction of prescription shopper line. Media Release, 26/02/04. Accessed 14/05/04. URL: <http://www.ama.com.au/web.nsf/doc/WEEN-5WHU28>
- Bedi, N., & Ray, R. (1998). Use liability of buprenorphine – a study among experienced drug users. *Indian Journal of Physiological Pharmacology*, 42 (1), 95 – 100.
- Bell, J. (Undated). Methadone maintenance and crime. Sydney: Prince of Wales Hospital.
- Bell, J. (1997). Methadone and Property crime. Second National Outlook Symposium: Violent Crime, Property Crime and Public Policy. Canberra, March.
- Benson, B. L., Leburn, I. S. & Rasmussen, D. W. (1994). The impact of law enforcement on crime: An investigation of the opportunity cost of police resources. *Journal of Drug Issues*, 31 (4), 987 – 1,006.
- Beyer, L., Crofts, N. & Reid, G. (2002). Drug offending and criminal justice responses: practitioners' perspectives. *International Journal of Drug Policy*, 13, 203 – 211.
- Bigelow, G. E. & Preston, K. L. (1992). Assessment of buprenorphine in a drug discrimination procedure in humans. In J. D. Blain (Ed). *Buprenorphine: An Alternative Treatment for Opioid Dependence. National Institute of Drug Abuse Research Monograph*, 121. Rockville, MD: National Institute of Drug Abuse.

- Blumstein, A., Cohen, J., Roth, J.A. & Visher, C.A. (1986). *Criminal careers and career criminals*. Vol 1. Washington, D.C: National Academy Press.
- Bonn, D. & Bonn, J. (1998). Anxious times for the treatment of anxiety. *The Lancet*, 352, (October 3), 1,126.
- Breen, C., Degenhardt, L., Roxburgh, A., Bruno, R., Fry, C., Duquemin, A., Fischer, J., Gray, B. & Jenkinson, R. (2002). The impact of changes in the availability of publicly subsidised 10mg temazepam gel capsules in Australia. Canberra: Australian Government Department of Health and Ageing.
- Breen, C., Degenhardt, L., Roxburgh, A., Bruno, R., Duquemin, A., Fetherston, J., Fischer, J., Jenkinson, R., Kinner, S., Longo, M. & Rushforth, C. (2003). *Australian drug trends 2002. Findings from the illicit drug reporting system (IDRS)*. NDARC Monograph No. 50. Sydney: University of New South Wales.
- Breen, C., Degenhardt, A., Roxburgh, A., Bruno, R., Fetherston, J., Jenkinson, R., Kinner, S., Moon, C., Proudfoot, P., Ward, J. & Weekley, J. (2004a). *Australian drug trends 2003. Findings from the Illicit Drug Reporting System (IDRS)*. NDARC Monograph No. 51. Sydney: University of New South Wales.
- Bruno, R. (2004). *Benzodiazepine and Pharmaceutical Opiate Misuse and their Relationship to Crime: An Examination of Illicit Prescription Drug Markets in Hobart – Tasmanian Technical Report*. Melbourne: Turning Point Alcohol and Drug Centre.
- Bruno, R. & McLean, S. (2001). *Tasmanian drug trends 2000. Findings from the Illicit Drug Reporting System (IDRS)*. NDARC Technical Report No. 109. Sydney: University of New South Wales.
- Bruno, R. & McLean, S. (2002). *Tasmanian drug trends 2001. Findings from the Illicit Drug Reporting System (IDRS)*. NDARC Technical Report No.135. Sydney: University of New South Wales.
- Bruno, R. & McLean, S. (2003). *Tasmanian drug trends 2002. Findings from the Illicit Drug Reporting System (IDRS)*. NDARC Technical Report No. 148. Sydney: University of New South Wales.
- Bruno, R. & McLean, S. (2004). *Tasmanian drug trends 2003. Findings from the Illicit Drug Reporting System (IDRS)*. NDARC Technical Report No. 178. Sydney: University of New South Wales.
- Buddle, M., Zhou, J. & MacDonald, M. (2003). *Prevalence of HIV, HCV and injecting and sexual behaviour among IDU at Needle and Syringe Programs: Australian NSP survey national data report 1995 – 2002*. Sydney: National Centre in HIV Epidemiology and Clinical Research, University of New South Wales.
- Calkins, R. F. & Aktan, G. B. (2000). Estimation of heroin prevalence in Michigan using capture-recapture and heroin problem index methods. *Journal of Drug Issues*, 30 (1), 187 – 204.
- Caplehorn, J. R. & Drummer, O. H. (1999). Mortality associated with New South Wales methadone programs in 1994: lives lost and saved. *Medical Journal of Australia*, 170 (3), 104 – 109.

- Caplehorn, J. R. & Drummer, O. H. (2002a). Fatal methadone toxicity: signs and circumstances, and the role of benzodiazepines. *Aust N Z J Public Health*, 26, 358-362.
- Caplehorn, J. R. & Drummer, O. H. (2002b). Methadone doses and op[st-mortem blood concentration. *Drug and Alcohol Review*, 21(4), 329-333.
- Caulfield, C. (2004). Chemist sold stolen drugs. *Herald Sun* newspaper, 15/7/04. Melbourne.
- Caulkins, J. P. (1997). Is crack cheaper than (powder) heroin? *Addiction*, 92 (11), 1,437 – 1,443.
- Caulkins, J. P. (2002). Law enforcement's role in a harm reduction regime. *Crime and Justice Bulletin* No. 64. Sydney: NSW Bureau of Crime Statistics and Research.
- Caulkins, J. P., Johnson, B., Taylor, A. & Taylor, L. (1999). What drug dealers tell us about their costs of doing business. *Journal of Drug Issues*, 29 (2), 323 – 340.
- Caulkins, J. P. & MacCoun, R. (2003). Limited rationality and the limits of supply reduction. *Journal of Drug Issues*, 2003 (Spring), 433 – 464.
- Caulkins, J. P. & Reuter, P. (1998). What price data tell us about drug markets. *Journal of Drug Issues*, 28 (3), 593 – 612.
- Clark, N. C., Lintzeris, N. & Muhleisen, P. J. (2002). Severe opiate withdrawal in a heroin user precipitated by a massive buprenorphine dose. *MJA*, 176 (4), 166 – 167.
- Cross, J., Johnson, B., Davis, W. & Liberty, H. (2001). Supporting the habit: Income generation activities of frequent crack users compared with frequent users of other drugs. *Drug and Alcohol Dependence*, 64, 191 – 201.
- Commonwealth of Australia (2002). The national strategy for Quality Use of Medicines. Commonwealth of Australia: Canberra. <http://www.nmp.health.gov.au/pdf/natstrateng.pdf> [Accessed 14 July 2004].
- Cook, L., Sefcik, E. & Stetina, P. (2004). Pain management in the addicted population: A case study comparison of prescriptive practice. *Journal of Addictions Nursing*, 15, 11 – 14.
- Curtis, R. & Wendel, T. (2000). Towards the development of a typology of illegal drug markets. In M. Natarajan & M. Hough (Eds.). *Illegal Drug Markets: From Research to Prevention Policy*. Crime Prevention Studies Volume II (pp. 121 – 152). Monsey: Criminal Justice Press.
- Daderman, A. M., Frederiksson, B., Kristiansson, M., Nilsson, L. H. & Lidberg, L. (2002). Violent behavior, impulsive decision-making, and anterograde amnesia while intoxicated with flunitrazepam and alcohol or other drugs: a case study in forensic psychiatric patients. *J Am Acad Psychiatry Law*, 30 (2), 238 – 251.
- Daderman, A. M. & Lidberg, L. (1999). Flunitrazepam (Rohypnol) abuse in combination with alcohol causes premeditated, grievous violence in male juvenile offenders. *Journal of the American Academy of Psychiatry and the Law*, 27 (1), 83 – 89.
- Darke, S. (1994). The use of benzodiazepines among injecting drug users. *Drug and Alcohol Review*, 13, 63 – 69.
- Darke, S., Hall, W., Ross, M. & Wodak, A. (1992). Benzodiazepine use and HIV risk-taking behaviour among injecting drug users. *Drug and Alcohol Dependence*, 31, 31 – 36.

- Darke, S., Hall, W. & Topp, L. (2001). The illicit drug reporting system (IDRS) 1996–2000. *NDARC Technical Report No 101*. Sydney: University of New South Wales.
- Darke, S. & Ross, J. (2000). The use of antidepressants among injecting drug users in Sydney, Australia. *Addiction*, 95, 407 – 471.
- Darke, S., Ross, J. & Cohen, J. (1994). The use of benzodiazepines among regular amphetamine users. *Addiction*, 89, 1,683 – 1,690.
- Darke, S., Ross, J. & Hall, W. (1995). Benzodiazepine use among injecting drug users. *Medical Journal of Australia*, 162, 645 – 647.
- Darke, S., Swift, W., Hall, W. & Ross, M. (1993). Drug use, HIV risk-taking and psychosocial correlates of benzodiazepine use among methadone maintenance clients. *Drug and Alcohol Dependence*, 34, 67 – 70
- Darke, S., Topp, L. & Ross, J. (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 and Alcohol Review*, 21, 27 – 32.
- Davis, W., Johnson, B., Randolph, D. & Liberty, H. (2003). An enumeration method of determining the prevalence of users and operatives of cocaine and heroin in Central Harlem. *Drug and Alcohol Dependence*, 72, 45 – 58.
- Decocq, G., Fremaux, D., Smail, A., Compagnon, M. & Andrejak, M. (1997). Local complications after intravenous injection of dissolved tablets of buprenorphine. *Presse Medicale*, 26(30), 1,433.
- Degenhardt, L., Day, C. & Hall, W. (Eds) (2004). *The causes, course and consequences of the heroin shortage in Australia*. NDARC Monograph No 53. Sydney: University of New South Wales.
- De Las Cuevas, C., Sanz, E.J., De La Fuente, J.A., Padilla, J. & Berenguer, J.C. (2000). The Severity of Dependence Scale (SDS) as a screening test for benzodiazepine dependence: SDS validation study. *Addiction*, 95 (2), 245 – 250.
- Dietze, P. & Fitzgerald, J. (2002). Interpreting changes in heroin supply in Melbourne: Droughts, gluts or cycles? *Drug and Alcohol Review*, 21, 295 – 303.
- Dietze, P., Miller, P., Clemens, S., Matthews, S., Gilmour, S. & Collins, L. (2004). *The course and consequences of the heroin shortage in Victoria*. NDLERF Monograph No 6. National Drug Law Enforcement Research Fund.
- Dobbin, M. (1997). Flunitrazepam (Rohypnol, Hypnodorm). Unpublished Report. Melbourne: Victorian Department of Human Services.
- Dobbin, M. (1998). A paper on prescription drug use for the doctor shopping workshops. Canberra: Health Insurance Commission.
- Dobbin, M. (2001). Temazepam injecting in Victoria 2001. Unpublished Report. Melbourne: Victorian Department of Human Services.
- Dobbin, M. (2002). The Victorian temazepam injection prevention initiative. *The Health of Victorians – The Chief Health Officer's Bulletin*, 2 (1), 13 – 16.

- Dobbin, M., Martyres, R.F., Clode, D. & Champion de Crespigny, F.E. (2003). Association of benzodiazepine injection with the prescription of temazepam capsules. *Drug and Alcohol Review*, 22 (2), 153 – 157.
- Donnelly, N., Weatherburn, D. & Chilvers, M. (2004). The impact of the Australian heroin shortage on robbery in NSW. Sydney: NSW Bureau of Crime Statistics and Research.
- Drug Use Monitoring Scheme (DRUMS). (2003). Data for opioids prescribing under the PBS/RPBS, 1991 – 2002. The Treaties and Monitoring Team, Office of Chemical Safety. Canberra: Therapeutic Goods Administration, Australian Government Department of Health and Ageing.
- Drug Utilisation Sub-Committee (DUSC). (2004). Data for benzodiazepines prescribing under the PBS/RPBS 2000–2002. Pharmaceutical Benefits Branch, Health Access and Financing Division. Canberra: Australian Government Department of Health and Ageing.
- Duquemin, A. & Gray, B. (2003). Northern Territory drug trends 2002: Findings of the Illicit Drug Reporting System (IDRS). *Technical Report No. 151*. Sydney: University of New South Wales.
- DuPont, R.L. (1998). Abuse of Benzodiazepines: The problems and the solutions. *American Journal of Drug and Alcohol Use*, (14), Supp 1:1 – 69.
- Eck, J. & Weisburd, D. (Eds.) (1995). *Crime Prevention Studies*. Vol. 4, Crime and Place. Monsey, NY: Criminal Justice Press.
- Family and Friends for Drug Law Reform (2004). Crime and illicit drugs. An Information Paper. Last modified 17/02/04. Downloaded 14/07/04. URL: <http://www.ffdlr.org.au/resources/Crime%20and%20Illicit%20drugs.htm>. February 17, 2004.
- Ferri, C., Marsden, J., De Araujo, M., Laranjeira R. & Gossop, M. (2000). Validity and reliability of the Severity of Dependence Scale (SDS) in a Brazilian sample of drug users. *Drug and Alcohol Review*, 19 (4), 451 – 455.
- Fitzgerald, J., Broad, S. & Dare, A. (1999). *Regulating the street heroin market in Fitzroy/Collingwood*. Melbourne: University of Melbourne.
- Fitzgerald, J.L., Hope, A.F. & Dare, A.J. (1999). The size and dynamics of the injecting drug user population. The injecting drug use needs and impact study. Report No.3. Melbourne: University of Melbourne.
- Fountain, J., Griffiths, P., Farrell M., Gossop, M. & Strang J. (1998) Diversion Tactics: How a Sample of Drug Misusers in Treatment Obtained Surplus Drugs to Sell on the Illicit Market. *International Journal of Drug Policy*, 9, 159 – 167.
- French, A. P. (1989). Dangerously aggressive behavior as a side effect of alprazolam. *Am J Psychiatry*, 146 (2), 276.
- French, M. T., McGeary, K.A., Chitwood, D.D., McCoy, C.B., Inciardi, J. & McBride, D. (2000). Chronic drug use and crime. *Substance Use and Crime*, 21 (2), 95 – 109.
- Fry, C.L. & Bruno, R. (2002). Recent trends in benzodiazepine use by injecting drug users in Victoria and Tasmania. *Drug and Alcohol Review*, 21 (4), 363 – 367.

- Fry, C. & Miller, P. (2002). Victorian Drug Trends 2001: Findings from the Illicit Drug Reporting System (IDRS) Study. *NDARC Technical Report No. 129*. Sydney: University of New South Wales.
- Gelkopf, M., Bleich, A., Hayward, R., Bodner, G. & Adelson, M. (1999). Characteristics of benzodiazepine use in methadone maintenance treatment patients: a 1 year prospective study in an Israeli clinic. *Drug and Alcohol Dependence*, 55, 63 – 68.
- Georgia Council on Substance Abuse (2004). White House Office of National Drug Control Policy Announces 2004 Drug Control Strategy: Initiative to Control Prescription Drug Abuse Highlighted. <http://www.gasubstanceabuse.org/mar01.04.htm> [Accessed 14 July 2004].
- Gijssbers, A.J. & Whelan, G. (2004). E-drug deals: part of the Wild West world of e-commerce. *MJA*, 180, 103.
- GlaxoSmithKline Australia Pty Ltd. (2003). Physeptone injection information sheet. *Information Sheet No 2*. Melbourne: GlaxoSmithKline Australia Pty Ltd.
- Goldstein P. J. (1985), The drugs/violence nexus: a tripartite conceptual framework. *Journal of Drug Issues*, 15, 493 – 506.
- Goode, E. (1997). Beyond politics and reason: *The drug legalisation debate*. New York: St Martin's Press.
- Gossop, M., Darke, S., Griffiths, P., Hando, J., Powis, B., Hall, W. & Strang, J. (1995). The Severity of Dependence Scale (SDS): psychometric properties of the SDS in English and Australian samples of heroin and cocaine and amphetamine users. *Addiction*, 90, 607 – 614.
- Gouny, P., Gaitz, J. P. & Vayssairat, M. (1999). Acute hand ischemia secondary to intra-arterial buprenorphine injection: treatment with iloprost and dextran-40—a case report. *Angiology*, 50(7), 605 – 606.
- Guild Insurance Limited (2003). *Pharmacy-related crime claims statistics*. Melbourne: Guild Insurance Limited.
- Hall, W. (1996). Methadone maintenance treatment as a crime control measure. *Crime and Justice Bulletin No 29*. Sydney: NSW Bureau of Crime Statistics and Research.
- Hall, W., Bell, J. & Carless, J. (1993). Crime and drug use among applicants for methadone maintenance. *Drug and Alcohol Dependence*, 31 (2), 123 – 129.
- Hammersley, R., Forsyth, A.J., Morrison, V. & Davies, J.B. (1989). The relationship between crime and opioid use. *British Journal of Addiction*, 84, 1,029 – 1,043.
- Hando, J., Darke, S., O'Brien, S., Maher, L. & Hall, W. (1998). The development of an early warning system to detect trends in illicit drug use in Australia: the illicit drug reporting system. *Substance Use and Misuse*, 35, 811 – 844.
- Harrison, L. & Gfroerer, J. (1992). Intersection of drug use and criminal behaviour: results from the national household survey on drug use. *Crime and Delinquency*, 38 (4), 422 – 443.
- Hartnagel, T. F. (1997). Crime, illegal drug use and social control in the transition from school to work. *Criminal behaviour and mental health*, 7, 311 – 326.

- Health Insurance Commission (HIC) (2003). About doctor shopping. Information Sheet. Canberra: Health Insurance Commission.
- Health Insurance Commission (HIC) (2004). Prescription shopping project determination 2003. *Commonwealth of Australia Gazette*, 2004 (GNI13), 1,071 – 1,076.
- Hough, M. (1996). Problem drug use and criminal justice. London: Home Office Drugs Prevention Initiative. <http://www.homeoffice.gov.uk/drugs/index.html> [Accessed 14 July 2004].
- Hough, M., McSweeney, T. & Turnbull, P. (2002). Drugs and Crime: What are the links? Evidence to the Home Affairs Committee Inquiry into drug policy. London: DrugScope.
- Inciardi, J.A. & Pottieger, A.E. (1994). Kids, crack and crime. *Journal of Drug Issues*, 21, 257 – 270.
- Jaffe, J. (1992). Drug addiction and drug use. In A. Goodman Gilman, T. Rall, A. Nies & P. Taylor (Eds). *Goodman & Gilman's The Pharmacological Basis of Therapeutics. Vol. 1* (pp. 523 – 573). New York: McGraw-Hill Inc.
- Jaffe, J. & Martin, W. (1992). Opioid analgesics and antagonists. In A. Goodman Gilman, T. Rall, A. Nies & P. Taylor (Eds). *Goodman & Gilman's The Pharmacological Basis of Therapeutics. Vol. 1* (pp. 485 – 521). New York: McGraw-Hill Inc.
- Jenkinson, R., Fry, C. & Miller, P. (2003). Victorian drug trends 2002: Findings from the illicit drug reporting system (IDRS). Sydney: National Drug and Alcohol Research Centre, University of New South Wales.
- Jenkinson, R., Miller, P. & Fry, C. (2004). Victorian drug trends 2003: Findings from the illicit drug reporting system (IDRS). Sydney: National Drug and Alcohol Research Centre, University of New South Wales.
- Jenkinson, R.A., Clark, N.C., Fry, C.L. & Dobbin, M. (2005). Buprenorphine diversion and injection in Melbourne, Australia: an emerging problem? *Addiction*, 100, 197 – 205.
- Johnston, J., Laslett, A.M., Jenkinson, R., Miller, P. & Fry, C. (2004a). Victorian Party Drug Trends 2003: Findings from the Party Drug Initiative (PDI). *NDARC Technical Report No. 183*. Sydney: University of New South Wales.
- Johnston, J., Laslett, A.M., Miller, P., Jenkinson, R., Fry, C. & Dietze, P. (2004b). Victorian Psychostimulant Monitoring Project: Trialing Enhanced Drug Trend Monitoring of Melbourne Psychostimulant Markets. Fitzroy: Turning Point Alcohol and Drug Centre Inc.
- Kamien, M. (2004). 'Doctor shoppers': at risk by any other name. *Medical Journal of Australia*, 180 (5), 204 – 205.
- Kaye S., & Darke S. (2000). A comparison of the harms associated with the injection of heroin and amphetamines. *Drug and Alcohol Review*, 58, 189 – 195.
- Kaye, S. & Darke, S. (2002). Determining a diagnostic cut-off on the Severity of Dependence Scale (SDS) for cocaine dependence. *Addiction*, 97 (6), 727 – 31
- Killias, M. & Ribeaud, D. (1999). Drug use and crime among juveniles. An international perspective. *Studies on Crime and Crime Prevention*, 8 (2), 189 – 209.

- Kinlock, T.W., O'Grady, K.E. & Hanlon, T.E. (2003). Prediction of the criminal activity of incarcerated drug-abusing offenders. *Journal of Drug Issues*, 26, 897 – 920.
- Kinner, S. & Fischer, J. (2002). Queensland drug trends 2002: Findings of the illicit drug reporting system (IDRS), Canberra: Australian Government Department of Health and Ageing.
- Kinner, S. & Fischer, J. (2003). Queensland drug trends 2002: Findings of the illicit drug reporting system (IDRS). *NDARC Technical Report No. 147*. Sydney: University of New South Wales.
- Kinnunen, A. (1997). *Drug markets and drug related crime in Helsinki*. Helsinki: National Research Institute of Legal Policy.
- Kleiman, M. A. (1992). *Against excess: drug policy for results*. New York: Basic Books.
- Kouri, E. M., Pope, H. G., Powell, K. F., Oliva, P. S. & Campbell, C. (1997). Drug use history and criminal behaviour among 133 incarcerated men. *American Journal of Drug and Alcohol Use*, 23 (3), 413 – 419.
- Larson, A. & Bammer, G. (1996). Why? who? how? – estimating numbers of illicit drug users: lessons from a case study from the Australian Capital Territory. *Australian and New Zealand Journal of Public Health*, 20(5), 493 – 499.
- Lasoncz, I. (2001). Drug Use Careers of Offenders: Northern Territory TOPLINE Results. *Australian Institute of Criminology Roundtable No 56*, October 31, Darwin: Australian Institute of Criminology.
- Lind, B., Chen, S., Weatherburn, D. & Mattick, R. (2004). *The effectiveness of methadone maintenance treatment in controlling crime: An aggregate-level analysis*. Sydney: NSW Bureau of Crime Statistics and Research.
- Lintzeris, N., Lenné, M. & Ritter, A. (1999). Methadone injecting in Australia: a tale of two cities. *Addiction*, 94(8), 1,175 – 1,178.
- Lloyd, A., Guibert, R. & Bell, J. (2000). Forged prescriptions study. Melbourne: Report to Pharmaceutical Society of Australia (Victoria Branch) Ltd. Melbourne: Pharmaceutical Society of Australia (Victoria Branch) Ltd.
- Loxley, W., Toumbourou, J., Stockwell, T., Haines, B., Scott, K., Godfrey, C., Waters, E., Patton, G., Fordham, R., Gray, D., Marshall, J., Ryder, D., Siggers, S., Sanci, L. & Williams, J. (2004). *The prevention of substance use, risk and harm in Australia: a review of the evidence*. Ministerial Council on Drug Strategy. The National Drug Research Institute and the Centre for Adolescent Health.
- Maher, L. & Dixon, D. (1999). Policing and public health: law enforcement and harm minimisation in a street-level drug market. *British Journal of Criminology*, 39 (4), 488 – 511.
- Maher, L. & Dixon, D. (2001). The cost of crackdowns: Policing Cabramatta's heroin market. *Current Issues in Criminal Justice*, 13(1), 5 – 22.
- Makkai, T. (2002). Illicit drugs and crime. In A. Graycar & P. Grabosky (Eds). *The Cambridge Handbook of Australian Criminology* (pp. 110 – 125). Cambridge: Cambridge University Press.
- Makkai, T. (2003). Substance use, psychological distress and crime. *Medical Journal of Australia*, 179 (8), 399 – 400.

- Makkai, T., McGregor, K. & Wei, Z. (2003). Drug use monitoring in Australia: a project overview. Canberra: Australian Institute of Criminology.
- Makkai, T. & Payne, J. (2003). *Key findings from the drug use careers of offenders (DUCO) study*. Canberra: Australian Institute of Criminology.
- Manning, P. K. & Cullum-Swan, B. (1994). Narrative, content and semiotic analysis. In N. K. Denzin & Y. S. Lincoln (Eds). *Handbook of Qualitative Research* (pp. 463 – 477). California: Sage Publications Inc.
- Marshall, B. & Longnecker, D. (1992). General anaesthetics. In A. Goodman Gilman, T. Rall, A. Nies, & P. Taylor (Eds). *Goodman & Gilman's The Pharmacological Basis of Therapeutics* (pp. 285 – 310). New York: McGraw-Hill Inc.
- Martyres, R.F., Clode, D. & Burns, J.M. (2004). Seeking drugs or seeking help? Escalating 'doctor shopping' by young heroin users before fatal overdose. *MJA*, 180, 211 – 214.
- Mattick, R., Hay, A., Chan, J. & Hall, W. (1997). Methadone maintenance and drug-related crime. *Journal of Substance Abuse*, 9, 15 – 25.
- Mazerolle, L., Green, L., Kadleck, C. & Roehl, J. (1998). Controlling Drug and Disorder Problems: The Role of Place Managers. *Criminology*, 36 (2), 371 – 402.
- Mazerolle, L., Kadleck, C. & Roehl, J. (2004). Differential Police Control at Drug Dealing Places. *Security Journal*, 17(1), 61 – 69.
- Medical and Toxicological Information Review (MTIR). (2003). Crime and prescription drugs Information Sheet. downloaded 25/09/03. URL: <http://www.nicom.com/news15.html>.
- McBride, A. J., Pates, R., Ramadan, R. & McGowan, C. (2003). Delphi survey of experts' opinions on strategies used by community pharmacists to reduce over-the-counter drug misuse. *Addiction*, 98 (4), 487 – 497.
- Miller, P., Fry, C. & Dietze, P. (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.
- Moon, C. (2004). Northern Territory Drug Trends 2003: Findings from the Illicit Drug Reporting System (IDRS). *NDARC Technical Report No. 181*. Sydney: University of New South Wales.
- National Center on Addiction and Substance Abuse (2004). 'You've got drugs!' Prescription drug pushers on the Internet. A CASA White Paper. Columbia University, New York. [http://www.casacolumbia.org/pdshopprov/files/you\\_ve\\_got\\_drugs.pdf](http://www.casacolumbia.org/pdshopprov/files/you_ve_got_drugs.pdf) [Accessed 14 July 2004]
- NDSCWPPDA. (1997). Proposal for a National Prescription Drug Strategy: National Drug Strategy Committee Working Party on Prescription Drug Abuse. Unpublished Document [Copy provided on 14 July 2004 - Dr Malcolm Dobbin, Public Health Division, Department of Human Services, Victoria]
- Northern Territory Government. (2003). Poisons and Dangerous Drugs Act Strengthened. [http://www.nt.gov.au/ocm/media\\_releases/20030814\\_poisons.shtml](http://www.nt.gov.au/ocm/media_releases/20030814_poisons.shtml)
- O'Reilly, B. (2002). Northern Territory Drug Trends 2001: Findings from the Illicit Drug Reporting System (IDRS). *NDARC Technical Report No. 137*. Sydney: University of New South Wales.

- O'Reilly, B., Leibrick, F., Huxtable, D. & Chenhall, R. (2004). Benzodiazepine and Pharmaceutical Opioid Misuse and their Relationship to Crime: An Examination of Illicit Prescription Drug Markets in the Northern Territory. Melbourne: Turning Point Alcohol and Drug Centre.
- O'Reilly, B. & Rysavy, P. (2001). Northern Territory drug trends 2000: Findings of the Illicit Drug Reporting System (IDRS). *NDARC Technical Report No. 104*. Sydney: University of New South Wales.
- Osman, O.T., Rudorfer, M. V. & Potter, W. Z. (1989). Idazoxan: a selective alpha 2-antagonist and effective sustained antidepressant in two bipolar depressed patients. *Archives of General Psychiatry*, 46, 958 – 959.
- Parker, H. & Kirby, P. (1996). Methadone Maintenance and Crime Reduction on Merseyside, Police Research Group. *Crime Detection and Prevention Series Paper 72*. London: Home Office Police Policy Directorate Police Research Group. <http://www.homeoffice.gov.uk/rds/prgpdfs/cdp72bf.pdf>.
- Peterssun, H. & Lader, M. H. (1981). Benzodiazepine dependence. *British Journal of Addiction*, 76, 133 – 145.
- Queensland Bureau of Criminal Intelligence (2002). Prescription drug abuse and fraud in Queensland: A strategic overview of prescription drug abuse and prescription fraud in Queensland. Queensland Bureau of Criminal Intelligence, Strategic Crime Analysis Unit, [Protected Document].
- Rall, T. (1992). Hypnotics and sedatives: Ethanol. In A. Goodman Gilman, T. Rall, A. Nies & P. Taylor (Eds). *Goodman & Gilman's The Pharmacological Basis of Therapeutics Vol. 1* (pp. 345 – 382). New York: McGraw-Hill Inc.
- Reece, S. (2004). Rapid opioid detoxification. ADCA Update Email Bulletin. Alcohol and Drug Council of Australia, Thursday 3<sup>rd</sup> June.
- Reuter, P. (2001). *The limits of supply-side drug control*. Santa Monica, California: Rand Drug Policy Research Centre.
- Ross, J., Darke, S. & Hall, W. (1996a). Benzodiazepine injecting among heroin users. *The Tenth National Drug and Alcohol Research Centre Annual Symposium*, Sydney: University of New South Wales.
- Ross, J., Darke, S., & Hall, W. (1996b). Benzodiazepine use among heroin users in Sydney: Patterns of use, availability and procurement. *Drug and Alcohol Review*, 15, 237 – 243.
- Ross, J., Darke, S. & Hall, W. (1997). Transitions between routes of benzodiazepine administration among heroin users in Sydney. *Addiction*, 92, 697 – 705.
- Ross, J. & Darke, S. (2000). The nature of benzodiazepine dependence among heroin users in Sydney, Australia. *Addiction*, 95(12), 1,785 – 1,793.
- Rouen, S., Dolan, K., Day, C., Topp, L., Darke, S. & Hall, W. (2001). Changes in heroin availability in Sydney Australia in early 2001. *NDARC Technical Report No. 119*. Sydney: University of New South Wales.
- Ruben, S. M. & Morrison, C.L. (1992). Temazepam misuse in a group of injecting drug users. *British Journal of Addiction*, 87(10), 1,387 – 1,392.

- Rumbold, G. & Fry, C. (1999). The heroin market place project: Examining the short-term impact of the Port Macquarie heroin seizure on the characteristics of the retail heroin market in Melbourne. Melbourne: Turning Point Alcohol and Drug Centre.
- Sajan, A., Corneil, T. & Grzybowski, S. (1998). The street value of prescription drugs. *Canadian Medical Association Journal*, 159, 139 – 142.
- Salmelainen, P. (1995). The correlates of offending frequency: A study of juvenile theft offenders in detention. Sydney: NSW Bureau of Crime Statistics and Research.
- Sarantakos, S. (1998). *Social Research* (2<sup>nd</sup> Ed.). South Yarra: Macmillan Education Australia Pty Ltd.
- Sell, L. & Zador, D. (2004). Patients prescribed injectable heroin or methadone – their opinions and experiences of treatment. *Addiction*, 99, 442 – 449.
- Shand, F. & Mattick, R.P. (2001). Clients of Treatment Service Agencies: May 2001 Census Findings. Canberra: AGPS.
- Shand, F., Topp, L., Darke, S., Makkai, T. & Griffiths, P. (2003). The monitoring of drug trends in Australia. *Drug and Alcohol Review*, 22, 61 – 72.
- Simmer, E. D. (1999). A fugue-like state associated with diazepam use. *Mil Med*, 164 (6), 442 – 443.
- Simoni-Wastila, L. & Tompkins, C. (2001). Balancing diversion control and medical necessity: The case of prescription drugs with abuse potential. *Substance Use and Misuse*, 36(9-10), 1,275 – 1,296.
- Simpson, M. (2003). The relationship between drug use and crime: a puzzle inside an enigma. *International Journal of Drug Policy*, 14, 307 – 319.
- Smith, B., Miller P., O’Keeffe, B. & Fry, C. (2004). Benzodiazepine and Pharmaceutical Opioid Misuse and their Relationship to Crime: An Examination of Illicit Prescription Drug Markets in Melbourne. Melbourne: Turning Point Alcohol & Drug Centre Inc.
- Spooner, C. & McPherson, M. (2001). In what ways do police contribute to the prevention and management of alcohol-related problems in NSW? *NDARC Technical Report No. 123*. Sydney: University of New South Wales.
- South Australian Coalition Against Crime Working Group (SACACWG). (2003). Drugs and crime: Facts and fictions. <http://www.cpu.sa.gov.au/>.
- St George, B.N., Emmanuel, J.R. & Middleton, K.L. (2004). Overseas-based online pharmacies: a source of supply for illicit drug users? *MJA*, 180, 118 – 119.
- Stevenson, R. J. & Forsythe, L. M. (1998). The stolen goods market in New South Wales: An interview study with imprisoned burglars. Sydney: NSW Bureau of Crime Statistics and Research.
- Strain, E. C., Preston, K. L., Liebson, I. A., & Bigelow, G. E. (1992). Acute effects of buprenorphine, hydromorphone and naloxone in methadone-maintained volunteers. *Journal of Pharmacology & Experimental Therapeutics*, 261(3), 985 – 993.

- Strain, E. C., Preston, K. L., Leibson, I. A., & Bigelow, G. E. (1995). Buprenorphine effects in methadone-maintained volunteers: Effects at two hours after methadone. *Journal of Pharmacology & Experimental Therapeutics*, 272(2), 628 – 638.
- Strain, E. C., & Walsh, S. L. (1997). The effects of buprenorphine in buprenorphine-maintained volunteers. *Psychopharmacology (Berl)*, 129(4), 329 – 38.
- Strategic Crime Analysis Unit (SCAU). (2002). Prescription drug use and fraud in Queensland: A strategic overview of prescription drug use and prescription fraud in Queensland. Brisbane: Bureau of Criminal Intelligence, Queensland.
- Strauss, A. & Corbin, J. (1990) Basics of qualitative research. *Grounded theory procedures and techniques*. Newbury Park: Sage Publications.
- Taylor, L., Caulkins, J. & Reuter, P. (2000). *Some simple economics of illegal drug markets and violence*. Santa Monica: Rand Drug Policy Research Centre.
- Thurman, V. A. (2001). The point of triangulation. *Journal of Nursing Scholarship*, 33 (3), 253 – 258.
- Topp, L. & Churchill, A. (2002) Australia's dynamic methamphetamine market. *NDARC Drug Trends Bulletin, June 2002*. Sydney: University of New South Wales.
- Topp, L., Darke, S., Bruno, R., Fry, C., Hargreaves, K., Humeniuk, R., McAllister, R., O'Reilly, B. & Williams, P. (2001). Australian Drug Trends 2000: Findings of the Illicit Drug Reporting System (IDRS). *NDARC Monograph No. 47*. Sydney: University of New South Wales.
- Topp, L., Kaye, S., Bruno, R., Longo, M., Williams, P., O'Reilly, B., Fry, C., Rose, G. & Darke, S., (2002). Australian Drug Trends 2001: Findings of the Illicit Drug Reporting System (IDRS). *NDARC Monograph No. 48*. Sydney: University of New South Wales.
- van Beusekom, I. & Iguchi, M. (2001). A Review of Recent Advances in Knowledge About Methadone Maintenance Treatment, RAND. <http://www.rand.org/publications/MR/MR1396/>
- Varescon, I., Vidal-Trecan, G., Nabet, N. & Boissonnas, A. (2002). Buprenorphine deviated from normal use: the buprenorphine injection. *L'Encephale*, 28(5), 397 – 402.
- Victorian Department of Human Services. (2002a). Injecting temazepam: The facts. *Fact Sheet*. Melbourne: Department of Human Services, Victoria.
- Victorian Department of Human Services. (2002b). The Victorian drug statistics handbook - 2002. Patterns of drug use and related harm in Australia. Melbourne: Department of Human Services, Victoria.
- Victorian Department of Human Services. (2004). The Victorian Drug Statistics Handbook 2003: Patterns of drug use and related harm in Victoria. Melbourne: Department of Human Services, Victoria.
- Victoria Police (2004). An investigation guide to pharmaceutical drug trafficking and use. Victoria Police Drug and Alcohol Strategy Unit. Melbourne: Victoria Police.
- Wallington, J., Gerostamoulos, J. & Drummer, O. (2002). Heroin deaths in Victoria: 2001. Melbourne: Victorian Institute of Forensic Medicine and Department of Forensic Medicine, Monash University.

- Waltzman, M. L. (1999). Flunitrazepam: a review of 'roofies'. *Pediatric Emergency Care*, 15(1), 59 – 60.
- Wastila, L. & Bishop, C. (1996). The influence of multiple copy prescription programs on analgesic utilization. *Journal of Pharmaceutical Care and Pain Symptom Control*, 4(3), 3-19.
- Weatherburn D. & Lind, B. (1997). The impact of law enforcement activity on a heroin market. *Addiction*, 92(5), 557 – 569.
- Weatherburn, D. & Lind, B. (1999). Heroin harm minimization: do we really have to choose between law enforcement and treatment? *Crime and Justice Bulletin*, Number 46. NSW Bureau of Crime Statistics and Research.
- Weatherburn, D., Lind, B., & Forsythe, L. (1999). Drug law enforcement: Its effect on treatment experience and injection practices. *General Report*. Sydney: NSW Bureau of Crime Statistics and Research.
- Weatherburn, D., Jones, C., Freeman, K. & Makkai, T. (2001) The Australian Heroin Drought and its Implication for Drug Policy. *Crime and Justice Bulletin*, No. 59. Sydney: NSW Bureau of Crime Statistics and Research.
- Weatherburn, D., Topp, L., Midford, R. & Allsop, S. (2000). Drug crime prevention and mitigation: a literature review and research agenda. <http://www.lawlink.nsw.gov.au/bocsar>.
- Wei, Z., Makkai, T. & McGregor, K. (2002). Modelling illicit drug use, criminal offending behaviour and treatment in the criminal justice population: an overview. Canberra: Australian Institute of Criminology. <http://www.aic.gov.au/research/projects/0042.html>.
- Weierter, S. & Lynch, M. (2002). Drug use and crime: Findings from the DUMA Survey. Brisbane: Crime and Misconduct Commission.
- White, M.D. & Luksetich, W.A. (1983). Heroin: Price Elasticity and Enforcement Strategies. *Economic Inquiry*, 21(4), 557 – 564.
- Wilce, H. (2004). Temazepam capsules: what was the problem? *Australian Prescriber*, 27(3), 58 – 59.
- Williams, P. (2001). Illicit drug use in regional Australia, 1988 – 1998. *Trends and Issues in Criminal Justice*. No. 192. Canberra: Australian Institute of Criminology.
- Williams, P. & Morris, L. (2000). Drug use careers of offenders (DUCO) Tasmanian sample. *Final Report* (In confidence). Canberra: Australian Institute of Criminology.
- Williams, P., White, P., Teece, M. & Kitto, R. (2001). Problem-oriented policing: Operation mantle – a case study. *Trends and Issues in Criminal Justice*. No. 190. Canberra: Australian Institute of Criminology.
- Zacny, J., Bigelow, G., Compton, P., Foley, K., Iguchi, M. & Sannerud, C. (2003). College on Problems of Drug Dependence taskforce on prescription opioid non-medical use and abuse: position statement. *Drug and Alcohol Dependence*, 69, 215 – 232.